FINAL REPORT

FOR

ENERGY SECTOR PROJECT

EMERGENCY HEAT AND POWER PROJECT NO. 1

PROJECT NO 438-0003

VOLUME I

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Prepared by Raytheon Engineers & Constructors

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EXECUTIVE SUMMARY

Raytheon Engineers & Constructors Inc , which is a consolidation of United Engineers and Constructors and the Badger Company, (RE&C) conducted feasibility studies funded by a US Trade and Development Program grant (TDP) under a contract with the Mongolian Fuel and Energy Ministry (Ministry) to evaluate the conditions and needs of the energy sector, including power plants, electric power transmission and dispatch facilities and district heating systems Included as a part of the studies were evaluations of the energy sector, district heating, dispatch facilities and energy sector organization, management, accounting revenue and information systems

The effort included on-site surveys, interviews and meetings with Ministry personnel to review findings, develop budgetary cost estimates and make recommendations for equipment, material or structures replacement, repair or upgrade

As a result of this effort RE&C identified a need to assist the Ministry in procurement of critically needed spare parts for its power and heating plants This subsequently resulted in a contract to RE&C by US AID (AID) titled or known as the Mongolia Emergency Heat and Power Project No 1 Soon after the contract to provide assistance for the power plant sector was signed, RE&C was requested by AID to provide assistance in the coal mine sector Because RE&C lacked technical expertise in coal mining engineering and operations and maintenance, AID initially utilized Parsons-Maine, Inc (PMI) to assist RE&C, which focused on coal mine sector procurement Later in the project PMI's assistance was withdrawn and AID instructed RE&C to issue a sole source subcontract to Morrison-Knudsen Corp (M-K) to provide coal mine sector technical assistance

This project initially involved the engineering, design, procurement, delivery and installation of equipment for all of the Ministry's major power plants plus an effort to provide instrumentation and controls for the coal pulverizing systems at Plant No 3 in Ulaanbaatar during the winter heating season of 1992-1993 The controls upgrade was required to mitigate frequent explosions at this plant The required equipment for the power plant sector and their order of importance were developed during the discussions and on-site surveys performed in developing and completing the feasibility study of the TDP project

In addition to having operational control over Mongolia's power plants, heating plants and coal mines, the Ministry also controls two semi-independent procurement companies, one for power and heating plant procurement (Erchim Impex) and one for coal mine procurement (Nuurs Co) The maintenance entry order and tracking systems in the power and heating plant sector are entirely manual with no adequate methods to track priority equipment/commodity needs Consequently, Erchim Impex ends up with large procurement lists for all power plants with little ability to distinguish priorities from one plant to the other Additionally, the procurement cycle tends to reflect annual requirements based on central planning concepts left over from Mongolia's recent past

As indicated previously, the initial power sector needs and priorities were reflected in a list of needed procurements developed by RE&C at the conclusion of the TDP study The methodology employed in the development of this list involved a series of meetings with the chief engineers of all of the significant power plants in Mongolia At these meetings, individual plant O&M needs were identified, prioritized and then force ranked for the power sector as a whole Subsequent to this effort AID and PMI personnel visited Mongolia without RE&C and met with Erchim Impex and Nurrs personnel This resulted in a different procurement list which was based on procurement priorities largely reflecting the procurement organizations' needs and priorities which did not, in cases, reflect the O&M needs of the power plants RE&C did not discover that key operations personnel were not involved in the PMI/AID meetings in Mongolia until much later in the project This resulted in much confusion and wasted time/effort in the power sector

It was discovered that there was wide spread confusion within the Ministry's procurement organizations (Nuurs and Erchim Impex) regarding the details of the AID assistance project Nuurs and Erchim Impex personnel both clearly believed that AID would simply transfer US dollars to them for procurement Thus, they entered into a series of "contracts" with Commonwealth of Independent States (CIS) Original Equipment Manufacturers (OEM's), without sufficient funds During a joint RE&C/AID meeting with the Ministry early in the project, AID's Mission Officer clearly stated that AID would not provide funds to cover these "contracts" Unfortunately, a prime driving force behind these procurement organizations was not to focus on operational maintenance needs, but rather to focus on procurement to "pay off" these "contracts"

In general, this was not the case in the coal mine sector The prime reason for this is that Nuurs has a much closer and more coordinated involvement with coal mine operations than Erchim Impex does with power and heating plant operations Another factor is the relative magnitudes of power sector procurement as compared to coal mine sector procurement (more power plants than coal mines and more parts/commodities in a power plant than in a coal mine operation) An obvious solution to these problems is a computer based maintenance order entry and tracking system for power plants and coal mines The need for this was identified and quantified by RE&C in the TDP feasibility study Copies of a report dealing with this issue were provided to AID by RE&C

For cost and schedule reasons, the majority of the mechanical parts and commodities needed in both the power/heating plant and coal mine sectors could only be provided by the OEMs in the former Soviet Union or CIS Making procurements in the CIS is extremely difficult and specialized procedures had to be developed to accomplish this (See section 4 1 of the Phase II Installation Strategy Report for specifics) Until the mechanical equipment for which parts are required is retired or replaced, this will always be true However, if more time and money becomes available, more procurements can be made in the US The approximate dollar value of CIS procurement will ultimately amount to approximately $5,392,000 The dollar value of US procurement will amount to approximately $3,147,000, including freight forwarding costs The total dollar value of the UE&C/AID contract is $10 735 million, including change orders of $500,000, $1 3 million and $135,000

During the spring of 1993, value engineering services were provided under the Component I RE&C Contract for the power plant and coal mine sectors The products of this effort included the development of recommended spare parts lists for the 1993/1994 and 1994/1995 heating seasons, recommendations for improvements for plant and mine operations and maintenance, and detailed recommendations for restructuring the existing spare parts inventory control and ordering systems

An RE&C procurement specialist traveled to Mongolia in March 1993 to obtain background data Through his work and cooperative efforts by Erchim Impex and the Ministry, RE&C developed prioritized lists of critical spare parts for Power Plant No 3 and the Darkhan Plant Recommendations for capital improvement programs to improve power plant housekeeping and maintenance were made together with estimates of cost

An O&M training program outline was prepared for the power plant sector focusing on the needs of Power Plant No 3 and the Darkhan plant, together with a schedule and detailed estimate of cost to implement the program RE&C also prepared an outline for a minimum level Total Resource Allocation and Control (TRAC) system to integrate spare parts and equipment management data with preventative and outage maintenance planning

Under the subcontract to Morrison Knudsen, RE&C provided for value engineering and technical assistance services for the coal mine sector During the spring, M-K developed detailed procurement recommendations, developed an outline for training improvements, and prepared a series of recommendations for spare parts inventory and ordering system improvements

At the request of AID, M-K also provided a management overview study for the Shivee Ovoo Mine, which included a conceptual mine plan, capital and operating cost estimates, and schedules for engineering and construction

The lists of priority spare parts for the power plant and coal mines, recommended power plant capital improvement programs, training program outlines, cost estimates and schedules were documented for presentation at the Value Engineering (VE) Session held in Mongolia during the last week of April The VE work prepared under this contract will enable the next phase contractor to start with sufficient background and prioritized listings of procurements in sufficient time to expedite the purchase and delivery of equipment and materials prior to the start of the next heating season

In conclusion, the overall success of this project (which can only be qualitatively established with the passage of time) was adversely impacted by two significant events The first is the late date of contract signing (September 30, 1992, two weeks before the start of the heating season) and the second was the almost total cessation of rail freight movement in the Russian rail system There were reasons for both of these events but there proved to be precious little that RE&C could do about them

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1.0 INTRODUCTION

This report constitutes the Final Report prepared by Raytheon Engineers and Constructors under Contract No 438-0003-C-00-2350-00 for the US Agency for International Development (AID) - Thailand The work has been performed in accordance with the Contract scope of work as defined in , Section C, Articles I through V and Amendments Numbers 1, 2 and 3

The Government of Mongolia continues to be faced with an on-going crisis in its power/energy and mining sectors The primary factors contributing to the crisis include a) outdated power plants and central hot water heating systems designs b) lack of spare parts and/or the necessary hard currency to purchase replacement parts c) lack of heating oil to supplement the firing of low grade lignite fuel, d) inefficient mining, fuel preparation, and transport systems and e) limited knowledge of energy conservation measures (ECMS) and the lack of expertise and material to implement the ECMS

To further compound these issues, maintenance, repair and upgrade of systems and equipment which are in-place is even more difficult, due to the fact that all of the equipment is of Soviet or Eastern European origin

AID retained Raytheon Engineers and Constructors (RE&C, formerly United Engineers and Constructors) for engineering procurement/ installation expertise to identify problem areas, propose solutions, and provide domestic and overseas procurement and technical services to the power plant and coal mine sectors This report presents a summary of the work which has been accomplished in the three completed project phases

Report contents are organized by Phase highlighting major project accomplishments and milestones

Included in the appendix are copies of the Phase I Report and the Phase II Installation Strategy Report which have been previously submitted

The Phase I Interim Report outlined the proposed procurement plan and provided a preliminary list of items recommended for procurement for the power plants The Phase II Installation Strategy Report documented equipment procurement procedures, shipping and acceptance procedures, described the instrumentation and controls modification scope, installation plan for the new control systems and testing procedures Most importantly, the Phase II Installation Strategy Report summarized the history of the project procurement process during Phases I and II and addressed problem areas related to establishing purchasing priorities

A copy of the Phase III Activity Summary Report is provided in the Appendix to document the accomplishments of the Phase III installation work This report includes a description of the systems installed, discusses the benefits provided by the new hardware and systems, and documents the status of the field testing and system tuning program as of April 30, 1993, the date of departure from Mongolia of the field supervision team

Copies of reports documenting the activities of the project's coal mine technical service sub-contractor, Morrison Knudsen Corporation, have been included for reference in Appendix I

2 0 PURPOSE AND SCOPE

The objective of this project was to identify problem areas likely to prevent safe and efficient operation of Mongolia's power plants during the winter of 92/93, b) develop solutions to the defined problems, c) purchase and deliver necessary spare parts and commodities required to effect the solutions, and d) provide technical assistance to assure proper installation and operation of new equipment or systems provided to improve plant operations

Specific tasks which were initially defined for accomplishment of the stated objectives included the following

a Building on the experience gained from the completed TDP Feasibility Studies, RE&C was to observe and analyze the coal supply, preparation and handling operations at Power Plant No 3 in Ulaanbaatar and the Darkhan Plant to identify problem areas and areas requiring improvements Specific attention was to be paid to identifying the cause of explosions at Power Plant No 3 and designing corrective actions

b Observe and analyze Power Plant No 3 and Darkhan station power and district heating systems and identify repairable /replacement parts necessary to maintain 92/93 heating season operations

c Review the possibility of using spare parts from similar eastern European plants, using the assistance of a Mongolian Ministry engineer

d Prepare equipment, commodity and instrumentation specifications required for procurement on an expedited basis

e Procure equipment and supplies in accordance with AID regulations and direction received from the AID project office

f Arrange for transport, export, receipt and storage of all spare parts, commodities and equipment prior to transfer to the GOM

g Manage, supervise and where necessary provide technical installation assistance for installation of new systems which initially included new Feedwater Evaporators and new boiler plant instrumentation and control systems The scope of work for the feedwater evaporators was subsequently deleted during the project by AID and the GOM

h Provide technical assistance in the testing and check-out of instrumentation and control systems to assure proper operation

i Provide all necessary engineering support and technical assistance, as directed by AID, to keep power supply and district heating systems operating during the 92/93 heating season

Completion of the work tasks was originally scheduled to be accomplished in four phases defined by AID as follows

Phase I — An initial work phase to include identification of problems, initial determination of emergency procurements and development of lists, specifications, and processes

Phase II — A project phase which included finalization of equipment specifications, inquiry documents, purchase of spare parts, related commodities, and required tools for installation, packing and shipment of procurements

Phase III — This was primarily a field phase which was to focus on receiving of shipments, and provision of technical assistance to oversee the installation and testing of new power plant equipment and systems

Phase IV — This was a phase identified to provide additional services such as engineering, procurement, shipment of equipment and supplies and installation assistance if necessary, and requested This Phase was defined originally to extend to June 30, 1993 Project funds allocated for Phase IV services were transferred by a Contract Modification to provide additional funds for Phase II equipment procurement during February of 1993

3.0 SUMMARY

1 Accomplishments

The purpose of the AID Grant Project to the Government of Mongolia (to the Fuel and Energy Ministry) was to assist the Mongolians in their attempt the provide reliable heat and power to the population during the 1992 - 1993 heating season

Funding to accomplish the objective was limited and fell short of the needs of the power plant and coal mine sectors

The needs of the power/heating plants and coal mines are extensive and continued procurements and technical assistance must be provided to sustain operation of the country's district heating and power distribution systems in the future Recommendations for future procurements and technical training were presented by RE&C at the April 1993 Value Engineering Session

Within the limitations of available funding, RE&C provided engineering, procurement and technical assistance to both the power plant and coal mine sectors The following briefly summarizes the major accomplishments of this project Further detail of supporting services provided is described in the report and appendix sections which follow

a In Phase I, RE&C's instrumentation and control's team provided detailed recommendations for improving pulverized coal feed system operations at Power Plant No 3 in Ulaanbaatar Due to limitations in project funding, work scheduled for the Darkhan Power Plant had to be postponed

The recommendations resulted in the procurement and installation of $750,000 of new systems and hardware to automate pulverized coal feed controls and provide alarm systems to alert plant operators of coal flow supply problems within the bunkers and at the high pressure boiler burners These improvements are an important first step toward providing a state-of-the art boiler control system The modifications and systems were designed to be expanded upon in the future as additional funding becomes available

b In Phases I and II, RE&C technical specialists provided detailed recommendations for new parts, systems and consummables necessary to keep the power plants operational during the 1992/1993 heating season and for the near future

Engineers travelled to Mongolia in October and December of 1992 and January 1993 to coordinate procurement requirements and purchasing priorities with AID, the Ministry of Fuel and Energy, plant O&M personnel, and the government's procurement agencies, Erchim Impex and Nuurs

A similar effort was provided during Phase II by the Morrison Knudsen team with coal mine O&M and Ministry personnel

Lists for procurement of power plant and coal mine equipment, spare parts, and consummables were developed, prioritized and reviewed with AID These items were placed on a project engineering and procurement schedule Numerous revisions were made to the engineering and procurement schedule during the course of the project as a result of priority changes which were driven by the changing nature of the O&M requirements of the power plants and coal mines and by conflicting objectives within the Ministry (specifically the objectives of the operating personnel and those of the procurement organizations which were not always the same)

As a result of these changes in direction a number of items were deleted from the priority list, and not purchased Typical items included in this category of deleted equipment included Feedwater Evaporators, Boiler Feed Pumps, District Heating System Heat Exchangers, Pulverizer Spare Parts, Turbine Auxiliary Systems and Ash Sluicing System Pumps and valves

For technical, cost and schedule reasons, a large amount of the parts and commodities which were needed for the power/heating plants and coal mines could only be provided by original equipment manufactures in the former Soviet Union or Commonwealth of Independent States (CIS) The Installation Strategy Report, which is included in the final report appendix, documents the history of the entire procurement process including CIS procurements

The need for sourcing spare parts from the CIS will continue to be an issue until mechanical equipment for which parts are required is retired or replaced

Overall, RE&C placed forty-four purchase orders for power plant and coal mine procurements Total dollar value of procurements including freight forwarding costs is approximately $8,539,000

c Technical assistance was provided by an RE&C field team to supervise the installation, testing, and check-out of instrumentation and control systems provided by this project The work completed during Phase III of the project is described in detail in the Phase III Activity Summary Report included in the appendix

The team was successful in completing the installation of all system hardware, and provided training to enable the plant operating staff to complete checkout and tuning of control systems on boilers and auxiliaries which were unavailable for final checking and testing (due to need to keep the boilers on-line or due to boiler outages, equipment related issues, i e boiler re-tubing or pulverizer outage)

d The project provided value engineering services including listings of recommended spare parts for the 1993/1994 and 1994/1995 heating seasons, recommendations for O&M training improvements, and spare parts inventory control system improvements for the power plant and coal mine sectors

An RE&C procurement specialist travelled to Mongolia in March, 1993 to develop a prioritized list of critical spare parts for the power plants, and met with representatives of the Central Energy System, the Power plant O&M staff, and Erchim Impex An O&M training program was developed focusing on the needs of Power Plant No 3 and the Darkhan plant during the next two years RE&C also prepared an outline for recommended improvements to the spare parts inventory system for the power plants

Under a sub-contract to Morrison Knudsen Corporation (M-K), RE&C provided for value engineering and technical assistance services for the coal mine sector

Value engineering included the development of detailed procurement recommendations, development of an outline for training improvements to be instituted at the coal mines, and recommendations for spare parts inventory and ordering system improvements The M-K field team also provided instruction in the use of state-of-the art explosive blast delays

A management overview study for the Shivee Ovoo mine was prepared by the Morrison-Knudsen Corporation This study included development of a conceptual mine plan, capital and operating cost estimates, and schedules for engineering and construction

Value Engineering Recommendations for the coal mine sector and the management overview study have been documented and are presented in Appendix I

4.0 PHASE I WORK ACCOMPLISHED

4.1 General

The project was originally organized to be executed in four distinct project phases The first phase was intended to be a planning phase during which RE&C was to identify deficiencies noted within the power plants, in particular the causes of explosions at Power Plant No 3, determine needs for spare parts, and develop procurement lists, specifications and a procurement plan addressing purchasing procedures and decision making processes

Phase I was scheduled to extend from July 15 to september 30, 1992

Major tasks accomplished during this phase included

- Completion of a plant inspection to survey existing instrumentation and control systems and review boiler pulverized coal feed systems This survey was made by a RE&C instrumentation and controls team during a trip to Mongolia from July 16 to July 31, 1992

- Preparation of a Phase I Interim Report which outlined the proposed RE&C procurement plan and presented a preliminary listing of recommended I&C components and priority spare parts for procurement

- Attendance at a status planning session held at the AID/Washington office from August 18 through August 20, 1992 The purpose of the planning session meetings was to review the project procurement plans, perform value engineering and finalize a priority listing of critical spare parts for the coal mine and power plant sector

- Completion of a field trip to Germany by a RE&C engineer to identify, select and arrange for shipment of surplus spare parts offered by the German government for use in the Mongolian power plants

- Development of the engineering and procurement schedule to be used as a basis for project critical parts and system procurements

4 2 Pulverized Coal and Plant Instrument and Control Inspection

During the period from July 16 to July 31, 1992, Mr William Cunningham, Chief Instrumentation and Controls Engineer for the Boston Office of RE&C, led a field survey of plant control systems, pulverizer and boiler operations He was accompanied by Mr Arkardi Katsnelson, an instrumentation and control specialist who is fluent in Russian and also functioned as the team interpreter Both gentlemen had visited Mongolia previously during the winter of 1991/1992, as part of the engineering team which completed feasibility studies for plant rehabilitation funded by a U S trade and Development Program grant

The intent of the July survey was to build on knowledge obtained during completion of the feasibility study, by reviewing current boiler operating conditions and parameters, and provide recommendations for improvements to plant control systems at Power Plant No 3 to reduce the possibility of pulverizer explosions and improve boiler availability

As a result of this trip, RE&C engineers prepared a listing of systems and hardware recommended for procurement This list became the basis for the instrumentation modifications work Items included in the original list were

- New transmitters to replace current units
- Replacement motors for damper drives
- No coal alarm for feeders
- New RTD's for pulverizer outlet temperature measurement
- New RTD's & meters to monitor transport air temperatures
- New controllers for pulverizer temperature and pressure control
- New flame scanners and cooling air fans
- Oxygen analyzer for boiler outlet

A copy of the report describing details of the July, 1992 field trip is included in Appendix B of the Installation Strategy Report The Installation Strategy Report is its entirety has been included as an attachment to this Final Report as Appendix E

4 3 Phase I Interim Report

The Phase I Interim Report was prepared in August and submitted to AID/Washington on August 14, 1992

This report documented the procurement plan proposed by RE&C and provided a preliminary list of items recommended for procurement for the power plants

The RE&C plan focused on accomplishing the following sequences of tasks to procure equipment and supplies in accordance with AID regulations

a RE&C would solicit firm priced proposals from Vendors for commodity items and engineered equipment The plan was to request proposals to be submitted within a two (2) or three (3) week span of time, depending on the nature of the item

b Detailed procurement/shipping schedules were to be developed after receipt of proposals incorporating the vendor's best expedited shipping dates

c RE&C proposed that a go/no go decision strategy be incorporated to determine shipping means If it were determined that the parts could arrive in time to be of value for the heating season, the decision would be to ship (go) via air transport (provided that the cube/weight ratio were not high) If it were determined that the parts could not arrive in time for the heating season, the decision would be a "no go" and shipment would be provided by ocean transport

d RE&C was to perform bid evaluations for the procurements and forward the evaluations, with the recommended successful bidder identified, to AID/Washington for approval prior to placing purchase orders

e RE&C was to consider higher grade material and technology offered by United States suppliers as options

f Inquiry Documents would be sent to Russian OEMS and United States OEMS The decision to place the purchase order would take into account

1 Ability to supply the part
2 Schedule
3 Price

4 4 Status/Planning Session Meetings

A series of meetings were held at the AID/Washington office from August 18 through August 20, 1992 to review the status of work performed to that date on the Mongolian Emergency Heat and Power Project The meeting was attended by representatives of AID Washington, Parsons-Main, and Mr Richard Kelley, project manager for RE&C's work on the Component I Contract

At this meeting AID advised RE&C to procure all items, including parts and equipment for the coal mine sector based on spare parts lists developed by Parsons Main (PMI) from their own in-country surveys

The primary products of these meetings which had a direct impact on the course of the project included the development of a procurement plan and list of recommended procurements of critical spare parts These resulted from value engineering work performed during the meetings by AID, RE&C and PMI and from input Parson-Main (PMI) obtained from Erchim Impex and NUURS personnel during the PMI field trip to Mongolia Erchim Impex and Nuurs are the central Mongolian agencies responsible for power plant and coal mine equipment procurement

4 5 Engineering and Procurement Schedule

Information taken from the AID planning session meeting notes formulated the basis of the initial issue of the RE&C Engineering and Procurement (E/P) schedule developed for the power plant and coal mine procurements

At the date of the initial issue of the E/P schedule, further development of equipment specifications, and finalization of inquiry documents for some items required additional detailed technical information from the Fuel and Energy Ministry and Parsons-Main Although RE&C initiated issue of inquiry documents to prospective vendors for those items for which technical data was available, RE&C was not in a position from mid to late September to issue any purchase orders for items listed on this E/P schedule This was due to the fact that the contract was not finalized and RE&C had not received authorization from AID/Thailand to proceed

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In retrospect not having authorization to purchase equipment and materials in September was a fortunate circumstance as it saved the project from spending millions of dollars unnecessarily It would be learned during a field trip made to Mongolia in early October to finalize details for installation of the feedwater evaporator system, that the equipment shown on this initial E/P schedule reflected priorities of the procurement organizations and did not reflect the actual O&M needs of the power plants and coal mines RE&C eventually discovered that key operations personnel were not involved in the PMI/AID meetings held in Mongolia in the Summer of 1992

As a consequence, the engineering team returned from the October field trip with a totally revised listing of equipment procurements for the coal mines and the power plants

This revised list would form the basis for equipment and materials purchased during Phase II

4 6 German Plant Survey

The project scope of work defined as a task the review of the possibility of using surplus spare parts from similar Russian built pulverized coal (PC) fired power plants located in eastern Europe which were being dismantled

In early September, 1992, Mr Roger Wessel, of RE&C, was dispatched to Berlin to assist a team sent from Mongolia composed of Messrs Sukbaatar, Ganjuur and Davaarsuren, in their search for spare parts/components and systems from plants located in the former East Germany

During the trip, it was determined that 1) the pulverized coal plants being dismantled near Halle, Germany were Russian designed plants, 2) only used parts from the plants were available, 3) the German utility was familiar with the needs of the Mongolians and had already set aside certain used components, 4) the Mongolian team was inspecting and selecting used parts from the plant being dismantled near Halle, and 5) the team planned to visit German designed/supplied PC plants being dismantled near Dortmund in western Germany to see if other makes of used components could be used as substitute items in the Mongolian plants

The project's charter regarding the purchase or transport of surplus parts had been clearly defined in correspondence from AID RE&C had been instructed to identify, select, and arrange for shipment of new spare parts that were designated as surplus Our direction stated that the project was not to become involved in the transport of any used parts

Based on these specific instructions, no further action by RE&C resulted from the trip to Germany, nor were any project funds used to transport surplus used equipment which had been cannibalized from the demolition of the German power plants

6 0 PHASE III

1 General

Phase III was specified to be a field execution phase during which shipments of equipment and materials would be received and technical assistance would be provided to oversee the installation and testing of instrumentation and control systems recommended and purchased in Phases I and II to improve pulverizer operations

Phase III had been projected to start as early as September 15, 1992 and conclude on or about December 15, 1992 Unfortunately, due to a variety of circumstances, Phase III work did not initiate in principal until January of 1993 after the arrival of the first shipment of priority cargo in the December, 1992 air charter

Delay in the start of Phase III was in part due to the delayed start of the purchasing effort Authorization to purchase equipment and materials for the power plant was not received until late September Authorization to purchase equipment and materials for the coal mines was received subsequently in late October

Problems encountered finalizing the purchasing priority requirements and difficulties obtaining resolution of detailed technical issues delayed procurement and extended the time required to obtain equipment deliveries beyond the dates necessary to permit overseas ocean shipment and delivery of US sourced equipment before the end of the year

During the Fall of 1992, Raytheon Engineers and Constructors placed purchase orders for a wide array of power plant and coal mine items including custom engineered plant instrumentation and control system hardware During this period every effort was made to expedite shipment from the vendors to enable the possibility of an expedited shipment prior to the start of the peak of the heating season

In mid-December, after consideration of other alternatives, and accumulation of over 244 tons of cargo, approval was granted to provide for the airlift of priority cargo to Mongolia which included control hardware as well as other power plant and coal mine equipment and materials

In January, a team of RE&C field personnel, including Mr Robert Beck, an Instrumentation and Control Engineer, Mr Philip McCandless, an Electrical Test/Start-up Engineer, and Mr Gerald Paradysz, a RE&C Field Inspector traveled to Mongolia to complete Phase III work

This team returned to the United States on April 30, 1993 after completing mechanical/electrical installation work at Power Plant No 3 and receipt and inspection for the bulk of the equipment scheduled for procurement in the October 1992 priority list Mr Samuel Bailey, a replacement for Mr Paradysz, arrived in-country on April 25, 1993 to receive and inspect deliveries of equipment, parts, and consummables purchased with project supplemental funds provided in Contract Modification No 2 Mr Bailey's assignment extended through May 1993

In March, Mr Solomon Feldman, a member of the RE&C procurement team, who is fluent in Russian, arrived in Mongolia to obtain field information to complete value engineering services including development of prioritized spare parts lists for the power plant sector

These lists were presented at the value engineering session conducted in country at the end of April and will be used by the Component III contractor as a basis to define the scope of procurements for the 1993/1994 and 1994/1995 heating seasons

Significant milestones for the period from January through May 1993, and major tasks accomplished during Phase III included the following

- Receipt and Inspection of US and CIS sourced procurements by a joint team comprised of RE&C's field inspector and a representative of the Mongolian Fuel and Energy Ministry

- Installation of control hardware and systems to provide for pulverizer air discharge temperature and pressure control, no coal flow alarm, and burner flame scanners for the high pressure boilers at Power Plant No 3

- Completion by RE&C of value engineering work for the power plants including inspection of existing material supplies, development of prioritized spare parts lists for the power plants, development of an O&M training program outline, and recommendations for improvements to the maintenance order entry and tracking system

  A separate program was provided for the coal mine sector as part of the continuing technical services scope provided by Morrison Knudsen as a change order to a Phase II service sub-contract

- Attendance and participation at the value engineering seminar conducted in Mongolia during the period from April 29 through May 2, 1993

  During the period extending from the end of May through July, the RE&C home office team coordinated final arrangements for transportation, customs clearance, security and final payment of shipments of CIS sourced power plant and coal mine equipment and material which had not arrived in Mongolia prior to the departure of the RE&C inspector In-country inspection and receipt services for shipments which arrived after May 28, 1990 were performed by the Morrison Knudsen Corporation using staff who were in-country under the Component III Contract

6 2 Receipt and Inspection of Procurements

In January 1993, Mr Gerald Paradysz was assigned to the RE&C in-country office to provide project liaison with the Fuel and Energy Ministry and the AID/Mongolia office and provide material receiving services

Mr Paradysz's prime responsibility was to provide inspection of incoming material and equipment shipments He was responsible for documenting the condition of each shipment and for executing the transfer of the shipments to the Fuel and Energy Ministry

During the period from January though April, Mr Paradysz worked closely with the designated Ministry representative and inspected, cleared, and transferred to the Ministry all shipments received in-country

On April 25, Mr Samuel Bailey, an RE&C field inspector was assigned to the Ulaanbaatar field office to assume the duties of Mr Paradysz for the remainder of the project

Mr Bailey was responsible for the inspection of remaining shipments of goods purchased with project supplemental funds during February, 1993 He was also responsible for in-country project closeout including the turnover of "government furnished" communications and office equipment which had been purchased using project funds A complete inventory of the equipment turned over to the Component III Contractor is included in Appendix G

6 3 Pulverizer Instrumentation and Controls Installation

During Phase I, a team of RE&C instrumentation and control engineers completed a site survey of existing pulverizer and boiler controls The team developed specific recommendations for the purchase of new hardware and systems to reduce the potential for pulverizer and furnace explosions at Power Plant No 3 Due to limitations in project funding, the intent was to furnish basic control devices and systems which would alert the plant operators of potential problems and provide basic control of the pulverizer systems

Control hardware and systems were purchased and shipped to Mongolia during Phase II

Items purchased using project funds included

- New transmitters to replace current, inoperable units
- Replacement motors for three (3) damper drives
- Loss of Coal Flow Alarms for Raw Coal Feeders
- New RTD's for measuring pulverizer outlet temperature
- New RTD's and meters on control board to monitor transport air temperature
- New Controllers for pulverizer temperature and pressure
- New damper operators for coal pulverizing mill flow control dampers
- New flame scanners and scanner cooling air system (high pressure boilers)

During the period from January through April 1993, a RE&C field team provided Phase III engineering services which included supervision of installation, testing, and checkout of instrumentation hardware and systems

Installation of flame scanner system hardware was completed as scheduled on six of the seven high pressure boilers Work on Boiler No 13 was not programmed as the boiler had been the scheduled by the Ministry to be out of service for an extended period (2 years) The scanner cooling air system was installed and is fully operational

Installation of No Coal Flow Alarms on the low pressure and high pressure boilers was completed Pulverizer Temperature and Pressure Control System hardware installation was completed, however, functional testing and tuning of control systems could not be completed on some units due to a variety of causes including boiler outages and malfunctioning of boiler auxiliaries including pulverizers and air heaters

A detailed report of the status of the field installation work accomplished, discussion of operating improvements provided by the new hardware, and status of system testing and turnover is documented in the Activity Summary Report prepared for Phase III which is included as Appendix F of this report

6 4 Value Engineering for the Power Plant Sector

6 4 1 Critical Spare Parts

In March, 1993, Mr Solomon Feldman, an RE&C procurement specialist, traveled to Mongolia to obtain background data to develop a prioritized list of critical spare parts for the power plants for 1993/1994 and 1994/1995 heating seasons The list developed by RE&C list will be valuable in assisting the Ministry as well as the Component III Contractor in the execution of the contract for the on-going critical spare parts procurement program The work will enable the next phase contractor to start with a prioritized listing of procurements in sufficient time to permit purchase and delivery of equipment prior to the start of the next heating season

During his trip to Mongolia, Mr Feldman met with Minister Jigjid, representatives of the Central Energy System, Erchim Impex, and power plant operating personnel He visited Power Plants Numbers 3 and 4 in Ulaanbaatar and traveled to Darkhan to collect detailed technical data and verify spare parts requests

He also surveyed the central machine repair shop which was constructed 3 years ago This shop has over 200 workers who produce or refurbish air heaters, economizers, impellers, couplings, gear housings, gears up to 800 mm dia, coal dust ducts, and rehabilitates AC motors in sizes up to 6000 volts His visit confirmed that the shop has the basic tools to rehabilitate power plant equipment but lacks materials and specialized technology The shop is in desperate need of wire for motor re-winding, motor insulation, and alloy steel for shafts During discussions with the machine shop staff, the Mongolian technicians also confirmed the need for specialized training on topics such as gear rehabilitation, machining, surfacing (hard facing), and post-weld heat treatment

As part of his assignment, Mr Feldman inspected the Erchim Impex warehouse to verify the extent of the inventory of spare parts

Through his work and cooperative efforts by Erchim Impex and the Ministry, spare parts lists were developed for Power Plant No 3, Power Plant No 4 and the Darkhan plant The data contained in these lists was subsequently used to establish prioritized procurement lists for the Value Engineering session

6 4 2 Recommended Plant Improvements

As a result of his plant and repair facility inspections, Mr Feldman also prepared a series of recommendations for improving plant housekeeping and boiler operations

The recommendations were presented at the April value engineering sessions held in Mongolia RE&C documented two capital improvement programs to improve plant lighting and to provide for plant vacuum systems Costs estimates and system descriptions for these recommended modifications are included in Section 5 0 of the Activity Summary Report which is included in the Appendix of this report

6 4 3 O&M Training

RE&C prepared an O&M training program outline for the power plant sector for presentation at the April value engineering session The O&M training program focused on the needs of Power Plant No 3 and the Darkhan Power Plant during the 2 1/2 year period of the Emergency Spare Part Component III program

The goals of this O&M training program developed by RE&C were defined as follows

1 To Develop administrative procedures
2 Develop technical procedures
3 Develop a plan for improving plant maintenance
4 To train maintenance personnel

The RE&C training outline was based on field information gathered and observations made during plant inspections by a RE&C operations specialist during the execution of the Plant Feasibility Studies for the TDP program and knowledge gained during the ESP Component I project

The training outline recommended a six step program for training Energy Ministry, plant management and maintenance personnel All training was scheduled to take place in Mongolia The outline included a suggested schedule for the Component III Contractor to teach technical English, prepare training materials, translate existing procedures, document new procedures and conduct both on-the-job and formal training sessions

A detailed estimate of cost to implement the recommended RE&C training program was provided The total cost for program implementation was estimated to be $384,000

A copy of the O&M training program outline, together with schedule and cost estimate detail is included in Appendix H of this report

6 4 4 Spare Parts Ordering Improvements

During the course of completion of the TDP feasibility study, RE&C observed deficiencies in existing management programs which govern power plant operations, preventative maintenance, outage planning, and spare parts inventory control

Major problems identified at that time included the lack of spare parts, poor maintenance and operating practices, and an maintenance management system which lacks proper validation

RE&C has observed that the system which is currently in place has many of the elements necessary for effective inventory control, but these elements are not being utilized and are not effective

RE&C prepared an outline for recommended improvements to the spare parts inventory system A Total Resource Allocation and Control (TRAC) System was recommended to integrate spare parts and equipment management data with preventative and outage maintenance planning The TRAC system is a computer based data base and maintenance management system which is capable of providing the element of automation and validation which is missing from the current management system

A five step program for the set-up and customizing of a TRAC system for the power plants was devised The five steps are

Step 1 System Audit
Step 2 System Specification
Step 3 System Modification
Step 4 System Testing
Step 5 Hardware Acquisition and Set-Up

RE&C also recommended a series of training programs to support system implementation A three part program was proposed for training of Mongolian personnel (one administrator and two system experts per plant) in the United States

A separate training phase was projected for in-country to provide TRAC system training to the facility personnel This program would be established by a TRAC system specialist with input from Mongolian systems experts trained in the United States The bulk of the training would be conducted by the Mongolian experts

A 14-month schedule was proposed for customizing, set-up, training, data collection, and implementation support

The cost to provide system hardware and training for Power Plant No 3 and the Darkhan plant was estimated to be $807,800

A copy of the interim spare parts improvement outline including a complete description of the TRAC system together with schedule and cost details are included in Appendix H

5 0 PHASE II WORK ACCOMPLISHED

1 GENERAL

Phase II of the project was intended to be a "procurement" phase during which RE&C would finalize equipment and commodities specifications, purchase spare parts and required tools to support any installation work in Mongolia, and make necessary arrangements for packing and shipping the purchased items to Mongolia

Phase II had originally been scheduled to commence when AID/Washington authorized the contractor to initiate procurement of the equipment and was to end with final equipment transport arrangements, on or about October 30, 1992 In hindsight this schedule could be termed as being optimistic as information regarding the initial procurement priorities was released in late August and technical information required to properly execute an inquiry or purchase order for coal mining and some power plant procurement was still not available to the RE&C in late September Correct detail information for most items was not received until the RE&C engineering teams returned from Mongolia in mid October with the "Revised Equipment Lists" and supporting technical information Procurement of items for which adequate technical detail was available could not be completed due to delays in receiving contract amendments/authorizations

RE&C eventually received contract authorization for $6 3 million dollars to purchase and deliver power plant parts on September 30, 1992

Authorization to proceed with procurement of urgently needed parts and consumable items for the coal mines was subsequently received on October 20, 1992

Even though there were delays in receiving proper authorization to purchase equipment, the RE&C team continued to issue specifications and inquiries to U S and Russian equipment suppliers

The groundwork expended during September and October resulted in the purchase of 244 tons of U S sourced power plant instrument and control system hardware, coal mine and power plant spare parts and consumable items Items deemed as being high priority were eventually shipped via Air Charter in mid December 1992 The balance of the U S sourced consumable items shipped via ocean transport and rail through Russia to Mongolia in late February

Significant milestones of Phase II included

- The RE&C field trip to Mongolia in October which re-defined project procurement priorities and provided constructive input invaluable to completion of the Phase II purchasing effort
- Receipt of contract authorization to purchase power plant equipment and spare parts on September 30, 1992
- Receipt of contract authorization to purchase parts and equipment for the coal mines on October 20, 1992

- Issue of sub-contract to Morrison-Knudsen Co to provide consulting services for coal mine operations Morrison-Knudsen engineers arrived in Mongolia on November 9, 1992 and departed on December 23, 1992

- Departure of an RE&C team to Moscow on November 13, 1992 to expedite solicitation of inquiries, evaluation of bids, and purchase of power plant and coal mine equipment in accordance with AID/Washington purchase directives and instructions

- Departure of the ANTONOV AN124 air charter on December 15, 1992

- Major revision to project E/P schedule resulting from AID correspondence dated December 26 and December 28, 1992 This correspondence verified the need for additional project procurements identified and recommended in RE&C letters to aid dated December 17 and 23, 1992

- Receipt of contract authorization to purchase supplemental equipment and additional technical support services dated February 2, 1993 This contract modification indirectly extended completion of procurement Phase II through the spring of 1993

- Last major revision to E/P schedule including revised project procurement priorities for new funding items resulting from meetings held in Mongolia the week ending January 23, 1993 with the Fuel and Energy Ministry

- Trip to Moscow, February 9 to 19, 1993 to make final equipment and material procurements for CIS sourced "New Funding Items"

- Return to Mongolia of M-K engineering team the first week of February, 1993 to provide additional technical services requested by AID/Washington including instruction of U S blasting technology, preparation of lists for future coal mine procurements (93/94 and 94/95 heating seasons) and value engineering services

- Arrival of a commercial air charter from Moscow on February 12 delivering labelled cargo including detonator assemblies purchased by AID to instruct the Mongolians in the use of U S blasting technology, and electrical parts to support the instrumentation installation work

- Arrival of a second commercial air charter, AN-12 from Moscow on March 16, delivering oversized priority items which could not be shipped previously and priority cargo of additional coal mine and power plant spare parts and equipment

5 2 RE&C OCTOBER 1992 FIELD TRIP TO MONGOLIA

On September 30, an engineering team departed for Mongolia The primary objective of this trip was to make final arrangements for the installation of feedwater evaporators at the No 3 Power Plant

Upon reaching Mongolia and after meeting initially with Ministry and power plant operations management personnel, it became apparent to RE&C management that changes in project direction would have to be made to accommodate client requirements to correct for deficiencies in O&M procurement information provided to AID and Parsons-Main Clarification was also required to correct confusion regarding the details of the AID Assistance Project, in particular the question of transfer of funds to accommodate materials ordered from the CIS under Mongolian contracts

During the second and third weeks of October, meetings were held in Mongolia with representatives of the Fuel and Energy Ministry, RE&C, and U S AID to resolve outstanding issues regarding scope of procurements and to obtain additional technical information It was learned, during these meetings, that prior information lists for both power plant and coal mine procurement provided to RE&C contained conflicting, and in some cases, incorrect information Therefore, it became necessary to completely review the entire project procurement scope

After a series of meetings, final agreement was reached among all parties, including RE&C, the Fuel and Energy Ministry, and U S AID regarding the overall scope and priority for procurement of critical spare parts for the coal mines and power plants

At that point in time, since the start of work on the program, the listing of critical spare parts had undergone a minimum of three major revisions All parties concerned recognized the need to procure spare parts on a prioritized basis Some re-prioritization was expected, however the changes experienced on the October revision were far greater than anyone could have expected and resulted primarily from significant communication problems both within the Ministry and between RE&C and Parsons-Main It was understood by all concerned parties that procurement of every item on the revised list developed in October would not be possible given the limitations of available funding

On the basis of the revised priority list approved in the third week of October RE&C was able to focus procurement efforts, request detailed technical information when required, and expedite purchase of equipment

5 3 MORRISON - KNUDSEN SUB-CONTRACT

In November, 1992 two mining engineers, Messrs Bruce DeMarcus and Arthur Helbrig were sent at U S AID's request to evaluate existing mine conditions, operations, and make recommendations for the use and purchase of explosives

Prior to the arrival of the M-K engineers, all requests for information for coal mine procurements had been forwarded to the Fuel and Energy Ministry and the NUURS Company either by direct telex or through Mr Philip McCandless, who was one of two RE&C in-country engineers This was a tedious process given the lack of adequate communications between the United States and Mongolia, lack of adequate data transmission of faxing, and difficulties in translating technical requirements from Russian to English and from English to Russian

The M-K specialists had access to the mines, mine operations and maintenance staff and communicated with the Ministry's operating staff as wells as the NUURS coal mine equipment procurement group These relationships were a valuable asset Information obtained from telephone conversations and faxes with in-country RE&C and M-K personnel during the third and fourth weeks of November proved to be useful in expediting critical purchases such as explosives, batteries, and wire rope (52 mm and 39 mm) and in identifying Russian procurement items which had already been delivered to Mongolia and could be eliminated from the procurement list

Due to deteriorating conditions within the coal mines, which were poor at the start of this project, new items were identified by the M-K team for addition to the procurement list

In telephone conversations and in correspondence received by express mail and computer modem data transfer, M-K engineers identified a wide array of items as being urgently required In an attachment received on November 30, a comprehensive listing was provided Some items in this listing had been included in the revised October procurement list, and had already been purchased from United States or CIS sources Others which were not in the October list include a variety ranging from miscellaneous purchases to potential major procurements

A brief summary of commodities which fell in this category included

- low voltage electrical cable (1000V and 660V)
- copper wire to rewind motors
- main frame rollers for 15/90 dragline
- new generators for draglines
- compressors for draglines
- conveyor vulcanizing glue and mechanical splices
- dozer tracks
- repair parts for Polish dump cars
- welding rods
- locomotive rebuild parts
- 64V, 450 amp locomotive batteries

In subsequent telephone/data transfers, RE&C obtained new priority listings and technical information which continued to reflect needs for specific items A memorandum, dated November 30, 1992, which was transferred on December 8, 1992, contained a "minimum Top Priority List" of items This list included minimum requirements for ventilation bag (duct), wire rope (39 mm and 52 mm), conveyor belt and accessories, batteries, excavator teeth, hoist generator, and bearings RE&C had already executed purchase orders for those items which were on the October lists The specific quantity requirements for the 39 mm and 52 mm wire rope listed had already been incorporated and purchased Procurement of the hoist generator, four additional main bearings, and conveyor splices had not occurred and could not be executed without project approval and additional funding

As late as December 15, RE&C received additional input which was intended to help in prioritizing the loading of the air charter Unfortunately, RE&C could not accommodate some of these suggestions as the cargo had already been palletized and transfer to the airport was imminent

A number of the items recommended for procurement by the M-K team were eventually purchased using supplemental project funds

A detailed summary of the activities of the M-K team during their stay from November 9 to December 23, 1992 is included in their final report dated March 11, 1993 A copy of this report is included for reference in Appendix I

5 4 RE&C NOVEMBER PURCHASE TRIP TO RUSSIA

In November 1992, an RE&C team traveled to Moscow to expedite the issue of inquiries, evaluation of bids, and possible issue of purchase orders to Russian and CIS vendors This trip was necessary due to the difficulties encountered to that date communicating with Russian factories from the United States as well as the need to expedite purchase and delivery of materials to alleviate the emergency situation which existed at the Mongolian power plant and coal mines

The team proceeded to obtain competitive bids for 27 bid packages which had been identified as capable of being sourced from Russian or CIS factories or suppliers

During November the RE&C team placed a total of thirteen purchase orders for a variety of Russian and CIS sourced materials and services

These orders were placed in accordance with specific direction and authorization received from AID/Washington which allowed for sourcing spare parts and equipment from non U S suppliers provided specific procurement and delivery criteria were met

Items or services purchased included

- Locomotive Rebuild Services
- Quantities of Wire Rope
- Replacement Conveyor Belting for Coal Mines
- Replacement Conveyor Belting for Power Plants
- New Excavator EKG-5A
- Excavator Motors
- Drag Line Bearings
- Boiler Tubing
- Power Plant Bearings
- Drag line and excavator spare parts for ESH 10/70, 3/50, & 6 5/45
- Explosives

The orders were placed based on shipping dates which were committed to by the vendors during negotiations

Based on the committed ship dates and Mongolian past experience with CIS sourced materials, RE&C projected deliveries for the bulk of the purchase orders to be completed prior to the peak of the heating season in January 1993

Experience proved otherwise due primarily to a temporary breakdown within the Russian rail system which caused significant delays in shipment of materials Shortages of rail cars, customs clearance problems between republics of the CIS, and blockages at key boarder station/rail transfer facilities all contributed to shipping delays

5 5 ANATOV AN124 AIR CHARTER

Early in the project, the need for airlifting critical U S sourced equipment and materials was identified In order to deliver materials to Mongolia prior to the start of the peak heating season in January, provisions for an air charter were discussed with the projects' freight forwarder and AID, and funds were budgeted for the leasing of suitable aircraft It was anticipated that two 747 air freighters would be required and leased to transport the projected total of two hundred metric tons of equipment and materials at a budget cost initially estimated to be on the order of $500,000

Raytheon Engineers requested that the project freight forwarder, AN-MAR Project International Inc , investigate the availability of aircraft for air charter and shipment of U S sourced equipment and material to Mongolia A report was prepared which summarized the results of a study which included extensive research and evaluation of possible air charter arrangements and facilities which could be used to airlift equipment and material to Mongolia before the end of the year

In the report AN-MAR indicated that their primary recommendation was the charter of an ANTONOV AN124 aircraft with a payload of 300,000 lbs They projected that two charter flights using ANTONOV AN124 aircraft would be required to ship an anticipated US cargo weighing in the range of 450,000 lbs Total Costs for two air charters using the Russian cargo transports were estimated to be $933,400

In their study, AN-MAR had evaluated the use of other air charter equipment Charter of DC-8 aircraft with maximum payload of 100,000 lbs each was listed as an alternative It was anticipated that 5 flights using DC-8 equipment would have been required to airlift the 450,000 lb cargo

Total Transportation costs for the 5 DC-8 flights were estimated at $1,264,900

Use of government furnished aircraft had been discussed and considered Charter of a military aircraft (C5A with a cargo capacity equivalent to a 747) was offered to the project by the Department of Defense at a cost estimated to be in the range of $700,000 to $800,000 for each plane Two planes would be required to complete the shipment

Based on the information contained in the AN-MAR report and the need for shipment of equipment and materials to Mongolia, prior to the end of the year RE&C recommended that the project commit funds for the first air charter using an ANTONOV AN124 aircraft of foreign flag, flying from JFK/Stewart Airport to Ulaanbaatar

The use of the Russian cargo aircraft resolved a number of problems which had been identified during the AN-MAR study The aircraft provided front nose load capability for oversized items such as boiler tubes, wire cable and wire rope reels In addition, the plane had self-unloading capability and would be equipped with its own keeling ramps and hoist

The DC-8 aircraft considered as an alternate was side door loaded and presented problems in handling oversized items Both the DC-8 and the 747 aircraft which were originally considered would have required special hydraulic scissor-lift equipment for off-loading This equipment was not available in Mongolia, and would have required that the equipment be shipped in for off-loading the charter freight

A significant advantage to the use of the ANATOV charter seen at the time was that the crews were experienced in flying to Mongolia and had successfully landed air transports at Ulaanbaatar This appeared to be a significant issue in the hiring of U S based air-charter equipment

No U S carriers offered in writing any 747's for charter service AN-MAR had contacted 10 air charter firms to obtain 747 aircraft None of the firms contacted expressed any interest Federal Express had initially indicated interest but declined due to holiday commitments and their unwillingness to risk flying into Ulaanbaatar

Based on the information presented by our freight forwarder and the fact that no alternative government aircraft were available at a comparable cost, a recommendation was forwarded and approved by AID/Washington for an initial high capacity air charter

On December 15, approximately 130 tons of equipment and consumable items were shipped via air charter in a Russian AN124 Items included in this priority shipment were 16 tons of wire rope, 1000 meters of mine ventilation duct, 99 truck tires, 200 truck batteries, and 42 tons of power cable required to sustain mining operations The shipment also contained 25 tons of boiler tubing and instrumentation and control equipment required for improving coal pulverizer operations

The equipment including fragile electronic components was received intact with no losses reported

5 6 Revision to E/P Schedule to Include Proposed New Funding Items

In late December Raytheon Engineers received two faxed memos from AID/Washington which were originally transmitted from Mongolia, directing changes to the procurement list and purchasing order of priority

These fax transmissions were responses and clarifications to a Raytheon Engineers and Constructors letter of December 23, 1992 which outlined the status of project procurements and provided an update of the project financial position

The RE&C December 23 letter summarized a category of "procurements under consideration" which consisted of additional items recommended for purchase by the M-K engineers for the coal mines, items contained on the approved E/P schedule but not purchased at that date (due to priority ranking) and procurement of items which the Ministry and AID had discussed and agreed upon in meetings held in-country in December

RE&C issued a second procurement recommendation update letter dated December 31, 1992 This letter was written to supersede the December 23, 1992 letter and incorporate all direction received during the last week of December, and advised AID that RE&C would redirect the procurement effort to include all items contained in the late December AID fax transmissions

Noteworthy was the fact that the letter further documented the requirement for additional funding or the use of project contingency funds to obtain the"procurements under consideration", which RE&C recommended for purchase combined with those added by AID from their meetings with the Ministry, NUURS and Erchim Impex

In January RE&C proceeded to develop a plan to finalize these new procurements The project E/P schedule was updated Inquires were forwarded to potential suppliers and additional technical information required to complete the purchase of the items listed in the AID faxes was requested from the Ministry through Mr Altangerel, our designated project contact at the NUURS Corporation

Due to the fact that the ceiling of the budget for authorized funding for material purchases had been reached, RE&C was forced to hold issue of any purchase orders pending receipt of supplemental project funds

5 7 Final Revision to E/P Schedule from January meetings with FEM

In late January, Mr Kelly, RE&C's project manager travelled to Mongolia The purpose of this trip was to review the status of the Phase III Instrumentation and Control installation work in progress, meet with AID/Mongolia and Ministry personnel to coordinate final phases of the project, meet with NUURS, Mongoltrans and the Mongolian National rail organization to resolve issues relating to transportation and customs clearance, and to hold meetings with power plant operations personnel at the Central Energy System to review status of plant operations including issues of coal supply and unit availability The meetings with the Central Energy System were required due to problems which had identified during the peak heating season in regard to coal receiving capability at the plants, rolling blackouts, and district heating production problems As a result of the meetings with Erchim Impex, NUURS, and the Ministry, a new listing of priority procurements to be funded by the requested project supplemental funds was developed This listing including a wide variety of items for the coal mines and power plants

In some cases, items which RE&C and AID/Washington previously considered for procurement, such as district heat exchangers, were deleted In other cases, new items were placed on the list and given a high priority ranking Items typically included in this category were spare parts and equipment for Power Plant No 3 and Power Plant No 4 identified as being necessary to maintain plant operations

This listing was faxed to the RE&C Boston office on January 24, 1993 and became the basis for the last major revision to the project E/P Schedule

Following receipt of this information RE&C developed a "final procurement plan" and initiated contacts with the Russian equipment manufacturers who were identified by the Ministry as sole sources for the new equipment items placed on this latest list

Plans were finalized for a trip to Moscow to expedite the issue of inquiries and execution of purchase orders for Russian sourced equipment

5 8 Contract Authorization for Supplemental Funds

In mid-December RE&C recognized the need for supplemental funding to finalize purchase orders and execute new orders for equipment and consumable items recommended for the coal mine and power plant sectors

In a December 17, 1992 letter to AID/Washington, RE&C documented the need for supplemental funding to finalize the placement of purchase orders for items which were already approved on the overall, priority ranked "October list" and additional funds to obtain items which had recently been recommended for priority procurement based on input from Mongolia and US AID

This letter outlined the possible use of the Phase IV and project contingency funds to obtain additional equipment spare parts and support services

On December 18, 1992, RE&C forwarded a letter to AID/Thailand requesting the release of additional funding

On February 3, 1993, RE&C received a contract amendment to increase funds for Phase II engineering, additional procurements, and support labor This contract amendment released Phase IV funds to support sub-contract efforts provided by the project's freight forwarder and by Morrison-Knudsen

With the issue of the contract amendment, RE&C was able to release for ocean shipment the remaining 250,000 pounds of US sourced procurements which remained in the AN-MAR warehouse since December of 1992

A change order was also issued to M-K to provide additional technical services to instruct the Mongolians in U S blasting technology, prepare lists for future coal mine equipment procurements for the 93/94 and 94/95 heating seasons, and provide value engineering services Three members of the M-K engineering team departed from Mongolia during the first week of February 1993 to complete this effort

The contract amendment also allowed RE&C to issue purchase orders for items defined in late January 1993 as priority procurements Many of these items were sole sourced items which could only be purchased from Russian or CIS vendors An RE&C procurement team returned to Moscow in February 1993 to finalize equipment and material purchases

5 9 February Procurement Trip to Moscow

In February 1993, two members of the RE&C procurement team returned to Moscow to expedite the issue of inquires and placement of purchase orders for CIS sourced equipment

This trip was necessary due to the re-definition of the procurement list and priority purchase ranking which occurred as a result of meetings in Mongolia during late December 1992 and January 1993 which have been discussed in previous sections of this report

As a result of their efforts, the procurement team was able to place eight (8) purchase orders for CIS sourced equipment for the power plants and coal mines

The orders were placed after obtaining individual written source approvals from the AID/Washington project office

Items purchased included

- Generator for ESH 10/70 Excavator
- Generator for ESH 20/90 Excavator
- Excavator Compressor for EKG 4 6
- Truck Engine Spare Parts
- Excavator Spare Parts for 10011E and 5112 Shovels
- Pulverizer Gears for Power Plant No 3
- Pulverizer Drive Pinion Bearings
- Chemicals for Power Plants

The team also issued inquiry documents and negotiated with prospective suppliers for other spare parts and consumables Purchase orders could not be completed for these items due to a variety of reasons including lack of agreement as to terms and conditions, or in some cases due to extended deliveries There were also instances where price and delivery were found to be acceptable, however the items were lower on the priority ranking, and project funds were exhausted by the time the seller had agreed to the terms of the purchase order

Items that were recommended for procurement and were not purchased in Component I included

- Dozer Tracks
- Brushes for Electric Motors
- Excavator Compressors (for 10/70, 13/50, 6 5/4 5 & EKG 8I)
- Dump Car Parts
- Tires and Tubes (for off-road trucks Size 21 00-33)
- Roller Crushers for No 4 Power Plant
- ID Fan Wheels for Power Plant No 4

5 10 Morrison Knudsen Involvement Winter/Spring 1993

In December of 1992, RE&C was requested by AID/Washington to issue a change order to Morrison Knudsen Corporation to provide continuing technical assistance services for the Mongolian coal mining operations

In January RE&C received an initial eight part proposal from M-K responding to the AID request for additional services THE M-K proposal offered to provide continuing technical assistance for a wide area of scope including detailed procurement assistance, operational and maintenance expertise, establishment of cost monitoring procedures, presentation of training seminars, identification of near term material acquisitions, forecast for supply and material requirements for the remainder of 1993, a pre-feasibility study for the Shivee Ovoo Mine and active involvement of M-K personnel in the purchase of coal mine supplies The cost estimated for these proposed services was in excess of the funding allocated by AID for additional technical assistance services

After careful review of available project funding and the status of the on-going purchasing priority revisions, and in consideration of the future needs of the project, the M-K scope was modified to focus on six basic areas of responsibility

1 Procurements for the 1992/1993 heating season

M-K was requested to participate in this area to support RE&C at the request of the RE&C field team to provide technical assistance on an as requested basis Due to the full time presence of an RE&C inspector, it was determined that day-to-day assistance for checking of deliveries would not be required

2 Procurements for the 1993/1994 Heating Season

M-K was requested to develop a prioritized list of critical spare parts for the following mines for the 1993/1994 heating season

- Bagga Nuur
- Sharin Gol
- Nalaikh
- Shivee Ovoo

Cost estimates for the spare parts were to be developed for US and CIS sourcing Estimates of transportation costs for US sourced items were to be required as well as estimates of manufacturing lead time and delivery time required to support on-site dates for operations This information would be furnished to AID and the Component III Contractor for use in the continuation of the assistance project

3 Operations and Maintenance Training

M-K was requested to develop an outline for an O&M training program, together with a schedule and estimate of the cost required to implement the program Evaluation criteria was to be provided to determine the relative cost and benefit of the O&M training in comparison to the procurement of critically required spare parts for the 1993/1994 and ensuing heating seasons

Finally, the M-K team was to provide training for use and implementation of US blasting technology, in particular the effective use of delays in blasting

4 Maintenance Order Entry & Tracking Systems

The M-K team was requested to document the existing mining sector maintenance order entry and tracking system and provide short term and long term recommendations for improvements Schedule and cost estimates to implement program improvements were to be developed for presentation at the Value Engineering Session

5 Shivee Ovoo Mine

M-K was requested to provide a management overview study for the Shivee Ovoo Mine The study was to include a conceptual mine plan, budgetary capital and O&M cost estimates, and engineering and construction schedules to support mine development

6 Value Engineering

M-K was requested to include in their budget sufficient funds to attend and participate in a one-week value engineering session to be held in Mongolia

The above scope of work was successfully negotiated Funds for the continuing scope of services were approved by AID/Thailand in the Contract Modification dated February 2, 1993 A three man team comprised of Mr Bruce DeMarcus, Director of Engineering, Mr Arthur Helbig, Manager of Operations, and Mr Donald Ellis, Manager of Maintenance returned to Mongolia in early February to initiate the continuing services work Mr Ellis and Helbig remained in Mongolia, developing procurement data and conducting training seminars

Mr DeMarcus subsequently returned to the United States after kick-off of the continuing service work He returned to Mongolia in March to complete the management overview study for the Shivee Ovoo Mine and shortly thereafter returned to the United States Mr DeMarcus returned to Mongolia in April 1993, to attend the value engineering session held from April 29 through May 2

A summary of the work developed and documented by the M-K team from February through April 1993 has been included for reference in Appendix I

5 11 Lufthansa Commercial Air Charter

Following completion of the December airlift of high priority US cargo from the United States to Ulaanbaatar, Mongolia, a decision was made by AID to cancel plans for a second large air charter which would transport all cargo remaining in the freight forwarder's warehouse, as well as transport items which had deliveries scheduled after the December departure date

It was decided in December by AID/Washington that lower priority items would be shipped by container via ocean and rail from the US to Mongolia

It was also decided that items which were recognized as being essential for (a) continued installation of instrumentation and controls at Power Plant No 3 and (b) coal mine assistance during the first quarter of 1993, would be shipped via commercial air lines from New York to Ulaanbaatar The implicit assumption made coincident with this decision was that commercial airline freight and/or charter service would be capable of handling the balance of the priority items remaining to be shipped

Raytheon Engineers reviewed the listing of cargo remaining in the warehouse, assigned priority ranking and defined the cargo suitable for ocean shipment AID received listings of the items to be ocean shipped

Priority cargo remaining in the warehouse, which included "labeled" cargo such as compressed gas cylinders and nuclear sources for level switches, needed to be shipped by our freight forwarder by commercial air

Our freight forwarder investigated multiple routes for commercial air shipment A brief summary of the situation surrounding this investigation was included in the AN-MAR letter of January 27, 1993

The following facts complicated any possible commercial cargo freight arrangements

a The routing via Beijing was not advisable Both Air China and Air Mongolia had discontinued all air cargo transport between Beijing and Ulaanbaatar Trucking of cargo to Xingang for subsequent rail transport had proven to be ineffective and delays at the border between China and Mongolia prohibited such a route

b On-forwarding of cargo through customs in Moscow remained difficult No organization was identified to transfer cargo via truck from the international airport to a domestic airport where the cargo could be transferred to a regularly scheduled Air Mongol or Aeroflot flight (Provided Air Mongol or Aeroflot would accept the cargo for transport, an open question)

c Use of international small package services was out of the question Services, such as DHL, had proven to be disastrous Some packages never arrived at their destination

d Cargo remaining to be shipped included labeled cargos and oversized items, neither of which would be transportable by regularly scheduled commercial flights from Moscow to Ulaanbaatar

Given the above facts, it was decided that leasing a small charter aircraft was the only way to guarantee expedited delivery of labeled cargos and oversized items This was done through Lufthansa

A first Anatov 12 air charter was arranged The charter departed Moscow on February 16, and arrived on February 17, 1993 This plane transported mine gas detectors (with compressed gas calibration cylinders) motors, flame scanner equipment, nuclear level switches and radioactive sources, electrical parts to support the instrumentation installation work, additional cable, and detonator assemblies purchased by AID to instruct the Mongolians in the use of US blasting technology at the coal mines

At the last moment (after air cargo arrived in Moscow from the US) Lufthansa was unable to provide the AN-12 (which had a cargo loading rear door similar to a US C-130) and instead, provided an Aeroflot passenger plane as a substitute (without advising RE&C) This resulted in one or more large pallets of electric motors, being broken open with the result that the motors were shipped loose inside the Aeroflot plane Two motors with a value of $400 were lost as a result In spite of the confusion surrounding the delayed arrival and unnotified switch of aircraft, it should be noted that the balance of the cargo was received intact and undamaged

A second charter was arranged to carry the balance of oversized equipment Oversized material was shipped from New York to Moscow via Lufthansa Commercial Air Cargo The cargo was transferred at the airport to an Anatov 12 air cargo charter which departed on March 15, after experiencing weather delays, and arrived in Ulaanbaatar on March 16

Cargo contained on this second small charter plane included oversized items such as the scanner cooling air blowers and instrumentation panels, priority cargo of wire for re-winding electric motors for the coal mines, replacement differential pressure transmitters, additional wire for power plant wiring, and piping materials required to complete the flame scanner system installation at the No 3 Power Plant

APPENDIX A

EQUIPMENT LISTS AND ENGINEERING AND PROCUREMENT SCHEDULES

ITEM ID	DESCRIPTION	COMMITTED THRU 2/12/93 M & E THRU 2/12/93 LAB	FORECAST	
	Authorized Amount	**$10,600,000**	**$10,600,000**	
	UE & C ENGINEERING SERVICES	($1,548,095)	($1,860,872)	
	SUBTOTAL ENGINEERING	$9,051,905	$8,739,128	
COAL MINES				
C1–1A	52 MM Dia Wire Rope	($54,000)	($54,000)	Russia
C1–1B	52 MM Dia Wire Rope	($12,533)	($12,533)	US
C1–2	1600 MM Wide Conveyor Belt	($69,120)	($69,120)	Russia
C1–3	Mine Vent Ducting	($34,900)	($34,900)	US
C1–4	Nilakah Mine Dewatering Pump	($25,000)	($25,000)	Russia
C1–5	Nilakah Mine Gas Detectors	($20,015)	($20,015)	US
C1–6	Bull Dozers	($713,552)	($713,552)	US
C1–8	Locomotive Batteries		$0	US
C1–9	Copper Wire for Rewinding Motors	($21,417)	($21,417)	US
C1–10	House Rollers/Shafts ESH 15/90	($75,000)	($75,000)	Russia
C1–12A	Generator for ESH 10/70	($110,000)	($110,000)	Russia
C1–12B	Generator for ESH 20/90	($100,000)	($100,000)	Russia
C1–13	Dozer Tracks		$0	Russia
C1–14	Brushes for Electric Motors		($9,000)	Russia
C1–15	Excavator Compressors (3 Types)	($2,100)	($2,100)	Russia
C1–16	Dump Car Parts		$0	Poland
C1–17	Detonation Cord	($10,628)	($10,628)	US
C2–1A	Balance Wire Rope	($174,000)	($174,000)	Russia
C2–1B	Balance Wire Rope	($14,468)	($14,468)	US
C2–2	Trailing Cable and I & C Cable	($317,727)	($317,727)	US
[redacted]	Balance Conveyor Belt	($268,775)	($268,775)	Russia
[redacted]1	Truck Engine Parts	($219,636)	($219,636)	Russia
C3–3	Excavator Parts ESH 10/70, 13/50, 6 5/45	($421,525)	($421,525)	Russia
C3–4	Locomotive Rebuilds 2 Ea	($174,732)	($174,732)	Russia
C3–5	Explosives	($570,000)	($570,000)	Russia
C3–6	Excavator EKG 5–A	($650,000)	($650,000)	Russia
C3–6A	Small Excav Parts 10011E, 5112B	($270,525)	($270,525)	Russia
C3–7A	Tires & Tubes		$0	Russia
C3–7B	Tires, Tubes & Valves	($149,080)	($149,080)	US
C3–8	Vehicle Batteries	($48,556)	($48,556)	US
C3–9	Excavator Motors	($562,600)	($562,600)	Russia
C3–11	Drag Line Bearings	($3,900)	($3,900)	Russia
		==========	==========	
SUBTOTAL COAL MINE PURCHASES FROM RUSSIA		($3,750,913)	($3,759,913)	
SUBTOTAL COAL MINE PURCHASES FROM US		($1,342,876)	($1,342,876)	
TOTAL COAL MINE		($5,093,789)	($5,102 789)	

POWER PLANTS				
P1–1	Transmitters for PC Mills	($207,570)	($207,570)	US
P1–2	RTDs for PC Mills		Inc w/p1–1	US
P1–3A	Misc AC Motor Drives for PC Mills	($24,976)	($24,976)	US
P1–3B	Misc DC Motors For Coal Feeders	($3,934)	($20,000)	US
P1–4	Controllers for PC Mills		Inc w/p1–1	
P1–5	Feeder Alarms for PC Mills	($43,200)	($43,200)	US
P1–6	Damper Drives for PC Mills	($63,330)	($63,330)	US
P1–7	Scanners	($128,830)	($128,830)	US
P1–8	Pulverizer Gears (P P NO 3)	($78,000)	($78,000)	Russia
P1–9	Roller Crushers (P P NO 4)		$0	Russia
P1–10	ID Fan Impellers (Wheels–P P NO 4)	($68,000)	($34,000)	Russia
P1–11	Pulverizer Pinion Bearings (P P NO 4)	($10,600)	($10,600)	Russia
P1	Misc I&C Installation Equip	($15,181)	($25,000)	US
P2–1A	Boiler Tubes	($147,002)	($147,002)	US
P2–1B	Boiler Tubes–Russian	($963,764)	($963,764)	Russia
P2–2	Misc Bearings	($62,298)	($62,298)	Russia
P2–6	Conveyor Belting (Power & Coal)	($280,850)	($280,850)	Russia
P2–7	Chemicals for Power Plants	($200,940)	($202,985)	Russia
P2–9	Strip Chart Recording Paper	($80,297)	($80,297)	US
P2–10	Babbitt Ingots	($13,997)	($13,997)	US
SUBTOTAL POWER PLANT PURCHASES FROM RUSSIA		($1,664,452)	($1,632,497)	
SUBTOTAL POWER PLANT PURCHASES FROM US		($728,316)	($754,202)	
TOTAL POWER PLANT		($2,392,768)	($2,386,699)	
GENERAL				
G–1	AN–MAR	($1,050,000)	($1,050,000)	(1 AN–124)
G–10	M–K Tech Assistance	($234,815)	($234,815)	US
SUBTOTAL GENERAL		($1,284,815)	($1,284,815)	
TOTAL RUSSIAN PURCHASES		($5,415,365)	($5,392,410)	
TOTAL US PURCHASES		($2,071,192)	($2,097,078)	
	AVAILABLE TO SPEND	$280,533	($35,175)	

UNITED ENGINEERS and CONSTRUCTORS, INC E and P SCHEDULE EMERGENCY HEAT and POWER PROJ No 1

ITEM	SPEC	DESCRIPTION	RESP	EST COST		SOURCE	SHIP	ON SITE	SHIPING	STATUS/COMMENTS
	No	USE LOCATION	DISCPLN	($1000)		COUNTRY	DATE	DATE	MODE	
	COAL MINE PROCUREMENTS			FOB	FOB					
				UB	Factory					
1 1A	7419	52 MM DIA WIRE ROPE	PDC		S					Purchased In Russia
	002				F	RUSSIA				Received Inspected and Complete
	5029	BAGGA NUUR MINE	MECH	54	A					
1 1B	7419	52 MM DIA WIRE ROPE	PDC		S					Made Air Charter Received Inspected and Complete
	002				F	U S			AIR	2 Substitute Rope 1865 LF Approx 14 000 Lbs
	5029A	BAGGA NUUR MINE	MECH	12 5	A					
1 2	7419	1600 MM WIDE CONVEYOR	PDC		S					
	002	BELT			F	RUSSIA			RAIL	Belting Shipped 12/26/92 Received Inspected and Complete
	267 3	BAGGA NUUR MINE	MECH	69	A					720 Sq Meters (450 Linear Meters)
1 3	7419	FLEXIBLE VENTILATION	PDC		S				AIR	Partial Shipment Made Air Charter (1000 meters)
	002	PIPE or DUCTING			F	U S			OCEAN	Balance Shipped via Ocean 5000 Linear Meters Total
	225 1	NILAHAH MINE	MECH	34 9	A					Received Inspected and Complete
1 4	7419	MULTI STAGE WATER PUMP	DEH		S					
	002	AND MOTOR			F	RUSSIA			RAIL	180 M3 Cap 240 M Head 1500 RPM Explosion Proof Elec Mtr Drive
	238 1	NILAHAH MINE	MECH	25	A					
1 5	7419	PORTABLE GAS	MAD		S					This is a Temporary/Portable System Not the Permanent/
	002	DETECTORS			F	U S			AIR	Stationary System Originally Planned 12 Portable Units
	252 10	NILAHAH MINE	I & C	25	A					Ship via Air Contains Labeled (Hazardous) Cargo Received Inspected & Complete
1 6	7419	BULL DOZERS	PDC		S					2 Caterpillars Model D8N with Rippers
	002				F	U S			OCEAN/	Received Inspected and Complete
	400 1	SG or LOCAL MINES?	MECH	714	A				RAIL	
1 7	7419	ZIPPER SPLICES	PDC		S					Inquiry Forwarded Bids Received Item Deleted due to position on
	002			10	F	U S	ITEM DELETED			latest priority list and lack of funds
	267 4		MECH		A					
1 8	7419	LOCOMOTIVE BATTERIES	SCA		S					P O Cancelled due to Project Funding and Transport Issues
	002			18	F	U S	ITEM DELETED		AIR	(Weight limits on air shipments)
	137 2		ELEC		A	RUSSIA				
1 9	7419	COPPER WIRE FOR RE	SCA		S					P O Placed to US Manufacturer
	002	WINDING MOTORS			F	U S			AIR	Approx 8000 Lbs Wire (#14 #15 #16 #17 #18 # 18 1/2 # 20 #20 1/2 #21 AWG)
	113 2		ELEC	21	A					Received Inspected and Complete
1 10	7419	HOUSE ROLLERS/ SHAFTS	PDC		S					
	002	ESH 15/90 DRAGLINE			F	RUSSIA				102 Rollers
	400 10		MECH	75	A				RAIL	102 Axles (Shafts) Delivered Received Inspected and Complete

UNITED ENGINEERS and CONSTRUCTORS, INC. E and P SCHEDULE EMERGENCY HEAT and POWER PROJ No 1

ITEM	SPEC No	DESCRIPTION USE LOCATION	RESP DISCPLN	EST COST ($1000)		SOURCE COUNTRY	SHIP DATE	ON SITE DATE	SHIPING MODE	STATUS/COMMENTS
1 11	7419	HARD FACING WELD RODS	PDC		S					Inquiry forwarded Bids Received Item deleted from Priority List by FEM
	002			4	F	U S	ITEM DELETED		AIR	
	400 12		MECH		A					
1 12A	7419	GENERATOR FOR	PDC		S					Furnished by Karpinski Zavod
	002	DRAGLINE			F					Received Inspected and Complete
	400 13	ESH 10/70	MECH	110	A	RUSSIA			RAIL	
1 12B	7419	GENERATOR FOR	PDC		S					2500 KW 1200 Volt 750 Amp Hoist Generator by T M Service
	002	DRAGLINE			F	RUSSIA				Received Inspected and Complete
	400 14	ESH 20/90	MECH	100	A				RAIL	
1 13	7419	DOZER TRACKS	PDC		S					P O Not Executed Insufficient Funds and
	002			78	F	RUSSIA	ITEM DELETED			Letter of Credit Issue
	400 11		MECH		A				RAIL	To be Purchased in Component III
1 14	7419	BRUSHES FOR ELEC	PDC		S					Insufficient Funds
	002	MOTORS		9	F	RUSSIA	ITEM DELETED			To be Purchased in Component III
			MECH		A				RAIL	
1 15A	7419	EXCAVATOR COMPRESSOR	PDC		S					Insufficient Funds
	002	FOR ESH 10/70 13/50 6 5/45		6 1	F	RUSSIA	ITEM DELETED			To be Purchased in Component III
			MECH		A					
1 15B	7419	EXCAVATOR COMPRESSOR	PDC		S					Insufficient Funds
	002	FOR EKG 8I		3	F	RUSSIA	ITEM DELETED			To be Purchased in Component III
			MECH		A					
1 15C	7419	EXCAVATOR COMPRESSOR	PDC		S					Detail EK-4 Furnished by Trade Bureau (Ural MashExport)
	002	FOR EKG 4 6 EKG 5A			F	RUSSIA				Received Inspected and Complete
	400 17		MECH	2 1	A					
1 16	7419	DUMP CAR PARTS	PDC		S					Item deleted due to Insufficient funds Vendor Contact Difficultly and position on Priority List
	002			33	F	POLAND	ITEM DELETED			
			MECH		A					
1 17	7419	BLAST INITIATION SYSTEM	PDC		S					Approx 1000 Lbs Non Electric Detonator Assemblies
	002	MATERIALS			F	U S				800 Units 80 Ft 840 Units 60 Ft 400 Units 24 Ft
	400 21	(DETONATION CORD)	MECH	10 6	A					Received Inspected and Complete
2 1	7419	BALANCE OF WIRE ROPE	PDC		S				AIR	Partial Shipment Made Air Charter (39mm) (8 Tons US)
	002	VARIOUS SIZES			F	US			RAIL	Balance Scheduled to Ship from Russia by Rail on 2/28/93 Rail Problems Cited
	5026	BN SG & NILAHAH MINES	MECH	174	14 A	RUSSIA				for Delivery Slippage 145 Metric Tons Russian Received Inspected and Complete
2 2	7419	TRAILING CABLE	SCA		S				AIR	Includes cabling for Installation of Instrumentation Components for Power Plant 3
	002	125 000 lb 13 Spools			F	U S			OCEAN	Partial Shipment Made Air Charter Balance Shipped via Ocean
	113 1	BN & SG MINES	ELECT		315 5 A				RAIL	Total 24 600 LF Approx 125 000 Lbs Received Inspected and Complete

ITEM	SPEC No	DESCRIPTION USE LOCATION	RESP DISCPLN	EST COST ($1000)		SOURCE COUNTRY	SHIP DATE	ON SITE DATE	SHIPING MODE	STATUS/COMMENTS
2 3	7419	BALANCE OF CONVEYOR	PDC		S					
	002	BELTS VARIOUS WIDTHS			F	RUSSIA			RAIL	Belting Shipped 12/26/92 from Russia Received Inspected and Complete
	267 2	BN SG & NILAHAH MINES	MECH	269	A					4135 Sq Meters Various Sizes (800 1000 1200 1400 mm)
2 4	7419	COAL CRUSHER PARTS	PDC		S					Supplier Failed to Provide Good Faith Bid Ministry Subsequently Arranged to
	002			0	F	RUSSIA	ITEM DELETED		RAIL	Receive Parts via Trade Barter Arrangement
	400 4	SHARIN GOL MINE	MECH		A					Item deleted from list
3 1	7419	TRUCK ENGINE SPARE	PDC		S					Received Inspected and Complete
	002	PARTS			F	RUSSIA			RAIL	
	5027	BN&SG MINES	MECH	219 6	A					
3 2	7419	EXCAVATOR SPARE	PDC		S					PARTS ON SITE via off Project Arrangements between Ministry and Supplier
	002	PARTS ESH 20/90 & 15/90		0	F	RUSSIA	ITEM DELETED			Item deleted from list
	400 2	BAGGA NUUR MINE	MECH		A					
3 3	7419	EXCAVATOR SPARE PARTS	PDC		S					Shipment Released with Corporate Guarantee 2/1/93
	002	ESH 10/70 13/50 & 6 5/45			F	RUSSIA			RAIL	Received Inspected and Complete
	400 8	BN & SG MINES	MECH	421	A					
3 4	7419	LOCOMOTIVE REBUILDS	PDC		S					Major Overhaul In Russia
	002	DIESEL ELECTRIC			F	RUSSIA			RAIL	2 Rebuilds Purchased
	400 9	SHARIN GOL MINE	MECH	175	A					Repairs Completed
3 5	7419	EXPLOSIVES	DEH		S					Vendor Slipped Shipping Date from Contracted Date Due to Rail Problems
	002				F	RUSSIA			RAIL	500 Metric Tons Powder Ammonite 500 Metric Tons Cartridge Ammonite
	400 6	BN & SG MINES	MECH	570	A					25 Rail Cars Received Inspected and Complete
3 6	7419	NEW EXCAVATOR & PARTS	PDC		S					ESH-8I has been delivered via off project arrangements between Ministry & supplier
&	002	EKG 5A 10011 5112		270	F	RUSSIA			RAIL	EKG 5A purch as indicated and deliv to border 12/29/92 Parts Models 10011 & 5112 ordered
3 6A	400 7	SG & LOCAL MINES	MECH	650	A					Received Inspected and Complete
3 7A	7419	TIRES & TUBES	RMS		S					Purchase Subject to Additional Funding and Negotiation of Terms & Conditions
	002			135	F	RUSSIA	ITEM DELETED		RAIL	Item Deleted due to Lack of Funds & Letter of Credit Issue
	5028	MINE	MECH		A					Prospect to buy American next year In Component III
3 7B	7419	TIRES & TUBES	RMS		S				AIR	Partial Shipment made Air Charter (99 Tires)
	002				F	U S			OCEAN	Balance shipped via ocean
	5028	MINE	MECH	150	A					Total Order 150 Size 12 00 20 50 Size 18 00 25 Received Inspected and Complete
3 8	7419	VEHICLE BATTERIES	SCA		S				AIR	Partial Shipment made Air Charter (200 162 AMP HR Batteries)
	002				F	U S			OCEAN	Balance to ship via ocean (290 75 and 132 AMP HR Batteries)
	137 1	MINES	ELECT	49	A					Arrived march 29, Inspected and Complete
3 9	7419	EXCAVATOR MOTORS	PDC		S					Shipment Slipped due to Rail Problems
	002				F	RUSSIA			RAIL	P O Modified due to Vendor Manuf /Delivery Problems with Item 6 of 7
	128 1	BN & SG MINES	MECH	563 4	A					16 Motors Various Sizes (54 KVT 100 KVT 190 KVT) Received Inspected and Complete

UNITED ENGINEERS and CONSTRUCTORS, INC E and P SCHEDULE EMERGENCY HEAT and POWER PROJ No 1

ITEM	SPEC	DESCRIPTION	RESP	EST COST		SOURCE	SHIP	ON SITE	SHIPING	STATUS/COMMENTS
	No	USE LOCATION	DISCPLN	($1000)		COUNTRY	DATE	DATE	MODE	
3 10	7419	DRILL RIG 1 EA	DEH		S					ITEM DELETED
	002	DIESEL		0	F	US	ITEM DELETED			NOT INCLUDED W/ FORECAST OF EXPENDITURES
	400 5	LOCAL MINES	MECH		A					And not on Dec or January priority listings
3 11	7419	DRAG LINE BEARINGS	PDC		S					Vendor slipped ship date due to railroad problems
	002				F	RUSSIA			RAIL	Replacement Bearing for Hoist Gen for ESH 15/90 Part No 32244
	400 3	BAGGA NUUR MINE	MECH	4	A					Received Inspected and Complete
			75%	4025 8		RUSSIA COAL SECTOR				
			25%	1357 9		U S COAL SECTOR				
				5383 7		TOTAL COAL SECTOR				

ITEM	SPEC No	DESCRIPTION USE LOCATION	RESP DISCPLN	EST COST ($1000)		SOURCE COUNTRY	SHIP DATE	ON SITE DATE	SHIPING MODE	STATUS/COMMENTS
		POWER PLANT PROCUREMENTS	FOB	FOB						
			UB	Factory						
1 1	7419	TRANSMITTERS FOR	WEC		S					Shipment Made Air Charter
	001	PC MILLS			F	U S			AIR	18 Differential Press & 18 Fan Outlet Temp Transmitters
	252 1	PP 3	I & C	w/1-4	A					
1 2	7419	RTD s	WEC		S					Ship via Air
	001	FOR PC MILS			F	U S			AIR	18 Pulverizer Outlet RTD's & 18 Fan Outlet Temp RTDs
	252 2	PP 3	I & C	w/1-4	A					
1 3 A	7419	MISC AC MOTOR DRIVES	WEC		S					Partial Shipment via Commercial Air
	001	FOR PC MILLS			F	U S			AIR	From U S Balance from Germany Ship 2/8/93
	252 3	PP 3	I & C	25	A					133 Motors Total
1 3B	7419	MISC DC MOTOR DRIVES			S					Ship via Commercial Air
	001	FOR PC MILLS		20	F	US			AIR	3 Motors
	252 8	PP 3			A					
1 4	7419	CONTROLLERS FOR PC	WEC		S					Partial Shipment Made Air Charter
	001	MILLS			F	U S			AIR	Balance Shipped via Commercial Air on 2/8/93 (Power Supplies)
	252 4	PP 3	I & C	188	A					On Site 2/17/93 54 Controllers
1 5	7419	FEEDER ALARMS FOR	WEC		S					Ship Via Commercial Air & Charter
	001	PC MILLS			F	U S			AIR	18 Nuclear Coal Monitors
	252 5	PP 3	I & C	43	A					
1-6	7419	DAMPER DRIVES FOR	WEC		S					These Drive Units Made First Air Charter
	001	PC MILLS			F	U S			AIR	6 Rotary Electronic Control Drives
	252-6	PP 3	I & C	64	A					
1 7	7419	SCANNERS FOR PC	WEC		S					Scanners & Special Cable Ship via Commercial Air & Charter
	001	FIRING			F	U S			AIR	Cabinets and Fans Shipped via Second Commercial Air Charter
	252 7	PP 3	I & C	129	A					Total 42 Scanners 2 Scanner Cabinets & Duplex Cooling Blower System
1 8	7419	PULVERIZER GEAR PARTS	PDC		S					Not Enough Funds for
	001				F	RUSSIAN				6 Pairs Requested Must Prioritize Reqts
	252 16		MECH	78	A					2 Pairs Purchased 2 Pinions & 2 Crown Gears
1 9	7419	ROLLER CRUSHERS	PDC		S					P O Not Executed Due to Long Lead Time (minimum 6 Months)
	001	FOR NO 4 P O		170 –	F	RUSSIAN	ITEM DELETED			Even though High on Jan list
			MECH		A					
1 10	7419	ID FAN IMPELLERS	PDC		S					P O Cancelled
	001	(WHEELS) FOR NO 4 P P			F	RUSSIAN	ITEM DELETED			Due to Lead Time
			MECH	34	A					Even though High on Jan list

UNITED ENGINEERS and CONSTRUCTORS, INC E and P SCHEDULE EMERGENCY HEAT and POWER PROJ No 1

ITEM	SPEC No	DESCRIPTION USE LOCATION	RESP DISCPLN	EST COST ($1000)		SOURCE COUNTRY	SHIP DATE	ON SITE DATE	SHIPING MODE	STATUS/COMMENTS
1 11	7419	PULVERIZER DRIVE	PDC		S					
	001	PINION BEARINGS FOR			F	RUSSIAN				8 Pinion Bearings No 300 3264 Int l No 23264
	252 14	NO 4 P O	MECH	10 6	A					Received Inspected and Complete
2 1A	7419	BOILER TUBING	RMS		S				AIR	Part of Shipment Made Air Charter
	001				F	U S			OCEAN	Balance of Shipment will Ship via Ocean
	211 1	PP 4 3 2 D & E 73 M TONS	MECH	147	A					Total Wt 73 Metric Tons or 161 500 Lbs Received Inspected and Complete
2 1B	7419	BOILER TUBING	RMS		S					Vendor Slipped Shipment from Scheduled 12/20/92 Date
	001				F	RUSSIAN			RAIL	First Shipment Made 1/26/93
	211 1	PP 4 3 2 D & E 914 TONS	MECH	964	A					914 Metric Tons Ordered
2 2	7419	BEARINGS 40 TYPES	RMS		S					Shipment Delayed due to Rail Problems
	001				F	RUSSIAN			RAIL	Received Inspected and Complete
	259 3	PP 3	MECH	62	A					
2 3	7419	BEARINGS	RMS		S					
	001	COMBINED WITH 2 2 ABOVE		INCL.	F	RUSSIAN				
	259 3		MECH	W/ 2 2	A					
2 4	7419	AC MOTORS 3 EA	RMS		S					No longer made Substitutes for this heating season unlikely
	001	COMBINED WITH 2 13 BELOW		INCL. INCL.	F	RUSSIAN	ITEM DELETED			
	128 1		MECH	W/ 2 13	A					
2 5	7419	AC MOTOR 1 EA	RMS		S					No longer made Substitutes for this heating season unlikely
	001	COMBINED WITH 2 13 BELOW		INCL INCL.	F	RUSSIAN	ITEM DELETED			
	128 1	PP 3	MECH	W/ 2 13	A					
2 6	7419	CONVEYOR BELTING			S					Shipment Made on 12/26/92 Received Inspected and Complete
	001	PARTS & MATERIAL			F	RUSSIAN			RAIL	4300 Sq Meters Various Sizes (650 800 1200 1400 1600 MM)
	267 1	D PP		281	A					2 5 Metric Tons Glue 5 Metric Tons Row Rubber
2 7A	7419	NA3PO4	RMS		S					Received Inspected and Complete
	001	60 Tons			F	RUSSIAN			RAIL	
	213 1	PP 4 3 2 D E & C	MECH	9 8	A					
2 7B	7419	NAOH	RMS		S					
	001	60 Tons			F	RUSSIAN	ITEM DELETED		RAIL	60 Tons NAOH Tech Grade 98% Caustic Soda
	213 2	PP 4 3 2 D E & C	MECH	30 9	A					Item Deleted per C O No 1 dated 4/22/93
2 7C	7419	CAC2	RMS		S					Item Deleted
	001			0	F	RUSSIAN	ITEM DELETED		RAIL	Removed from Priority List
	213 3	PP 4 3 2 D E & C	MECH		A					
2 7D	7419	ACTIVATED COAL	RMS		S					Received Inspected and Complete
	001	50 Tons			F	RUSSIAN			RAIL	50 Tons
	213 4	PP 4 3 2 D E & C	MECH	65	A					

UNITED ENGINEERS and CONSTRUCTORS, INC. E and P SCHEDULE EMERGENCY HEAT and POWER PROJ No 1

ITEM	SPEC No	DESCRIPTION USE LOCATION	RESP DISCPLN	EST COST ($1000)		SOURCE COUNTRY	SHIP DATE	ON SITE DATE	SHIPING MODE	STATUS/COMMENTS
2 7E	7419	CATONITE	RMS		S					Received Inspected and Complete
	001	40 Tons			F	RUSSIAN			RAIL	40 Tons
	213 5	PP 4 3 2 D E & C	MECH	95 2	A					
2 7F	7419	NH3	RMS		S					RECEIVED QUOTE P O NOT PLACED
	001	TREATING BED MEDIA		1 3	F	RUSSIAN	ITEM DELETED		RAIL	
	213-6	PP 4 3 2 D E & C	MECH		A					
2 8	7419	DISTRICT HEAT	RMS		S					Item Deleted from Priority List In January
	001	EXCHANGERS 2 EA		84	F	RUSSIAN	ITEM DELETED		RAIL	
	233 1	D PP	MECH		A					
2 9	7419	STRIP CHART	RMS		S					Made First Air Charter
	001	RECORDING PAPER			F	U S			AIR	14 000 Lbs (29 630 Rolls Strip Chart Paper)
	5005	PP 4 3 & D	MECH	80	A					Received Inspected and Complete
2 10	7419	BABBITTT INGOTS FOR	RMS		S					Arrived In UB 12/14/92
	001	PLAIN BEARINGS			F	U S				Delivered 12/29/92 2 Metric Tons
	19 1	PP 4 & 3	MECH	14	A					Received Inspected and Complete
2 11	7419	MOTOR OPERATED	RMS		S					Item Deleted from Priority List In January
	001	REDUCING GEAR 25 EA		38	F	RUSSIAN	ITEM DELETED		RAIL	
		PP 3	MECH		A					
2 12	7419	MOTOR OPERATED	RMS		S					Item Deleted from Priority List
	001	REDUCING GEAR 10 EA		8	F	RUSSIAN			RAIL	
		PP 3	MECH		A					
2 13	7419	AC MOTORS 4 EA	RMS		S					No Longer Made Substitutes for this heating season unlikely
	001			0	F	RUSSIAN		N/A	RAIL	NOT INCLUDED W/ FORECAST OF EXPENDITURES
	128 1	PP 4 & D	MECH		A					
2 14	7419	100 KW DIESEL GENER	SCA		S					Deleted because low on priority list
	001	SETS 50 EA		0	F	U S	ITEM DELETED		OCEAN	NOT INCLUDED W/ 'FORECAST OF EXPENDITURES '
		LOCAL/REMOTE LOCALS	ELECT		A					
			68%	1809 2		RUSSIA POWER SECTOR				
			32%	832 6		U S POWER SECTOR				
				2641 8		TOTAL POWER SECTOR				

ITEM	SPEC No	DESCRIPTION / USE LOCATION	RESP DISCPLN	EST COST ($1000)		SOURCE COUNTRY	SHIP DATE	ON SITE DATE	SHIPING MODE	STATUS/COMMENTS
		GENERAL PROCUREMENTS		FOB Factor	FOB Factory					
G 1		FREIGHT FORWARDING	RHK		S					
		COMPANY		1050	F	U S				
					A			NA	NA	
G 2		RUSSIAN PROCUREMENT	RHK		S					
		REP / AGENT		0	F	RUSSIAN		NA	NA	Item Deleted
		ENERGOMONTAGE			A					
G 3	7419	SATELLITE COMMO DISH	REM		S					Arrived In UB 12/14/92
	001				F	U S				Delivered 12/29/92
	5015	FOR IN-COUNTRY OFFICE	MECH	27	A					Turned over to Component III Contractor
G-4	7419	COMPUTER HDW & SFW	REM		S					Arrived In UB 12/14/92
	001				F	U S				Delivered 12/29/92
	5017	FOR IN-COUNTRY OFFICE	MECH	9	A					Turned over to Component III Contractor
G 5	7419	FAX MACHINE	REM		S					
	001				F	RUSSIAN				In UB
	5025	FOR IN-COUNTRY OFFICE	MECH	1	A					Turned over to Component III Contractor
G 6	7419	PHOTOCOPIER	REM		S					
	001				F	RUSSIAN				In UB
	5024	FOR IN-COUNTRY OFFICE	MECH	5	A					Turned over to Component III Contractor
G 7	7419	STANDBY DIESEL GEN	REM		S					Arrived In UB 12/14/92
	001	SET 5 KW			F	U S				Delivered 12/29/92
	5019	FOR IN-COUNTRY OFFICE	MECH	1	A					Turned over to Component III Contractor
G 8	7419	TEST EQUIPMENT	WEC		S					Arrived In UB 12/14/92
	001	FOR STARTUP CREW			F	U S				Delivered 12/29/92
	5022		I & C	3	A					Turned over to Ministry
G 9	7419	2 WAY RADIOS	REM		S					Arrived In UB 12/14/92
	001				F	U S				Delivered 12/29/92
	5021		MECH	2	A					Turned over to Component III Contractor
G 10	7419	M K TECHNICAL	DEH		S					Includes 144 851 Allowance for Continuing Services & Blast Training
	001	ASSISTANCE FOR		234 8	F	U S			NA	
		COAL MINES	MECH		A					
			0%	6		RUSSIAN GENERAL				
			100%	1326 8		U S GENERAL				
				1332 8		TOTAL GENERAL				
			62%	5841		RUSSIA TOTAL PROJECT				
			38%	3517 3		U S TOTAL PROJECT				
				9358 3		TOTAL PROJECT				

APPENDIX B

SPECIFICATIONS FOR PURCHASED EQUIPMENT

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 4	10-19-92	54418/RMS	tam	7419 001-19-1

SELLER S SHIPPING DATE: 10/16/92

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Edison, New Jersey

TERMS OF PAYMENT: Net 30 Days

SELLER:
ESSEX METALS
990 Hobson Street
Union, NJ 07083
Attn Mr Steven Solomon, President
1-800-526-4961

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC.
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

UNITED ENGINEERS & CONSTRUCTORS INC.
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn J M McCormack
617-422-5280

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by telephoning Mr Franz Fassenbender at Tel (201) 303-1300, FAX (201) 313-9564

ROUTE VIA: Freight Forwarder

ITEM	QUANTITY	DESCRIPTION	Unit Price	Ext Price
1	2 metric tons	True genuine babbitt metal having the following chemical analysis Tin 88 0 - 90 0% Antimony 7 0 - 8 0% Copper 3 0 - 4 0% The genuine Babbitt Metal shall be provided as bars measuring 13" long x 3/12" wide, 2" high and have a weight of 25 lbs each NOTE Metric tons are 2,205 lbs/ton Origin of Goods U S origin	$6,999 00/ton	$13,998 00

TOTAL FIRM PRICE $13,998 00

Applicable Documents

The following is incorporated in this purchase order with the same force and effect as if they were given in full text Upon request, the Purchaser will make their full text available.

THIS ORDER IS SUBJECT TO THE TERMS, CONDITIONS, AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC.
BY J M McCormack
J M McCormack

TOTAL PRICE OF ORDER	
$13,998 00	
PURCHASE ORDER NO	
7419 001 19 1	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419 001

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 6	11/20/92	85610/RMS	MHS	7419.001-211-1

SELLER S SHIPPING DATE: VARIOUS SHIPPING DATES

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: ULAANBAATAR,MONGOLIA

TERMS OF PAYMENT: SEE BELOW

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO: SEE ARTICLE NO 2 BELOW

SELLER:
ASSOCIATION ENERGOMONTAGE
103074, MOSCOW, K-74
7, KITAYSKEY PASS
ATTN P P TRIANPAFILIDI
TEL 220-59-00

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO: SEE ARTICLE NO 2 BELOW

CONSIGN TO

MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU,6, ULAANBAATAR -46, MONGOLIA
ATTN MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	PRICE

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
		GROUP 1		
		SEAMLESS STEEL TUBES COLD ROLLED FOR HIGH PRESSURE BOILERS		
		CT20, TY14-3-460-75 CATALOG NO. 128-0-1		
19	4 TONS	25MM O D X 3 MM WALL		
7	4 TONS	25MM O D X 3 5MM WALL		
20	10 TONS	28MM O D X 4 0MM WALL		
2	15 TONS	32MM O D X 4 0MM WALL		
4	35 TONS	38MM O D X 4 0MM WALL		
1	40 TONS	60MM O.D X 6 0MM WALL		
41	100 TONS	76MM O D X 4 0MM WALL		
5	40 TONS	83MM O D X 4 0MM WALL		
6	20 TONS	89MM O D X 4 5MM WALL		
TOTAL	268 TONS		$1,148 00	$307,664 00
		GROUP 2		
		SEAMLESS STEEL TUBES HOT ROLLED FOR HIGH PRESSURE BOILERS		
		CT20, TY14-3-460-75 CATALOG NO 128-0-2		
21	40 TONS	83MM O D X 4 5MM WALL		
22	20 TONS	108MM O O X 4 5MM WALL		

THIS ORDER IS SUBJECT TO THE TERMS, CONDITIONS, AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY
TITLE PRESIDENT
DATE 25.11.92

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY G F Hill
G F HILL
Mark H Spurlock

TOTAL PRICE OF ORDER	
$963,764 00	
PURCHASE ORDER NO	
7419 001 211 1	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O ACCOUNT NO 7419 100

Guy F. Hill

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	SELLER	REL	PURCHASE ORDER NO
2 OF 6	ENERGOMONTAGE		7419 001-211-1

ITEM	QUANTITY	DESCRIPTION		PRICE
23	5 TONS	133MM O D X 7 0MM WALL		
24	5 TONS	133MM O D X 10 0MM WALL		
25	5 TONS	133MM O D X 13 0MM WALL		
28	10 TONS	159MM O D X 6 0MM WALL		
26	5 TONS	159MM O D X 7 0MM WALL		
27	5 TONS	159MM O D X 9 0MM WALL		
40	100 TONS	57MM O D X 4 0MM WALL		
39	100 TONS	76MM O D X 4 0MM WALL		
10	15 TONS	133MM O D X 4 0MM WALL		
TOTAL	310 TONS		$726 00	$225,060 00
		GROUP 3		
SEAMLESS STEEL TUBES COLD ROLLED FOR HIGH PRESSURE BOILERS CT12X1MF, TY14-3-460-75, CATALOG NO 128-0-3				
29	10 TONS	38MM O D X 5 0MM WALL		
30	20 TONS	38MM O D X 7 0MM WALL		
TOTAL	30 TONS		$1,496 00	$44,880.00
		GROUP 4		
SEAMLESS CARBON STEEL TUBES, THIN WALL, GOST 8734-74 CATALOG NO 128-0-4				
8	180 TONS	40MM O D X 1 5MM WALL		
9	120 TONS	51MM O D X 2 5MM WALL		
TOTAL	300 TONS		$1,148 00	$344,440 00
		GROUP 5		
SEAMLESS STAINLESS STEEL TUBES, THIN WALL, GOST 9941-81 CTX18H10T, CATALOG NO 128-0-5				
31	1000M	10MM O D X 2 0MM WALL		
32	1200M	12MM O.D X 2 0MM WALL		
33	1100M	16MM O D X 2 0MM WALL		
34	200M	20MM O D X 2 0MM WALL		
35	300M	22MM O D X 2 0MM WALL		
TOTAL	2 5 TONS		$6,960.00	$17,400.00
		GROUP 6		
SEANLESS STAINLES STEEL TUBES ROLLED, GOST 9941-81 CT12X18H10T, CATALOG NO 128-0-6				
36	1 TON	50MM O D X 3 0MM WALL		
37	1 TON	57MM O D X 3 0MM WALL		
38	1 5TONS	60MM O D. X 4 0MM WALL		
TOTAL	3 5 TONS		$6,960.00	$24,360.00
FREIGHT			INCLUDED IN TOTAL P O PRICE	
		TOTAL FIRM PRICE	$963,764 00	

ARTICLE 1- MARKING INSTRUCTIONS- SHALL BE AS FOLLOWS

Mongolian Emergency Heat and Power Project No 1
Mongolian Fuel and Energy Ministry
Ulaanbaatar, Mongolia

Emergency Spare Parts for Power Plants and Coal Mines
Emergency Duty Free Cargo for the Mongolian Government

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #1

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	12-22-92	88726C	tam	7419 001-211-1

SELLER S SHIPPING DATE: Various Shipping Dates

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Ulaanbaatar, Mongolia

TERMS OF PAYMENT: see below

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO: See Article No 2 Below

SELLER:
ASSOCIATION ENERGOMONTAGE
103074, Moscow, K-74
7, Kitayskey Pass
Attn P P Trianpafilidi

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO: See Article No. 2 Below

CONSIGN TO:
Mongolian Fuel and Energy Ministry, Bagga Poiruu 6, Ulaanbaatar-46, Mongolia
Attn Minister Jigjid

ROUTE VIA: rail

ITEM	QUANTITY	DESCRIPTION	PRICE

Change and incorporate the following under Article 2 in the original purchase order

Reference second paragraph "For each shipment " and replace with the following

For each shipment (cargo), the Seller shall provide the above listed documents by either FAXing or via overnight air shipment, through TNT Worldwide Express or DHL to the following.

United Engineers & Constructors Inc
100 Summer Street
Boston, MA 02110
Attn Mr M H Spaulding
Tel (617) 422-5360
FAX (617) 338-6239
FAX (617) 423-9020

Delete paragraph three (3) "Upon receipt of the above listed . ." of Article 2 in its entirety

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M H Spaulding
M.H. Spaulding

Guy F Hall

TOTAL PRICE OF ORDER (Rev)	
$963,764 00	__ Buyer __ Requisitioner __ Expediter __ Accounting __ Field/MRR __ Client __ Other _____
PURCHASE ORDER NO 7419 001 211 1	

J O Account No. 7419 001

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United Engineers & Constructors
A Raytheon Company

CHANGE ORDER # 2

PAGE NO	DATE	REQN NO./BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	1/18/93		MHS	7419 001-211-1

SELLER S SHIPPING DATE: VARIOUS

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES, CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: ULAANBAATAR, MONGOLIA

TERMS OF PAYMENT: SEE BELOW

SELLER:
"vostokenergomontazh"
664007, Irkutsk, Russia
119-A, Deckabrskih Sobitey St
Attn Nickolay I Turumov
Tel 3952-27-28-49
Fax 3952-27-33-34

MAIL THE ORIGINAL AND ( ) COPIES OF INVOICES, THE ORIGINAL SHIPPING PAPERS, AND PACKING LIST TO:
See Article No 2 Below

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO:
See Article No 2 Below

CONSIGN TO: Mongolian Fuel and Energy Ministry, Bagga Poiruu 6, Ulaanbaatar -46, Mongolia Attn Minister Jigjid

ROUTE VIA: Rail

ITEM	QUANTITY	DESCRIPTION	PRICE

INCORPORATE THE FOLLOWING

Change Article 4 "These payments shall be made to the following bank and account number" to the following

Account of "International Company of Finance and Investments" Number 8000056436 in Bank of New York, New York, in favor of "Irkutskii Combank Socialnogo Razvitia Account Number 090107601 for Trust "Wostokenergomontaj" Account Number 000070077

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED:
BY _____
TITLE. _____
DATE. _____

Form 4425 11/91

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC
BY M H Spaulding
Guy F Hall

TOTAL PRICE OF ORDER (Rev) $963,764 00

PURCHASE ORDER NO 7419 001-211-1

__ Buyer
__ Requestioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O ACCOUNT NO. 7419 100

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United Engineers & Constructors
A Raytheon Company

CHANGE ORDER # 3

PAGE NO	DATE	REQN NO./BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	2/23/93		[illegible]S	7419 001-211-1

SELLER'S SHIPPING DATE	THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES, CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES	REL
VARIOUS		

FOB POINT	MAIL THE ORIGINAL AND ( ) COPIES OF INVOICES, THE ORIGINAL SHIPPING PAPERS, AND PACKING LIST TO-
ULAANBAATAR, MONGOLIA	
TERMS OF PAYMENT	
SEE BELOW	See Article No 2 Below
SELLER	ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO-
"Ostoknergomontazh" 664007 Irkutsk Russia 129-a Dekabrskih Sobitey St Attn Nickolay I Turumov Tel 3952-27-28-49 Fa 3952-27-33-3-	See Article No 2 Below

CONSIGN TO [illegible]

ROUTE VIA Rail

ITEM	QUANTITY	DESCRIPTION	PRICE

INCORPORATE THE FOLLOWING

Change Article 4 "These payments shall be made to the following bank and account number" to the following:

Account of "International Company of Finance and Investments" number 890005b-36 in Bank of New York, New York in favor of "Irkutskii Company Sodeystvie Razvitia account number 07301127/001for Trust "Ostoknergomontaj" account number 00007077

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED-
BY _____
TITLE. _____
DATE. _____

Form 4425 11/91

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M H Spaulding

Guy F Hall

TOTAL PRICE OF ORDER (Incl.)	
$963,764 00	___ Buyer ___ Requisitioner ___ Expediter ___ Accounting ___ Field/MRR ___ Client ___ Other _____
PURCHASE ORDER NO	
7419 001-211-1	

T.O. ACCOUNT NO 7419.100

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United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #4

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	04-19-93	64611/PC	tam	7419 001-211-1

SELLER S SHIPPING DATE: Various

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Ulaanbaatar, Mongolia

MAIL THE ORIGINAL AND TWO (3) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO: SEE ARTICLE NO. 2 BELOW

TERMS OF PAYMENT: See Below

SELLER:
"Vostokenergomontazh"
664007, Irkutsk, Russia
119-A, Deckabrskih Sobitey St
Attn Nickolay I Turumov

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO: SEE ARTICLE NO 2 BELOW

CONSIGN TO: Mongolian Fuel and Energy Ministry, Bagga Poiruu 6,
Ulaanbaatar-46, Mongolia
Attn Minister Jigjid

ROUTE VIA: RAIL

ITEM	QUANTITY	DESCRIPTION	Total of Previous Order
			$ NO CHANGE

INCORPROATE AND CHANGE THE FOLLOWING

1 Incorporate Group 2 5, GOST 8732-74 with the following items

Items 40 39 and 10

2 Change wall thickness on Item 8 from 1 5 mm to 2 0 mm for 38 out of 180 mt

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC.
BY M H Spaulding
M H Spaulding

TOTAL PRICE OF ORDER (Rev) $963,764 00

PURCHASE ORDER NO 7419 001 211 1

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419 100

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United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #5

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	4/22/93	64613/RHK	tam	7419 001-211-1

SELLER S SHIPPING DATE	THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES	REL
Various		

FOB POINT	MAIL THE ORIGINAL AND THREE (3) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO
Ulaanbaatar, Mongolia	SEE ARTICLE NO 2 BELOW
TERMS OF PAYMENT	
See Below	
SELLER	ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO
VOSTOKENERGOMANTASH 664007, Irkutsk, Russia 119-A, Deckabrskih Sohley St Attn Nickolay I Turumov	SEE ARTICLE NO. 2 BELOW

CONSIGN TO Mongolian Fuel and Energy Ministry, Bagga Poiruu 6, Ulaanbaatar - 46, Mongolia

ROUTE VIA Rail

Item	Qty	Description	Total of Previous Order

INCORPORATE THE FOLLOWING

1 Change the following for item 40, Group 2.

From 57 mm x 4 00 mm tubes
To: 57 mm x 3 5 mm for 10 54 MT and for the remaining 60.46 MT of line item #40 to 60 mm x 3 5 mm or 60 mm x 4.0 mm

NOTE 60 mm tubes are used in 75 ton/hr. and 220 ton/hr boilers in Power Plant #3

2 Change the following for item 9, Group 4

From. 51 mm x 2 5 mm tubes
To: 51 mm x 3 0 mm for the remaining 47.8 MT

USE Mongolian Emergency Heat and Power Project No 1

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC.

BY _____
M.H. Spaulding

TOTAL PRICE OF ORDER (Rev)	
$963,764 00	___ Buyer ___ Requisitioner ___ Expediter ___ Accounting ___ Field/MRR ___ Client ___ Other _____
PURCHASE ORDER NO 7419 001 211 1	

J O Account No 7419 100

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #6

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	5/13/93	64615/RHK	tam	7419 001-211-1

SELLER S SHIPPING DATE: Various

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Ulaanbaatar, Mongolia

TERMS OF PAYMENT: See Below

MAIL THE ORIGINAL AND THREE (3) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

SEE ARTICLE NO 2 BELOW

SELLER

VOSTOKENERGOMANTAZH
664007, Irkutsk, Russia
119-A, Deckabrskih Sohley St
Attn Nickolay I Turumov

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

SEE ARTICLE NO 2 BELOW

CONSIGN TO: Mongolian Fuel and Energy Ministry, Bagga Poiruu 6, Ulaanbaatar - 46, Mongolia

ROUTE VIA: Rail

Item	Qty	Description	Total of Previous Order
			$963,764 00

INCORPORATE THE FOLLOWING

1 Change the following for item 8, Group 4

From 40 mm x 1 5 mm
To: 40 mm x 2.0 mm for the remaining tubes.

NOTE. The change based on Vostokenergomontazh providing the same total length of tubes as ordered under 40 mm x 1 5 mm.

USE. Mongolian Emergency Heat and Power Project No 1

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC.

BY _____
M.H. Spaulding

TOTAL PRICE OF ORDER (Rev)	
$963,764.00	
PURCHASE ORDER NO 7419 001 211 1	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O. Account No 7419.100

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #7

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	5/26/93	64617/SF	tam	7419 001-211-1

SELLER S SHIPPING DATE: Various

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL:

FOB POINT: Ulaanbaatar, Mongolia

TERMS OF PAYMENT: See Below

SELLER:
VOSTOKENERGOMANTAZH
664007, Irkutsk, Russia
119-A, Deckabrskih Sohley St.
Attn Nickolay I Turumov

MAIL THE ORIGINAL AND THREE (3) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO:
SEE ARTICLE NO 2 BELOW

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO:
SEE ARTICLE NO. 2 BELOW

CONSIGN TO: Mongolian Fuel and Energy Ministry, Bagga Poiruu 6, Ulaanbaatar - 46, Mongolia

ROUTE VIA: Rail

Item	Qty	Description	Total of Previous Order
			$963,764.00

INCORPORATE THE FOLLOWING:

Change the following for Item 10, Group 2 5

From 133 mm x 4 0 mm
To. 133 mm x 5.0 mm

NOTE This change is based on Vostokenergomontazh providing the same total length of tubes as ordered under 133 mm x 4 0 mm.

USE. Mongolian Emergency Heat and Power Project No 1

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY M H Spaulding
M H Spaulding

TOTAL PRICE OF ORDER (Rev)	
$963,764.00	
PURCHASE ORDER NO	
7419 001 211 1	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

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J.O. Account No. 7419 100

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 4	11-23-92	92987/RMS	tam	7419 001-211-1

SELLER S SHIPPING DATE
2 trucks before 12-09-92, 2 trucks on 12-09-92

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT
Winimac, Indiana

TERMS OF PAYMENT
Net 30 Days

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

SELLER

SENIOR BOILER TUBE COMPANY
650 Green Lane
P o Box 2065
Union, NJ 07083
Attn Mr John Bussiculo
1-800-845-3052

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn J M McCormack
617-422-5280

CONSIGN TO Seller must contact An-Mar International Inc for shipping instructions by telephoning Mr Franz Fassbender at Tel No (201) 313-1300 - FAX No (201) 313-9564

ROUTE VIA FREIGHT FORWARDER

ITEM	QUANTITY	DESCRIPTION	Unit Price	Ext Price
		BOILER TUBES		
1	860 pieces	(54,400 lbs ie 24 67 metric tons) boiler tubes, 38 mm O D x 4 0 mm wall, straight tubes, 8 meters (26,247 ft) long of ASTM-A-209-T1 material	$66 40/piece	$57,104 00
2	1040 pieces	(54,269 lbs ie 24 61 metric tons) boiler tubes, 32 mm O D x 4 0 mm wall, straight tubes, 8 meters (26,247 ft) long of ASTM-A210A1 material	$46 19/piece	$48,037 60
3	500 pieces	(52,806 lbs ie 23 95 metric tons) boiler tubes, 60 mm O D x 4 0 mm wall, straight tubes, 8 meters, (26 247 ft) long of ASTM-A210A1 material	$83 72/piece	$41,860 00
	NOTE	Metric tons are 2,205 lbs/ton		
		TOTAL FIRM PRICE		**$147,001 60**

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY Joanne M McCormack
J M McCormack
Guy F Hill

TOTAL PRICE OF ORDER
$147,001 60
PURCHASE ORDER NO
7419 001 211 1

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419 100

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United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #1

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	4/22/93	64612/RHK	tam	7419 001-213-1

SELLER S SHIPPING DATE: Various

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: FOB - Nauchskı

TERMS OF PAYMENT: See Below

MAIL THE ORIGINAL AND THREE (3) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

SEE ARTICLE NO 2 BELOW

SELLER

TECHNOPROMEXPORT
18/1, Ovchınwıkouskaya Nab,
Moscow, Russıa 113324
Attm Mr Yurıy Efımov

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

SEE ARTICLE NO 2 BELOW

CONSIGN TO Mongolıan Fuel and Energy Mınıstry, Bagga Poıruu 6 Ulaanbaatar - 46, Mongolıa

ROUTE VIA Raıl

Item	Qty	Description	Total of Previous Order
			$200,940 00

INCORPORATE THE FOLLOWING

Delete the followıng ıtems

Item 1 - Trı-Sodıum Phosphate ($9,840 00)

Item 2 - Sodıum - Hydroxıde ($30,900 00)

USE Mongolıan Fuel and Energy Project No 1

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M H Spaulding

TOTAL PRICE OF ORDER (Rev)	
$160,200 00	
PURCHASE ORDER NO 7419 001 213 1	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419 100

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #2

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	4/23/93	429893/PDC	tam	7419 001-213-1

SELLER S SHIPPING DATE: Various

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: FOB - Nauchskı

TERMS OF PAYMENT: See Below

MAIL THE ORIGINAL AND THREE (3) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO: SEE ARTICLE NO 2 BELOW

SELLER:
TECHNOPROMEXPORT
18/1, Ovchınwıkowskaya Nar
Moscow, Russıa 113324
Attm Mr Yurıy Efımov

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO: SEE ARTICLE NO 2 BELOW

CONSIGN TO: Mongolıan Fuel and Energy Mınıstry, Bagga Poıruu 6 Ulaanbaatar - 46, Mongolıa

ROUTE VIA: Raıl

Item	Qty	Description	Total of Previous Order
			$160,200 00

INCORPORATE THE FOLLOWING

Reıncorporate Item No 1 whıch was deleted under change order no 1

Item No 1 - Trı-Sodıum Phosphate $9,840 00

USE Mongolıan Fuel and Energy Project No 1

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC.
BY M H Spaulding
M H Spaulding

TOTAL PRICE OF ORDER (Rev) $170,040 00

PURCHASE ORDER NO 7419 001 213 1

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419.100

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 5	2/17/93	89102/pc	MHS	7419 001-213-1

SELLER S SHIPPING DATE: VARIOUS-SEE BELOW

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: FOB-NAUCHSKI

TERMS OF PAYMENT: SEE BELOW

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO: SEE ARTICLE NO 2 BELOW

SELLER
TECHNOPROMEXPORT
18/1, OVCHINNIKOVSKAYA NAB
MOSCOW, USSR 113324
ATTN YURIY I EFIMOV
TEL 220-13-58

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO: SEE ARTICLE NO 2 BELOW

CONSIGN TO
MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU 6 ULAANBAATAR,-46, MONGOLIA
MONGOLIA, ATTN MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
1	60 TONS	TRI-SODIUM PHOSPHATE 25%/NA_3PO_4X 10 H_2O IN ACCORDANCE WITH RUSSIAN GOVERNMENT STANDARD GOST 201-76	$164 00	$9,840 00
2	40 TONS	UNIVERSAL CATIONITE IN ACCORDANCE WITH RUSSIAN GOVERNMENT STANDARD KY-2-8 MPTy 6-05-0903-65, GOST 20298-76	$2,380.00	$95,200 00
3	60 TONS	SODIUM HYDROXIDE, TECHNICAL GRADE NaOH, 98% CAUSTIC SODA	$515 00	$30,900 00

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS, AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED:
BY
TITLE Director of TPE Department
DATE 17/2/93

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY M H Spaulding
M H SPAULDING

TOTAL PRICE OF ORDER	
$200,940 00	
PURCHASE ORDER NO	
7419 001 213 1	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O ACCOUNT NO 7419 100

Guy F. Hill

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	SELLER	REL	PURCHASE ORDER NO
2 OF 5	TECHNOPROMEXPORT		7419 001-213-1

ITEM	QUANTITY	DESCRIPTION	PRICE	
4	50 TONS	ACTIVATED COAL Ck-I Copt I IN ACCORDANCE WITH RUSSIAN GOVERNMENT STANDARD GOST-5696-74	$1,300 00	$65,000 00

TOTAL FIRM PRICE DELIVERED $200,940 00

ARTICLE 1- MARKING INSTRUCTIONS- SHALL BE AS FOLLOWS

Mongolian Emergency Heat and Power Project No 1
Mongolian Fuel and Energy Ministry
Ulaanbaatar, Mongolia

Emergency Spare Parts for Power Plants and Coal Mines
Emergency Duty Free Cargo for the Mongolian Government

US AID PROJECT No 438-0003
UE&C Project No 7419 001
UE&C Purchase Order No 7419 001-213-1

The "US AID Label" and "Made in RUSSIA" shall be clearly marked on each package of each shipment

Each package in the shipment shall be marked (eg 1 of N, 2 of N, N of N)

Each package shall be marked with proper metric dimensions and weights

Packages should be properly EXPORT BOXED/BUNDLED TO WITHSTAND OUTSIDE STORAGE as well as railroad/trucking/airfreight handling

ARTICLE 2- SHIPPING DOCUMENTATION- THE FOLLOWING SHALL BE INCLUDED IN BOTH RUSSIAN AND ENGLISH FOR EACH SHIPMENT/CARGO

a Copy of Inland Bill of Lading
b Copy of Commercial Invoice
c Copy of Packing List(Shall be attached to the outside of each package, enclosed in water proof plastic
d Copy of Certificate of Origin or if no 'Certificate is available, supplier shall stamp Made in Russia on the Commercial Invoice
e Copy of Inspection Certificate(Quality Certificate)
~~f. Export License(if applicable)~~

MHS

For each shipment(cargo), the seller shall provide the above listed documents, as soon as shipment leaves seller's facility by either faxing or via overnight air shipment, through TNT Worldwide Express or DHL to the following

United Engineers and Constructors, Inc
100 Summer Street
Boston, Ma (USA) 02110
Attn Mark H Spaulding
Tel 617-422-5360
Fax 617-338-6239 or 617-423-9020

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 4	01-17-93	92993/RMS	tam	7419 001-248-1

SELLER S SHIPPING DATE: 4 days from order

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Linden, NJ

TERMS OF PAYMENT: 1/2% 10 days, net 30 days

SELLER:
FLEXICO PRODUCTS
637 East Elizabeth Avenue
Linden, NJ 07036
Attn Ms Lori Battaglia

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO:
UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO:
UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn G F Hill
617-422-5298

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by contacting Mr Franz Fassbender at Tel No (201) 313-1300, FAX No (201)313-9564

ROUTE VIA

ITEM	QUANTITY	DESCRIPTION	Unit Price	PRICE
1	45 PCS	One inch (1) nominal I D stainless steel corrugated flexible metal hose Unbraided hose Each piece shall be three (3) feet in length and shall have a carbon steel standard iron pipe thread rigid female coupling as per fig no 3106 shown on page 3 of flexline brochure on one end and a carbon steel standard iron pipe thread male union as per fig no 3110 shown on page 3 of the flexible brochure on the other end	$19 74/piece	$880 30
		TOTAL FIRM PRICE $888 30		
	NOTE	US AID approval and concurrance not required due to price of the order less than $25,000 00		

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY Lori Battaglia
TITLE Sales
DATE 1-19-93

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY Jeanne I McCormack as Mgr
Jeanne I McCormack
G.F. Hill

TOTAL PRICE OF ORDER	
$888 30	
PURCHASE ORDER NO	
7419 001 248 1	

- Buyer
- Requisitioner
- Expediter
- Accounting
- Field/Mfg
- Client
- Other

J O Account No 7419 10

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 4	01-25-93	92994/RMS	tam	7419 001-248-2

SELLER S SHIPPING DATE: Est 2-1-93

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Jersey City, NJ

TERMS OF PAYMENT: Net 30 Days

SELLER:
THE IDEAL SUPPLY CO
445 Communipaw Avenue
Jersey City, NJ 07304
Attn Mr Jack Frenkel
(201) 333-2600

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn· Accounts Payable

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn M G Simpson
617-422-422-5379

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by telephoning Mr Franz Fassbender at Tel No (201) 313-1300 - FAX No. (201) 313-9564

ROUTE VIA: BUYER'S FREIGHT FORWARDER

ITEM	QUANTITY	DESCRIPTION	PRICE

SCANNER AIR PIPING SYSTEM

1 — Furnish miscellaneous pipe and supplies as shown on ATTACHMENT NO 1, two (2) pages, attached hereto and made apart hereof

TOTAL PRICE $2,371.50

The following is incorporated in this purchase order with the same force and effect as if they were given in full text Upon request, the Purchaser will make their full text available

FAR CLAUSES

(X)	52 202-01	Definitions (APR 1984)
(X)	52 203-01	Officials Not to Benefit (APR 1984)
(X)	52 203-03	Gratuities (APR 1984)
(X)	52 203-05	Covenant Against Contingent Fees (APR 1984)
(X)	52 203-07	Anti-Kickback Procedures (APR 1984)
(X)	52 204-2	Security Requirements (APR 1984)
(X)	52 204-3	Taxpayer Identification
(X)	52 212-13 & Alternate I	Stop-Work Order (APR 1984)
(X)	52 215-01	Examination of Records by Comptroller General (APR 1984)
(X)	52 215-02	Audit-Negotiation (APR 1984)

THIS ORDER IS SUBJECT TO THE TERMS, CONDITIONS, AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M G Simpson
M G Simpson

C L Hill

TOTAL PRICE OF ORDER: $2,371 50

PURCHASE ORDER NO: 7419 001 248 2

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419 100

e Order No 7419 001-248-2
al Supply Co
Scanner Air Piping System

ATTACHMENT NO 1

Item No	Qty	Description	Unit Price		Ext Price
1	20 ft	6" schedule 40 pipe, carbon steel, ~~ASTM A106 Gr. B or~~ ASTM A53 Gr. B, ~~seamless~~ for butt welding	6 25/ft	✓	125 00
2	200 ft	1" schedule 40 carbon steel pipe, ASTM A106, Gr B or ASTM A53 Gr B seamless for butt welding	1 20/ft	✓	240 00
3	40	6" u-bolts black carbon steel complete with two (2) hex nuts on each threaded end as per Part No S-7 of Imperial Bolt and Manufacturing, Inc	2 00/ea	✓	80 00
4	20	6" adjustable band hangers, black carbon steel, as per Part No M-2900 of Imperial Bolt and Manufacturing, Inc	1 26/ea	✓	25 20
5	70	2" adjustable band hangers, black carbon steel, as per Part No M-2900 of Imperial Bolt and Manufacturing, Inc	0 34/ea	✓	23 80
6	30	2" u-bolts black carbon steel complete with two (2) hex nuts on each threaded end as per Part No S-7 of Imperial Bolt and Manufacturing, Inc	0 26/ea	✓	7 80
7	400 ft	1/2" continuous threaded rod right hand thread, black carbon steel as per Part No P-8000 of Imperial Bolt and Manufacturing, Inc	0 23/ft	✓	92 00
8	100	1/2" hexagon rod couplings female thread right hand national course thread, black carbon steel, as per Part No S-3 of Imperial Bolt and Manufacturing, Inc Note These hexagon rod couplings are for the threaded rod of Item 7	0 17/ea	✓	17 00
9	50	1/2" adjustable beam brackets, black carbon steel, as per Part No I-350 of Imperial Bolt and Manufacturing, Inc	0 78/ea	✓	39 00
10	100	1/2" hex nuts as per Part No I-1018 of Imperial Bolt and Manufacturing, Inc Note These hex nuts are for the threaded rod of Item 7	0 06/ea	✓	6 00
11	40	Welded bracket, size #1, medium pattern, black carbon steel, as per Part No M-7200 of Imperial Bolt and Manufacturing Inc	25 86/ea	✓	1,034 40

228 20 actual

91 08 actual

66

ATTACHMENT NO 1

12	500 ft	3/8" Continous threaded rod right hand thread, black carbon steel, as per Part No P-8000 of Imperial Bolt and Manufacturing, Inc	0 15/ft	~ 75 00	74 10 actual
13	200 ea	3/8" Hex nuts as per Part No I-1018 of Imperial Bolt and Manufacturing, Inc Note These Hex Nuts are for the threaded rod of Item 12	0 04/ea	~ 8 00	
14	100 ea	3/8" Hexagon rod couplings, female thread, right hand national course thread, black carbon steel, as per Part No S-3 of Imperial Bolt and Manufacturing, Inc Note These Hexagon rod couplings are for the threaded rod of Item 12	0 16/ea	~ 16 00	
15	100 ea	3/8" Adjustable beam brackets, black carbon steel, as per Part No I-358 of Imperial Bolt and Manufacturing, Inc	0 78/ea	~78 00	
16	1 ea	Threader, ratchet type, drop head type complete with rachet and handle as manufactured by Rigid Tool Co Model No 00R	40 95/ea	~ 40 95	
17	1 ea	1" drop head type die, carbon steel for threading right hand NPT threads Die shall fit Item 15 above	45 75 ea	~ 45 75	
18	6 lengths	2-1/2" NPS Schedule 80 SA-106 Gr B Pipe, ten foot (10') lengths	36 40 ea	✓ 218 40	
19	12 lengths	2" Schedule 40 SA-106 Gr B Pipe, ten foot (10') lengths	16 60 ea	✓ 199.20	
		TOTAL		$2371 50	

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #1

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	02-19-93	89179/WEC	tam	7419 001-252-1

SELLER S SHIPPING DATE 1/17/93

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT
Spring House, PA

TERMS OF PAYMENT
Net 30 Days

SELLER
MOORE PRODUCTS COMPANY
100 Corporate Place
Peabody, MA 01960
Attn Mr W C Cunningham
(508) 535-9512

MAIL THE ORIGINAL AND THREE (3) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO
UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn M G Simpson
617-422-422-5379

CONSIGN TO Mongolian Emergency Heat and Power Project No 1
Mongolian Fuel and Energy Ministry
Ulaanbaatar, Mongolia

ROUTE VIA FREIGHT FORWARDER

Item	Qty	Description	Total of Previous Order
			$168,637 00

ADD THE FOLLOWING

			Unit Price	Ext Price
17	18	Pulverizer Outlet Pressure - Moore Model 340D1AS12BNNNNN Mycro XTC differential pressure transmitter with a 4 to 20 ma output	$ 990 00	$ 17,820 00
18		Credit for retun of P O Item No 1 (Moore Model 340D2AH12BNNNNN)		($17,820 00)
19	18	Restocking charge (25%) for return	$ 247 50	$ 4,455 00
		TOTAL ADD		**$ 4,455 00**

Ship returned product to

Moore Products Company
Sumney Town Pike
Spring House, PA 19477
Attn Bob Wagener

USE Mongolian Emergency Heat and Power Project No 1

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC.
BY M G Simpson
M.G Simpson
Gwen F. Hill

TOTAL PRICE OF ORDER (Rev)	
$173,092 00	
PURCHASE ORDER NO 7419 001 252 1	___ Buyer ___ Requisitioner ___ Expediter ___ Accounting ___ Field/MRR ___ Client ___ Other _____

J O Account No 7419 100

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 6	11-04-92	92552/92553/92554	tam	7419 001-252-1

SELLER S SHIPPING DATE: Various - As Noted Below

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Various - As Noted Below

TERMS OF PAYMENT: Net 30 Days

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

SELLER

MOORE PRODUCTS COMPANY
100 Corporate Place
Peabody, MA 01960
Attn Mr W C. Cunningham
~~(617) 245-5414~~
1-508-535-9512

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn M H Spaulding
617-422-5360

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by telephoning Mr Franz Fassbender at
Tel No (201) 313-1300 - FAX No (201) 313-9564

ROUTE VIA: FREIGHT FORWARDER

Item	Quantity	Description	Unit Price	Ext. Price
1	18	Pulverizer Outlet Pressure - Moore Model 34OD2AH12BNNNNN Mycro XTC Differential Pressure Transmitter with a 4 - 20 ma output	$1,100 00	$19,800 00
2	18	Pulverizer Fan Outlet Temperature - Transmitter Model 344BNNNNN Mycro XTC with a 4 - 20 ma output	$740 00	13,320 00
3	18	Pulverizer Outlet Temperature RTD's with well and mounting coupling	$187 00	$3,366 00
4	18	Pulverizer Fan Outlet Temperature RTD's with well and mounting coupling	$187 00	$3,366 00
5	6	Pulverizer Fan Outlet Temperature Electronic Indicating Station which will accept two (2) 4 - 20 ma input and display both temperatures Model 372E11NN (1 per boiler)	$520 00	$3,120 00
6	24	Moore Model 352EAN1NNF Single Loop Controller with pulse output (4 per boiler)	$1,700 00	$40,800 00
7	12	Moore Model 352EAN1NDF Single Loop Controller with pulse output and RTD input (2 per boiler)	$2,000 00	$24,000 00
8	6	Acopian R24M9-230 Redundant power supplies 220 VAC 50 Hz to 24 VDC, rack mount (1 per boiler)	$1,600 00	$9,600 00

THIS ORDER IS SUBJECT TO THE TERMS, CONDITIONS, AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M H Spaulding
M H Spaulding

TOTAL PRICE OF ORDER	
$168,637 00	___ Buyer ___ Requisitioner ___ Expediter ___ Accounting ___ Field/MRR ___ Client ___ Other _____
PURCHASE ORDER NO 7419 001 252 1	

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	SELLER	REL	PURCHASE ORDER NO
2 OF 6	MOORE PRODUCTS		7419 001-252-1

ITEM	QUANTITY	DESCRIPTION		PRICE
9	6	Industrial Module Rack P/N 16052-42 for seven module (1 per boiler)	$1,500 00	$9,000 00
10	2	Instrument racks to mount the above equipment for the high pressure boilers	$2,615 00	$5,230 00
11	3	Pulverizer Fan Outlet Temperature Electronic Indicating Station which will accept two 4 - 20 ma input and display both temperatures Model 372E11NNF (1/2 per boiler) with standard case mounting	$670 00	$2,101 00
12	6	Moore Model 352EA11NNF Single Loop Controller with 4 - 20 ma output (1 per boiler) with standard case mounting This will control the new Beck damper drive	$1,350 00	$8,100 00
13	6	Moore Model 352EA21NNF Single Loop Controller with pulse output (1 per boiler) with standard case mounting	$1,900 00	$11,400 00
14	6	Moore Model 352EA21DNF Single Loop Controller with pulse output and RTD input (1 per boiler) with standard case mounting	$2,200 00	$13,200 0.
15	6	Acopian R24M9-230 Redundant power supplies 220 VAC 50 Hz to 24 VDC, panel mount (1 per boiler)	$1,600 00	$9,600 00
		Relays rack mounted with rail to interface between the pulse output signals and the damper drive	-----	------
		Furnish the required wire to permit field wiring of the components and all hardware to mount components	-----	------
16		Configuration and documentation for the controllers	-----	$7,200 00
		Subtotal		**$183,112 00**
		Moore Products Discount		($14,475 00)
		TOTAL FIRM PRICE		**$168,637 00**

NOTE This Purchase Order accounts for the following Inquiry No 's

7419 001-252-1
7419 001-252-2
7419 001-252-4

Origin of Goods

U S Origin

Applicable Documents

The following is incorporated in this purchase order with the same force and effect as if they were given in full text Upon request, the Purchaser will make their full text available

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 4	11-25-92	92558A/WEC	mgs	7419 001-252-3

SELLER S SHIPPING DATE: 12/09/92

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Hamburg, Germany

TERMS OF PAYMENT: Net 30 Days

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

SELLER

SIEMENS ENERGY & AUTOMATION, INC
187 Ballardvale Street
Suite A270
Wilmington, MA 01887
Attn Mr Mark Simulis
508-658-0142

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn M G Simpson
617-422-5379

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by telephoning Mr Franz Fassbender at Tel No (201) 313-1300 - FAX No (201) 313-9564

ROUTE VIA: BUYER'S FREIGHT FORWARDER

ITEM	QUANTITY	DESCRIPTION	PRICE	
		MOTORS FOR DAMPER DRIVES		
1	70 EA	AC MOTORS PER DATA SHEET 4, SPEC NO 252-3-IC21A SELLER S PRODUCT NO 1LA5080-4AA22	$187 00 EA	$13,090 00
2	9 EA	AC MOTORS PER DATA SHEET 5, SPEC NO 252-3-IC21A SELLER'S PRODUCT NO ILA5096-4AA22	198 67 EA	1,788 00

These motors shall be per UE&C's drawing no 7419-M1, except for the shaft diameter which shall be per Siemens' drawing of June 1992 Both drawings are attached hereto and made a part hereof The Client (at site) is aware of the increase in shaft size and feel they can adjust the gear box to suit

TOTAL FIRM PRICE **$14,878 00**

Origin of Goods Hamburg, Germany

Applicable Documents

A Motor Specification Sheet 4, Spec No 252-3-IC21A, Rev 2, 11/23/92

B Motor Specification Sheet 5, Spec No 252-3-IC21A, Rev 2, 11/24/92

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY MG Simpson
M G Simpson

TOTAL PRICE OF ORDER	
$14,878 00	X Buyer __ Requisitioner __ Expediter __ Accounting __ Field/MRR __ Client __ Other _____
PURCHASE ORDER NO 7419 001 252 3	

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MOTOR
SPECIFICATION SHEET

JOB NO	7419 001	COMP BY ARK	SHEET 4
REV NO 2		DATE 08/25/92	SPEC NO 252 3 IC21A
		Rev 1 11/18/92	TAG NO M 3003 UB3
CLIENT	Mongolian Peoples Republic	Rev 2 11/23/92	
PROJECT	Critical Spare Parts		

GENERAL	1	QUANTITY	70
		SERVICE	MOTORS FOR PULV AIR DAMPERS
	2	MANUFACTURER	Siemens
	2	MODEL	1LA5080 4AA22
	2	FRAME SIZE	80
		ENCLOSURE	Totally Enclosed Fan Cooled
	1	Motor Drawing	Refer to note 4
MOTOR DATA		VOLTAGE / PHASE / CYCLE	220/380 VAC /3 PH /50 CYCLE
	2	FULL LOAD AMPS	1 5 amps at 380 VAC
	2	LOCKED ROTOR AMPS	7 05 amps
		CLASS OF INSULATION	B MIN STATOR WIND INSULAT RESIST=0 5 OM
		RPM	1365
		HP	0 5
	1	DIMENSIONS Note 3 & 4	
	2	START UP TORQUE	7 2 NM
	2	LOCKED ROTOR TORQUE	8 5 NM
	1	ROTATION	CW & CCW DIRECTION
		C FACE MOUNTING	YES
		MOUNTING OF THE MOTOR	ANY DIRECTION
NOTES		1 PROVIDE A CORROSION RESISTANT METAL TAG WITH TAG NO EMBOSSED ON IT	
		ATTACHED TO THE INSTRUMENT	
		2 To replace a Model 4AAM63V4U3 Russian made product	
		3 These motors shall be mounted in existing drives	
	1	4 Motors shall be per drawing no 7419 M1	
		This motor is an alternate to sheet 1	
		*Seller to furnish the final information	

MOTOR
SPECIFICATION SHEET

JOB NO	7419 001	COMP BY ARK	SHEET 5
REV NO 2		DATE 08/25/92	SPEC NO 252 3 IC21A
		Rev 1 18 Nov	TAG NO M 3005 UB3
CLIENT	Mongolian Peoples Republic	Rev 2 24 Nov	
PROJECT	Critical Spare Parts		

GENERAL		QUANTITY	9
		SERVICE	MOTORS FOR PULV AIR DAMPERS
	2	MANUFACTURER	Siemens
	2	MODEL	ILA5096 4AA22
	2	FRAME SIZE	90L
		ENCLOSURE	Totally Enclosed Fan Cooled
MOTOR DATA		VOLTAGE / PHASE / CYCLE	220/380 VAC /3 PH /50 CYCLE
	2	FULL LOAD AMPS	3 7 AMPS AT 380 VOLTS
	2	LOCKED ROTOR AMPS	18 14
		CLASS OF INSULATION	B MIN STATOR WIND INSULAT RESIST=0 5 OM
		RPM	1360
		HP	1 74
	1	DIMENSIONS Note 3 & 4	
	2	START UP TORQUE	18 7 NM
	2	LOCKED ROTOR TORQUE	22 NM
	1	ROTATION	CW & CCW DIRECTION
		C FACE MOUNTING	YES
		MOUNTING OF THE MOTOR	ANY DIRECTION
NOTES		1 PROVIDE A CORROSION RESISTANT METAL TAG WITH TAG NO EMBOSSED ON IT	
		ATTACHED TO THE INSTRUMENT	
		2 To replace a Model 4AXS80A4U3 Russian made product	
		3 These motors shall be mounted in existing drives	
	1	4 Motors shall be per drawing no 7419 M1	
		This motor is an alternate to Sheet 3	
		*Seller to furnish the final information	

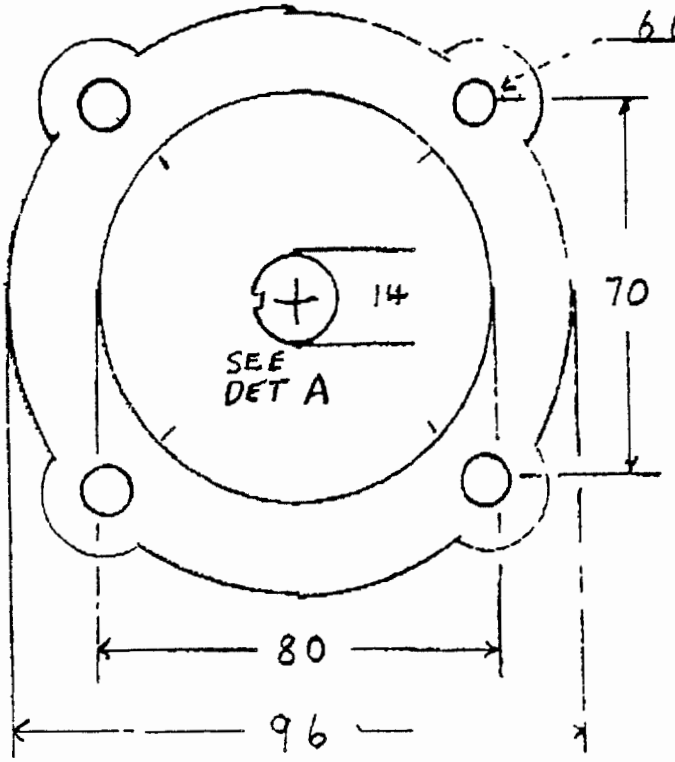
United Engineers & Constructors
A Raytheon Company

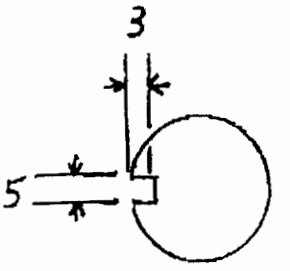
GENERAL COMPUTATION SHEET

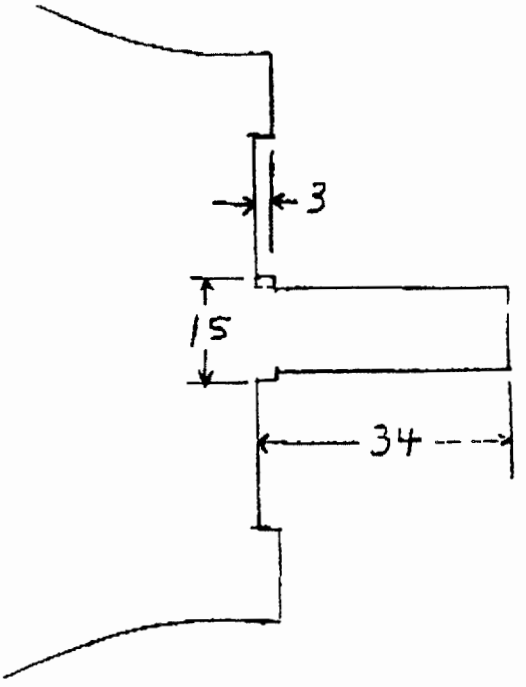
CALCULATION SET NO			REV	COMP BY	CHK'D BY
PRELIM.	FINAL	VOID	0	DATE	DATE
SHEET 1 OF 6				DATE	DATE
JO 7419.001					

PROJECT _____

SUBJECT C FRAME DIMENSIONS FOR DAMPER ACTUATOR MOTORS







NOTES:

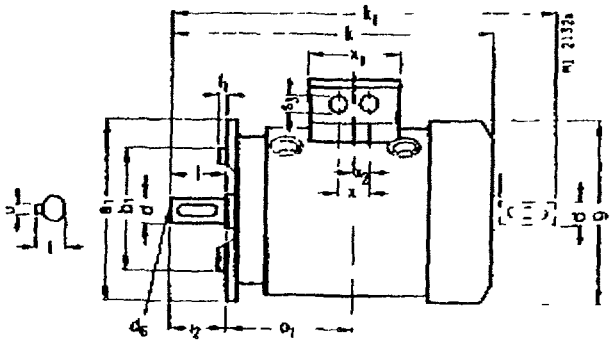
1. ALL DIMENSIONS ARE IN MILLIMETERS
2. MOUNTING HOLES ARE DRILLED AND TAPED FOR EITHER 6 OR 8 MM ALL DAMPER MOUNTING BRACKETS ARE DRILLED 8 MM.
3. THESE ARE THE C FACE DIMENSIONS FOR THE FOLLOWING AIR DAMPER ACTUATOR MOTORS.
   AOL2-1/4/S1
   AOL2-2/4/S1
   + AAM63V4U3
4. NOT TO SCALE

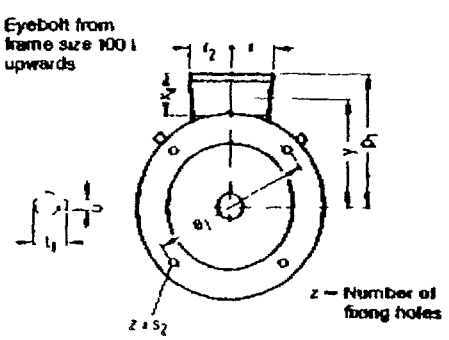
DWG No 7419-M1

SIEMENS

June 1992

Dimensions





IEC MOTOR DIMENSIONS—B14 Flange Motors

For motor — Dimension symbols to

Frame size	Type 1LA5 1MA5	DIN/IEC	Mounting flange to Din 42 948 small flange Size	a_1 P	b_1 N	d O	e_1 M	f_1 T	t_2 LE	l E	s_2 S	z_1 Z	large flange* Size	a_1 P	b_1 N	e_1 M	f_1 T	z_1 LE	s_2 S	z_1 Z	g' AC	k L	k_1 LC	p_1 AD	q LF	r AG	r_2 AS	s_2 O	x BE	x_1 LL	x_2 BE	x_4 HK	y AG
56	1LA5 050[1] 1LA5 053[1]	IEC	C 80	80	50	9	65	2.5	20	20	M 5	4	C 105	105	70	85	2.5	20	M 6	4	12	123	177	200	108	100	35	35	Pg 16*	— (36)	96	20	42	83
63	060 063		C 90	90	60	11	75	2.5	23	23	M 5	4	C 120	120	80	100	3	23	M 6	4	12	130	213	241	108 (138)	103	35 (58)	35 (52)	Pg 16*	— (36)	96 (105)	20 (18)	42 (71)	83 (105)
71	070 073		C 105	105	70	14	65	2.5	30	30	M 6	4	12	C 140	140	95	115	3	30	M 8	4	15	145	240	278	116 (146)	120	35 (58)	35 (52)	Pg 16*	— (36)	96 (105)	20 (18)	42 (71)	92 (113)
80	080 083		C 120	120	80	19	100	3	40	40	M 6	4	14	C 160	160	110	130	3.5	40	M 8	4	15	162	274[2]	324[2]	124 (154)	140	35 (58)	35 (52)	Pg 16*	— (36)	96 (105)	20 (18)	42 (71)	100 (121)
90 S 90 L	090 096		C 140	140	95	24	115	3	50	50	M 8	4	18	C 160	160	110	130	3.5	50	M 8	4	18	181	332	389	130 (160)	169	35 (58)	35 (52)	Pg 16*	— (36)	96 (105)	20 (18)	42 (71)	106 (127)
100 L	106 107		C 160	160	110	28	130	3.5	60	60	M 8	4	18	C 200	200	130	165	3.5	60	M 10	4	12	203	372	438	158	193	58	52	Pg 21	42	105	—	59	125
112 M	113		C 160	160	110	28	130	3.5	60	60	M 8	4	16	C 200	200	130	165	3.5	60	M 10	4	16	228	395	461	158	200	58	52	Pg 21	42	105	—	59	138

The dimensions in brackets refer to Type 1MA5 motors when they differ from Type 1LA5

[1] Measured over bolt heads

[2] The fixing bolts for the tapped holes s_2 can be screwed in to the depth stated in the table

Two cable entries 90° apart

[3] Canopy not a stocked standard item

[4] Large B14 Flange not a stocked standard item

[5] For shaft diameter and keyway refer to horizontal foot mid motor outline

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 4	11-25-92	92559/WEC	mgs	7419 001-252-3A

SELLER S SHIPPING DATE: 12/09/92

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Hamburg, Germany

TERMS OF PAYMENT: Net 30 Days

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

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Attn M G Simpson
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CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by telephoning Mr Franz Fassbender at Tel (201) 313-1300 - Fax No (201) 313-9564

ROUTE VIA: BUYER'S FREIGHT FORWARDER

ITEM	QUANTITY	DESCRIPTION		PRICE
		MOTORS FOR DAMPER DRIVES (FAN DAMPERS)		
1	54 EA	AC MOTORS PER DATA SHEET 2, SPEC NO 252-3-IC21A SELLER'S PRODUCT NO 1LA5080-4AA21	$187 00	$10,098 00

These motors shall be per UE&C s Drawing No 7419-M2 & M3, and Siemens' Drawing No 510 3278 CDE Both drawings are attached hereto and made a part hereof

TOTAL FIRM PRICE $10,098 00

Origin of Goods Hamburg, Germany

Applicable Documents

A Motor Specification Sheet 2, Spec No 252-3-IC21A, Rev 2, 11/24/92

B The following is incorporated in this purchase order with the same force and effect as if they were given in full text Upon request, the Purchaser will make their full text available

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS, AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY M G Simpson
M G Simpson

TOTAL PRICE OF ORDER	
$10,098 00	
PURCHASE ORDER NO	
7419 001 252 3A	

- X Buyer
- __ Requisitioner
- __ Expediter
- __ Accounting
- __ Field/MRR
- __ Client
- __ Other _____

MOTOR
SPECIFICATION SHEET

JOB NO	7419 001	COMP BY ARK	SHEET 2
REV NO 2		DATE 08/20/92	SPEC NO 252 3 IC21A
		Rev 1 Nov 18, 1992	TAG NO M 3002 UB3
CLIENT	Mongolian Peoples Republic	REV 2 Nov 24, 1992	
PROJECT	Critical Spare Parts		

GENERAL	1	QUANTITY	54
		SERVICE	ID & FD FANS DAMPER S DRIVES
	2	MANUFACTURER	Siemens
	2	MODEL	ILA5080 4AA21
	2	FRAME SIZE	80
		ENCLOSURE	Totally Enclosed Fan Cooled
MOTOR DATA		VOLTAGE / PHASE / CYCLE	220/380 VAC /3 PH /50 CYCLE
	2	FULL LOAD AMPS	1 5 AMPS AT 380 VOLTS
	2	LOCKED ROTOR AMPS	7 05 AMPS
		CLASS OF INSULATION	A , MIN STATOR WIND INSULAT RESIST=0 5 OM
		RPM	1400
		HP (KW = 0 4)	0 54
	1	DIMENSIONS Note 3 & 4	REFER TO DWG NO 7419 001 IC2
	2	START UP TORQUE	7 2 NM
	2	LOCKED ROTOR TORQUE	8 5 NM
	2	ROTATION	BOTH DIRECTIONS
		C FACE MOUNTING	YES
	1	MOUNTING OF THE MOTOR	CW & CCW DIRECTION
NOTES		1 PROVIDE A CORROSION RESISTANT METAL TAG WITH TAG NO EMBOSSED ON IT	
		ATTACHED TO THE INSTRUMENT	
		2 To replace a Model AOL2 2 / 4 / S1 Russian made product	
		3 These motors shall be mounted in existing drives	
	2	4 Motors shall be per drawing no 7419 M2 & M3 and Siemens Dwg No 510 32781CDE	
		Shaft Dia is smaller and bolt holes are smaller	
		*Seller to furnish the final information	

M 5007 REV 4/81

United Engineers & Constructors
A Raytheon Company

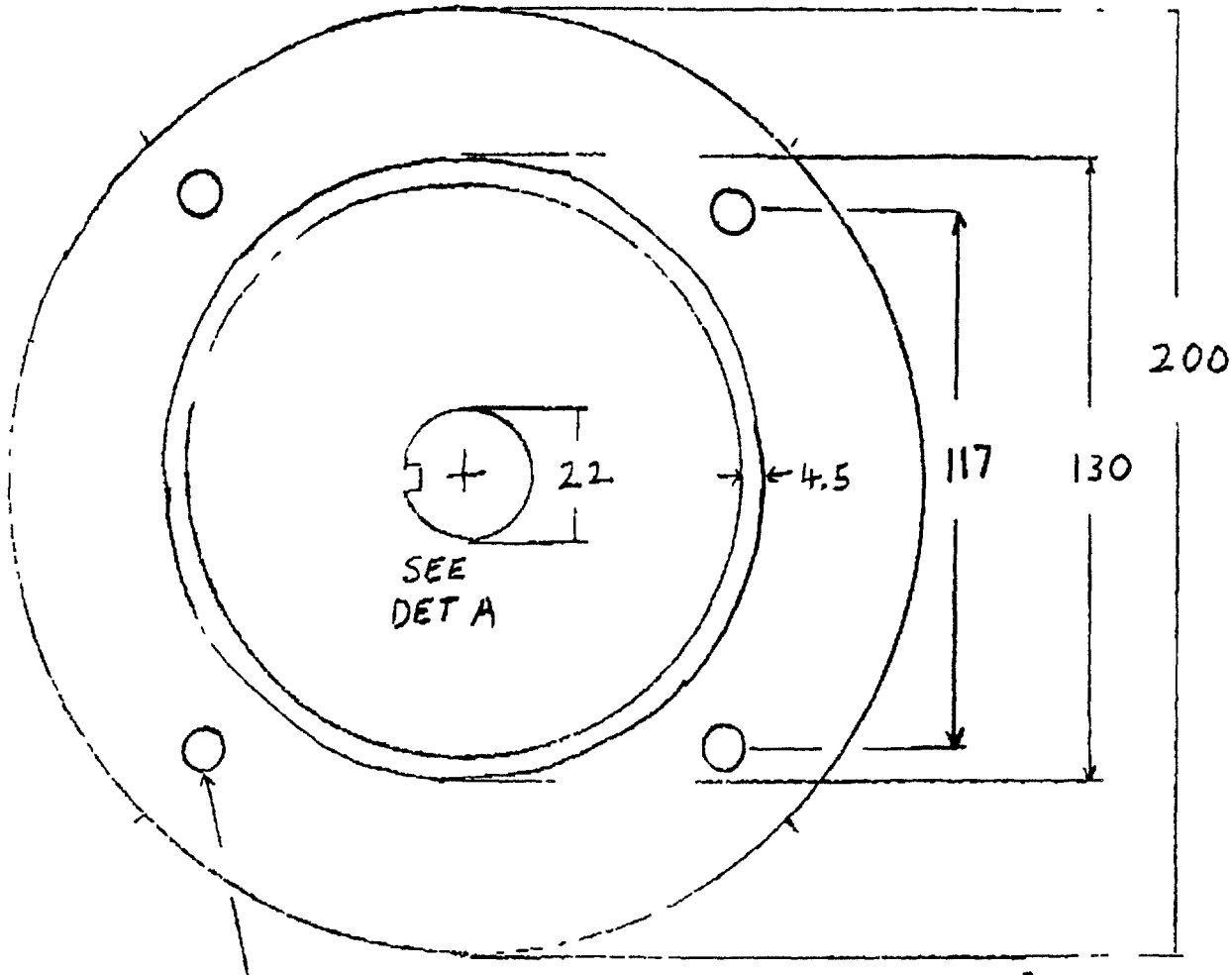
GENERAL COMPUTATION SHEET

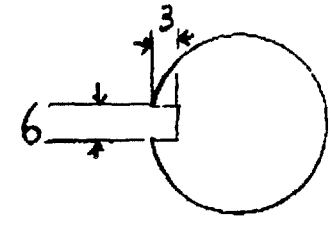
CALCULATION SET NO.			REV	COMP BY	CHKD BY
PRELIM	FINAL	VOID	0	DATE	DATE
SHEET 2 OF 6				DATE	DATE
JO					

PROJECT _____

SUBJECT C FRAME DIMENSIONS FOR RES ~~DAMPER~~ VALVE ACTUATOR MOTORS

PAGE 1





DETAIL A

SEE NOTES ON PAGE 3

DWG NO 7419-M2

AI 5087 REV 4/81

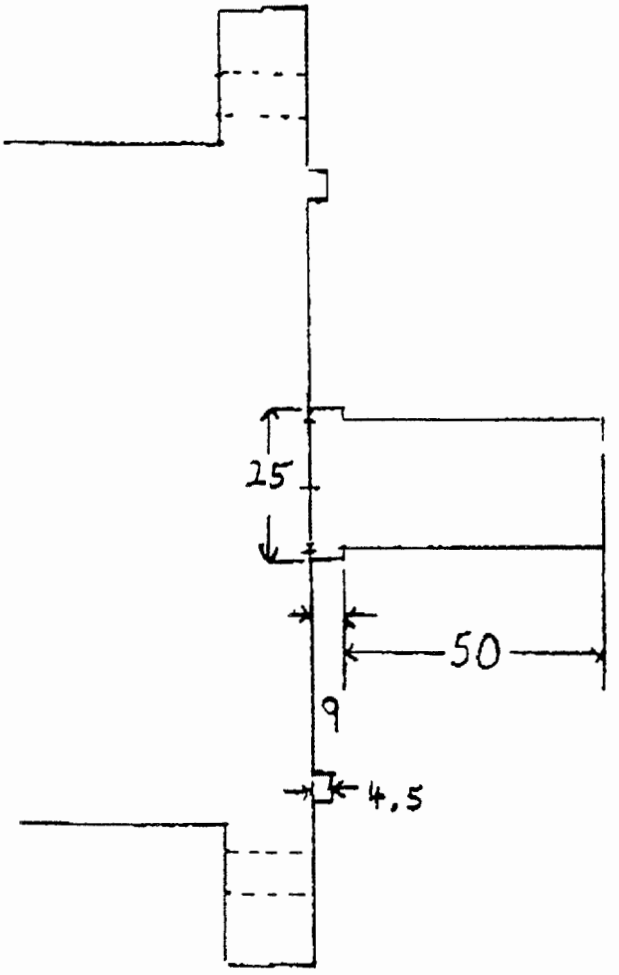
United Engineers & Constructors
A Raytheon Company

GENERAL COMPUTATION SHEET

CALCUL'N SET NO			REV	COMP BY	CHK'D BY
PRELIM	FINAL	VOID	0	DATE	DATE
SHEET 3 OF 6				DATE	DATE
JO					

PROJECT _____

SUBJECT C FRAME DIMENSIONS FOR VALVE ACTUATOR MOTORS



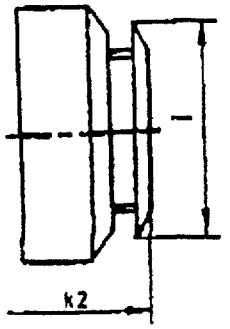
NOTES.

1. ALL DIMENSIONS ARE IN MILLIMETERS
2. THESE ARE THE C FACE DIMENSIONS FOR THE FOLLOWING VALVE ACTUATOR MOTORS
   AERS 8044U3
   +AXS80A4U-
3. NOT TO SCALE

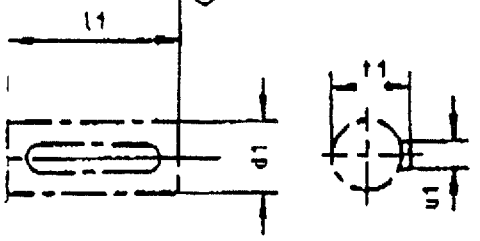
DWG No 7419-M3

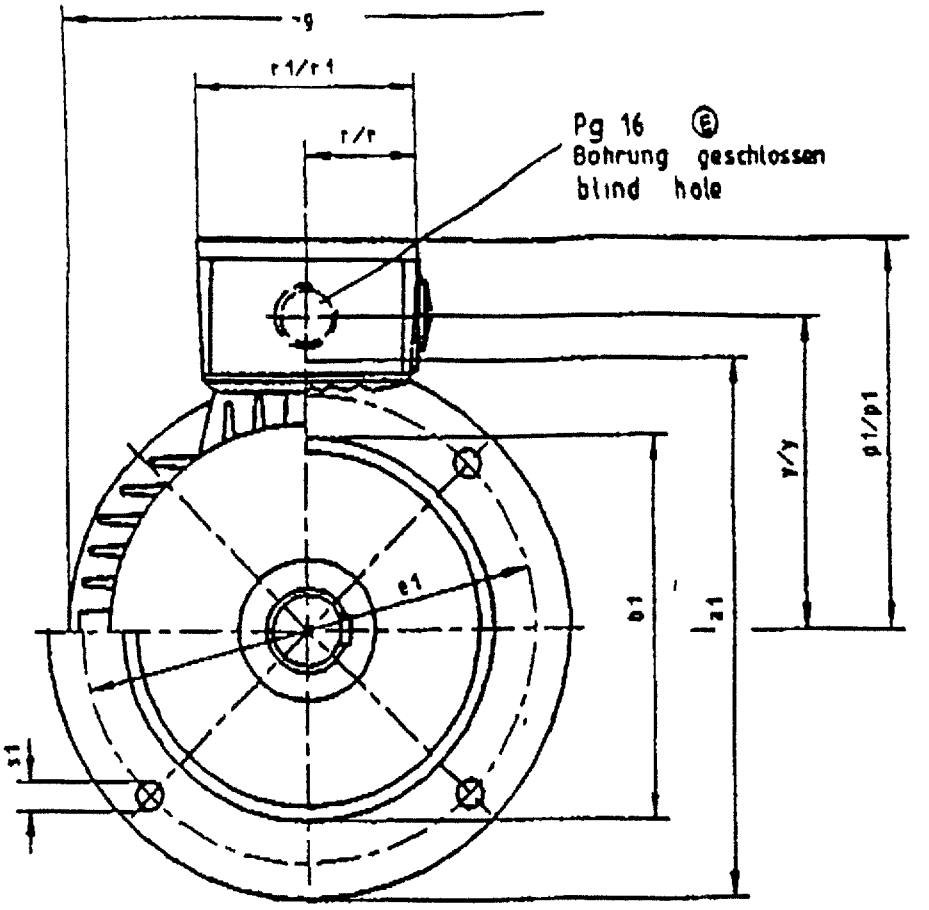
Klemmenkasten um 180 drehbar
Terminal box can be turned through 180 deg

Ausf mit Schutzdach
with protection shield



Zentrierung
Ⓔ R 25 DIN 332





Diese Pause wird bei Änderung nicht eingezogen.

23. MAI 1990

EW Bad Neustadt a d Saale

Schutzart IP54
Type of enclosure IP54
All dimensions in mm

Das zweite Wellenende kann übertragen
Volle Nennleistung bei unmittelbarer Kupplung,
halbe Nennleistung bei Ritzel- und Riemenscheibenantrieb
Non driving shaft end:
When directly coupled the rated power can be transmitted
with belt and pinion drives only half the rated power
could be transmitted

			D	E	GA	F						DA	FA	GC	FA	Ⓕ		beidichter Flansch			Schutzdach prot shield			Al-Klemmenkasten gk130 Al-terminal box gk130						
r1	s2	s3	d	l	t	u	x	x1	y			d1	l1	t1	u1	d5		k	k1	q	°	k2		p1	r	r1	x	x1	y'
5	70		Pg 16	9	20	10,2	3	20	96	83			9	20	10,2	3	DR M3		---	---	---	---	---		138	58	110	18	105	105
5	70		Pg 16	11	23	12,5	4	20	96	83			11	23	12,5	4	DR M4		---	---	---	125	263		138	58	110	18	105	105
5	70		Pg 16	14	30	16	5	20	96	92			14	30	16	5	DR M5		---	---	---	125	296		146	58	110	18	105	113
5	70		Pg 16	19	40	21,5	6	20	96	100			19	40	21,5	6	DR M6		300	350	166	125	300		154	58	110	18	105	121
35	70		Pg 16	24	50	27	8	20	96	107			19	40	21,5	6	DR M8		---	---	---	160	366		160	58	110	18	105	127

C	Mass z neu	7 6 85	Ks	DATUM	19 11 85
D	Typ geandert	23.4 86	Lbl	BEARB	BAUER
E	Ä Nr 11 0366.	30 1 90	Lbl	GEPR.	
ZUST	MITTEILUNG	DATUM	NAME		

Siemens AG

MASSSTAB OHNE - <no scale

CADIS

PLOTTER-ZEICHNUNG

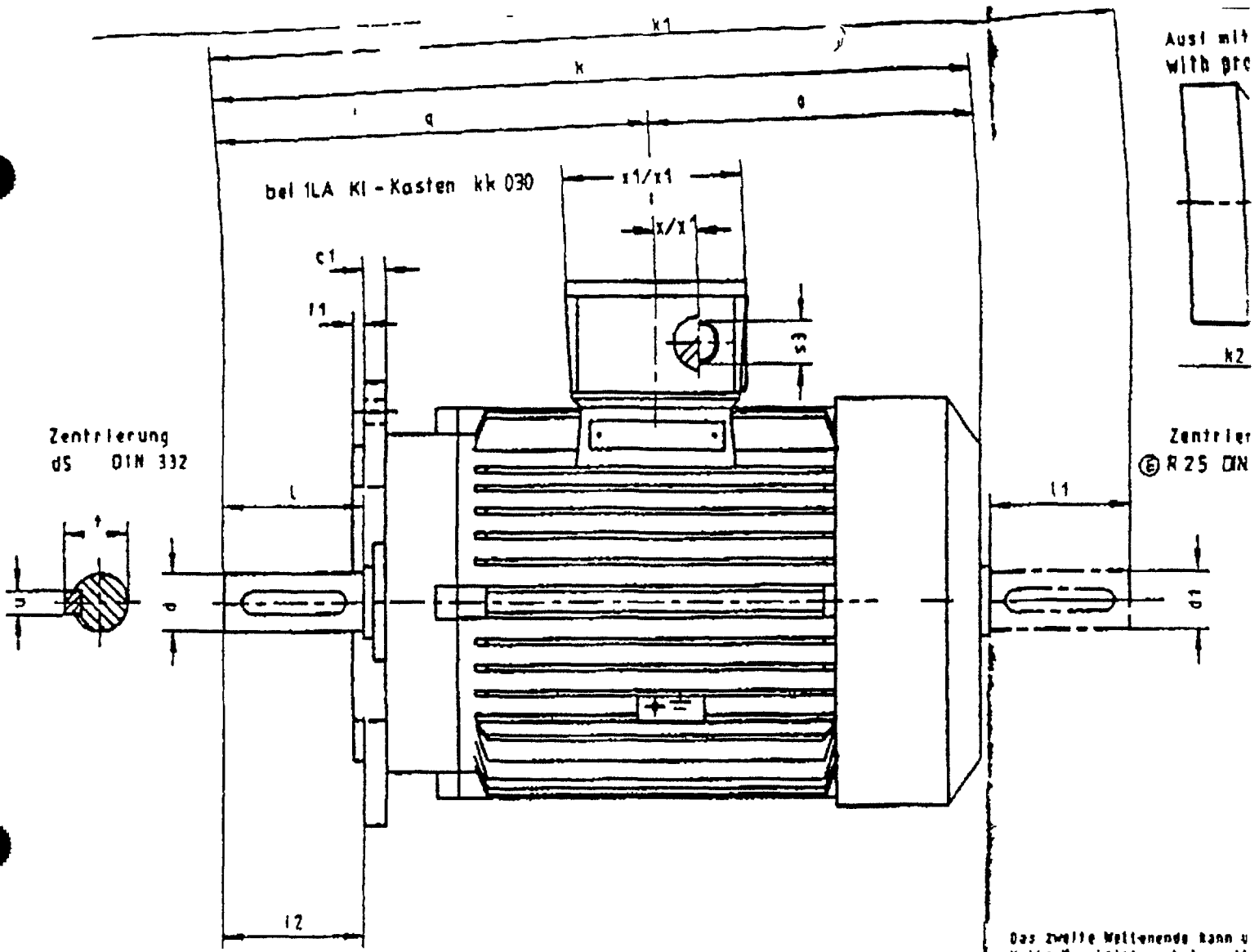
Massblatt
dimension sheet

1LA5/1LA9 050 ... 096
1MA5 060 ... 096

Bauform 1MB5
type of constr

510.32781 CDE

Blatt 80



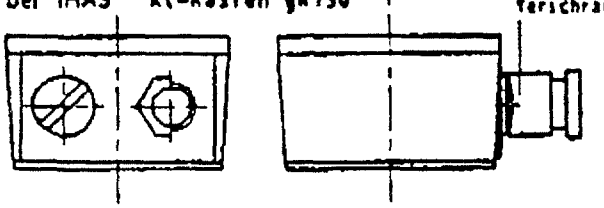
1LA 5/1LA9 050/053 ohne Belüftung
* bei 1MA 5083-6 Mass k k1 k2 o +35 mm
* bei 1LA 9083 Mass k,k1 k2,o +35 mm
** bei 1LA 9096 Mass k k1 k2 o +27 mm

Das zweite Wellenende kann u
Volle Nennleistung bei ausschl
halbe Nennleistung bei Riem
Non driving shaft end:
When directly coupled the r
with belt and pinion drives
could be transmitted

Bezeichnung nach IEC			P	N	LA	M	T		S	AC		L	LC								D	E	GA	
BG size	Typ type	Kl-Kasten term -box	a1	b1	c1	e1	f1	f2	s1	g		k	k1	o	p1		q	r	r1	s2	s3	d	l	t	
56	1LA5/1LA9 050/053	kk 030	120	80	8	100	3	20	7	123		196	219	77	108		119	35	70		Pg 16	9	20	10,2	
63	1LA5/1MA5/1LA9 060/063	kk *** 030	140	95	9	115	3	23	9	130		232	260	110	108		122	35	70		Pg 16	11	23	12,5	
71	1LA5/1MA5/1LA9 070/073	kk *** 030	160	110	9	130	3,5	30	9	145		267	305	120	116		147	35	70		Pg 16	14	30	16	
80	1LA5/1MA5/1LA9 080/083	kk *** 030	200	130	10	165	3,5	40	11	162		274	324	134	124		140	35	70		Pg 16	19	40	21,5	
90	1LA5/1MA5/1LA9 090/096	kk *** 030	200	130	10	165	3,5	50	11	181		332	389	163	130		169	35	70		Pg 16	24	50	27	

Mass dimension	Zulaessige Abweichung admissible tolerance
b1	230 j6 >230 h6
e1	200 ±0,25mm >200 ±0,5mm
f2	80 ±1mm >80 ±2mm
d d1	K6 DIN 7160
	DIN6885-01

*** bei 1MA5 Kl-Kasten gk130



Klemmenkasten um 4x90 drehbar
Terminal box can be turned through 4x90 deg

Ⓔ

C	Ma
D	TY
E	A
ZUST	

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 4	11-25-92	92557/WEC	tam	7419 001-252-5

SELLER S SHIPPING DATE: See Below

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Chagrin Falls, Ohio

TERMS OF PAYMENT: Net 30 Days

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

SELLER

STOCK EQUIPMENT COMPANY
C/O ROBERT K GRIFFITH ASSOCIATES
P O Box 111
Putnam, CT 06260
Attn Mr Louis Griffith
(203) 928-7971

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn M G Simpson
617-422-422-5379

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by telephoning Mr Franz Fassbender at Tel No (201) 313-1300 - FAX No (201) 313-9564

ROUTE VIA: BUYER'S FREIGHT FORWARDER

ITEM	QUANTITY	DESCRIPTION	Unit Price	Ext Price
		COAL FEEDER ALARMS		
1	18	Nuclear Coal Monitor Kay-Ray/Sensall, Inc Model 4800X Level Detection System	$2,400 00	$43,200 00
		TOTAL FIRM PRICE		$43,200 00

I Shipping Information

A Weight Each 42 lbs

Total Packaging 3 boxes at 4 x 2' x 2 each
1050 lbs total

B The successful Bidder will be responsible for full compliance with the Export Administration Regulations of the U S Department of Commerce, including the assignment of an Export Control Commodity Number Classification, and securing a validated export license, if required

C Upon each delivery, the commercial invoice accompanied by packing list must clearly show the applicable ECCN and license designation (including general license designation if applicable) and also show the following project control notices These commodities are licensed by the United States for ultimate destination Mongolia Diversion or disposition of these commodities contrary to U S law is prohibited"

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY M G Simpson
M G Simpson
Gene L. Hill

TOTAL PRICE OF ORDER $43,200 00

PURCHASE ORDER NO 7419 001 252 5

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419 001

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 4	11-04-92	92551/WEC	tam	7419 001-252-6

SELLER S SHIPPING DATE: 12-5-92

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Newtown, PA

TERMS OF PAYMENT: Net 30 Days

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn. Accounts Payable

SELLER

HAROLD BECK & SONS, INC
2300 Terry Drive
Newtown, PA 18940
Attn Mr. Scott Kempf
(215) 968-4600

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn M H Spaulding
617-422-5360

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by telephoning Mr Franz Fassbender at Tel No (201) 313-1300 - FAX No (201) 313-9564

ROUTE VIA: FREIGHT FORWARDER

Item	Quantity	Description	Unit Price	Ext. Price
1	6	Beck Model 11-400 Rotary Electronic Control Control Drive, 240 VAC, 50 Hz, 1 phase, 1800 lb ft torque output	$10,555 00	$63,330.00
		TOTAL FIRM PRICE		**$63,330 00**

Origin of Goods

U S Origin

Applicable Documents

The following is incorporated in this purchase order with the same force and effect as if they were given in full text Upon request, the Purchaser will make their full text available

A FAR CLAUSES

(X) 52 202-01 Definitions (APR 1984)
(X) 52 203-01 Officials Not to Benefit (APR 1984)
(X) 52 203-03 Gratuities (APR 1984)
(X) 52 203-05 Covenant Against Contingent Fees (APR 1984)
(X) 52 203-07 Anti-Kickback Procedures (APR 1984)
(X) 52 204-2 Security Requirements (APR 1984)

THIS ORDER IS SUBJECT TO THE TERMS, CONDITIONS, AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M H Spaulding
M.H. Spaulding

Carol F. Hill

TOTAL PRICE OF ORDER	
$63,330 00	___ Buyer ___ Requisitioner ___ Expediter ___ Accounting ___ Field/MRR ___ Client ___ Other _____
PURCHASE ORDER NO. 7419 001 252-6	

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PURCH FILE COPY

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 4	12-4-92	92560 & 92562/WEC	mgs	7419 001-252-7

SELLER S SHIPPING DATE: See Page 4 of 4

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Minneapolis, MN

TERMS OF PAYMENT: See Page 4 of 4

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn· Accounts Payable

SELLER

DETECTOR ELECTRONICS CORPORATION
BURNER MANAGEMENT SYSTEMS GROUP
6901 West 110th Street
Minneapolis, MN 55438
Attn Mr. Bill Reichow
612-941-5665
800-765-FIRE (3473)

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn M G Simpson
617-422-5379

CONSIGN TO: Seller must contact An-Mar International inc for shipping instructions by telephoning Mr Franz Fassbender at Tel No (210) 313-1300 - Fax No (201) 313-9564

ROUTE VIA: BUYER'S FREIGHT FORWARDER

ITEM	QUANTITY	DESCRIPTION	PRICE
		SCANNERS FOR PULVERIZER BURNERS/HIGH PRESSURE BOILERS ONLY	
1	1	Duplex Scanner Cooling Blower System	$118,597 00
2	1 set	Mount silencer & filters in upright position	700 00
3	2 ✓	Boiler Flame Scanner Cabinets	inc
4	42	Infrared Red Flame Scanners, part #48PT1-9003	inc
5	42	Scanner Cables at 100 meters each	9,544 50
6	10	Maintenance Manuals in Russian & English	inc
		TOTAL FIRM PRICE	**$128,829 50**

Above equipment pricing and parts only in accordance with Seller's proposal no 923192A dated 10/23/92 and amendment no 1 dated 10/29/92, and fax dated 12/1/92

V Seller shall advise UE&C of the proper scanner location, based on burner drawings Advise UE&C of any change to the burner air dampers and burner front plate Seller shall also advise UE&C of the hardware required to mount the scanners

UE&C s Specification No 7419-001-252-7, dated 9/14/92 and Data Sheet 1 as Revised 10/6/92, shall apply

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY M G Simpson
M G Simpson
Guy F. Atkinson

TOTAL PRICE OF ORDER	✓ Buyer
$128,829 50	___ Requisitioner
	___ Expediter
	___ Accounting
	___ Field/MRR
PURCHASE ORDER NO	___ Client
7419 001 252 7	___ Other ____

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
OF 4	01-25-93	92564/WEC	tam	7419 001-252-8

SELLER S SHIPPING DATE: 1/28/93

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES

REL

FOB POINT: Ft Mills, S C

TERMS OF PAYMENT: Net 30 Days

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPEPS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

SELLER

BALDOR MOTORS & DRIVES
65 South Turnpike Road
Wallingford, CT 06492
Attn Mr Edward Cowern
(203) 269-1354

ALL CORPESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn M H Spaulding
617-422-5360

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by telephoning Mr Franz Fassbender at Tel No (201) 313-1300, FAX No (201) 313-9564

ROUTE VIA: BUYER S FREIGHT FORWARDER

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	EXTENSION PRICE
1	3	DIRECT CURRENT MOTORS, per data sheet IC-21B Sheet 13 and attached drawings MODEL #1810ATC	$1,311 39	$3,934 17

TOTAL FIRM PRICE $3,934 17

A The successful Bidder will be responsible for full compliance with the Export Administration Regulations of the U S Department of Commerce, including the assignment of an Export Control Commodity Number Classificatin, and securing a validated export license, if required

B Upon each delivery, the commercial invoice accompanied by packing list must clearly show the applicable ECCN and license designation (including general license designation if applicable) and also show the following project control notices "these commodities are licensed by the United States for ultimate destination Mongolia Diversion or disposition of these commodities contrary to U S law is prohibited'

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M H Spaulding
M.H. Spaulding

TOTAL PRICE OF ORDER	
$3,934 17	
PURCHASE ORDER NO	
7419 001 252-8	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419 100 65

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #1

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	02-19-93	89180/WEC	tam	7419 001-252-10

SELLER S SHIPPING DATE

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT
Spring House, PA

TERMS OF PAYMENT
Net 30 Days

MAIL THE ORIGINAL AND THREE (3) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

SELLER

MOORE PRODUCTS COMPANY
100 Corporate Place
Peabody, MA 01960
Attn Mr W C Cunningham
(508) 535-9512

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn M G Simpson
617-422-422-5379

CONSIGN TO Mongolian Emergency Heat and Power Project No 1
Mongolian Fuel and Energy Ministry
Ulaanbaatar, Mongolia

ROUTE VIA FREIGHT FORWARDER

Item	Qty	Description	Total of Previous Order
			$17,063 00

ADD THE FOLLOWING

			Unit Price	Ext Price
9	2	Pulverizer Outlet Pressure - Moore Model 340D1AS12BNNNNN Mycro XTC differential pressure transmitter with a 4 to 20 ma output	$ 990 00	$ 1,980 00
10		Credit for return of P O Item No 2 Moore Model 340D2AH12BNNNNN Original Moore Invoice No 307225 12/7/92		($1,980 00)
11	2	Restocking charge (25%) for return	$ 247 50	$ 495 00
		TOTAL ADD		**$ 495 00**

Ship returned product to

Moore Products Company
Sumney Town Pike
Spring House, PA 19477
Attn Bob Wagener

USE Mongolian Emergency Heat and Power Project No 1

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M G Simpson
M G Simpson

TOTAL PRICE OF ORDER (Rev)	
$17,558 00	
PURCHASE ORDER NO 7419 001 252 10	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419 100

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 5	11-10-92	92556/WEC	tam	7419 001-252-10

SELLER S SHIPPING DATE: Various - As Noted Below

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Various - As Noted Below

TERMS OF PAYMENT: Net 30 Days

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

SELLER

MOORE PRODUCTS COMPANY
100 Corporate Place
Peabody, MA 01960
Attn Mr W C Cunningham
(617) 245-5414

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn M H Spaulding
617-422-5360

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by telephoning Mr Franz Fassbender at Tel No (201) 313-1300 - FAX No (201) 313-9564

ROUTE VIA: FREIGHT FORWARDER

SPARE PARTS FOR NEW CONTROLS FOR PULVERIZER AIR DAMPERS

Item	Quantity	Description	Unit Price	Ext Price
1	4	RTD's with well and mounting coupling. Part No 20028-48 with the U = 8" and T = 16" dimensions	$187 00	$748 00
2	2	Pulverizer Outlet Pressure - Moore Model 34OD2AH12BNNNNN Mycro XTC Differential Pressure Transmitter with a 4 to 20 ma output	$1,100 00	$2,200 00
3	2	Pulverizer Fan Outlet Temperature Transmitter Model 344BNNNNN Mycro XTC with a 4 - 20 ma output	$740 00	$1,480 00
4	1	Handheld Communicator P/N 15965-665	$1,350 00	$1,350 00
5	1	Pulverizer Fan Outlet Temperature Electronic Indicating Station which will accept two 4 - 20 ma input and display both temperatures Model 372E11NN	$520 00	$520 00
6	4	Moore Model 352EAN1NNF Single Loop Controller with pulse output (two programmed with 7419-IC1 and two with 7419-IC4)	$1,700 00	$6,800 00

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC.
BY M H Spaulding /mgs
M H Spaulding

TOTAL PRICE OF ORDER	
$17,063 00	
PURCHASE ORDER NO 7419 001 252 10	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419 001

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	SELLER	REL	PURCHASE ORDER NO
2 OF 5	MOORE PRODUCTS COMPANY		7419 001 -252-10

Item	Quantity	Description	Unit Price	Ext Price
7	2	Moore Model 352EAN1NDF Single Loop Controller with pulse output and RTD input and programmed with 7419-IC2	$2,000 00	$4,000 00
8	1	Acopian R24M9-230 Redundant power supplies 220 VAC 50 Hz to 24 VDC, rack mount	$1,600 00	$1,600 00
		Subtotal		$18,698 00
		Moore Products Discount		($1,635 00)
		TOTAL FIRM PRICE		**$17,063 00**

Origin of Goods

U S Origin

Applicable Documents

The following is incorporated in this purchase order with the same force and effect as if they were given in full text Upon request, the Purchaser will make their full text available

A FAR CLAUSES

(X) 52 202-01 Definitions (APR 1984)
(X) 52 203-01 Officials Not to Benefit (APR 1984)
(X) 52 203-03 Gratuities (APR 1984)
(X) 52 203-05 Covenant Against Contingent Fees (APR 1984)
(X) 52 203-07 Anti-Kickback Procedures (APR 1984)
(X) 52 204-2 Security Requirements (APR 1984)
(X) 52 204-3 Taxpayer Identification
(X) 52 212-13 & Alternate I Stop-Work Order (APR 1984)
(X) 52 215-01 Examination of Records by Comptroller General (APR 1984)
(X) 52 215-02 Audit-Negotiation (APR 1984)
(X) 52 215-22 Price Reduction for Defective Cost or Pricing Data (APR 1984)
(X) 52 215-24 Subcontractor Cost or Pricing Data (APR 1985)
(X) 52 216-07 Allowable Cost and Payment (APR 1984)
(X) 52 216 11 Cost Contract - No Fee (APR 1984)
(X) 52 219-08 Utilization of Small Business Concerns and Small Disadvantaged Business Concerns (APR 1984)
(X) 52 219-09 Small Business and Disadvantaged Business Business Subcontracting Plan (APR 1984)
(X) 52 219-13 Utilization of Women Owned Small Business (APR 1984)
(X) 52 222-02 Payment for Overtime Premiums (APR 1984)
(X) 52 222-03 Convict Labor (APR 1984)
(X) 52 222-26 Equal Opportunity (APR 1984)
(X) 52 222-28 Equal Opportunity Preaward Clearance of Subcontracts (APR 1984)
(X) 52 222-35 Affirmative Action for Special Disabled and Vietnam Era Veterans (APR 1984)
(X) 52 222-36 Affirmative Action for Handicapped Workers (APR 1984)

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PURCH COPY

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 4	12-09-92	52697/MD	tam	7419 001-252-11

SELLER S SHIPPING DATE: 12-15-92

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Pittsburgh, PA

TERMS OF PAYMENT: Net 30 Days

SELLER:
MSA INTERNATIONAL
P O Box 426
Pittsburge, PA 15230
Attn Mr Rick Veasey
(412) 967-3231

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO
UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO
UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn M G Simpson
617-422-422-5379

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by contacting Mr Franz Fassbender at
Tel No (201) 313-1300
FAX No (201) 313-9564

ROUTE VIA: Buyer's Freight Forwarder

ITEM	QUANTITY	DESCRIPTION	Unit Price	Ext Price
1	12	MSA Microgard portable alarm units for methane (0-5%) & oxygen (0-25%) detection including sample pump module and rechargeable battery pack Alarm unit Model 487135 including rechargeable Nicad battery pack Model 482250	$1,195 05	$14,340 60
2	24	Rechargeable battery pack PN482255	$145 08	$3,481 92
3	12	Battery charger 229 VAC 50 Hz PN635628	$20 87	$250 44
4	12	Vinyl carrying case PN478529	$20 69	$248 28
5	2	Model R calibration check kit PN476609 for use with pump module including flow control PN459948 and adapter hose PN449401	$153 92	$306 04
6	12	Calibration check gas, 2 5% methane in air PN491041 95 liter bottle	$113 92	$1,367 04
		TOTAL FIRM PRICE		**$19,995 18**

Above pricing reflects 7% discount

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY M G Simpson
M G Simpson

TOTAL PRICE OF ORDER	
$19,995 18	
PURCHASE ORDER NO	
7419 001 252 11	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419 001

89

PORTABLE GAS MONITORS
SPECIFICATION SHEET

JOB NO 7419 002 | COMP BY MAD | SHEET
REV NO 0 | DATE 12-3-92 | SPEC NO 252-2-IC10A
TAG NO

CLIENT Mongolian Peoples Republic
PROJECT Critical Spare Parts

THE ATTACHED SPECIFICATION SHEET NO. 252-2-1C10A IS AN INTEGRAL PART OF THIS SPECIFICATION.

USER LOCATION

The portable gas monitors will be used in Mongolia. All recommendations for spare parts shall consider the impact of delivery to this location as well as the shelf life of any consumables

FUNCTION

The function of the portable gas monitors is to sense the presence and/or build up of methane concentrations in a lignite mine, to sense a deficiency of oxygen, and to provide visual and audible alarm indications to warn personnel when unsafe conditions exist or develop

EQUIPMENT REQUIREMENTS

Sensors

Each sensor shall include a detachable rechargeable battery power pack, an integral sample pump, and elements to monitor for the presence of methane and oxygen

Self contained diagnostics shall monitor the "health" of the monitor and alarm any failures Each sensor shall include an audible and visual alarm indication which are actuated at a preset increase in percentage methane concentration level, at a preset decrease in percentage oxygen concentration level, at a low battery condition, upon a failure of the monitor, or upon a failure of the sample pump.

Enclosures

The sensor housing and all integral attachments shall meet Underwriter Laboratories, Inc. requirements for intrinsic safety as necessary for Class I, Groups A, B, C, and D, and shall be flame and RFI resistant

The housing shall include a digital or analog meter readout to display the methane/oxygen concentrations.

Provide a suitable carrying case for each sensor/pump assembly unit.

Power Requirements

The electrical supply for all equipment shall be a sealed rechargeable detachable battery pack.

Alarms and Displays

The monitor shall display the concentration of methane gas by volume in percent.

The monitor shall display the concentration of oxygen in percent.

The monitor shall alarm at a factory preset value (increasing) of 20% LEL for methane gas concentration.

The monitor shall alarm when the methane concentration is beyond the calibration range of the sensor

The monitor shall alarm at a factory preset value (decreasing) of (VENDOR TO ADVISE PERCENTAGE) for oxygen concentration

The monitor shall alarm upon failure of the sensor and upon failure of the sample pump.

Vendor Shall Provide the Following Information:

Technical Information

Data regarding:
- sensor life (mean time to failure, replacement), minimum one year required
- sensor replacement (mean time to repair)
- sensor calibration
  - time to calibrate
  - recommended frequency of calibration
- on hand spare parts recommendations in consideration of the installation location (Mongolia)
  - 100% sensor replacement, minimum, shall be included unless there is a shelf life limitation
- quantity of calibration kits, including
  - calibration gas cylinders
  - calibration gas cylinder shelf life
  - number of calibration cycles per cylinder
- calibration procedure manual write-up
- batteries used for battery pack
  - quantity of batteries per battery pack
  - battery size
  - battery type
  - spares for three years shall be included unless there is a shelf life limitation
- battery charger(s)
  - sufficient capacity shall be included to enable a complete complement of batteries, one per active element, to be simultaneously charged
  - provide charger power requirements (available power electrical supplies are 220V and 127V AC)
- battery life (operating time with a full charge)
  - number of recharges recommended
  - time to fully recharge a "low" battery
- description of methane sensor type and operating principle
- description of oxygen sensor type and operating principle

Instruction Manuals

All instruction manuals shall be written in English and Russian per specification requirements. If delivery of equipment is significantly delayed by the requirement for Russian manuals, bidder shall indicate additional time (days) beyond the "equipment ready for shipment date" for availability of manuals.

An exception to furnishing appropriate instructions/manuals in Russian is not allowed.

PORTAB GAS MONITORS
SPECIFICATION SHEET

JOB NO 7419 002	COMP BY MD	SHEET 1
REV NO 0	DATE 12 04 92	SPEC NO 252 2 IC10A
		TAG NO
CLIENT Mongolian Peoples Republic		AE 4000
PROJECT Critical Spare Parts		

GENERAL	QUANTITY	12
	LOCATION of MONITORS	UNDERGROUND LIGNITE COAL MINE
	SERVICE Refer to Note 8	PERSONNEL SAFETY
	MANUFACTURER	•
	MODEL	*
	TYPE / ASPIRATOR MODEL	* / YES
	No of HOURS Note 4	*
	Portable Detector	•
	RECHARGABLE BATTERY / TYPE	YES / •
SERVICE CONDITIONS	BATTERY OPERATED	SEPARATE BATTERY PACK (Refer to Note 7)
	Time required for a full battery charge	• HOURS
	CONTINUOUSLY MONITORING	YES
	ALARM VISUAL & AUDIBLE	YES
	ELECTRIC CLASSIFICATION	Enclosure NEMA • Refer to Note 3
	LOW BATTERY ALARM	YES
	Response Time to Gas Methane/O2	* / * Seconds
	Operating Temperature Range	•
BODY	MATERIAL	*
	ENCLOSURE	• Refer to Note 3
	Weight of the Detector with Battery & Aspirator	•
	Dimensions of the Detector Battery Aspirator Assembly	•
MEASUREMENT	TYPE OF GAS / RANGE	METHANE / 0 5% (BY VOLUME) %
	TYPE OF GAS / RANGE	OXYGEN / 0 25%
	OTHER TYPES OF GAS NOTE 2	*
Aspirating Pump	Type of Pump	•
	Battery Operated	SEPARATE BATTERY PACK (Refer to Note 7)
	ELECTRIC CLASSIFICATION	Enclosure NEMA * Refer to Note 3
	LOW BATTERY ALARM	YES
	Alarm Visual & Audible	YES
SET POINT	ADJUSTMENT IN / EXT	INTERNAL
	Alarm SET POINT Fixed Methane / O2	20% LEL Inc / * % Dec
ACCESSORIES DETECTOR	BATTERY CHARGER (S)	YES FOR • VAC 1 PHASE/ 50 Hz Refer to Note 6&7
	No of BATTERY Sets per Detector	3 per detector Suitable for 3 years minimum life
	Calibration Kits	Suitable for 3 years Refer to Note 5
ACCESSORIES PUMP	BATTERY CHARGER (S)	YES FOR • VAC 1 PHASE/ 50 Hz Refer to Note 6&7
	No of BATTERY Sets per PUMP	3 per pump - Suitable for 3 years minimum life
NOTES	1 PROVIDE A CORROSION RESISTANT METAL TAG WITH NO EMBOSSED ON	
	IT ATTACHED TO THE INSTRUMENT	
	2 Seller shall advise if any other type of gas should be monitored	
	3 Explosion Proof or Intrinsically Safe Design for coal mines	
	4 Number of hours of continuous operation after a full battery charge	
	5 Advise time required to calibrate frequency of calibration	
	6 Battery charger shall be suitable for charging (min of) 12 sets of batteries simultaneously	
	7 Automatic recharge of battery with 127 or 220 VAC 50 Hz 1 Phase available	
	8 The portable unit shall be self contained and battery operated	
	(*) SELLER TO FURNISH FINAL INFORMATION	

A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO./BY	PREPARED BY	PURCHASE ORDER NO
5	2/17/93	89367/pc	MHS	7419.001-252-14

SELLER S SHIPPING DATE: 3/5/93 m n d HB

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES, CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES

REL

FOB POINT: FOB-BORDER(NAUCHKI)

TERMS OF PAYMENT: SEE BELOW

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES, THE ORIGINAL SHIPPING PAPERS, AND PACKING LIST TO

SEE ARTICLE NO. 2 BELOW

SELLER

GPZ Company
Prospect Mira 52
Moscow, Russia 129041
Attn: Mr. V.M. Khramov
Tel 288-40-05
Fax 288-95-55

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

SEE ARTICLE NO. 2 BELOW

CONSIGN TO

MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU 6 ULAANBAATAR-46, MONGOLIA
ATTN MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	PRICE

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
1	8	Pulverizer Drive Pinion Bearings Bearing No 3003264, International Bearing No. 23264	$1,325 00	$10,600.00

TOTAL FIRM PRICE DELIVERED $10,600 00

THIS ORDER IS SUBJECT TO THE TERMS, CONDITIONS, AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY [signature]
TITLE Deputy Gen. Director
DATE 3/5/93

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC

BY [signature]
M H SPAULDING

Guy F Hill

TOTAL PRICE OF ORDER	
$10,600 00	___ Buyer ___ Requisitioner ___ Expediter ___ Accounting ___ Field/MRR ___ Client ___ Other _____
PURCHASE ORDER NO	
7419 001 252-14	

J O. ACCOUNT NO. 7419.100

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 5	2/16/93	89370/pc	MHS	7419 001-252-16

SELLER S SHIPPING DATE: 3/30/93

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: FOB-BORDER(NAUCHKI)

TERMS OF PAYMENT: SEE BELOW

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

SEE ARTICLE NO 2 BELOW

SELLER

Volgomash(Syzran Machine-building Plant)
Gydroturbinnaya Str No 13
446010 Syzran, Samarskaya Oblast, Russia
Attn Mr Lev Yu Tukharinov
Tel (84643) 78-4-00
Fax (84643) 73605

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

SEE ARTICLE NO 2 BELOW

CONSIGN TO

MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU 6 ULAANBAATAR-46, MONGOLIA
ATTN MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	PRICE

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
1	1	Pinion Gear per Spec No 3-61145		
2	1	Crown Gear per Spec No 4650-04		
3	1	Pinion Gear per Spec No 3B04 17 08-2		
4	1	Crown Gear per Spec No 3B 04-09-03-0-03		

TOTAL FIRM PRICE DELIVERED $78,000 00

June
Send to M. Eco. el account (#14 57, -2)
Kim 93, 04 or assigned

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

X

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC

BY M H Spaulding
M H SPAULDING

Guy Fildill

TOTAL PRICE OF ORDER
$78,000 00

PURCHASE ORDER NO
7419 001 252 16

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O ACCOUNT NO 7419 100

95

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 5	11/27/92	86116/RS	MHS	7419 001-259-3

SELLER S SHIPPING DATE
12/15/92,OR SOONER IF POSSIBLE

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS AND PACKAGES — REL

FOB POINT
FOB-BORDER(NAUCHSKI-SUHE-BATOR)

TERMS OF PAYMENT
SEE BELOW

SELLER
ZAGRANTECHCOMMUNSTROY
BAGDAN KHMELNITSKY STR, 2/15
MOSCOW, 101000, RUSSIAN FEDERATION
ATTN VIKTOR KOZLOV
TEL 925 7070

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO
SEE ARTICLE NO 2 BELOW

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO
SEE ARTICLE NO 2 BELOW

CONSIGN TO
MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU 6, ULAANBAATAR-46, MONGOLIA
ATTN MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	PRICE

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
1	VARIOUS	BEARINGS(SEE ATTACHMENT A FOR UNIT PRICE BREAK OUT)		$81,940 14

TOTAL FIRM PRICE $81,940 14

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS, AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED:
BY B Allen
TITLE Director
DATE 28.11.92

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY M H. Spaulding
M H SPAULDING
G F Hill

B I Chumachenko
Chief Engineer
28 11 92

TOTAL PRICE OF ORDER	
$81,940 14	
PURCHASE ORDER NO	
7419 001 259 3	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O ACCOUNT NO 7419 100

46

Приложение № I

к контракту № 59-863/426-036 -БМ-92
от [illegible] июня 1992г.
между ВО "Загрантехкоммунстрой",
Москва (Продавец) и МВТК "Эрчим-
импекс", г.Улан-Батор (Покупатель)

С П Е Ц И Ф И К А Ц И Я

подшипников, подлежащих поставке в Монголию по вышеуказанному контракту

№№ п/п	Обозначение	Ед.изм.	Кол-во	Цена за един. в дол.США	Сумма в дол.США
I	2	3	4	5	6
I.	3I2A	шт	3I7	5,70	I806,90
2.	535I8	-"-	24	I9,50	468,00
3.	53522	-"-	43	3I,00	I333,00
4.	53524	-"-	63	4I,30	260I,90
5.	3528A	-"-	48	57,30	2750,40
6.	3530A	-"-	54	69,80	3769,20
7.	3532A	-"-	44	89,30	3929,20
8.	3536	-"-	6	II9,80	7I8,80
9.	3538	-"-	I2	I45,90	I750,80
I0.	3540A	-"-	I3	I74,00	2262,00
II.	536I5	-"-	I6	2I,90	350,40
I2.	536I8	-"-	96	30,90	2966,40
I3.	536I4K	-"-	2	I8,30	36,60
I4.	53620	-"-	26	4I,70	I084,20
I5.	3626K	-"-	43	9I,70	3943,I0
I6.	3628A	-"-	I9	II6,70	22I7,30
I7.	3630A	-"-	I3	I43,80	I869,40
I8.	3634A	-"-	4I	I98,00	8II8,00
I9.	3640A	-"-	I7	3I8,60	54I6,20
20.	3644A	-"-	4	364,70	I458,80
2I.	3652	-"-	7	708,60	4960,20
22.	73IIK	-"-	29	677,30	I964I,70
23.	I3528A	-"-	4	I07,70	430,80
24.	I3630A	-"-	I0	2I8,80	2I88,00
25.	50206A-I	-"-	7	0,92	6,44
26.	502I3	-"-	I0	4,00	40,00
27.	536I3	-"-	I	30,90	30,90
28.	603I4AK	-"-	26	7,00	I89,30

I	2	3	4	5	
29.	II3532A	-"-	4	89,40	357
30.	II36I8	-"-	4	3I,00	I36
3I.	II3634AHK	-"-	8	I98,30	I584
32.	804704 K5	-"-	5	0,50	2
33.	II76724 Л	-"-	I0	36,50	365
34.	3003I56	-"-	6	294,60	I767
35.	3003I64	-"-	2	409,20	8I8
36.	3003744	-"-	2	240,70	48I
37.	4024I07	-"-	4	2,20	8
38.	4024II0	-"-	5	4,20	2I
39.	4024II2	-"-	6	4,70	28
40.	4024II3	-"-	6	5,20	3I

Итого 8I940,

(восемьдесят одна тысяча девятьсот сорок I4/I00)долларов США.

Настоящее Приложение № I является неотъемлемой частью контракта № 59-863/426-036 - БМ-92/02

"Продавец" "Покупатель"

27 XI 92 У. Козлов В.С.

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #1

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	12-22-92	88776A	tam	7419 001-259-3

SELLER S SHIPPING DATE: 12/15/92 or sooner if possible

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: fob border (NAUCHSKI-SUHE-BATOR)

TERMS OF PAYMENT: see below

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO: See Article No 2 Below

SELLER:
ZAGRANTECHCOMMUNSTROY
BAGDAN KHMELNITSKY STR, 2/15
Moscow, 101000, Russian Federation
Attn Viktor Kozlov

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO: See Article No 2 Below

CONSIGN TO:
Mongolian Fuel and Energy Ministry, Bagga Poiruu 6, Ulaanbaatar-46, Mongolia
Attn Minister Jigjid

ROUTE VIA: rail

ITEM	QUANITITY	DESCRIPTION	PRICE

Change and incorporate the following under Article 2 in the original purchase order.

Reference second paragraph "For each shipment " and replace with the following

For each shipment (cargo), the Seller shall provide the above listed documents by either FAXing or via overnight air shipment, through TNT Worldwide Express or DHL to the following

United Engineers & Constructors Inc
100 Summer Street
Boston, MA 02110
Attn Mr M H Spaulding
Tel (617) 422-5360
FAX (617) 338-6239
FAX (617) 423-9020

Delete paragraph three (3) "Upon receipt of the above listed " of Article 2 in its entirety

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M. H. Spaulding
M.H. Spaulding
Guy F Hall

TOTAL PRICE OF ORDER (Rev)	
$81,940 14	
PURCHASE ORDER NO 7419 001 259 3	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No. 7419 001

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #2

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	01-17-93	88780	tam	7419 001-259-3

SELLER S SHIPPING DATE: 01/15/93

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: border (Nauchskı-Suhe-Bator)

TERMS OF PAYMENT: See Below

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO: See Article No 2 Below

SELLER:
ZAGRANTECHCOMMUNSTROY
Bagdan Khmelnıtsky Str, 2/15
Moscow, 101000 Russıa
Attn Vıktor Kozlov
925-7070

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO: See Article No 2 Below

CONSIGN TO

ROUTE VIA

ITEM	QUANTITY	DESCRIPTION	PRICE

REVISE AND INCORPORATE THE FOLLOWING UNDER ARTICLE NO 4

Reference thırd paragraph, "These payments shall be made " should read as follows

1 $3,500 00 of the fırst 20% payment shall be remıtted to the State Bank of Mongolıa, Internatıonal, Account No 053154

Address Torgovaya, 6
Ulaanbaatar, Mongolıa
Telex 241 or 29334 UISBLMN
Contact Person - Mrs Dambu
Phone - 27048

2 $1,650 00 of the fırst 20% payment shall be remıtted to the correspondent's account 3-95-75-730 CHIPSUID 315784 of INCOMBANK, Moscow branch "Tchıstıye Prudı" ın Bank Amerıcan Internatıonal, New York ın favor of Zagrantechcommunstroy specıfyıng ıts account 003070017/001073014, Code S W I F T BICIWKOSUMM

3 All remaınıng amounts of the 20% and fınal 80% wıll be remıtted to Prıorbank ın ABN AMROBANK/OSTERREICH/AG ın favor of Mınsk Bearıng Plant, Byelorussıa Account of Prıorbank ın ABW AMRO BANK/OSTERREICH/AG ıs 21255008

Address Scholtenrıng 35, A-1011, Wıen Austrıa
Telex 1-35606
Phone /0222/31306
Contact Person - Vera Schturmann

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M.H. Spaulding
M.H./Spaulding

Greg F. Hall

TOTAL PRICE OF ORDER (Rev)	
$81,940 14	
PURCHASE ORDER NO 7419 001 259 3	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O. Account No 7419.100

100

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER # 3

1 of 2

PAGE NO	DATE	REQN NO./BY	PREPARED BY	PURCHASE ORDER NO
1 OF 2	2/7/93	88783	mhs	7419 001-259-3

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES, CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

SELLER S SHIPPING DATE: 1/26/93

FOB POINT: Border(Nauchski-Sukhe-bator

MAIL THE ORIGINAL AND ( ) COPIES OF INVOICES, THE ORIGINAL SHIPPING PAPERS, AND PACKING LIST TO:
See Article No 2 Below

TERMS OF PAYMENT: See Below

SELLER:
ZAgrantechcommunstroy
Bagdan Khmelnitskv Str, 2/15
Moscow, Russia 101000
Attn Viktor Kozlov
925-7070

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO:
See Article No 2 Below

CONSIGN TO:
Mongolian Fuel and Energy Ministry, Bagga Toiruu 6, Ulaanbaatar-46, Mongolia
Attn Minister Jigjid

ROUTE VIA: Rail

ITEM	QUANTITY	DESCRIPTION	TOTAL OF PREVIOUS ORDER	PRICE
				$ 81,940 14

INCORPORATE THE FOLLOWING

1. According to the request of the Mongolian party item 7311 K naming price of $ 19.641.70 is excluded from the Purchase Order and, consequently, the total firm price of the Order is changed from $ 81.940.14 to $ 62.298.44.

Reference first page of the Purchase Order "Total firm price..." should be as follows

"Total firm price - $ 62.298.44

Revise and incorporate the following under Article No 4

2. $ 4.750.00 of the first 20% payment consisting of $ 3.500.00 that were to be remitted to the State Bank of Mongolia /International Account No.053154/ and $ 1.250.00 that we got from $1.650.00 after diminishing the total firm price of the Purchase Order and that were to be remitted to correspondent's account 3-95-75730 CHIPSUID 315784 of Incombank, Moscow branch "Tchistiye Prudi" in Bank American International, New-York, should be remitted to Incombank, Moscow, to the Account 003070017 in favour of ZAGRANTECH-COMMUNSTROY.

Address of the Bank: Nametkina 14-1,
Moscow 117420, Russia
Telex 411700 PTB SU MICBANK
Fax /095/ 331 88 33
Phone /095/ 332 06 99

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United Engineers & Constructors
A Raytheon Company

CHANGE ORDER # 3

PAGE NO	DATE	REQN NO./BY	PREPARED BY	PURCHASE ORDER NO
2 OF 2				

SELLER S SHIPPING DATE	THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES, CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES	REL

FOB POINT	MAIL THE ORIGINAL AND ( ) COPIES OF INVOICES. THE ORIGINAL SHIPPING PAPERS, AND PACKING LIST TO-
TERMS OF PAYMENT	
SELLER	ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO-

CONSIGN TO

ROUTE VIA

ITEM	QUANTITY	DESCRIPTION	TOTAL OF PREVIOUS ORDER	PRICE

3. The remaining amount of the 20% i.e. $ 7.710.00 and the final 80% i.e. $ -9.838.44 should be remitted to Priorbank in ABN AMRO-BANK /OSTERREICH/ AG in favour of Minsk Bearing Plant, Byelorussia. The Bank data are specified in the Change Order No.2 /p.3/.

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED-
BY _____
TITLE. _____
DATE. _____

Form 4425 11/91

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M H Spaulding
M H SPAULDING

Guy F Hill

TOTAL PRICE OF ORDER (Incl)	___ Buyer ___ Requisitioner ___ Expediter ___ Accounting ___ Field/MRR ___ Client ___ Other _____
$62,298 44	
PURCHASE ORDER NO 7419 001-259-3	

T O ACCOUNT NO

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #1

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	12-22-92	887765	tam	7419 001-267-2

SELLER S SHIPPING DATE: 12-25-92 or sooner if possible

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: fob border (NAUCHSKI-SUHE-BATOR)

TERMS OF PAYMENT: see below

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

See Article No. 2 Below

SELLER

URAL FACTORY
St Titova, 11
G Ekaterinburg, 620003 Russia
Attn Kolesnikov Yuriy Artemovich
3432-25-14-43

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

See Article No 2 Below

CONSIGN TO

Mongolian Fuel and Energy Ministry, Bagga Poiruu 6, Ulaanbaatar-46, Mongolia
Attn Minister Jigjid

ROUTE VIA rail

ITEM	QUANTITY	DESCRIPTION	PRICE

Change Seller's name to the following

From Sverdlovsk Factory of Rubber Products

To Ural Factory

Change and incorporate the following under Article 2 in the original purchase order

Reference second paragraph "For each shipment . " and replace with the following

For each shipment (cargo), the Seller shall provide the above listed documents by either FAXing or via overnight air shipment, through TNT Worldwide Express or DHL to the following

United Engineers & Constructors Inc
100 Summer Street
Boston, MA 02110
Attn Mr M H Spaulding
Tel (617) 422-5360
FAX (617) 338-6239
FAX (617) 423-9020

Delete paragraph three (3) Upon receipt of the above listed ' of Article 2 in its entirety

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M H Spaulding
M.H. Spaulding

Gus F Hall

TOTAL PRICE OF ORDER (Rev)	
$268,775 00	
PURCHASE ORDER NO 7419 001 267 2	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419 001

183

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #1

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	12-22-92	81776K	tam	7419 001-267-1

SELLER S SHIPPING DATE: 12/30/92 or sooner if possible

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES

REL

FOB POINT: fob border (NAUCHSKI-SUHE-BATOR)

TERMS OF PAYMENT: see below

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

See Article No 2 Below

SELLER

URAL FACTORY
St Titova, 11
G Ekaterinburg, 620003 Russia
Attn Kolesnikov Yuriy Artemovich
3432-25-14-43

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

See Article No 2 Below

CONSIGN TO

Mongolian Fuel and Energy Ministry, Bagga Poiruu 6, Ulaanbaatar-46, Mongolia
Attn Minister Jigjid

ROUTE VIA rail

ITEM	QUANTITY	DESCRIPTION	PRICE

Change Seller's name to the following

From Sverdlovsk Factory of Rubber Products

To Ural Factory

Change and incorporate the following under Article 2 in the original purchase order

Reference second paragraph "For each shipment " and replace with the following·

For each shipment (cargo), the Seller shall provide the above listed documents by either FAXing or via overnight air shipment, through TNT Worldwide Express or DHL to the following

United Engineers & Constructors Inc
100 Summer Street
Boston, MA 02110
Attn. Mr M H Spaulding
Tel (617) 422-5360
FAX (617) 338-6239
FAX (617) 423-9020

Delete paragraph three (3) "Upon receipt of the above listed " of Article 2 in its entirety

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M H Spaulding
M.H. Spaulding

Guy F Dill

TOTAL PRICE OF ORDER (Rev)	
$280,850 00	
PURCHASE ORDER NO	
7419 001 267 1	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419 100

104

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 5	11/26/92	94050/PC	MHS	7419 001-267-1

SELLER S SHIPPING DATE: 12/30/92,OR SOONER IF POSSIBLE

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: FOB-BORDER(NAUCHSKI-SUHE-BATOR)

TERMS OF PAYMENT: SEE BELOW

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

SEE ARTICLE NO 2 BELOW

SELLER

SVERDLOVSK FACTORY OF RUBBER PRODUCTS
ST TITOVA, 11
EKATERINBURG, 620003, RUSSIA
ATTN KOLESNIKOV YURIY ARTEMOVICH
TEL 3432-25-14-43

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

SEE ARTICLE NO 2 BELOW

CONSIGN TO

MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU 6, ULAANBAATAR-46, MONGOLIA
ATTN MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
1		REPLACEMENT BELTING, GLUE, AND ROW RUBBER FOR CONVEYOR (SEE ATTACHMENT A FOR UNIT PRICE BREAK OUT)		$283,850 00
		LESS NEGOTIATED DISCOUNT		($3,000 00)
		TOTAL FIRM PRICE		$280,850 00

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY
TITLE ENGINEER
DATE 26.11.92

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY M H Spaulding
M H SPAULDING
Guy F. Hill

TOTAL PRICE OF ORDER	
$280,850 00	
PURCHASE ORDER NO	
7419 001 267 1	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O ACCOUNT NO 7419 100

105

Northeast Region Operations

United Engineers & Constructors
A Raytheon Company

NOV 1992

Purchasing Department

PURCHASE ORDER

PAGE NO	ATE	REQN NO/BY	PREPARED BY	PURCHASE ORDER NO
1 OF 4	10-30-92	86117/RMS	tam	7419 001-5005

SELLER S SHIPPING DATE: 12/7/92

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Buffalo, NY

TERMS OF PAYMENT: Net 20 Days

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

SELLER

GRAPHIC CONTROLS CO
189 Van Rensselaer Street
Buffalo, NY 14240
Attn Mr Richard Nowak
(716) 853-7500

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

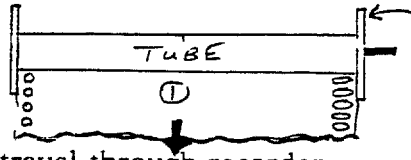
UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn M G Simpson
617-422-5379

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by telephoning Mr Franz Fassbender at Tel No (201) 303-1300, FAX No (201) 313-9564

ROUTE VIA

ITEM	QUANTITY	DESCRIPTION	PRICE

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
1	29,630	STRIP CHART RECORDER PAPER as per the enclosed sample piece of recorder paper in Seller's possession The paper is 180 millimeters wide The graph on the paper is 160 millimeters wide divided into 100 spaces across the 160 millimeter width The spacing of the lines across the paper varies from left to right Please print the paper with the exact same spacing as sample piece Every twentieth (20) line shall be darker and the dark lines including the edge lines shall be marked across the paper from left to right with 1000, 1100, 1200, 1300, 1400, 1500 (per sample) The length of paper per roll is 15 meters The paper shall be printed with lines equally spaced along its length Every other line shall be numbered from 1 to 24 with numbers repeated The paper shall be wound on Seller's cardboard tube #1153 The punching of the paper must be Option #1 as shown below	$2 71/roll	$80,297 3



Plastic Fixture

Circular punch on left
slotted punch on right

Chart travel through recorder

THIS ORDER IS SUBJECT TO THE TERMS, CONDITIONS, AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY
TITLE
DATE 11/4/92

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC.
BY M G Simpson
M.G Simpson
Guy F Hill

TOTAL PRICE OF ORDER	
$80,297 30	
PURCHASE ORDER NO	
7419 001 5005	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

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РЕЕСТРОВЫЙ №11758 АФ4ДВ ЛПТ160 ГОСТ 7826-82 ПР30/6

18 19 20 21 22 23 24 1 2 3 4 5 6

1000 1100 1200 1300 1400 1500

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	SELLER	REL	PURCHASE ORDER NO
2 OF 4	GRAPHIC CONTROLS CO		7419 001-5005

ITEM	QUANTITY	DESCRIPTION	PRICE

The paper must be wound on the tube with printed side out

Replace Russian catalog data (РЕЕСТРОВЫЙ No 1758 АФП6 ПП ГОСТ 7826-82 ПР3016) with Graphic Controls Co identification markings

TOTAL FIRM PRICE $80,297 30

A The successful bidder will be responsible for full compliance with the Export Administration Regulations of the U S Department of Commerce, including the assignment of an Export Control Commodity Number Classification, and securing a validated export license, if required

B Each Shipper's Export Declaration Form (Form 7525-V) in any resulting shipment shall be clearly marked with "Export Control Commodity Number 2E96G, G-DEST" for the general license symbol or the validated export license number if applicable In addition, the commercial invoice and bill of lading must show the project's control notice "United States law prohibits disposition of these commodities to the (Former) Soviet Bloc, Libya, Laos, the People's Republic of China, North Korea, Vietnam, Cambodia or Cuba unless otherwise authorized by the United States"

I APPLICABLE DOCUMENTS

The following documents are incorporated in and made part of this Purchase Order

With the same force and effect as if they were given in full text Upon request, the Purchaser will make their full text available

FAR CLAUSES

(X) 52 202-01	Definitions (APR 1984)
(X) 52 203-01	Officials Not to Benefit (APR 1984)
(X) 52 203-03	Gratuities (APR 1984)
(X) 52 203-05	Covenant Against Contingent Fees (APR 1984)
(X) 52 203-07	Anti-Kickback Procedures (APR 1984)
(X) 52 204-2	Security Requirements (APR 1984)
(X) 52 204-3	Taxpayer Identification
(X) 52 212-13 & Alternate I	Stop-Work Order (APR 1984)
(X) 52 215-01	Examination of Records by Comptroller General (APR 1984)
(X) 52 215-02	Audit-Negotiation (APR 1984)
(X) 52 215-22	Price Reduction for Defective Cost or Pricing Data (APR 1984)
(X) 52 215-24	Subcontractor Cost or Pricing Data (APR 1985)
(X) 52 216-07	Allowable Cost and Payment (APR 1984)
(X) 52 216 11	Cost Contract - No Fee (APR 1984)
(X) 52 219-08	Utilization of Small Business Concerns and Small Disadvantaged Business Concerns (APR 1984)
(X) 52 219-09	Small Business and Disadvantaged Business Business Subcontracting Plan (APR 1984)
(X) 52 219-13	Utilization of Women Owned Small Business (APR 1984)
(X) 52 222-02	Payment for Overtime Premiums (APR 1984)
(X) 52 222-03	Convict Labor (APR 1984)
(X) 52 222-26	Equal Opportunity (APR 1984)
(X) 52 222-28	Equal Opportunity Preaward Clearance of Subcontracts (APR 1984)

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #4

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	05-20-93	42989/PDC	tam	7419 002-113-1

SELLER S SHIPPING DATE

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT
Alsip, Illinois

TERMS OF PAYMENT
net 30 days

SELLER
ANIXTER
905 Turnpike Street, Unit 9
Canton, MA 02021
Attn. Mr Don Prescott
(617) 828-3330

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn. J. M McCormack

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO
UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn: J. M McCormack
617-422-5280

CONSIGN TO
Seller must contact An-Mar Shipping Inc. for shipping instructions by contacting Mr Franz Fassbender
Tel No (201) 313-1300
FAX No. (201) 313-9564

ROUTE VIA

Item	Qty	Description	Previous Total of Order
			$ 297,591 16

INCORPORATE THE FOLLOWING

13 Delete line item no 2 overnight shipping charge from purchase order ($40 00)

USE Mongolian Heat and Power Project No 1 - Scanner Blower Power Supply

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M. H. Spurlock
For J.M. McCormack

TOTAL PRICE OF ORDER (Rev)	
$297,551 16	
PURCHASE ORDER NO 7419 002 113 1	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419 200 10C

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #3

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	02-18-93	94220/SCA	tam	7419 002-113-1

SELLER S SHIPPING DATE: ship to An-Mar for arrival no later than 2/16/93

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Alsip, Illinois

TERMS OF PAYMENT: net 30 days

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC.
100 Summer Street, Boston, MA 02110
Attn J M McCormack

SELLER

ANIXTER
905 Turnpike Street, Unit 9
Canton, MA 02021
Attn Mr Don Prescott
(617) 828-3330

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

UNITED ENGINEERS & CONSTRUCTORS INC.
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn· J M McCormack
617-422-5280

CONSIGN TO: Seller must contact An-Mar Shipping Inc for shipping instructions by contacting Mr Franz Fassbender
Tel No (201) 313-1300
FAX No (201) 313-9564

ROUTE VIA: FEDERAL EXPRESS

Item	Qty	Description	Previous Total of Order
			$ 296,032 16

INCORPORATE THE FOLLOWING

			Unit Price	Ext. Price
12	110'	3/C #8 AWG copper with ground, 600 volt, UL listed type TC Tray Cable	$ 1.29/LF	$ 1,419 00
		Overnight shipping charge (estimate)		$ 40 00

USE Mongolian Heat and Power Project No 1 - Scanner Blower Power Supply

overnight Air Charge (est) was incorrectly incorporated in this P.O Per a Conversation with Anixter on 5/18/93 the total shipping weight for this item was 512 lbs This is much to heavy to ship overnight by Federal Express Marks

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC.
BY J M. McCormack
J M. McCormack
5.11.00

PURCHASE ORDER NO 7419 002 113 1

___ FAX/MRR
___ Client
___ Other _____

J.O Account No : 7419.200 110

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #1

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	12-07-92	94207/SCA	tam	7419 002-113-1

SELLER S SHIPPING DATE: 12/4/92

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: EL DORADO, ARIZONA

TERMS OF PAYMENT: Net 30 Days

SELLER
ANIXTER
905 Turnpike Street, Unit 9
Canton, MA 02021
Attn Mr Don Prescott
(617) 828-3330

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO
UNITED ENGINEERS & CONSTRUCTORS INC.
100 Summer Street, Boston, MA 02110
Attn J.M Brennen

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO
UNITED ENGINEERS & CONSTRUCTORS INC.
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn J M Brennen
617-422-5223

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by contacting Mr Franz Fassbender
Tel No (201) 313-1300
FAX No (201) 313-9564

ROUTE VIA: FREIGHT FORWARDER

Item	Quantity	Description	Total of Previous Order
			$285,241 39

CABLE

			Unit Price	Ext. Price
7	16,042 LF	3/C #12 AWG Type TC control cable, XLP insulation, hypalon jacket Anixter CAT #2RH-1203	$447/mft	$7,170.77
8	3,000 LF	1/PR #16 AWG, Type TC Instrumentation cable, XLP insulation, twisted, shielded with hypalon jacket Anixter CAT #2RH-1601 POS	$314/mft	$942 00
9	5,000 LF	3/C #16 AWG, Type TC Instrumentation cable similar to Item #2 Anixter CAT #2RH-1601-TOS	$360/mft	$1,800 00
10	LOT	Lagging $150 00/recl x 5 reels		$750 00

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY _____
J M Brennen

TOTAL PRICE OF ORDER (Rev) $295,904 16

PURCHASE ORDER NO 7419 002 113-1

___ Buyer
___ Requisitioner
___ Expediter
___ Accounting
___ Field/MRR
___ Client
___ Other _____

J O Account No. 7419.002

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #2

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	02-04-93	94207/SCA	tam	7419 002-113-1

SELLER S SHIPPING DATE: 2/4/93

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: n/a

TERMS OF PAYMENT: net 30 days

SELLER:
ANIXTER
905 Turnpike Street, Door A
Canton, MA 02021
Attn Mr. Don Prescott
(617) 828-3330

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC.
100 Summer Street, Boston, MA 02110
Attn: J.M McCormack

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

UNITED ENGINEERS & CONSTRUCTORS INC.
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn· J M McCormack
617-422-5280

CONSIGN TO: Seller must contact An-Mar International Inc. for shipping instructions by telephoning Mr Franz Fassbender at Tel No (201) 313-1300 - FAX No. (201) 313-9564

ROUTE VIA: Federal Express Priority

Item	Qty	Description		Previous Total of Order
				$295,904 16
		ADDITIONAL CABLE		
11	2000 LF	#16 AWG, single conductor copper switchboard wire, red insulation.	$45/1000'	$90 00
		Overnight shipping charge (estimate)		$38 00

USE Mongolian Emergency Heat and Power Project No 1

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC.
BY Joanne McCormack
J.M. McCormack

TOTAL PRICE OF ORDER (Rev)	
$296,032 16	___ Buyer ___ Requisitioner ___ Expediter ___ Accounting ___ Field/MRR ___ Client ___ Other _____
PURCHASE ORDER NO 7419 002 113 1	

J O Account No. 7419 200

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 5	11-23-92	94207/SCA	tam	7419 002-113-1

SELLER S SHIPPING DATE: 12-04-92 and 12-11-92

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: EL DORADO, ARIZONA

TERMS OF PAYMENT: Net 30 Days

SELLER:
ANIXTER - South Boston
905 Turnpike Street, Unit 9
Canton, MA 02021
Attn Mr. Don Prescott
(617) 828-3330

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO
UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn J M McCormack
617-422-5280

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by telephoning Mr Franz Fassbender at Tel No (201) 313-1300 - FAX No (201) 313-9564

ROUTE VIA: FREIGHT FORWARDER

ITEM	QUANTITY	DESCRIPTION	Unit Price	Ext Price
		MINE POWER CABLE - 8KV		
1	3280 FT	3/C #3 AWG	$7,903 00/MFT	$25,921 84
2	4920 FT	3/C #2 AWG	$8,540 00/MFT	$42,016 80
3	4920 FT	3/C #1/0 AWG	$10,542 00/MFT	$51,866 64
4	6562 FT	3/C #3/0 AWG	$13,654 00/MFT	$89,597 55
5	4920 FT	3/C #4/0 AWG	$15,018 00/MFT	$73,888 56
6		Lagging 150 00/reel x 13 reels		$1,950 00
		Above material meets the specification requirements of Specification TB2-517 - attached Manufacturing tolerance - plus 5%, minus 5%		
		TOTAL FIRM PRICE		**$285,241 39**

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY Jeanne M. McCormack
J M McCormack
Lucy L. Hill

TOTAL PRICE OF ORDER: $285,241 39

PURCHASE ORDER NO: 7419 002 113 1

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419 200

113

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

Revised

5	02-23-93	94218/SCA	tam	7419 002-113-2

n/a

Abington, VA

net 30 days

PAIGE ELECTRIC CO L P
59 Valley View Drive
Middlefield, CT 06455
Attn Mr Dan Pritchard
(203) 349-0472

ALL PACKAGES AND INVOICES OF THE SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn J M McCormack
617-422-5280

Seller must contact An-Mar International Inc for shipping instructions by contacting Mr Franz Fassbender at
Tel No (201) 313-3130
FAX No (201) 313-9564

FREIGHT FORWARDER

ITEM	QUANTITY	DESCRIPTION	PRICE
			Ext Price
1	346	#21 AWG	$916 25
2	325 LBS	#20 1/2 AWG	$860 64
3	334	#20 AWG	$844 83
4	667	#18 1/2 AWG	$1,641 04
5	1612	#18 AWG	$3,906 73
6	1392	#17 AWG	$3,308 05
7	1407	#16 1/2 AWG	$3,343 69
8	875	#16 AWG	$2,038 23
9	1011	#15 AWG	$2,307 46
10	1064	#14 1/2 AWG	$2,428 41
11	669	#14 AWG	$1,512 16
		TOTAL FIRM PRICE COMMITMENT	**$23,107 49**

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY D Pritchard
TITLE Estimator
DATE 3/22/93

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC.
BY: Joanne M McCormack
J M McCormack

TOTAL PRICE OF ORDER
$23,107 49

PURCHASE ORDER NO
7419 002 113 2

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other ____

J O Account No 7419 002

2 - 5	PAIGE ELECTRIC CO L P		7419 002-113-2

Wire shall be bare copper insulated with one (1) layer of polyester based resin and one (1) or more coats of polyamide resin

Wire shall have a temperature rating of 200 C and shall meet the requirements of NEMA MW000, Section MW-73-C

Codes and Standards

1 Wire shall conform to the codes and standards of the organizations listed In case of conflict they shall take precedence in the listed order

a National Electrical Code (NEC) Chapter 3
b National Electrical Manufacturers Association (NEMA) ICS
c Underwriters Laboratories (UL)
d American National Standards Institute (ANSI)

Tests

1 Wire shall be factory tested in accordance with the appropriate referenced standards

Submittals

1 Submit catalog cuts with dimensions and weights on all equipment

Storage and Handling

1 Wire shall be shipped twelve (12) inch reels and shall be packed for long storage and sealed to prevent the entrance of dirt and moisture

Packing

1 Plastic shrink wrapper and pallatized pails

Origin of Goods

U S Origin

Applicable Documents

The following is incorporated in this purchase order with the same force and effect as if they were given in full text Upon request, the Purchaser will make their full text available

A FAR CLAUSES

(X) 52 202-01 Definitions (APR 1984)
(X) 52 203-01 Officials Not to Benefit (APR 1984)
(X) 52 203-03 Gratuities (APR 1984)
(X) 52 203-05 Covenant Against Contingent Fees (APR 1984)
(X) 52 203-07 Anti-Kickback Procedures (APR 1984)
(X) 52 204-2 Security Requirements (APR 1984)
(X) 52 204-3 Taxpayer Identification
(X) 52 212-13 & Alternate I Stop-Work Order (APR 1984)
(X) 52 215-01 Examination of Records by Comptroller General (APR 1984)
(X) 52 215-02 Audit-Negotiation (APR 1984)
(X) 52 215-22 Price Reduction for Defective Cost or Pricing Data (APR 1984)
(X) 52 215-24 Subcontractor Cost or Pricing Data (APR 1985)
(X) 52 216-07 Allowable Cost and Payment (APR 1984)

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER # 2

PAGE NO	DATE	REQN NO./BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	02/22/93	88851	VHS	7419.002-128-1

SELLER S SHIPPING DATE: Various-See Below

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES, CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: FOB-BORDER (Suhe-Bator)

TERMS OF PAYMENT: See Below

MAIL THE ORIGINAL AND ( ) COPIES OF INVOICES, THE ORIGINAL SHIPPING PAPERS, AND PACKING LIST TO:
see article no 2 below

SELLER
TM SERVICE
BULGARIA, VARNA
ST KONSTANTIN DC STR 28, 21
ATTN SERGEY VOROBYOV OR ALEXANDER MISHAGIN
TEL 86-10-65

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO:
see article no 2 below

CONSIGN TO
Nuurs Company, Mongolian Fuel and Energy Ministry, Bagga Poiruu 6, Ulaanbaatar, Mongolia, Attn Minister Jigjid

ROUTE VIA

ITEM	QUANTITY	DESCRIPTION	TOTAL OF PREVIOUS ORDER	PRICE
				$ 650,800 00

INCORPORATE THE FOLLOWING

1 Change the seller to the following

TM Service
Bulgaria, Varna
St Konstantin DC Str 28,21
Attn Sergey Vorobyov or Alexander Mishagin
Tel 86-10-65

2 Change Section 4 "These payments shall be made " to the following

First Private Bank
Drzky St , 1
9000 Varna, Republic of Bulgaria
Person of Contact Mr Ivanov
Tel (052) 222859 or 231374
Account No 967 604 1130 300-6 (USD)

3 Delete Item #6 in its entirety ($87,400 00)

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED:
BY _____
TITLE. _____
DATE. _____

Form 4425 11/91

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC

BY M H Spaulding
M H SPAULDING

Guy F Hill

TOTAL PRICE OF ORDER (Incl)	
$563,400.00	__ Buyer __ Requisitioner __ Expediter __ Accounting __ Field/MRR __ Client __ Other _____
PURCHASE ORDER NO 7419 002-128-1	

J O ACCOUNT NO 7419200

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 5	11/26/92	85684/PC	MHS	7419 002-128-1

SELLER S SHIPPING DATE: VARIOUS-SEE BELOW

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT Nauchki: FOB-BORDER (SUHE-BATOR)

TERMS OF PAYMENT: SEE BELOW

SELLER:
TRADE BUREAU
VAINERA STR ,13
620014,EKATERINBURG,RUSSIA
ATTN SERGEY VOROBYOV
TEL 510247

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO:
SEE ARTICLE NO 2 BELOW

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO:
SEE ARTICLE NO 2 BELOW

CONSIGN TO

MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU 6, ULAANBAATAR-46, MONGOLIA
ATTN MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
1	4	MOTOR-DPE-52Y1 54KVT, 1200RPM,2 SHAFTS	$19,800 00	$79,200 00
2	2	MOTOR-DPE-52Y1 54KVT, 1200RPM,1 SHAFT	$19,800 00	$39,600 00
3	4	MOTOR-DPV-52 54KVT, 1200RPM	$20,500 00	$82,000 00
4	2	MOTOR-DEV-812Y2 100KVT, 750RPM	$39,800 00	$79,600 00
5	2	MOTOR-DE-816YZ **190KVT, 750 RPM**	**$49,200 00**	**$98,400 00**
6	2	**MOTOR-DE-82Y1** **175KVT (200 KVT), 740 RPM**	**$43,700 00**	**$87,400 00**

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY [signature]
TITLE ENGINEER
DATE 26 11.92

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY G.F. Hill
G F HILL

Mark H Spalding
Guy F. Hill.

TOTAL PRICE OF ORDER	
$650,800 00	__ Buyer __ Requisitioner __ Expediter __ Accounting __ Field/MRR __ Client __ Other _____
PURCHASE ORDER NO 7419 002 128 1	

J O ACCOUNT NO 7419 200

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO OF	SELLER	REL	PURCHASE ORDER NO
5	TRADE BUREAU		7419 002-128-1

ITEM	QUANTITY	DESCRIPTION	PRICE
7	2	MOTOR-MPE-450-90043 400V	$92,300 00 $184,600 00

TOTAL FIRM PRICE $650,800 00

ARTICLE 1- MARKING INSTRUCTIONS- SHALL BE AS FOLLOWS

Mongolian Emergency Heat and Power Project No 1
Mongolian Fuel and Energy Ministry
Ulaanbaatar, Mongolia

Emergency Spare Parts for Power Plants and Coal Mines
Emergency Duty Free Cargo for the Mongolian Government

US AID PROJECT No. 438-0003
UE&C Project No 7419 002
UE&C Purchase Order No 7419 002-128-1

The "US AID Label" and "Made in Russia" shall be clearly marked on each package of each shipment

Each package in the shipment shall be marked (eg 1 of N, 2 of N, N of N)

Each package shall be marked with proper metric dimensions and weights

Packages should be properly EXPORT BOXED/BUNDLED TO WITHSTAND OUTSIDE STORAGE as well as railroad/trucking/airfreight handling

ARTICLE 2- SHIPPING DOCUMENTATION- THE FOLLOWING SHALL BE INCLUDED IN BOTH RUSSIAN AND ENGLISH FOR EACH SHIPMENT/CARGO

a Copy of Inland Bill of Lading
b Copy of Commercial Invoice
c Copy of Packing List(Shall be attached to the outside of each package, enclosed in water proof plastic
d Copy of Certificate of Origin or if no "Certificate" is available, supplier shall stamp "Made in Russia" on the Commercial Invoice
e Copy of Inspection Certificate
f Shipping date and scheduled date of arrival in Ulaanbaator
g Export License (N/A)

For each shipment(cargo), the above listed documents shall be FAXED and delivered (hard copy) by seller as expeditously as possible to the following independent agent in Moscow

Kuehne + Nagel
~~Leninskiprospekt, 95A~~ → OBRUCHYOVA STR №4 KORPUS 2 (Обручева 14 корп 2
Moscow, 117313
Phone (7-095) ~~132-35-11~~ 936-41-93 (94)
Fax 936-22-21
Telex 414-500 or 414-303 уехал 62
Attn Mr Horst Hemling ← Покровский Сергей Георгиевич
POKROVSKI Sergei Georgievich

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 4	12-07-92	94205/SCA	tam	7419 002-137-1

SELLER S SHIPPING DATE: A R O 12/14/92

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Bennington, VT, Lyon Station PA

TERMS OF PAYMENT: Net 30 Days

SELLER:
CENTRAL AUTOMOTIVE WAREHOUSE CORP
10 Braintree Street
Alston, MA 02134
Attn Mr Irwin Young
(617) 254-0414

MAIL THE ORIGINAL AND TWO (?) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn J M Brennen
617-422-5223

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by contacting Mr Franz Fassbender at
Tel No (201) 313-1300
FAX No (201) 313-9564

ROUTE VIA

ITEM	QUANTITY	DESCRIPTION	Unit Price	Ext Price
1	40	12V, 75AH, Lead Acid Battery for Vehicle Engine Starting (BCI-31)	$54 80	$2,192 00
2	250	12 Volt, 132 AH, Lead Acid Battery for Vehicle Engine Starting (BCI-4D)	$91 65	$22,912 50
3	200	12 Volt, 182 AH, Lead Acid Battery for Vehicle Engine Starting (BCI-8D)	$110 20	$22,040 40
4	252	5 GALLON - ELECTROLYTE	$5 60	$1,411 20
		TOTAL FIRM PRICE		**48,555 70**

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY _____
J M Brennen

TOTAL PRICE OF ORDER: $48,555 70

PURCHASE ORDER NO: 7419 002 137 1

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419 002

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United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #1

Revised 3/3/93

PAGE NO OF 1	DATE 02-26-93	REQN NO BY 88857	PREPARED BY tam	CONTRACT NO 7419 002-137-2
WORK SCHEDULE N/A			THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES	REL

FOB POINT
N/A

TERMS OF PAYMENT
net 30 days

SUBCONTRACTOR
YUASA/EXIDE INC
295 W 49th Street
Reading, PA 19606
Attn J Mikulsky

MAIL THE ORIGINAL AND TWO (3) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO
UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn J M McCormack

CONSIGN TO Seller must contact An-Mar Shipping for shipping instructions by telephoning Mr Franz Fassbender
Tel No (201) 313-3130, FAX No (201) 313-9564

ROUTE VIA N/A

Description	Total of Previous Order
	$17,374 00

INCORPORATE THE FOLLOWING

Cancel Item No 1 on P O 7419 002-137-2

4 Sets Locomotive Batteries plus Electrolyte ($ 17,374 00)

Cancellation Fee - 15% $ 2,605 00

UE&C will pay for all applicable shipping chargesassociated with return of this order

Batteries and Electrolytes to be shipped from Ridgefield, NJ to

Luasa/Exide Inc
920 Vista Park Drive
Pittsburgh, PA 15205

Attn Mr Elvin Beck

USE Mongolian Fuel and Energy Ministry

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYLR
UNITED ENGINEERS & CONSTRUCTORS INC.
BY J.M. McCormack
J.M McCormack

TOTAL PRICE OF ORDER (Rev)	
Estimated $2,605 00	__ Buyer __ Requisitioner __ Expediter __ Accounting __ Field/MRR __ Client __ Other _____
PURCHASE ORDER NO 7419 002 137 2	

J O Account No 7419 200120

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 5	02-18-93	94219/SCA	tam	7419 002-137-2

SELLER S SHIPPING DATE: n/a

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Countryside, Chicago

TERMS OF PAYMENT: n/a

SELLER:
YUASA/EXIDE INC
295 W 49th Street
Reading, PA 19606
Attn Mr John Mikolsky
(215) 370-1442

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC.
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

UNITED ENGINEERS & CONSTRUCTORS INC.
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn J M McCormack
617-422-5280

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by contacting Mr Franz Fassbender at
Tel No (201) 313-1300
FAX No (201) 313-9564

ROUTE VIA: FREIGHT FORWARDER

ITEM	QUANTITY	DESCRIPTION	Unit Price	Ext Price
1	4 SET	LOCOMOTIVE BATTERIES, 64 Volt, 32-LMS 450 D/C with separate electrolyte Batteries will be dry charged Electrolyte will be shipped separately Export packing not required	$ 4,572 00/set	$ 18,288 00
		(less 5%)		($914 00)
		Batteries shall be suitable for operation in an ambient temperature of -40°C		
		No lead acid diesel starting battery will operate in temperatures below 0°C Batteries must be kept from freezing or they will be damaged beyond repair		

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS, AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC.
BY _____
J M McCormack

TOTAL PRICE OF ORDER: $17,374 00

PURCHASE ORDER NO: 7419 002 137 2

J O Account No 7419 200

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

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RECEIVED DEC - 4 1992

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

7419-002-225-2

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 4	11-23-92	85692/PC	tam	7419 002-~~252~~-2

SELLER S SHIPPING DATE: 12-04-92

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES

REL

FOB POINT: Clifton, CO

TERMS OF PAYMENT: Net 30 Days

SELLER
SCHAUENBURG FLEXADUX CORP
569 32 1/2 Road
Clifton Grand Junction, CO 81520
Attn Mr Karl Bloom
(303) 434-~~6806~~ 5134

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO
UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO
UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn J M McCormack
617-422-5280

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by telephoning Mr Franz Fassbender at Tel No (201) 313-1300 - FAX No (201) 313-9564

ROUTE VIA: FREIGHT FORWARDER

Item	Quantity	Description	Price
1	5000 MTR	Flexible tubing, non-antistatic tubing 600 mm diameter, fabricated from 13 ounce T-16 material with grommet strip hooks and wire rope end rings	$32,300 00
2	LOT	Couplings to join 20 meter sections	$2,350 00
3	LOT	Miscellaneous items including - Repair Kits - Glue - Suspension Hooks	$250 00
		TOTAL FIRM PRICE	**$34,900 00**

Packing

Individual pieces will be compressed and wrapped individually and packed in overseas containers

Origin of Goods

U S Origin

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY [signature]
TITLE Treas/Mgr
DATE 12-1-92

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY [signature]
J M McCormack
[signature]

TOTAL PRICE OF ORDER	
$34,900 00	___ Buyer ___ Requisitioner ___ Expediter ___ Accounting ___ Field/MRR ___ Client ___ Other ____
PURCHASE ORDER NO 7419 002 252 2	

J O Account No 7419 200

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& Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO BY	PREPARED BY	PURCHASE ORDER NO
1 OF 5	11/26/92	94049/PC	MHS	7419 002-267-2

SELLER S SHIPPING DATE: 12/25/92,OR SOONER IF POSSIBLE

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: FOB-BORDER(NAUCHKI-SUHE-BATOR)

TERMS OF PAYMENT: SEE BELOW

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

SEE ARTICLE NO 2 BELOW

SELLER

SVERDLOVSK FACTORY OF RUBBER TECH PROD
ST TITOVA,11
EKATERINBURG, 620003, RUSSIA
ATTN KOLESNIKOV YURIY ARTEMOVICH
TEL (3432) 25-14-43

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

SEE ARTICLE NO 2 BELOW

CONSIGN TO

MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU 6 ULAANBAATAR-46, MONGOLIA
ATTN· MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
1	225 M²	Conveyor belting per spec 2M 800-4TK 200/5-2MPG	$ 65 00	$14,625 00
2	540 M²	Conveyor belting per spec 2M 1000-4-TK200/2-5-2M-PG	$65 00	$35,100 00
3	1800 M²	Conveyor belting per spec 2M 1200-3-AGE400-5-2MPG	$65 00	$117,000 00
4	1570 M²	Conveyor belting per spec 2M 1400-3-AG400-5-2MPG	$65 00	$102,050 00

TOTAL FIRM PRICE $268,775 00

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY [signature]
TITLE ENGINEER
DATE 26.11.92

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY M H Spaulding
M H SPAULDING

Guy F. Idell

TOTAL PRICE OF ORDER	
$268,775 00	___ Buyer ___ Requisitioner ___ Expediter ___ Accounting ___ Field/MRR ___ Client ___ Other _____
PURCHASE ORDER NO 7419 002 267 -	

J O ACCOUNT NO 7419 200

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United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #1

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	12-22-92	85776H	tam	7419 001-267-3

SELLER S SHIPPING DATE: 12-25-92 or sooner if possible

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: fob border (NAUCHSKI-SUHE-BATOR)

TERMS OF PAYMENT: see below

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO: See Article No 2 Below

SELLER:
URAL FACTORY
St Titova, 11
G Ekaterinburg, 620003 Russia
Attn Kolesnikov Yuriy Artemovich
3432-25-14-43

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO: See Article No 2 Below

CONSIGN TO

Mongolian Fuel and Energy Ministry, Bagga Poiruu 6, Ulaanbaatar-46, Mongolia
Attn Minister Jigjid

ROUTE VIA: rail

ITEM	QUANTITY	DESCRIPTION	PRICE

Change Seller's name to the following

From Sverdlovsk Factory of Rubber Products

To Ural Factory

Change and incorporate the following under Article 2 in the original purchase order

Reference second paragraph "For each shipment ' and replace with the following·

For each shipment (cargo), the Seller shall provide the above listed documents by either FAXing or via overnight air shipment, through TNT Worldwide Express or DHL to the following

United Engineers & Constructors Inc
100 Summer Street
Boston, MA 02110
Attn Mr M H Spaulding
Tel (617) 422-5360
FAX (617) 338-6239
FAX (617) 423-9020

Delete paragraph three (3) Upon receipt of the above listed " of Article 2 in its entirety

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M H Spaulding
M.H. Spaulding
Gary F Hill

TOTAL PRICE OF ORDER (Rev)	
$69,120 00	
PURCHASE ORDER NO	
7419 001 267 3	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419 001

Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO 'BY	PREPARED BY	PURCHASE ORDER NO
1 OF 6	11/26/92	94049A/PC	MHS	7419 002-267-3

SELLER S SHIPPING DATE: 12/25/92,OR SOONER IF POSSIBLE

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: FOB-BORDER(NAUCHKI-SUHE-BATOR)

TERMS OF PAYMENT: SEE BELOW

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO: SEE ARTICLE NO 2 BELOW

SELLER:
SVERDLOVSK FACTORY OF RUBBER TECH PROD
ST TITOVA,11
EKATERINBURG, 620003, RUSSIA
ATTN KOLESNIKOV YURIY ARTEMOVICH
TEL (3432) 25-14-43

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO: SEE ARTICLE NO 2 BELOW

CONSIGN TO

MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU 6 ULAANBAATAR-46, MONGOLIA
ATTN MINISTER JIGJID

ROUTE VIA: RAIL

ITEM	QUANTITY	DESCRIPTION	PRICE

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
1	720 M^2	Conveyor belting per spec 2M 1600-6TA300-6-2MPG	$96 00	$69,120 00

TOTAL FIRM PRICE $69,120 00

THIS ORDER IS SUBJECT TO THE TERMS, CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY [signature]
TITLE ENGINEER
DATE 26.11.92

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY [signature]
M H SPAULDING
Guy F. Hall

TOTAL PRICE OF ORDER	
$69,120 00	
PURCHASE ORDER NO	
7419 002 267 3	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O ACCOUNT NO 7419 200

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 5	10-23-92	85677/PC	tam	7419 002-400-1

SELLER S SHIPPING DATE: 10-30-92

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Sagami, Japan

TERMS OF PAYMENT: Net 30 Days

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

SELLER

CATERPILLAR, INC
DEFENSE AND FEDERAL PRODUCTS, JB7
100 N E Adams Street
Peoria, IL 61629
Attn Mr Ron Marshall
(309) 675-6978

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn M Spaulding
617-422-5360

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by telephoning Mr Franz Fassenbender at Tel No (201) ~~303~~ 313-1300, FAX No (201) 313-9564

ROUTE VIA: FREIGHT FORWARDER

ITEM	QUANTITY	DESCRIPTION	Unit Price	Ext Price
1	2	TRACK TYPE BULLDOZERS (Model D8N)	$321,686 00	$643,372 00
2		FIELD SERVICES, (A factory-trained representative will be provided for a continuous two (2) week period in Ulaanbaatar, Mongolia to provide technical advise and supervision for placing the bulldozers into service and to instruct Owner's personnel in proper operation and maintenance)	------	$25,029 00
3	2	SPECIAL TOOL SETS	$262 00	$524 00
4	10	MAINTENANCE MANUALS	$175 00	1,750 00
5	1 LOT	SPARE PARTS (3 YEARS per attached listing)	-------	$20,741 04
6	1 LOT	LUBRICANTS (1 YEAR SUPPLY per attached listing)	-------	$22,136 00
		Origin of Goods U S Origin		
		TOTAL FIRM PRICE		**$713,552 04**

THIS ORDER IS SUBJECT TO THE TERMS, CONDITIONS, AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY E. F. Wilson
TITLE Mgr, Machine Prod
DATE 10/26/92

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC.
BY M H Spaulding
M.H. Spaulding

TOTAL PRICE OF ORDER	
$713,552 04	
PURCHASE ORDER NO	
7419 002 400 1	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other ____

J O Account No 7419 002

QUOTATION
CATERPILLAR INC.
PEORIA, ILLINOIS, U.S.A.

TO
M. H. Spaulding
United Engineers & Construction Inc.
100 Summer Street
Boston, MA 02110

SHEET NO. 1

DATE
Sept. 18, 1992

Quantity	Part No	Part Name	Unit Price	Extension
36	1R0716	Filter Oil	$ 11.69	$ 420.84
24	1R0712	Filter Fuel	8.22	197 28
36	1R0720	Filter Transmission & Hydraulic	6 70	241 20
18	1H8128	Seal	1.42	25 56
18	5H3252	Seal	1.64	29.52
8	7W5495	Air Filter Primary	25.96	207 68
8	1P7360	Air Filter Secondary	19 23	153 84
132	2J3507	Nut	.74	97 68
132	4J9058	Bolt	1 64	216 48
4	4T6381	Edge	172 44	689.76
132	5P8250	Washer	57	75.24
8	6Y5540	Edge	101.32	810 56
4	8E4193	End Bit RH	162 17	648 68
4	8E4194	End Bit LH	162 17	648 68
8	9W2452	Tip	65.54	524 32
12	8E5559	Retainer	4.60	55.20
4	8E1848	Protector	131 80	527 20
12	6Y3394	Pin	4.78	57 36
8	6J6680	Pin	78 83	630 64
2	8E4518	Link A	3,905 74	7,811 48
60	7T2390	Shoe	47 95	2,877 00
150	6V1723	Bolt	2.17	325 50
15	6V1724	Bolt	2 25	33 75
15	6V1725	Bolt	3 14	47 10
150	7G6442	Nut	.91	136 50
2	7C9001	V-Belt	11.18	22 36
2	9G4231	Battery	158 61	317 22
2	9G4232	Battery	132 35	264 70
2	6N5337	V Belt Set	37 56	75 12
6	2W3413	Fuel Inj Pump	115 95	695 70
12	9M2341	Filter	2 89	34 68
12	8H2778	Seals	1 02	12 24
6	7W7032	Nozzle	70 73	424 38
1	7C4957	Water Pump	428 63	428 63
1	8E4059	Link	139 07	139 07
1	8E4060	Link	139 07	139 07
1	8E4457	Link	95 61	95 61
1	8E4458	Link	95 61	95 61
6	8E4505	Link	42 30	253 80
6	8E4506	Link	42 30	253 80

rpm\ue&cquot

$20,741 04

Oils/Lubes/Coolants

	Requirement	Will Supply
Hydraulic Oil	184 gal	4 X 55 gal drums
Transmission Oil	272 gal	5 X 55 gal. drums
Engine Oil	320 gal	6 X 55 gal drums
Antifreeze	30L	3 X 5 gal buckets

Oils have flash point of 205°C (400°F)
Antifreeze has flash point of 121°C (250°F)

Palletized weights and dimensions

Oils 4 pallets 42 X 42 X 48
56 cubic feet each - 224 cubic feet
7200 lbs including pallets

Antifreeze 1 pallet 42 X 48 X 30
35 cubic feet
280 lbs including pallet

2297rpm1/rw

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #1

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	12-22-92	88776I	tam	7419 002-400-3

SELLER S SHIPPING DATE: 12/30/92 or sooner if possible

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: fob border (SUHE-BATOR)

TERMS OF PAYMENT: see below

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO: See Article No 2 Below

SELLER:
TRADE BUREAU
VAINERA STR , 13
620014, Ekaterinburg, Russia
Attn Sergey Vorobyov

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO: See Article No 2 Below

CONSIGN TO:
Mongolian Fuel and Energy Ministry, Bagga Poiruu 6, Ulaanbaatar-46, Mongolia
Attn Minister Jigjid

ROUTE VIA: rail

ITEM	QUANTITY	DESCRIPTION	PRICE

Change and incorporate the following under Article 2 in the original purchase order

Reference second paragraph "For each shipment " and replace with the following

For each shipment (cargo), the Seller shall provide the above listed documents by either FAXing or via overnight air shipment, through TNT Worldwide Express or DHL to the following

United Engineers & Constructors Inc
100 Summer Street
Boston, MA 02110
Attn Mr M H Spaulding
Tel (617) 422-5360
FAX (617) 338-6239
FAX (617) 423-9020

Delete paragraph three (3) "Upon receipt of the above listed " of Article 2 in its entirety

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M K Spaulding
M.H. Spaulding

C... F Hall

TOTAL PRICE OF ORDER (Rev)	
$3,900 00	__ Buyer __ Requisitioner __ Expediter __ Accounting __ Field/MRR __ Client __ Other _____
PURCHASE ORDER NO 7419 002-400 3	

J O Account No 7419 002

129

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 5	11/26/92	85685/PC	MHS	7419 002-400-3

SELLER S SHIPPING DATE: 12/30/92,OR SOONER IF POSSIBLE

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: FOB-BORDER(SUHE-BATOR)

TERMS OF PAYMENT: SEE BELOW

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

SEE ARTICLE NO 2 BELOW

SELLER

TRADE BUREAU
VAINERA STR ,13
620014,EKATERINBURG,RUSSIA
ATTN SERGEY VOROBYOV
TEL 510247

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

SEE ARTICLE NO 2 BELOW

CONSIGN TO

MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU 6, ULAANBAATAR-46, MONGOLIA
ATTN MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	PRICE

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
1	2	REPLACEMENT MAIN BEARING FOR BAGA NUUR COAL MINE DRAGLINE PART NO 32244 3LU ESH 15/90	$1,950 00	$3,900 00

THIS ORDER IS SUBJECT TO THE TERMS, CONDITIONS, AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY [signature]
TITLE ENGINEER
DATE 26.11.92

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY [signature]
M H SPAULDING

Guy F Idell

TOTAL PRICE OF ORDER	
$3,900 00	
PURCHASE ORDER NO	
7419 002 400-3	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O ACCOUNT NO 7419 200

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #1

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	12-22-92	86776B	tam	7419 002-400-6

SELLER S SHIPPING DATE: Various

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: DAF-(NAUCHSKI)

TERMS OF PAYMENT: see below

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO: See Article No 2 Below

SELLER:
JOINT STOCK VENTURE/
NITRO-VZRYV IN COOPERATION WITH DORNAT LTD
12, MAROSEIKA ST
Attn Ivan Petrov

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO: See Article No 2 Below

CONSIGN TO

Mongolian Fuel and Energy Ministry, Bagga Poiruu 6, Ulaanbaatar-46, Mongolia
Attn Minister Jigjid
Buyer United Engineers & Constructors Inc , 100 Summer Street, Boston, MA 02110
ROUTE VIA Rail

ITEM	QUANTITY	DESCRIPTION	PRICE

Change and incorporate the following under Article 2 in the original purchase order

Reference second paragraph "For each shipment " and replace with the following·

For each shipment (cargo), the Seller shall provide the above listed documents by either FAXing or via overnight air shipment, through TNT Worldwide Express or DHL to the following·

United Engineers & Constructors Inc
100 Summer Street
Boston, MA 02110
Attn Mr M H. Spaulding
Tel (617) 422-5360
FAX (617) 338-6239
FAX (617) 423-9020

Delete paragraph three (3) "Upon receipt of the above listed ." of Article 2 in its entirety

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M H Spaulding
M.H. Spaulding

TOTAL PRICE OF ORDER (Rev)	
$570,000 00	
PURCHASE ORDER NO	
7419 002-400-6	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No. 7419 002

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #2

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	01-05-93	92969/PDC	tam	7419 002-400-6

SELLER S SHIPPING DATE: ASAP

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: DAF-Nauchski

TERMS OF PAYMENT: See Below

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO: See Article No. 2 Below

SELLER:
JOINT STOCK VENTURE/
NITRO-VZRYV IN COOPERATION W/ DORNAT LTD
12, Maroseika St
Moscow, 101850 Russian Federation
Attn Ivan Petrov
206-92-63

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO: See Article No 2 Below

CONSIGN TO
Mongolian Fuel and Energy Ministry, Bagga Poiruu 6, Ulaanbaatar-46, Mongolia
Attn Minister Jigjid
Buyer. United Engineers & Constructors Inc , 100 Summer Street, Boston, MA 02110

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	PRICE

INCORPORATE THE FOLLOWING

I Final destination point - Sharin Gol Mine
250 tons powder ammonite
250 tons cartridge ammonite

II Final destination point - Baganuur Mine
250 tons powder ammonite
250 tons cartridge ammonite

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC.
BY M H Spaulding
M.H Spaulding

TOTAL PRICE OF ORDER (Rev)	
$570,000 00	
PURCHASE ORDER NO	
7419 002 400-6	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419 200

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER # 3

	DATE	P.O. #	ENTERED BY	JOB NUMBER
	2/24/93	88777	tam	7419 002-00-6

USD	
DESCRIPTION See Below	See Article 3 Below
FROM Duke Power Company 422 South Church St Charlotte, NC 28242 Attn: Jim Petro 704-373-4853	See Article 3 Below

Increase Fuel and Spare Parts Limit Under Construction Services Agreement for Catawba Nuclear Station Dated June 1, 1983

ITEM	QUANTITY	DESCRIPTION	UNIT

CHANGE THE FOLLOWING

ARTICLE 4 PARAGRAPH 4

Change Account No to 8900056436

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M H Spaulding
M.H. Spaulding

Guy F. Hall

TOTAL PRICE OF ORDER (Rev.)	
$570,000 00	
PURCHASE ORDER NO.	
7419 002 400-6	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419 002

133

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER
(Contract)

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 5	12/09/92	68196/DH	MHS	7419 002-400-6

SELLER S SHIPPING DATE: VARIOUS

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: DAF-(NAUCHSKI)

TERMS OF PAYMENT: SEE BELOW

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO: SEE ARTICLE NO 2 BELOW

SELLER:
JOINT STOCK VENTURE/
NITRO-VZRYV IN COOPERATION WITH DORNAT LTD
12, MAROSEIKA ST
MOSCOW, 101850, RUSSIAN FEDERATION
ATTN IVAN PETROV
TEL 206-92-63

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO: SEE ARTICLE NO 2 BELOW

CONSIGN TO
MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU 6, ULAANBAATAR-46, MONGOLIA
ATTN MINISTER JIGJID
BUYER UNITED ENGINEERS & CONSTRUCTORS, 100 SUMMER STREET, BOSTON, MA 02110

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
1	500 TONS	POWDERY AMMONITE 6*B PER GOCT-21984-76	$500 00	$250,000 00
2	500 TONS	CARTRIDGE AMMONITE 6*B-200, 32MM PER GOCT-21984-76	$640 00	$320,000 00

TOTAL FIRM PRICE $570,000 00

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC

BY G I Hill
G F HILL

mhs

TOTAL PRICE OF ORDER	
$570,000 00	
PURCHASE ORDER NO	
7419 002 400-6	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O ACCOUNT NO 7419 200

134

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #1

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	12-22-92	88776D	tam	7419 002-400-7

SELLER S SHIPPING DATE: 12/15/92 or sooner if possible

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: fob border (SOLOVIOVSK-BAYNTUMAN)

TERMS OF PAYMENT: see below

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

See Article No 2 Below

SELLER

TM SERVICE
Bulgaria, Varna
St Konstantin DC Str 28,21
Attn Sergey Vorobyov
or Alexander Mishagin

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

See Article No 2 Below

CONSIGN TO

Mongolian Fuel and Energy Ministry, Coal Mine Aduunchuluun, Mongolia
Attn Minister Jigjid

ROUTE VIA rail

ITEM	QUANTITY	DESCRIPTION	PRICE

Change and incorporate the following under Article 2 in the original purchase order

Reference second paragraph "For each shipment " and replace with the following

For each shipment (cargo), the Seller shall provide the above listed documents by either FAXing or via overnight air shipment, through TNT Worldwide Express or DHL to the following

United Engineers & Constructors Inc
100 Summer Street
Boston, MA 02110
Attn Mr M H Spaulding
Tel (617) 422-5360
FAX (617) 338-6239
FAX (617) 423-9020

Delete paragraph three (3) "Upon receipt of the above listed " of Article 2 in its entirety

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M H Spaulding
M.H. Spaulding

Curtis H Hill

TOTAL PRICE OF ORDER (Rev)	
$650,000 00	___ Buyer ___ Requisitioner ___ Expediter ___ Accounting ___ Field/MRR ___ Client ___ Other _____
PURCHASE ORDER NO 7419 002-400 7	

J O Account No 7419 002

135

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 5	11/21/92	85683/PC	MHS	7419 002-400-7

SELLER S SHIPPING DATE: 12/15/92,OR SOONER IF POSSIBLE

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: FOB-BORDER(SOLOVIOVSK-BAYNTUMAN)

TERMS OF PAYMENT: SEE BELOW

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO
SEE ARTICLE NO 2 BELOW

SELLER
TM SERVICE
BULGARIA,VARNA
ST KONSTANTIN DC STR 28,21
ATTN SERGEY VEROBYOV, OR Alexander Mishagin
TEL 777167(Sofia, Bulgaria)
FAX 7-10359-2-345107
T- -6-10-65 (VARNA, BULGARIA)

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO
SEE ARTICLE NO 2 BELOW

CONSIGN TO
MONGOLIAN FUEL AND ENERGY MINISTRY, COAL MINE ADUUNCHULUUN, MONGOLIA
ATTN MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	PRICE

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
1	1	EKG-5A, EXCAVATOR	$650,000 00	$650,000 00
2	LOT	SPARE PARTS(1 YEAR SUPPLY) SEE ATTACHMENT	INCLUDED IN P O PRICE	
3	LOT	FREIGHT	INCLUDED IN P O PRICE	
4	LOT	DOCUMENTATION	INCLUDED IN P O PRICE	

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY _____
TITLE ENGINEER
DATE 24.11.92

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY G.F. Hill
G F HILL

m-748
Guy F. Hill

TOTAL PRICE OF ORDER	
$650,000 00	
PURCHASE ORDER NO	
7419 002 400-7	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O ACCOUNT NO 7419 200

136

ПРИЛОЖЕНИЕ No

К КОНТРАКТУ No

ОТ " " 199

APPENDIX No

TO THE CONTRACT No

DTD " " 199

ПЕРЕЧЕНЬ ЗАПАСНЫХ ЧАСТЕЙ ВХОДЯЩИХ В КОМПЛЕКТ ПОСТАВКИ ЭКСКАВАТОРА ЭКГ-5А
THE LIST OF SPARES INCLUDED IN DELIVERY SET OF EXCAVATOR EKG-5A

N п/п	ОБОЗНАЧЕНИЕ DESIGNATION	НАИМЕНОВАНИЕ НАИС	КОЛ-ВО Q-TY	ПРИМЕЧ
1	1085 52 06 СБ	Зуб ковша с наплавкой Hard-faced bucket tooth	5	
2	1080 02.107-1СБ	Засов двери Door lock bar	2	
3	1080 05.372-1	Шестерня моторная Motor pinion	1	
4	1080 55 306	Шестерня реечная Rack pinion	2	
5	1080.16 02-1	Вал-шестерня Pinion shaft	2	
6	1080 16.40-2	Шестерня моторная Motor pinion	2	
7	1080.34 01	Звено гусеничное Track link	2	
8	1080.34 02	Палец звена Pin	4	
9	1080.04 114-1	Рейка рулевая Rack	2	
10	1080.78 02	Вал-шестерня Pinion shaft	1	
11	1001.05 265	Диск Disk	3	
12	1001 09.369	Диск Disk	4	
13		Насос Г 11-27 Pump unit	1	
14	5005.17.14	Манжета 50 Cup packing	8	
15	ГОСТ 6969-54	Манжета 18х10 Cup packing	8	
		50х30	12	
		55х35	24	
		65х45	8	
16	60 02454	Манжета 80 Cup packing	9	
17	60 02460	Манжета 200 Cup packing	4	
18		Манжета ПГ 120 Н2в02 Cup packing	8	
19		Пружина 170 spring	8	

20		Шайба 12 Н2.5.02 Cup washing	8
21		Пружина 12 Spring	8
22		Шайба 20 Cup washing	6
23		Пружина 20 Spring	6
24		Шайба 24 Н2.01 Cup washing	8
25		Пружина 24 Spring	8
26	ГОСТ 6308-71	Кольцо 197-168-12 Ring	2
27	03817 00 15-01	Клапан Valve	24
28	03817 00 23-01	Кольцо уплотнительное Sealing ring	4
29		Масленка 3/8" Screw-type lubricator	15
30	ГОСТ 9833-73	Кольцо 075-085-58-2-2 Ring	8
31	1080.02 708-1	Кольцо Ring	4
32	1080 13 08	Стекло 6х380х610 Glass	2
33	1080.13 11	Стекло 6х380х610 Glass	2
34	1080 13.29	Стекло 6х500х1155 Glass	1
35	1080 13 34	Стекло 6 262х1155 Glass	1
36	1080 13.41	Стекло 6х500х1155 Glass	1
37	1019 86 22	Профиль резиновый L=16000 Shape	1
38	1014 96 89	Профиль резиновый L=18000 Shape	1
39	1080 13 09	Ручка Handle	1
40	ГОСТ 7798-70	Болты Bolts /	
		М 12х40 019	5
		М 12х40 019	10
		М 12х50 019	5
		М 16х70 019	10
41	ГОСТ 5915-70	Гайки Nuts /	
		М 6 01	5
		М 10 01	5
		М 12 019	20
		М 16 019	15
		М 20 019	10
		М 24 019	5
		М 6 01	5
		М 16 01	5
		М 48 019	5
42	ГОСТ 6402-70	Шайбы Washers /	
		6 65Г 019	10
		8 65Г 019	5
		10 65Г 019	10

		[illegible]	30	
		[illegible] 019	30	
		[illegible] 019	15	
		24 x5[illegible] 019	10	
43	ГОСТ 397-79	Шплинты / Cotter pin /		
		3,2x32 019	5	
		4x25 019	5	
		4x32 019	10	
		5x36 019	25	
		6,3x45 019	5	
		6,3x50 019	10	
		6,3x70 019	10	
		8x50 019	40	
		8x70 019	5	
		8x80 019	10	
		10x80 019	5	
44	1080.37.65-02СБ	Рукав с арматурой L=1100	2	*
	1082.37 65-02СБ	Рукав с арматурой L=1100	2	**
		Hose		
45	44 52726	Башмак токосъемника	3	*
	44.52799	Башмак токосъемника	6	**
		Current collector shoe		
46	44.52727	Шпилька	6	*
	44.52733	Шпилька	12	**
		Stud		
47	44 52728	Пружина	6	*
	44.52728-01	Пружина	12	**
		Spring		
48	ИНЯЖ 686113 006	Изолятор опорный ИОР-10-	5	
		Support insulator -7 5Т2		
49		Лампы накаливания / Lamps /		
		400Wt, 220V	3	*
		500Wt, 220V	4	**
		40Wt, 12V	10	
		60Wt, 220V	14	
		12V	7	
50		Вентилятор 45Wt, 220V	1	*
		Fan		
51	В 25-Т	Выпрямитель кремниевый	6	**
		Silicon rectifier unit		
52	Д 226 Б	Выпрямитель селеновый	6	**
		Selenium rectifier unit		
53	УП5311-И -Т	Переключатель универсальный	1	**
		Universal switch		
54	УП5312-С128-Т	Переключатель универсальный	1	**
		Universal switch		
55	УП5312-Ф343-Т	Переключатель универсальный	1	**
		Universal switch		
56	АИД100S4-Т2	Электродвигатель 380V,3kWt	1	**
		Motor 1430 об/м		
57	АИР80Ф4-Т2	Электродвигатель	1	**
		380V 1,1kWt, 1400 об/м		

ОБЩИЙ ВЕС КОМПЛЕКТА кг 2260 * / 2325 ** /
TOTAL WEIGHT OF THE SET, kg

ПРИМЕЧАНИЯ * – только для экскаваторов предназначенных для работы в умеренном климате
only for excavators intended for work in temperate climat;

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER # 1

PAGE NO	DATE	REQN NO./BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	4/6/93	88799/pc	mhs	7419 002-400-7A

N/A — SELLER'S SHIPPING DATE

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES, CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Fob- Border (Nauchkı)

TERMS OF PAYMENT: see below

MAIL THE ORIGINAL AND ( ) COPIES OF INVOICES, THE ORIGINAL SHIPPING PAPERS, AND PACKING LIST TO-

See Article No 2 Below

SELLER

Kostroma Excavator Factory
Inzhenerny per , 3
Kostroma, Russia 156604
Attn Alexander I Pankov
Tel (0942) 53-06-52

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO-

See Article No 2 below

CONSIGN TO

Mongolian Fuel and Energy Ministry, Bagga Poiruu 6 Ulaanbaatar-46, Mongolia
Attn Minister Jigjid

ROUTE VIA

ITEM	QUANTITY	DESCRIPTION	TOTAL OF PREVIOUS ORDER	PRICE
				$ 270,525 08

INCORPORATE THE FOLLOWING

Please change Article 4, Paragraph4 " These payments shall be made to the following bank and account number" to the following

ROSVNESHTORGBANK
Moscow, Russia No 608-205-524 with Republic National Bank of New York, New York in favor of KOSTROMAINCOMBANK account No 0730000106/001 with ROSVNESHTORGBANK, Moscow further crediting EKSKO No 070001001020

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED-
BY _____
TITLE. _____
DATE. _____

Form 4425 11/91

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M H Spaulding
M H Spaulding

TOTAL PRICE OF ORDER (Rev)	
$270,525 08	
PURCHASE ORDER NO: 7419 002-400-7A	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O ACCOUNT NO

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 5	2/9/93	89368/pc	MHS	7419 002-400-7A

SELLER S SHIPPING DATE	THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES	REL
2/20/93		

FOB POINT	MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO
FOB-BORDER(NAUCHKI)	SEE ARTICLE NO 2 BELOW
TERMS OF PAYMENT SEE BELOW	
SELLER Kostroma Excavator Factory Inzhenerny per , 3 Kostroma, Russia 156604 Attn Alexander I Pankov Tel (0942) 53-06-52	ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO SEE ARTICLE NO 2 BELOW

CONSIGN TO

MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU 6 ULAANBAATAR-46, MONGOLIA
ATTN MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	PRICE

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
1	VARIOUS	SPARE PARTS FOR EXCAVATORS EKG-10011E AND 5111B FOR SMALL LOCAL MINES (SEE ATTACHMENT A FOR UNIT PRICE BREAK OUT)		

TOTAL FIRM PRICE DELIVERED $270,525 08

NOTE
Dmitri Negotiated Reduction of ($8,262.)
Now required total of ($278,891.53)

THIS ORDER IS SUBJECT TO THE TERMS, CONDITIONS, AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY [illegible]
TITLE [illegible]
DATE 2/9/93

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC

BY M H Spaulding
M H SPAULDING

Guy F Hill

TOTAL PRICE OF ORDER	
$270,525 08	
PURCHASE ORDER NO	
7419 002 400-7A	

- __ Buyer
- __ Requisitioner
- __ Expediter
- __ Accounting
- __ Field/MRR
- __ Client
- __ Other _____

J O ACCOUNT NO 7419 200

141

ATTACHMENT B
TECHNICAL REQUIREMENTS

EXCAVATOR SPARES FOR EXCAVATORS
[redacted] E10011E,EO-5111B.
FOR SMALL LOCAL MINES

Запчасти
Технические
Экскаваторы или части
Экскаваторы ЕКГ 1001 5112

BEST AVAILABLE COPY

№	SPARE PARTS			
	[illegible] ЭЛЕМЕНТ ЭЛЕМЕНТ		Цена в долл США	Сумма
1	Накладка IN Ac	008	2,48	744,00
2	Подшипник в комплекте с муфтой ALL BEARING	10	129,37	1293,70
3	Муфта [illegible]	8	155,24	1241,92
4	Вертолет [illegible] BEVEL GEAR	8	330,30	2642,40
5	Колесо ведущее DRIVING SPROCKET	4	1915,74	7662,96
6	Колесо ведущее DRIVING SPROCKET	4	1915,74	7662,96
7	Крестовина левая [illegible]	10	194,51	1945,10
8	Крестовина правая CROSS	10	194,51	1945,10
9	Муфта фрикционная ведущая FRICTION CLUTCH	6	341,31	2047,86
10	Муфта фрикционная ведущая FRICTION CLUTCH	6	341,31	2047,86
11	Лента обвязочная LEADING BAND	10	66,42	664,20
12	Лента набегающая TRAIL NG BAND	10	22,77	227,70

	14	Вал поворотный	6		
	15	Цилиндр D180 PNEUMATIC CYLINDER DIA 180	8		
	16	Цилиндр 80 CYLINDER DIA 80	30		
	17	Цилиндр 80 CYLINDER DIA 80	30	119,25	3595,50
	18	Цилиндр 80173 CYLINDER DIA 80173	18	82,41	1481,80
	19	Колонна пульта управления CONTROL COLUMN	4	418,38	1673,52
	20	Колонна пульта управления CONTROL COLUMN	4	418,38	1673,52
	21	Путь вспомогательный AUXILIARY TRACK	4	121,11	484,44
	22	Диван BUCKET SEAT	5	905,02	4525,10
	23	Зеркало	10	45,42	454,20
	24	Кабина в сборе CABIN SET	6	3888,15	23328,90
	25	Вкладыш INSERT	10	47,75	477,50
	26	Механизм напорный CROWD MECHANISM	6	2819,72	16918,32
		Башмак SHOE	20	16,24	324,80
	28	Вал SHAFT	6	220,20	1321,20
	29	Венец зубчатый коронный 2188 M=14 RING GEAR	14	218,00	3052,00
	30	Цепь T-78 ' 56 звеньев CHAIN 156 LINKS	20	309,54	6191,80
	31	Балка крепления ковша	1	894,31	894,31
	32	Лента из двух половин SHOE OF TWO	60	148,65	8917,80
	33	Цепь 45 звень [illegible] M 145 LINKS	100	345,80	34580,00
	34	Золотник дифференциала DIFFERENTIAL	100	28,41	2841,00
	35	Вал горизонтальный SHAFT	6	2167,87	13007,22
	36	Наклад [illegible] LINING	232	7,71	1788,72
	37	Цепь тяговая T-180 [illegible] CHAIN DRIVING	6	686,53	4119,18
	38	Две [illegible] SPROCKET	4	122,21	488,84
	39	Цепь T-78 147 ЗВ CHAIN 147 LINKS	28	291,62	5820,40
	40	Вращающееся соединение на одно направление SINGLE DIRECTION SWIVEL JOINT	28	99,34	990,80

42	Соединение вращающееся в на 2 / DUAL-DIRECTION SWIVEL JOI	60	14,44	5662,20
43	Вкладыш на 2 половин / SHELL OF TWO HALVES	60	84,01	5040,60
44	Ремка клиновая	33	34,25	2827,50
45	Зуб ротора	100	55,11	3511,00
46	DIFFERENTIAL	80	82,57	6605,60
47	[illegible]	10	1453,32	14533,20
48	[illegible]	4800	0,33	1320,00
49	[illegible]	1	3626,69	3626,69
50	[illegible] / SIDEWALL BEARING CENTER	1	3699,36	3699,36
51	[illegible]	8	343,51	2748,08
52	[illegible]	12	23,12	277,44
53	[illegible]	16	17,84	285,44
54	[illegible]	14	6,94	97,16
55	[illegible]	10	23,12	231,20
56	[illegible] BUSHING	12	80,15	961,80
57	[illegible] / SHELL OF TWO HALVES	16	126,17	2018,72
58	[illegible]	12	58,57	702,84
59	[illegible]	8	7,16	57,28
60	[illegible]	6	10,19	61,14
61	[illegible] BUSHING	6	13,38	80,28
62	[illegible]	6	96,22	579,52
63	[illegible]	12	73,99	887,88
64	Втулка BUSHING	8	76,30	610,40
65	Опора поводковая	3	5890,35	17671,05

Всего

278 891,83 / 3% discount

$270,525 08

United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #1

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	12-22-92	887766	tam	7419 002-400-8

SELLER S SHIPPING DATE: Various

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: fob border (NAUCHSKI)

TERMS OF PAYMENT: see below

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO: See Article No. 2 Below

SELLER:
NOVOKRAMATORSKY
AONKMZ KRAMATORSK, ORDJONIKIDZE, 5
DONETSK REGION
UKRANIAN SSR
Attn Sergei Romanenko

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO: See Article No 2 Below

CONSIGN TO:
Mongolian Fuel and Energy Ministry, Bagga Poiruu 6 Ulaanbaatar,-46, Mongolia
Attn Minister Jigjid

ROUTE VIA: rail

ITEM	QUANTITY	DESCRIPTION	PRICE

Change and incorporate the following under Article 2 in the original purchase order

Reference second paragraph "For each shipment. " and replace with the following.

For each shipment (cargo), the Seller shall provide the above listed documents by either FAXing or via overnight air shipment, through TNT Worldwide Express or DHL to the following

United Engineers & Constructors Inc
100 Summer Street
Boston, MA 02110
Attn Mr. M H Spaulding
Tel (617) 422-5360
FAX (617) 338-6239
FAX (617) 423-9020

Delete paragraph three (3) "Upon receipt of the above listed " of Article 2 in its entirety

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC.
BY M H Spaulding
M.H. Spaulding
Guy F Hall

TOTAL PRICE OF ORDER (Rev)	
$421,525 00	___ Buyer ___ Requisitioner ___ Expediter ___ Accounting ___ Field/MRR ___ Client ___ Other _____
PURCHASE ORDER NO 7419 002-400-8	

J O. Account No 7419.002

1 of 6

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 6	11/28/92	85677/PC	MHS	7419 002-400-8

SELLER S SHIPPING DATE: VARIOUS

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: FOB-BORDER(NAUCHKI)

TERMS OF PAYMENT: SEE BELOW

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO: SEE ARTICLE NO 2 BELOW

SELLER:
NOVOKRAMATORSKY
AONKMZ KRAMATORSK, ORDJONIKIDZE,5
DONETSK REGION
UKRAINIAN SSR
ATTN SERGEI ROMANENKO
TEL 4-30-60(CODE 06264) FAX 4-30-60(CIS)
TELEX 115137 (INTERNATIONAL)

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO: SEE ARTICLE NO 2 BELOW

CONSIGN TO

MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU 6 ULAANBAATAR-46, MONGOLIA
ATTN MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	PRICE

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
1	VARIOUS	SPARE PARTS FOR DRAGLINES ESH 13/50,ESH 10/70 AND EXCAVATOR EST 6 5/45. (SEE ATTACHMENT A FOR UNIT PRICE BREAK OUT)		$421,525 00

TOTAL FIRM PRICE $421,525 00

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS, AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED,
BY [illegible]
TITLE CHAIRMAN
DATE 24.11.92

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY M H Spaulding
M H SPAULDING
Guy F. Hill.

PRICIPAL OFFICE CA

TOTAL PRICE OF ORDER	
$421,525.00	
PURCHASE ORDER NO	
7419 002 400-8	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O. ACCOUNT NO 7419 200

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 6	11/23/92	85688/PC	MHS	7419 002-400-9

SELLER S SHIPPING DATE	THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES	REL
SEE BELOW		

FOB POINT	MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO
SEE BELOW	SEE BELOW FOR INSTRUCTIONS
TERMS OF PAYMENT	
SEE BELOW	
SELLER	**ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO**
"ZHELDOREXPORT" 2, NOVO-BASMANNAYA MOSCOW,107174,USSR ATTN ZOYA I BOTNEVA TEL 262-34-95	SEE BELOW FOR INSTRUCTIONS

CONSIGN TO

MONGOLIAN FUEL AND ENERGY MINISTRY, SHARON GOL STRIP MINE
ATTN MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	PRICE

This agreement made this 24th day of November, by and between United Engineers and Constructors Inc , a Raytheon Company, Northeastern Regional Operation having its office at 100 Summer Street, Boston, Ma (USA) 02110 (hereinafter called "customer") and "Zheldorexport" with principal place of business at 2, Novo-Basmannaya, Moscow, USSR 107174 (hereinafter called "Seller") Also, in this document the Mongolian Fuel and Energy Ministry of Mongolia will hereinafter be referred to as "owner "

1 1 SUBJECT OF CONTRACT

Customer orders and seller takes over implementation of the work for capital repair of two (2) diesel locomotives, model# TEM-2, for level of work KP-2 KP-2 consists of the following

- Engine and related equipment
- Electrical Machines
- Electrical instruments and checking
- Instrumentation control instruments

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS, AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY Зеленцов
TITLE Старш эксперт
DATE 24.XI.92г

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY M H Spaulding
M H SPAULDING
Guy F Hill

TOTAL PRICE OF ORDER	
$174,732 00	___ Buyer ___ Requisitioner ___ Expediter ___ Accounting ___ Field/MRR ___ Client ___ Other _____
PURCHASE ORDER NO 7419 002 400-9	

J O. ACCOUNT NO 7419 200

Т +/с
супервайзер менеджер экспорта
24 11 92г

1 of 8

ITEM	QUANTITY	DESCRIPTION	PRICE

- Carriage
- Base and body of locomotives
- Brakes and phneumatic equipment
- Speedometers, signalization, autostop, firefighting equipment
- Interior, insulation, floor
- Wiring change
- Shock absorbers

2 Owner will deliver to seller 2 diesel locomotives in 20 DAYS after contract signing eller will complete repairing within two(2) months after receiving the locomotives

0 TECHNICAL STANDARDS

1 Repairing of diesel locomotives will be performed by ASTRACHANSKI DIESEL LOCOMOTIVES EPAIRING PLANT

2 Repairing of the diesel locomotives will be made according to rules, technical standards nd regulations that are in effect for facilities of the Ministry of Transportation, Russian ederation

3 Extent of repair work, list of parts and components to be replaced disregarding of its on[illegible]ion will be in accordance with the technical standards for respective repair All dd[illegible]onal work determined by unusual wearing of details and modernization of some omponents will be determined by the commitee of specialists from owner and/or customer and pairing plant during acceptance of equipment for repair and in accordance with paragraph 2 of this contract Any additional work which is determined and is not covered in level -2 must be approved by 'CUSTOMER" before any repairs can be made

4 Diesel locomotives delivered for repair shall be equiped with agregats and components hat can be rebuilt and have all necessary devises for safety during transportation After pairing locomotives shall be returned to owner with the same set of devises as it was -livered to repairing plant This condition shall be reflected in delivery-acceptance ocument according to paragraph 3 2 of this contract

5 Diesel locomotives shall be equiped with taxing and braking systems in good condition ondition and ability to operate these systems shall be ststed in document signed by the presentative of Depo of Registration of the locomotives

0 TRANSPORTATION AND REGULATION OF DELIVERY-ACCEPTANCE OF EQUIPMENT

1 Delivery of diesel locomotives shall be in accordance with regulations of repairing cilities

2 Representatives of the customer and/or owner escorting the locomotives to repairing cility and back shall possess the rights to sign the delivery-acceptance document on half of the customer/owner and in accordance with paragraph 2 3 of this contract

3 Hand over of locomotives for repair and acceptance of them after repair shall take place the repairing facility by the representatives of the owner and/or customer and the pairing facility and with drawing up the corresponding delivery-acceptance documents

4 The date of delivery-acceptance of locomotives for repair is the date when delivery-c[illegible]nce document is signed

5 Seller shall summons by telegraph the representatives of the owner and customer 20 days fore completing of the repairing of locomotives In case of the absence of owner and

M-7

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	SELLER	REL	PURCHASE ORDER NO
3 OF 6	"ZHELDOREXPORT"		7419 002-400-9

ITEM	QUANTITY	DESCRIPTION	PRICE

ustomer representatives, acceptance of the locomotives will be carried out by repairing acility In this case the document of acceptance will be signed only by representative of epairing facility

7 Above mentioned copies of delivery-acceptance document and copies of the fax are the rounds for the billing of 10% of $172,000 00

0 OBLIGATIONS

1 Seller guarantees quality of repairing of the locomotives during 12 months from the oment of accepting the locomotives into service as is mentioned in paragraph 3 3 of this ontract if all requirements for use of this equipment are in accordance with instructions f the factory-producer of the locomotives

2 In case of break down during warranty period mentioned in paragraph 4 1 of this contract wner shall immediately notify the seller During the 30 days from receiving of this otification seller shall send the specialist from repairing facility to decide what shall e done to fix the equipment Decision shall be reflected in document signed by the seller nd owner In case break down occurs through the fault of seller the repair shall be done ree of charge In case break down occurs due to improper use of equipment by owner the epair shall be done at owner's expense

n case of the absence of specialist during established time owner will draw-up the locument for repair of the equipment at the expense of the seller

5 Seller is obligated to consider all owner and customer complaints during one month from eceiving of the complaints

0 TERMS OF PAYMENT

1 Customer will pay advance of 10% of total contract amount $172,000 00 Advance will be aid upon receipt of below listed documentation In addition to this advance, customer will ay ammount of $683 00 per locomotive, which represents cost of transportation for ocomotives from Mongolian border to the locomotive repair facility The total advance mount will be $18,566 00 The remaining 90% plus return transportation costs of $683 00 per ocomotive will be paid by customer upon receipt of faxed acceptance-inspection document otal payment will be $156,166 00 for a total purchase order price of $174,732 00 Payment ill be made within 7 days after receipt

2 The following documents must be faxed and followed by hard copy by seller for approval nd payment of the above mentioned amounts

Delivery-Acceptance Document- signed by applicable representatives
Acceptance-Inspection Document- signed by applicable representatives

3 Payment will be made as follows in US dollars to the following bank and account

eneficiary Zheldorexport , Moscow,Russia (S W I F T BIC INCOSUMM)
Account 003070639
Inkombank
101000 Moscow, Chistee prudee 12/8
Person of contact Shukailo Alexei Alexandrovich
Tel 923-1304
VIA ACCOUNT NO 890-0056-096 WITH THE BANK OF NEW YORK,N Y

0 COMPLAINTS

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 4	01/13/93	89357/pc	MHS	7419 002-400-10

SELLER S SHIPPING DATE: 1/30/93,or sooner if possible

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: FOB-NAUCHKI-SUHE-BATOR

TERMS OF PAYMENT: SEE BELOW

SELLER:
TRADE BUREAU
VAINERA STR , 13
620014, EKATERINBURG, RUSSIA
ATTN SERGEY VOROBYOV
TEL 51 02 47

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO
SEE ARTICLE NO 2 BELOW

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO
SEE ARTICLE NO 2 BELOW

CONSIGN TO
MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU 6, ULAANBAATAR-46, MONGOLIA
ATTN MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
		HOUSE ROLLERS/AXLE SHAFTS FOR 15/90 DRAGLINE		
1	102	ROLLERS PER DWG 1040 04 01-1	$672 00	$68,544 00
2	102	AXLE(SHAFT) PER DWG 1030 04 03 1	$93 00	$9,486 00
		LESS DISCOUNT		($3,030 00)
		TOTAL FIRM PRICE DELIVERED		$75,000 00

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY M H. Spaulding
M H SPAULDING
Guy F Hall

TOTAL PRICE OF ORDER: $75,000 00
PURCHASE ORDER NO: 7419 002 400-10

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O ACCOUNT NO 7419 200

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 5	2/12/93	89368/pc	MHS	7419 002-400-13

SELLER S SHIPPING DATE: 3/28/93

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS AND PACKAGES — REL

FOB POINT: FOB-BORDER(NAUCHKI)

TERMS OF PAYMENT: SEE BELOW

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

SEE ARTICLE NO 2 BELOW

SELLER

KARPINSKI ELECTROMASHINOSTROIT ZAVOD
EKATERINBUZGSKAYA OBLAST
KARPINSK, RUSSIA 624480
ATTN MR DVOREZSKI VICTOR PAVLOVICH
TEL (34313) 2-23-42
FAX (34313) 2-27-15

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

SEE ARTICLE NO 2 BELOW

CONSIGN TO

NUURS COMPANY, MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU 6 ULAANBAATAR, MONGOLIA, ATTN MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	PRICE

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
1	1	GENERATOR, DETAIL NO 4[illegible]M-1000-2/2Y2 FOR DRAGLINE ESH 10/70	110000 00$	110000 00$

TOTAL FIRM PRICE DELIVERED 110000 00 $

OPTION BUYER HAS THE RIGHT TO CHANGE TRANSPORTATION TERMS TO FOB FACTORY IF THIS OPTION IS CHOSEN THE TOTAL PRICE OF THE CONTRACT WILL BE 101200$, AN 8 % DISCOUNT, AND AN AMMENDMENT TO THIS CONTRACT WILL BE WRITTEN AND INCORPORATED TO REFLECT THIS CHANGE SHIPMENT WILL BE READY ON 2/28/93 IF THIS OPTION IS CHOSEN

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY M H Spaulding
M H SPAULDING
Guy F Hill

TOTAL PRICE OF ORDER
$110000 00

PURCHASE ORDER NO
7419 002 400-13

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O ACCOUNT NO 7419 200

152

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 5	2/10/93	89373/pc	MHS	7419 002-400-14

SELLER S SHIPPING DATE: 3/15/93,or sooner if possible

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: FOB-BORDER(NAUCHKI)

TERMS OF PAYMENT: SEE BELOW

SELLER:
TM SERVICE
BULGARIA VARNA
ST KONSTANTIN DC STR 28, 21
ATTN SERGEY VOROBYOV/ALEXANDER MISHAGIN
TEL 86-10-65

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

SEE ARTICLE NO 2 BELOW

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

SEE ARTICLE NO 2 BELOW

CONSIGN TO

NUURS COMPANY, MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU 6 ULAANBAATAR, MONGOLIA,ATTN MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	PRICE

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
1	1	GENERATOR, DETAIL NO 113-2500-750-YX13 750 RPM, 2500 KW, 1200 VOLTS, 750 AMPS	$112,400 00	$112,400 00
		LESS NEGOTIATED DISCOUNT		($12,400 00)

TOTAL FIRM PRICE DELIVERED $100,000 00

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY [signature]
TITLE [illegible]
DATE [illegible]

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY [signature]
M H SPAULDING
Guy F Hill

TOTAL PRICE OF ORDER	
$100,000 00	__ Buyer __ Requisitioner __ Expediter __ Accounting __ Field/MRR __ Client __ Other _____
PURCHASE ORDER NO	
7419 002 400-14	

J O ACCOUNT NO 7419 200

153

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO BY	PREPARED BY	PURCHASE ORDER NO
1 OF 5	2/10/93	89377/pc	MHS	7419 002-400-17

SELLER S SHIPPING DATE: 3/15/93,OR SOONER IF POSSIBLE

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: FOB-BORDER(NAUCHKI)

TERMS OF PAYMENT: SEE BELOW

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO: SEE ARTICLE NO 2 BELOW

SELLER:
TRADE BUREAU
VAINERA STR , 13
EKATERINBURG, RUSSIA 620014
ATTN SERGEY VOROBYOV
TEL 51-02-47

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO: SEE ARTICLE NO 2 BELOW

CONSIGN TO

NUURS COMPANY, MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU 6 ULAANBAATAR, MONGOLIA, ATTN MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
1	1	COMPRESSOR, DETAIL NO Э K-4, FOR KG 4 6B, Э KG5A SHOVELS	$2,100 00	$2,100 00

TOTAL FIRM PRICE DELIVERED $2,100 00

THIS ORDER IS SUBJECT TO THE TERMS, CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY _____
TITLE ENGINEER
DATE 10 02 93

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY M H Spaulding
M H SPAULDING

Guy F Hill

TOTAL PRICE OF ORDER: $2,100 00

PURCHASE ORDER NO: 7419 002 400-17

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O ACCOUNT NO 7419 200

154

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 5	4/6/93	429887/pc	MHS	7419 002-400-22

SELLER S SHIPPING DATE: 4/13/93,OR SOONER IF POSSIBLE

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: FOB-BORDER(NAUCHKI)

TERMS OF PAYMENT: SEE BELOW

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

SEE ARTICLE NO 2 BELOW

SELLER

TRADE BUREAU
VAINERA STR , 13
EKATERINBURG, RUSSIA 620014
ATTN SERGEY VOROBYOV
TEL 51-02-47

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

SEE ARTICLE NO 2 BELOW

CONSIGN TO

NUURS COMPANY, MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU 6 ULAANBAATAR, MONGOLIA, ATTN MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
		Replacement Parts for EKG-5A		
1	2	Electric Motor, Position 4/33	$1,535.00	$3,070 00
2	2	Heater, Position 11/33	$570 00	$1,140 00
3	1	Filter	$610 00	$610 00
4	1	Air Conditioner	$2,490 00	$2,490 00
5	5	AP-50, Position 20/33	$80 00	$400 00
6	1	S/P for 5-Machine and Electric Motor Generator Set	$8,100 00	$8,100 00

TOTAL FIRM PRICE DELIVERED . . $15,810.00

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS, AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC

BY M H Spaulding
M H SPAULDING

TOTAL PRICE OF ORDER	
$15,810.00	
PURCHASE ORDER NO	
7419 002-400-22	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J.O. ACCOUNT NO 7419 200

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 4	11-10-92	54424/RMS	tam	7419 002-5006

SELLER S SHIPPING DATE: 12/04/92

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Topeka, Kansas

TERMS OF PAYMENT: Net 30 Days

SELLER
GOODYEAR TIRE AND RUBBER CO
1144 East Market Street
Akron, OH 44316
Attn Mr Bill McDevitt
(216) 796-1223

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO
UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO
UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn M.G Simpson
617-422-5379

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by telephoning Mr Franz Fassbender at Tel No (201) 313-1300 - FAX No (201) 313-9564

ROUTE VIA: FREIGHT FORWARDER

Item	Quantity	Description	Unit Price	Ext Price
1	50	Off-Road Tires 18 00-25, 32 ply E-4, complete with O-rings Seller's description HRL-4B (4S) Seller's product code 133 538 656	$1661 51	$83,075 00
2	150	Off-Road Tires 12 00-20, 16 ply, complete with o-rings Seller's description HRL-3A NYTT Seller's product code 123 340 184	$408 15	$61,222 50
		TOTAL FIRM PRICE		**$144,298.00**

I Shipping Information

A Tire Sizes

Item 1 780 lbs/353 kg Width 203" or 516 mm/diameter 65 2" or 1656 mm

Item 2 198 4 lbs/90 kg Width 13" or 330 mm/diameter 49 5" or 1260 mm

B The successful Bidder will be responsible for full compliance with the Export Administration Regulations of the U S Department of Commerce, including the assignment of an Export Control Commodity Number Classification, and securing a validated export license, if required

THIS ORDER IS SUBJECT TO THE TERMS, CONDITIONS, AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC.
BY M.G Simpson
M.G Simpson
Carl L. Hall

TOTAL PRICE OF ORDER	
$144,298 00	
PURCHASE ORDER NO	
7419 002 5006	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

T O Account No 7419 002

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United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #1

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	12-22-92	88776F	tam	7419 002-5026

SELLER S SHIPPING DATE: 01/30/93 or sooner if possible

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: fob border (NAUCHSKI-SUHE-BATOR)

TERMS OF PAYMENT: see below

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO: See Article No 2 Below

SELLER:
TRADE BUREAU
VAINERA ST , 13
620014, Ekaterinburg, Russia
Attn Sergey Vorobyov

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO: See Article No 2 Below

CONSIGN TO:
Mongolian Fuel and Energy Ministry, Bagga Poiruu 6, Ulaanbaatar-46, Mongolia
Attn Minister Jigjid

ROUTE VIA: rail

ITEM	QUANTITY	DESCRIPTION	PRICE

Change and incorporate the following under Article 2 in the original purchase order.

Reference second paragraph "For each shipment. " and replace with the following:

For each shipment (cargo), the Seller shall provide the above listed documents by either FAXing or via overnight air shipment, through TNT Worldwide Express or DHL to the following

United Engineers & Constructors Inc.
100 Summer Street
Boston, MA 02110
Attn Mr M.H. Spaulding
Tel. (617) 422-5360
FAX (617) 338-6239
FAX (617) 423-9020

Delete paragraph three (3) "Upon receipt of the above listed ." of Article 2 in its entirety

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M.H. Spaulding

Guy F. Hall

TOTAL PRICE OF ORDER (Rev)	
$174,000 00	
PURCHASE ORDER NO	
7419 002 5026	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No. 7419 002

15-1

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 5	11/26/92	94042/PC	MHS	7419 002-5026

SELLER S SHIPPING DATE: 01/30/93,OR SOONER IF POSSIBLE

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: FOB-BORDER(NAUSCHKI-SUTE-BATOR)

TERMS OF PAYMENT: SEE BELOW

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO: SEE ARTICLE NO 2 BELOW

SELLER:
TRADE BUREAU
VAINERA ST ,13
620014,EKATERINBURG,RUSSIA
ATTN SERGEY VOROBYOV
TEL 510247

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO: SEE ARTICLE NO 2 BELOW

CONSIGN TO

MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU 6, ULAANBAATAR-46, MONGOLIA
ATTN· MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	PRICE

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
1	10 TONS	WIRE ROPE(15 MM) roct 2688-80 r-B-H-180 STD GOST 2688-80	$1,200.00	$12,000 00
2	4 TONS	WIRE ROPE (10 5 MM) roct 3077-80 r-B-H-180 STD GOST 3077-80	$1,200 00	$4,800 00
3	58 TONS	WIRE ROPE (39MM) roct 7669-80 r-I-H- -O-O-160-170 STD GOST 7669-80	$1,200 00	$69,600 00
4	32 TONS	WIRE ROPE (57 MM) roct 7669-80 r-I-H- -O-O-160-170	$1,200 00	$38,400 00

THIS ORDER IS SUBJECT TO THE TERMS, CONDITIONS, AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY [signature]
TITLE ENGINEER
DATE 26 11 92

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY [signature]
M H SPAULDING

[signature]

TOTAL PRICE OF ORDER	
$174,000 00	
PURCHASE ORDER NO	
7419 002-5026	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other ____

J O ACCOUNT NO 7419 200

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	SELLER	REL	PURCHASE ORDER NO
2 OF 5	TRADE BUREAU		7419 002-5026

ITEM	QUANTITY	DESCRIPTION		PRICE
		STD GOST 7669-80		
5	10 TONS	WIRE ROPE (18 MM) roct 2688-80 r-B-H-180 STD GOST 2688-80	$1,200 00	$12,000 00
6	15 TONS	WIRE ROPE (45 5 MM) roct 7669-80 r-I-H- -O-O-160-170 STD GOST 7669-80	$1,200.00	$18,000.00
7	10 TONS	WIRE ROPE (22 MM) roct 3077-80 r -B-H-180 STD GOST 3077-80	$1,200 00	$12,000 00
8	2 TONS	WIRE ROPE (30 5 MM) roct 3077-80 r- -B-H-180 STD GOST 3077-80	$1,200.00	$2,400 00
9	4 TON	WIRE ROPE (29 MM) roct 7668-80 r- -B-H-180 STD GOST 7668-80	$1,200 00	$4,800 00

TOTAL FIRM PRICE $ 174,000 00

ARTICLE 1- MARKING INSTRUCTIONS- SHALL BE AS FOLLOWS

Mongolian Emergency Heat and Power Project No.1
Mongolian Fuel and Energy Ministry
Ulaanbaatar, Mongolia

Emergency Spare Parts for Power Plants and Coal Mines
Emergency Duty Free Cargo for the Mongolian Government

US AID PROJECT No 438-0003
UE&C Project No 7419 002
UE&C Purchase Order No 7419 002-5026

The US AID Label' and 'Made in Russia' shall be clearly marked on each package of each shipment

Each package in the shipment shall be marked (eg 1 of N, 2 of N, N of N)

Each package shall be marked with proper metric dimensions and weights

Packages should be properly EXPORT BOXED/BUNDLED TO WITHSTAND OUTSIDE STORAGE as well as railroad/trucking/airfreight handling.

ARTICLE 2- SHIPPING DOCUMENTATION- THE FOLLOWING SHALL BE INCLUDED IN BOTH RUSSIAN AND ENGLISH FOR EACH SHIPMENT/CARGO

a. Copy of Inland Bill of Lading
b. Copy of Commercial Invoice

United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO BY	PREPARED BY	PURCHASE ORDER NO
1 OF 4	12-08-92	85697/PC	tam	7419 002-5026(A)

SELLER S SHIPPING DATE: 12-18-92

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Sedalia, Missouri

TERMS OF PAYMENT: 2% 10th or 25th, Net 30 Days

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

SELLER

AMSTEAD INDUSTRIES INC
MACWHYTE WIRE ROPE COMPANY
2906 14th Avenue
Kenosha, WI 53141
Attn Mr Don Francis, Mining Manager
(414) 654-5381

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn M G Simpson
617-422-422-5379

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by contacting Mr Franz Fassbender at
Tel No (201) 313-1300
FAX No (201) 313-9564

ROUTE VIA: Buyer's Freight Forwarder

ITEM	QUANTITY	DESCRIPTION	Unit Price	Ext Price
1	3848 LF	Substitute for 39 mm wire rope, 1 1/2' 6 x 25 pref Monarch (IPS) right lang IWRC	$3 76/ft	$14,468 48
		TOTAL FIRM PRICE		**$14,468 48**

I Shipping Information

A Wire rope to be cut in the following lengths

	2 lengths at 1129 ft each	=	2,258 ft
	2 lengths at 401 ft each	=	802 ft
	4 lengths at 197 ft each	=	788 ft
TOTAL	8 lengths (8 spools)		3,848 ft

Dimensions/Weights Later

B The successful Bidder will be responsible for full compliance with the Export Administration Regulations of the U S Department of Commerce, including the assignment of an Export Control Commodity Number Classification, and securing a validated export license, if required

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY
TITLE MANAGER
DATE 12/17/92

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY M G Simpson
M G Simpson
12.11.92

TOTAL PRICE OF ORDER	
$14,468 48	
PURCHASE ORDER NO	
7419 002 5026(A)	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other ____

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A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
OF 5	2/10/93	89372/pc	MHS	7419 002-5027

SELLER S SHIPPING DATE: 3/26/93

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: DAF-(NAUCHKI)Russian/Mongolian Border

TERMS OF PAYMENT: SEE BELOW

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

SEE ARTICLE NO 2 BELOW

SELLER

YROSLAVL MOTOR PLANT
75 OKTYABRYA PR
YR)SLAVL, RUSSIA 150040
ATTN MR VIKTOR G. MAJOROV
TEL 0852 274 818

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

CONSIGN TO

NUURS COMPANY, MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU 6 ULAANBAATAR MONGOLIA. ULAANBAATAR RAILROAD STATION, ATTN MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	PRICE

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
1	LOT	IAMZ-240 Engine parts (See attachment A for unit price break out)		

Original Contract Price 236,167 43 USD

Less Negotiated 7% Discount (16,531 72) USD

Total Firm Price Delivered 219,635 71 USD

THIS ORDER IS SUBJECT TO THE TERMS, CONDITIONS, AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY _____
TITLE Начсчет
DATE 11.02.1993

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC

BY M H Spaulding
M H SPAULDING

TOTAL PRICE OF ORDER	
219,635 71 USD	
PURCHASE ORDER NO	
7419 002 5027	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O ACCOUNT NO. 7419 200

Guy F. Hill

000

Приложение No 1 к контракту

№ ~~840-05011965/930001~~
7419 002 – 5027 SF

лист 1

N п/п	Номер детали	Наименование детали	Коли-чество	Цена в US $	Сумма
~~1~~	~~240-1000104-Б2~~	~~ВКЛАДЫШ~~	~~3~~	~~152.54~~	~~457.62~~
2	240-1000107-Б6	К-Т КОЛЕНВАЛА	~~1~~ 2	3651.20	~~3651 20~~ 7302 40
3	236-1004002-А3	RINGS SET КОМПЛЕКТ КОЛЕЦ	48	29 11	1397 28
4	240-1004008	КОМПЛЕКТ	24	327.45	7858.80
5	236-1007180	ТОЛКАТЕЛЬ	12	21 39	256.68
6	240-1007236	ОСЬ	6	11 39	68.34
7	240-1007242	ОСЬ ТОЛКАТ	6	8.73	52.38
8	240-1007244	ВТУЛКА	4	6.69	26.76
9	240-1007245	ВТУЛКА	4	22.02	88 08
10	240-1007247	ВТУЛКА	6	7 14	42 84
11	240-1008098	GASKET ПРОКЛАДКА	10	1 21	12.10
12	240Т-1009040-А2	GASKET ПРОКЛАДКА	12	13 77	165 24
13	240-1029336	SHAFT ВАЛИК	6	64.00	384.00
14	240-1104308-Г	ТРУБКА В СБ	24	16 67	400 08
15	240-1104410-А	ТРУБКА В СБ	5	11 99	59 95
16	236-1109080-А	UNIT ЭЛЕМЕНТ ФИЛЬТР	12	62.15	745 80

Приложение No 1 к контракту
~~N 810-0501965/920001~~
№ 7419 002-5027 SF

Лист 2

N п/п	Номер детали	Наименование детали	Количество	Цена в US $	Сумма
17	90 1111008-20	НАСОС ТОПЛИВНЫЙ	2	2538 90	5077 80
18	26 1112110	РАСПЫЛИТЕЛЬ	40	22 75	910.00
19	201-1117038-A2	UNIT ЭЛЕМЕНТ	600	10.12	6072.00
20	240-1307010-A	PUMP НАСОС	3	264.39	793 17
21	45 7371 0209	ГЕНЕРАТОР_6307 37	3	807.59	2422 77
22	45 7375 1471	СТАРТЕР 2506 3708	3	878 08	2634 24

ИТОГО в US $ ~~33577.13~~ SF 36770.71

ПРОДАВЕЦ ПОКУПАТЕЛЬ

Приложение No 2 к контракту
~~N 840-05011965/930001~~
No 7419 002 -5027 SF
MN 8

лист 1

N п/п	Номер детали	Наименование детали	Количество	Цена в US $	Сумма
1	240-1000104-Б2	ВКЛАДЫШ	10	152.54	1525 40
~~2~~	~~240-1000104-Б2Р1~~	~~К-Т ВКЛАДЫШЕЙ~~	~~10~~	~~152.54~~	~~1525.40~~
~~3~~	~~240-1000104-Б2Р2~~	~~К-Т ВКЛАДЫШЕЙ~~	~~10~~	~~152.54~~	~~1525.40~~ 2486 88
4	236-1000106-Б4	КОЛЬЦА ПОРШН	SP 144 ~~72~~	17 27	~~1243 44~~ SF
5	240-1003213	ПРОКЛАДКА	120	13 00	1560 00
6	240П-1004008-Б	КОМПЛЕКТ	72	361 76	26046 72
7	240Т-1009040-А2	GASKET ПРОКЛАДКА	SF 10	13 77	137 70
8	240Т-1017040-А3	ЭЛЕМЕНТ ФИЛЬТРА	1000 ~~500~~	15 95	15950.00 ~~7975 00~~
9	201Т-1105540	UNIT ЭЛЕМЕНТ	600	8.93	5358 00
10	236-1109080-А	UNIT ЭЛЕМЕНТ ФИЛЬТР.	200	62 15	12430.00
11	26 1112110	РАСПЫЛИТЕЛЬ	100	22.75	2275 00
12	201-1117038-А2	UNIT ЭЛЕМЕНТ	400	10.12	4048 00
13	240Н-1118010-Б	ТУРБОКОМПРЕССОР	8	877 50	7020 00
14	240Н-1118011-Б	ТУРБОКОМПРЕССОР	8	877 50	7020 00

ИТОГО в US $ ~~79690 06~~ 85857.70 SF MN 8

ПРОДАВЕЦ ПОКУПАТЕЛЬ

Приложение No 3 к контракту
~~N 840-05011965/930001~~
№ 7749 002-5027 SF

mw

Лист 1

N п/п	Номер детали	Наименование детали	Коли-чество	Цена в US $	Сумма
1	240-1000104-Б2	ВКЛАДЫШ	10	152.54	1525 40
2	240-1000104-Б2Р1	К-Т ВКЛАДЫШЕЙ	12	152.54	1830 48
3	240-1000104-Б2Р2	К-Т ВКЛАДЫШЕЙ	12	152.54	1830 48
4	236-1000106-Б4	КОЛЬЦА ПОРШН.	120	17 27	2072 40
5	240-1000107-Б6	К-Т КОЛЕНВАЛА	6	3651 20	21907 20
6	236-1002024-А	RING КОЛЬЦО	240	1 35	324 00
7	236-1002040	RING КОЛЬЦО	120	1 23	147 60
8	240-1003213	ПРОКЛАДКА	120	13.00	1560 00
9	240П-1004008-Б	КОМПЛЕКТ	120	361.76	43411 20
10	201Т-1017038-А	UNIT ЭЛЕМЕНТ ФИЛЬТ	1000	15.95	15950 00
SF 11	901.1111008-~~2602~~	НАСОС ТОПЛИВНЫЙ	SF 3A	2538 90	7616 70 SF ~~10155.60~~
12	261 1112110	РАСПЫЛИТЕЛЬ	60	22 75	1365 00
~~SF 13~~	~~240Н-1118010-Б~~	~~ТУРБОКОМПРЕССОР~~	~~6~~	~~877.50~~	~~5265 00~~
~~SF 14~~	~~240Н-1118011-Б~~	~~ТУРБОКОМПРЕССОР~~	~~6~~	~~877.50~~	~~5265.00~~
SF 15	240Н-1011014-Б	НАСОС	8	101 24	809 92
SF 16	240Н-1002012-И	БЛОК В СБОРЕ	2	6594.32	13188.64
		ИТОГО в US $			~~113419 28~~ 113539.02

SF mw

ПРОДАВЕЦ

ПОКУПАТЕЛЬ

Total $ 236,167 43
less negotiated discount
(16,531 72)
$ 219,635 71

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United Engineers & Constructors
A Raytheon Company

CHANGE ORDER #1

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 1	12-22-92	88716E	tam	7419 002-5029

SELLER S SHIPPING DATE: 1/30/93 or sooner if possible

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: fob border (NAUCHSKI-SUHE-BATOR)

TERMS OF PAYMENT: see below

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO: See Article No 2 Below

SELLER:
TRADE BUREAU
Vainera St , 13
620014, Ekaterinburg, Russia
Attn Sergey Vorobyov
3432-25-14-43

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO: See Article No 2 Below

CONSIGN TO:
Mongolian Fuel and Energy Ministry, Bagga Poiruu 6, Ulaanbaatar-46, Mongolia
Attn Minister Jigjid

ROUTE VIA: rail

ITEM	QUANTITY	DESCRIPTION	PRICE

Change and incorporate the following under Article 2 in the original purchase order

Reference second paragraph "For each shipment ." and replace with the following

For each shipment (cargo), the Seller shall provide the above listed documents by either FAXing or via overnight air shipment, through TNT Worldwide Express or DHL to the following

United Engineers & Constructors Inc
100 Summer Street
Boston, MA 02110
Attn Mr M H Spaulding
Tel (617) 422-5360
FAX (617) 338-6239
FAX (617) 423-9020

Delete paragraph three (3) "Upon receipt of the above listed. " of Article 2 in its entirety

A Copy of this Order must be signed by Seller and returned within two weeks of receipt.
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER.
UNITED ENGINEERS & CONSTRUCTORS INC.

BY M H Spaulding
M.H. Spaulding
Gen F. Hall

TOTAL PRICE OF ORDER (Rev)	
$54,000 00	__ Buyer __ Requisitioner __ Expediter __ Accounting __ Field/MRR __ Client __ Other _____
PURCHASE ORDER NO 7419 002 5029	

J O Account No 7419.002

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 5	11/26/92	94042A/PC	MHS	7419 002-5029

SELLER S SHIPPING DATE: 01/30/93,OR SOONER IF POSSIBLE

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE SHIPPING PAPERS AND PACKAGES — REL

FOB POINT: FOB-BORDER(NAUSCHKI-SUTE-BATOR)

TERMS OF PAYMENT: SEE BELOW

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO: SEE ARTICLE NO 2 BELOW

SELLER

TRADE BUREAU
VAINERA ST ,13
620014,EKATERINBURG,RUSSIA
ATTN SERGEY VOROBYOV
TEL 510247

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO: SEE ARTICLE NO 2 BELOW

CONSIGN TO

MONGOLIAN FUEL AND ENERGY MINISTRY, BAGGA POIRUU 6, ULAANBAATAR-46, MONGOLIA
ATTN MINISTER JIGJID

ROUTE VIA RAIL

ITEM	QUANTITY	DESCRIPTION	PRICE

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	PRICE EXTENSION
1	45 TONS	WIRE ROPE(52 MM) roct 7669-80 r-I-H- -O-O-160-170 STD GOST 7669-80	$1,200 00	$54,000 00

NOTE BUYER(UNITED ENGINEERS & CONSTRUCTORS) WILL HAVE THE OPTION TO CHANGE THE METHOD OF TRANSPORT FOR THIS ORDER TRADE BUREAU HAS PROVIED BUYER WITH A $21,000 00 PROPOSAL TO AIRLFT THIS MATERIAL TO MONGOLIA IF THIS OPTION IS SELECTED SELLER MUST BE NOTIFIED BEFORE JANUARY 1, 1993 ALSO, THE PAYMENT FOR AIRLIFTING MUST BE MADE UPON NOTIFICATION

THIS ORDER IS SUBJECT TO THE TERMS, CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY [signature]
TITLE ENGINEER
DATE 26.11.92

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC

BY [signature]
M H SPAULDING

[signature]

TOTAL PRICE OF ORDER	
$54,000 00	
PURCHASE ORDER NO	
7419 002 5079	

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O ACCOUNT NO 7419 200

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO BY	PREPARED BY	PURCHASE ORDER NO
1 OF 4	12-08-92	85696/PC	tam	7419 002-5029(A)

SELLER S SHIPPING DATE: 12-18-92

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Pittsburg, PA

TERMS OF PAYMENT: Net 30 Days

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC.
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

SELLER

WIRE ROPE CORP OF AMERICA, INC
P O Box 288
St Joseph, MO 64502

Attn Mr Jim Allaman

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn M G Simpson
617-422-422-5379

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by contacting Mr Franz Fassbender at
Tel No (201) 313-1300
FAX No (201) 313-9564

ROUTE VIA: Buyer's Freight Forwarder

ITEM	QUANTITY	DESCRIPTION	Unit Price	Ext Price
1	1865 LF	Substitute for 52 mm wire rope, 2" 6 x 26 WS RLL XIP, IWRC	$6 72/ft	$12,532 80
		TOTAL FIRM PRICE		**$12,532 80**

I Shipping Information

A Wire rope to be cut in the following lengths

1 length at 663 ft
1 length at 663 ft
1 length at 539 ft

TOTAL 3 lengths (3 spools) 1,865 ft

Dimensions/Weights
663' - Reel dimensions - 54" x 39 1/4" x 54"
Gross weight 5250 lbs per reel
Cubic feet 66 2 per reel

539 - Reel dimensions 54' x 39 1/4" x 54'
Gross weight 4333 lbs
Cubic feet 66 2

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be signed by Seller and returned within two weeks of receipt
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC
BY M G Simpson
M G Simpson
Carol F Hill

TOTAL PRICE OF ORDER: $12,532 80

PURCHASE ORDER NO: 7419 002 5029(A)

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419 002

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United Engineers & Constructors
A Raytheon Company

PURCHASE ORDER

PAGE NO	DATE	REQN NO /BY	PREPARED BY	PURCHASE ORDER NO
1 OF 4	11-18-92	92989/rms	mgs	7419 002-5032

SELLER S SHIPPING DATE: 12/04/92

THE ORDER NO RELEASE NO MUST APPEAR ON INVOICES CORRESPONDENCE, SHIPPING PAPERS, AND PACKAGES — REL

FOB POINT: Clarksdale, MS

TERMS OF PAYMENT: Net 30 days

MAIL THE ORIGINAL AND TWO (2) COPIES OF INVOICES THE ORIGINAL SHIPPING PAPERS AND PACKING LIST TO

UNITED ENGINEERS & CONSTRUCTORS INC
100 Summer Street, Boston, MA 02110
Attn Accounts Payable

SELLER

THE COOPER TIRE COMPANY
701 Lima Avenue
Findlay, OH 45840
Attn Philip Caris
(419) 423-1321

ALL CORRESPONDENCE AND A COPY OF THE SHIPPING PAPERS AND PACKING LIST MUST BE SENT TO

UNITED ENGINEERS & CONSTRUCTORS INC
Northeastern Operations
100 Summer Street
Boston, MA 02110
Attn M G Simpson
617-422-5379

CONSIGN TO: Seller must contact An-Mar International Inc for shipping instructions by telephoning Mr Franz Fassbender at (201) 313-1300 -- Fax (201) 313-9564

ROUTE VIA: FREIGHT FORWARDER

ITEM	QUANTITY	DESCRIPTION	PRICE

TUBES FOR OFF-ROAD TIRES

			Unit Price	Ext Price
1	50 EA	Off-Road Tire Tubes - Size 18 00-25, Radial type Complete with spud no SP1000 and valve no TRJ1175C Seller's Product No OA401850 Size No 18 00-24/25	$50 63	$2,531 50
2	150 EA	Off-Road Tire Tubes - Size 12 00-20, Radial type Complete with valve no TR444 Seller s Product No OD40120R Size No 12 00R20	$15 00	$2,250 00

TOTAL FIRM PRICE **$4,781 50**

I Shipping Information

A Tube Weights/Sizes

Item 1 29 7 lbs/tube, 1 per box, box is 6 5"H x 14 5'W x 26 75'L

Item 2 10 4 lbs/tube, 2 per box, box is 8 5'H x 13 25'W x 14 5'L

THIS ORDER IS SUBJECT TO THE TERMS CONDITIONS AND SPECIFICATIONS AS STATED HEREIN

A Copy of this Order must be [illegible] by Seller and returned [illegible] in two weeks of receipt
ORDER ACKNOWLEDGED
BY _____
TITLE _____
DATE _____

BUYER
UNITED ENGINEERS & CONSTRUCTORS INC

BY M G Simpson
M G Simpson

TOTAL PRICE OF ORDER: $4,781 50

PURCHASE ORDER NO: 7419 002 5032

__ Buyer
__ Requisitioner
__ Expediter
__ Accounting
__ Field/MRR
__ Client
__ Other _____

J O Account No 7419 002

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APPENDIX C

ENGINEERING DRAWINGS

Record drawings for the Feedwater Evaporator Installation are not included as the Feedwater Evaporators were eliminated from the project in October, 1992. Refer to the Phase III Activity Summary Report for record drawings documenting Instrumentation and Controls modification work performed in Power Plant No. 3

APPENDIX D

PHASE I - PROJECT STRATEGY REPORT

United Engineers & Constructors
100 Summer Street
Boston MA 02110

617 422 5200
Telecopier 617 338 6239

United Engineers & Constructors
A **Raytheon** Company

August 14 1992

AID PRE/CAP
SA-2/Room 402
Washington, DC 20523

Attention Mr Ken Rikard

Status - Phase I Interim Report

Gentlemen

The status of Phase I (start-up) is as follows

1 The I&C/Electrical team left Mongolia on July 31, 1992 They arrived back in the office with their material/data and started working on requisition lists on August 10, 1992 The I&C components list will be available on August 17, 1992 These items will then be added to the top of the spare parts list

2 Freight forwarding companies have been interviewed last week and this week, and the interview process will be completed next week

3 The I&C components, together with the first four (4) pages of spare parts (Exhibit A), will cost in the vicinity of $5 million It turns out that the parts on page 5 to the end of the list can only be procured from Russian OEMs (or, possibly, from the former East Germans)

4 Inquiry documents have been prepared and requisitions/data sheets/specifications are being prepared for the spare parts on the list See Exhibit B for procurement status

5 **Procurement Plan**

a UE&C will request firm priced proposals within two (2) weeks of issuing the RFP/Inquiry Documents for commodity spare parts For engineered equipment (e g , feedwater evaporators, district heat exchangers, etc) we will ask for firm priced proposals within three (3) weeks of issuing the RFP/Inquiry Documents

b When UE&C receives the proposals (with best expedited shipping dates) we will meet with the selected freight forwarding company and work out a detailed procurement/shipping schedule

c The basic concept is to make a "go/no go" decision regarding shipping means If the spare parts can arrive in time to do some good for this heating season, it will be a "go", i e , ship by air transport (unless cube/weight is too high) If the spare parts cannot arrive in time to do any good this heating season, it will be a "no go", i e , ship ocean transport Note that, in general, air transport will be directly into Ulaanbaatar and ocean transport will entail rail transport through China, with transloading at the Chinese/Mongolian boarder (due to rail gage difference)

d UE&C will perform bid evaluations for all procurements (including the freight forwarder) and then send the evaluations, with recommended successful bidder identified, to AID (K. Rikard) for approval prior to placing purchase orders

e Each RFP/RFQ will list, as the base case, the spare part description listed by the Fuel and Energy Ministry in Exhibit A. It turns out that, in general, United States suppliers seem to have equivalent spare parts which are based on higher grade materials and/or superior technology Therefore, where it makes sense, UE&C will request appropriate options Note that when UE&C proposes to provide spare parts which are fabricated from "higher grade materials and/or superior technology", we have sent (and will continue to send) telexes to the Ministry for their concurrence

f The Russian OEMs for the spare parts are identified in Attachment A to Exhibit A. Each set of Inquiry Documents will be sent to both the Russian OEMs and United States OEMs The decision to place the purchase order will take into account the following prioritized items

1) Ability to supply the spare part(s)
2) Schedule (consistent with "go/no go" philosophy)
3) Price

Note that exceptions to the foregoing include spare parts which can only be provided by Russian OEMs or by the former East Germans (at transportation only cost, assuming they are first inspected and found to be in reasonable condition)

g UE&C's procurement procedures will be forwarded to AID (K. Rikard) next week for review

Three things (not directly related to this report) have come up which are noteworthy

The first is that UE&C's I&C/Electrical Team, which just returned from Mongolia, was given additional requests from plant and other personnel to add items to the spare parts list I have instructed them to put a "secondary" list of such spare parts together As soon as this list is

developed, we will send it to the Ministry and request them to add (or not add their choice) them to the "official" list and if they are added, to prioritize them When UE&C receives their response, we will act on it

The second is that, due to rapidly deteriorating conditions in-country, it is prudent to consider logistics contingency plans to support this project This includes food and fuel for UE&C (and other) personnel involved in the project, and a satellite (INMARSAT) communication link It also should include the development of a list of conditions, which if encountered, would form the basis upon which a given trip or part of the project would be curtailed or postponed

The third is that our projections show that UE&C billings for this project will likely reach the $90,800 spending cap which UE&C is operating under by the end of next week UE&C has advised Neil Edin (AID C O in Bangkok, Thailand) of this and we are taking appropriate steps to expedite the contract definitization

Please advise your concurrence with/comments on the plan which we have outlined above at your earliest convenience

Best regards,

R. H. Kelley

R H Kelley
Project Manager

RHK kmr

Attachments

cc Eric Peterson
Neil Edin
Jay Nessbaum

bcc P E Klisiewicz
D G Munson
R H Kelley/Project File (2 copies) R-1
G F Hill (action Item 5g)
S J Page (14-U-2)

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EXHIBIT A

See Attachment A
For Explaination.

APPLICATION FOR EQUIPMENT AND MATERIALS OF POWER PLANT

Mongolia 8 Jul, 1

Item	Brief item description	Quantity	Unit of measure	Catalog No or model NO or size or dimensions	Material of construction or chemical composition or specification	
1	2	3	4	5	6	
1 (2)	Alternating current motor P 14 (Motor Book) P 30	3	piece	A 114 2 M (2A3MI-500/6000 Y4)	N 400 kW, U 6000 V n 3000 rpm, clockwise from motor To Driven Kg	I I No
2 (2)	Alternating current motor P 14, P 30	1		A 113 2M (2A3MI-315/6000 Y4)	N 320 kW U 6000V n 3000 rpm	I P No3
3 (3)	Feed water pump with motor	1	Set	MD 270 150/3	Q-270 m3/H, P 150 kg/cm2 N 2000 kW U 6000 V, n-3000 rpm	P I N
4 (2)	Alternating current motor	1	piece	AO 101 4a	N 125kW U 400 V, n 1500 rpm,	I I No
5 (15)	Balls for ball mills	1100	t	Q 40 mm	Brinell hardness = 600 chemical composition (%) C = 0,4 Mo = 0,15 Cr = 0,3 Mn = 0,5	I I No3 No 4
6 (13)	Babbitt for plain bearing		t	1 83	chemical composition (%) Sn=81 — 83 Sb = 10 12, Cu = 5 6,5	I I N
7 (17)	Centrifuge for T G oil cleaning (water/solids)	1	Ea	HCM1 3000	Weight 1510 kg Type of Turbine	I I No

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1	2	3	4	5	6	7
8 (2)	Alternating current motor	[illegible]	piece	A1 315 52 4У3	N 160 kW U-400 V n-1470 rpm,	P I N I
9 (2)	Alternating current motor	2	-	A03 315 56 У3	N-110 kW, U-400 V, n 985 rpm	I P No4
10	Evaporator (In lieu of Demin Trains-lack of acid & caustic)	5	-"-	U 1000 200 drawing No 08 8116-011 Сь	Q =50 t/H Evap Rate P1 6kg/cm2,Am P 1 2kg/cm2, Evap Weight-38 ti	P.P No 3
11 (2)	Alternating current motor	1		4AH 280 54 У3	N=132 kW, U-400V n=1470 rpm	I I No4
12 (4)	Chemical agent pump (H_2SO)	2	unit	2X6E or 6X9D	7	Dr khar
13 (10)	Strip chart recorder a paper	80000	m2	Регистрация N 1758 ЛЮДБ ЛПГ 160 ГОСТ 7826-82 ПГ 30/6		
14	Reducing gear of a valve 2400 mm diameter, pressure 25 kg/cm2	25	piece	ТИП-8 Motor Oper	Torque 80 kgf M, n 50rpm Regulating range 35 to 200 rpm weight 108 kg	P P N
15	Reducing gear for a valve diameter of 175 mm, pressure 23,5 MPa, temperature 250°C	10	-	825-3 0 1 model of motor 4AC 100S 4,	Torque-1300 N•M N 3,2 kW n 20,5 rpm	I I N
16	Sluices valves	3	-	Rated diameter 400 mm	For coal ash slurry with approx 10% concentration pressure 7 kgf/cm2 temperature ≤ 15°C valve disc Alumina ceramics; valve seat H Cr FC	P P Eriden

12

1	2	3	4	5	6
17 (16)	District heat water exchanger (main)	1	(Kit) unit	IKB 500 3 23	
18 (16)	District heat water exchanger	1	-	IKB 500 11 23	
19 (4)	Ash slurry pump	2	unit	ITT 400/40	400 MT/Hr / 4 Kg/cm²
20 (4)	Ash slurry pump	1		ITT 800/.1	800 mT/Hr / 7.1 Kg/cm²
21 (17)	Cables for electrowelding	4	km	kg 40 x 3	
22	Reinforced glands (seal) with spring	80	piece	30 x 52 x 10	← 30mm, 10 mm, wire spring to clamp on shaft, 52mm
23 (18)	Constant current motor	4		2HB 132 M2 XJ14 1 6 kW 1000 1500 r.p.m	
24	Drain pump with a diesel motor	2		Q - 350 m3/H, H 50m in H_2O	
25 (14) (5)	Boiler a water wall tubes (Seamless) OD 60 x 6 mm	40	t	Grade 20 TV 14-3 460 75	Carbonic steel Chemical composition P I N.4 % C=0,07 0,14, u 0,25 Mn=0,35 0,65, Pand S < 0,04, Si=0,17 0,37, Ni Less that 0,3 (Ni) = Less that 0 3

Tc

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1	2	3	4	5	6	7
	ROLLED TUBES FOR HIGH PRESSURE BOILERS (Seamless) (4w) (8)					
26	D 32 x 4,0 mm		t	Сталь 20. ТУ-14-3-460-75	Carbonic steel	P P No3
27	D 60 x 4,0 mm		t	Сталь 20 ТУ-14-3-460-75	Chemical composition % ,	P P No3
28.	D 38 x 4,0 mm	80	t	Сталь 20. ТУ-14-3-460-75	C = 0,17 - 0,24	P P Darl -dh
29	D 83 x 4,0 mm	40	t	Сталь 20. ТУ-14-3-460-75	Mn = 0,35 - 0,65	
30.	D 89 x 4,5 mm	140	t		Si = 0,17 - 0,37	
31	D 25 x 3,5 mm	10	t		S = Less that 0,0025 P = less that 0,03 Cr = less that 0,03 Cu = less that 0,3 Ti = less that 0,25	
	(14) (5)					
	Tubes, ~~PIPE~~ SEAMLESS (weldless) L P Boilers					
32.	D 40 x 1,5 mm (5)(10)	180	t	ГОСТ - 8731 - 74	Carbonic steel	P P No4 P P No3
				or		
33	D 51 x 2,5 mm	120	t	ГОСТ - 8732 - 78	Chemical composition (%)	
34	D 133 x 4,0 mm	15	t		C = 0,17 - 0,24	
35.	D 57 x 4,0 mm	30	t		Mn = 0,35 - 0,65	
36	D 76 x 3,5 mm	350	t		Si = 0,17 - 0,37 S ≤ 0 04 P ≤ 0 035 Ni ≤ 0,25 Cu ≤ 0 25	
	(5) (16)					

Remaining Spare Parts Not Sent
(T-G, PC Mill, etc parts only
capabable of Russian OEM Supply)

ATTACHMENT A

Contracts Signed For Orders without Payment

(Item Nos Refer to Nos In Parenthesis on Spare Parts Lists)

1 248632. c. Kaluga str. Moscowskaıj 255
Turbine plant of Kaluga. Russıa
TLX: 183188 ROTOR

2 107078, moscow Russıa WO SOVELEKTRO 1/2 k. 1
Sadovay- Spasskay
Telephone 208-28-37 tlx : 411003
telefax : 208-27- 45 , 208- 40- 77.

3 244011 c Suma , Ukraına pl
60 Latiya SSSR , NPO Nasosenergomash

4 VAO. " CHIMMASHEXPORT " , 25 BEZBOZHNYI
PER, 129869 , MOSCOW tlx: 411032 SOKEM SU

5 WO " Zagrantehkommunstroı " Moscow
10100, ul. Marosejka 2/15
tlx: 411683. ASTRA.

6 623112. Sverdlovskaja obl. , g. Pervovralsk
Russia ul. Torgovaja , 1

7 VVO " Sudoimport" g.Moscow 103006
Uspenskiı per. 10 tlx : 411387

8 VTF "Volgomosh" Sizranskiı zavod
"tıajelogo mashınostroenıa 446010,
g. Sizran , ul. Gidroturbinnaja 13.
telephone 7-86-47.

9 129041, Moscow, Prospekt Mira,52
Vneshn[redacted]yaja firma "GPI" . tlx 411639.
GBI [redacted]

10 V/O " Vostokintorg " Moscow , G-200
ul. Smolensko Sennaja 32/34
tlx: 411123

11 LPEO " Elektrosila " imeni s m Kirova
198008 Sankt- Peterburg ,
Moskowskaij pr 137 telephone 298-20-75
telefax: 298-95-10

12 453310 Russia Bashkirstan g.Melevz
NPO " Minvdobrenie " telephone 20302

13 VPO " Zarvbejenergostroi " g. Moscow
Potapovskaja per 5. tlx 113788 smeta

14 113324 Moscow Ovchinnikvskaja nab 18/1
" Technopromexport " tlx: 411158

15 652680 Russia g. Gurreevsk Kemerovskoj
obl , ul Gagarina 1
Gureevskij metallurgicheskij zavod
im . Kurako

16 347928 Russia Rostovckaja obl ,
g Tadanrog , ul. Lenina , 220
Vneshnetorgovaja firma TKZ

17 129010 Moscow,Bezbojnij ner . ,
d.25 "A" V/O "Energomashexport "

18 Ukraina NPO "Pskovelectromash " 180600,
g.Pskov, Oktiabrskig prospect

ATTACHMENT B

Application for bearing of Fower Flants

Mongolia 8 iuly 1992

1-tem	Quan-tity	Unit of measure	Model No	1-tem	Quan-tity	Unit of measure	Model No	1-tem	Quan-tity	Unit of measure	Model No	1-tem	Quan-tity	Unit of measure	Model No	I-tem	Quan-tity	Unit of measure	Model No	
1	4000	piece	203 P11	24	1500	piece	180606	47	1200	piece	307 13	70	63	piece	3524 37	93	10	piece	11767241	99
2	3400	- -	207 11	25	232	- -	180607	48	1500	- -	309 13	71	54	- -	3530 37	94	6	- -	3003156	39
3	2800	- -	306 13	26	400	- -	180609	49	140	- -	317 13	72	44	- -	3532 37	95	2	- -	3003154	
4	175	- -	1607 35	27	15	- -	32332M	50	10	- -	32332 52	73	6	- -	3536 37	96	2	- -	3003744	40
5	950	- -	1608 33	28	50	- -	322 13	51	34	- -	180605	74	12	- -	3538 37	97	4	- -	4024107	71
6	54	- -	2226 48	29	33	- -	324 13	52	1737	- -	204 11	75	13	- -	3540 37	98	5	- -	4024110	71
7	60	- -	2234 48	30	50	- -	2347 51	53	67	- -	320 13	76	16	- -	3615 38 (5)	99	6	- -	4024112	71
8	40	- -	2311 51	31	80	- -	2322 57	54	71	- -	7306 112	77	2	- -	3614 38	100	6	- -	4024113	71
9	73	- -	2324 52	32	68	- -	3628 38	55	40	- -	7505 (5)	78	96	- -	3618 36	101	2	- -	32544	50
10	27	- -	2326 52	33	36	- -	3624 38	56	20	- -	96 46418	79	26	- -	3620 38	102	12	- -	66432	98
11	138	- -	3616 37	34	30	- -	5307 85	57	40	- -	98 66406	80	13	- -	3630 38	103	7	- -	50206A	21
12	88	- -	3626K 38	35	10	- -	7538 143	58	1	- -	9039352	81	17	- -	3640 38	104	4	- -	113532	41
13	30	- -	3528 37	36	94	- -	8108 129	59	40	- -	98 2222	82	4	- -	3644 38	105	40	- -	804709K	
14	197	- -	8110 129	37	25	- -	8216 130	60	10	- -	98 66410	83	7	- -	3652 58					
15	56	- -	32208K 48	38	14	- -	3003264 40	61	6	- -	96 36318	84	29	- -	7311K 112					
16	141	- -	3522 37	39	40	- -	206 11	62	8	- -	60308	85	4	- -	13528 41					
17	10	- -	42230 49	40	700	- -	308 13	63	70	- -	60309	86	10	- -	13630 42					
18	28	- -	46234П 95	41	40	- -	2326M 52	64	10	- -	143 7515	87	8	- -	36207 95					
19	8	- -	46318П 96	42	54	- -	8222 130	65	32	- -	38 3622	88	33	- -	50207 21					
20	60	- -	46330П 96	43	2500	- -	205 11	66	1000	- -	13 304	89	10	- -	50213 21					
21	30	- -	46416П 96	44	50	- -	208 11	67	3	- -	7234	90	4	- -	113618 42					
22	30	- -	66409 98	45	500	- -	209 11	68	317	- -	13 312	91	8	- -	113634K 42					
23	56	- -	66412 98	46	2100	- -	305 13 (5)	69	24	- -	37 3518	92	5	- -	804704K5 74					

9 - firma „GP2" 5 - Wo Zagran tek kommun stroi

EXHIBIT B

MONGOLIAN EMERGENCY HEAT & POWER PROJECT NO 1

STATUS OF SPARE PARTS PROCUREMENTS

Priority Number	Item/Description	Requisition Status (1)	Inquiry/P O Issue Date (2)	Inquiry/P O RFQ Due (2)	Inquiry/P O P O Date(2)
N/A	Freight forwarding firm	IP	WE 8/~~21~~28/92 P A/A	9/15	
N/A	Components for PC mills	IP(7)	WE 9/4/92 P		
1	A-C Motor	IP	WE 8/~~14~~28/92 P/A	9/11	
2	A-C Motor	IP	WE 8/~~14~~28/92 P		
3	Feedwater Pump with motor	IP	WE 8/~~28~~9/92 P		
4	A-C Motor	IP	WE 8/~~14~~28/92 P		
5	Balls for ball mills	IP	WE 8/~~14~~21/92 P/A		
6	Babbitt for Plain Bearing	IP	WE 8/~~14~~21/92 P/A		
7	Centrifuge for T-G Oil Clean	IP	WE 9/4/92 P		
8	A-C Motor	IP	WE 8/~~14~~28/92 P		
9	A-C Motor	IP	WE 8/~~14~~28/92 P		
10	Evaporator	IP	WE 9/4/92 P		
11	A-C Motor	IP	WE 8/~~14~~28/92 P		
(12)	Chemical Agent Pump Waiting	Telex - No Resp			
13	Strip Chart Recorder Paper	IP	WE 9/~~18~~4/92 P		
(14)	Reducing Gear of Valve	WIM	WE 9/11/92 P		

NOTES (1) IP = In Process, C = Complete
(2) WE = Week Ending, P = Plan, A = Actual

Dist To Everyone on Rpt
Add Coal Mining Stuff

MONGOLIAN EMERGENCY HEAT & POWER PROJECT NO. 1

STATUS OF SPARE PARTS PROCUREMENTS

Priority Number	Item/Description	Requisition Status (1)	Inquiry/P O Issue Date (2)	Inquiry/P O RFQ Due (2)	Inquiry/P O P O Date(2)
15	Reducing Gear for a Valve		WE 9/11/92 P		
(16) No Actn	Sluice Valves Need Engr Help		WE 9/11/92 P		
(17)	District Heat-Water Exchanger "	IP	WE 8/28/92 P 9/18		
(18)	District Heat-Water Exchanger "	IP	WE 8/28/92 P 9/18		
(19)	Ash Slurry Pump "		WE 9/18/92 P		
(20)	Ash Slurry Pump "		WE 9/18/92 P		
21	Cables for Electro Welding	Elect	Undef		
22	Reinforced Glands (Seal) With Spring	Waiting			
23	Constant Current Motor	IP	WE 8/14/92 P 29		
24	Drain Pump with Diesel Motor	Telex/Waiting			
25	Boiler Water Wall Tubes	IP	WE 8/28/92 P/A 9/2	9/18	
26-31	Tubes - High Press Boilers	IP	WE 8/28/92 P/A 9/2	"	
32-36	Tubes - Low Press Boilers	IP	WE 8/28/92 P A 9/2	"	
	INMASAT Dish				
	Evap Substation		9/4 / P		
	Computer/~~FAX Mach~~/Xerox FAX Mach				

NOTES (1) IP = In Process, C = Complete
(2) WE = Week Ending, P = Plan, A = Actual

APPENDIX E

INSTALLATION STRATEGY REPORT

INSTALLATION STRATEGY REPORT

FOR

EMERGENCY HEAT AND POWER PROJECT NO 1

FOR

MONGOLIAN FUEL AND ENERGY MINISTRY

FEBRUARY 1993

UNITED ENGINEERS & CONSTRUCTORS INC

EMERGENCY HEAT AND POWER PROJECT NO. 1

INSTALLATION STRATEGY REPORT
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1 0 EXECUTIVE SUMMARY

United Engineers & Constructors Inc (UE&C) conducted feasibility studies funded by a U S Trade and Development Program grant (TDP) under a contract with the Mongolian Fuel and Energy Ministry (Ministry) to evaluate the conditions and needs of the energy sector,including power plants, electric power transmission and dispatch facilities and district heating systems Included as a part of the studies were evaluations of the energy sector, district heating, dispatch facilities and energy sector organization, management, accounting revenue and information systems

The effort included on-site surveys, interviews and meetings with Ministry personnel to review findings, develop budgetary cost estimates and make recommendations for equipment, material or structures replacement, repair or upgrade

As a result of this effort UE&C identified a need to assist the Ministry in procurement of critically needed spare parts for its power and heating plants This subsequently resulted in a contract to UE&C by US AID (AID) titled or known as the Mongolian Emergency Heat and Power Project No 1 Soon after the contract to provide assistance for the power plant sector was signed, UE&C was requested by AID to provide assistance in the coal mine sector Because UE&C lacked technical expertise in coal mining engineering and operations and maintenance, AID initially utilized Parsons-Maine, Inc (PMI) to assist UE&C, which focused on coal mine sector procurement Later in the project PMI's assistance was withdrawn and AID instructed UE&C to issue a sole source subcontract to Morrison-Knudsen Corp (M-K) to provide coal mine sector technical assistance

This project initially involved the engineering, design, procurement, delivery and installation of equipment for all of the Ministry's major power plants plus an effort to provide instrumentation and controls for the coal pulverizing systems at Plant No 3 in Ulaanbaatar during the winter heating season of 1992-1993 The controls upgrade was required to mitigate frequent explosions at this plant The required equipment for the power plant sector and their order of importance were developed during the discussions and on-site surveys performed in developing and completing the feasibility study of the TDP project

In addition to having operational control over Mongolia's power plants, heating plants and coal mines, the Ministry also controls two semi-independent procurement companies, one for power and heating plant procurement (Erchim Impex) and one for coal mine procurement (Nuurs Co) The maintenance entry order and tracking systems in the power and heating plant sector are entirely manual with no adequate methods to track priority equipment/commodity needs Consequently, Erchim Impex ends up with large procurement lists for all power plants with little ability to

distinguish priorities from one plant to the other Additionally, the procurement cycle tends to reflect annual requirements based on central planning concepts left over from Mongolia's recent past

As indicated previously, the initial power sector needs and priorities were reflected in a list of needed procurements developed by UE&C at the conclusion of the TDP study The methodology employed in the development of this list involved a series of meetings with the chief engineers of all of the significant power plants in Mongolia At these meetings, individual plant O&M needs were identified, prioritized and then force ranked for the power sector as a whole Subsequent to this effort AID and PMI personnel visited Mongolia without UE&C and met with Erchim Impex and Nuurs personnel This resulted in a different procurement list which was based on procurement priorities largely reflecting the procurement organizations' needs and priorities which did not, in cases, reflect the O&M needs of the power plants UE&C did not discover that key operations personnel were not involved in the PMI/AID meetings in Mongolia until much later in the project This resulted in much confusion and wasted time/effort in the power sector

It was discovered that there was wide spread confusion within the Ministry's procurement organizations (Nuurs and Erchim Impex) regarding the details of the AID assistance project Nuurs and Erchim Impex personnel both clearly believed that AID would simply transfer U S dollars to them for procurement Thus, they entered into a series of "contracts" with Commonwealth of Independent States (CIS) Original Equipment Manufacturers (OEM's), without sufficient funds During a joint UE&C/AID meeting with the Ministry early in the project, AID's Mission Officer clearly stated that AID would not provide funds to cover these "contracts" Unfortunately, a prime driving force behind these procurement organizations was not to focus on operational maintenance needs, but rather to focus on procurement to "pay off" these "contracts"

In general, this was not the case in the coal mine sector The prime reason for this is that Nuurs has a much closer and more coordinated involvement with coal mine operations than Erchim Impex does with power and heating plant operations Another factor is the relative magnitudes of power sector procurement as compared to coal mine sector procurement (more power plants than coal mines and more parts/commodities in a power plant than in a coal mine operation) An obvious solution to these problems is a computer based maintenance order entry and tracking system for power plants and coal mines The need for this was identified and quantified by UE&C in the TDP feasibility study Copies of a report dealing with this issue were provided to AID by UE&C

For cost and schedule reasons, the majority of the mechanical parts and commodities needed in both the power/heating plant and coal mine sectors could only be provided by the original equipment manufactures (OEMs) in the Former Soviet

provided by the original equipment manufactures (OEMs) in the Former Soviet Union or Commonwealth of Independent States (CIS) Making procurements in the CIS is extremely difficult and specialized procedures had to be developed to accomplish this (see section 4 1) Until the mechanical equipment for which parts are required is retired or replaced, this will always be true However, if more time and money becomes available, more procurement can be made in the U S The approximate dollar value of CIS procurement will ultimately amount to approximately $5,392,000 The dollar value of U S procurement will amount to approximately $3,147,000, including freight forwarding costs The total dollar value of the UE&C/AID contract is $10 6 million, including change orders of $500,000 and $1 3 million

The overall success of this project (which can only be qualitatively established with the passage of time) was adversely impacted by two significant events The first is the late date of contract signing (September 30, 1992, two weeks before the start of the heating season) and the second was the almost total cessation of rail freight movement in the Russian rail system There were reasons for both of these events but there proved to be precious little that UE&C could do about them

2 0 PURPOSE AND SCOPE

The purpose of the AID Grant Project to the Government of Mongolia (to the Fuel and Energy Ministry) is to assist the Mongolians in their attempt to provide reliable heat and power to the population during the 1992-1993 heating season Plans include future assistance projects for the 1993-1994 heating season and beyond Unfortunately, the funding available falls far short of the needs of the power and coal mining sectors Even though we "force ranked" all procurements with prioritized lists, all of the items on the lists were and are high priority/urgently needed items In retrospect there was probably too much attention paid to the position of the various procurement items on the lists

A major problem area was the continuing debate about how much to spend on coal mine procurements versus power and heating plant procurements The two organizations within the Ministry each made convincing arguments which had equal validity The coal mine position was that, "If you can't get coal to the power plants, you won't be able to operate them thus, there would be no heat and power" The power and heating plant position was that, "No matter how much coal you provide to the power and heating plants, if the plants are in such poor shape that they won't run, it makes no difference how much coal you deliver to the plants, there still won't be any heat or power" For the time being, the coal mine people seem to be prevailing, however both sectors still need massive assistance

UE&C's efforts have been largely devoted to making procurements in both the U S and the CIS, however some engineering and design work was required in order to accomplish the procurement tasks as will be seen in the sections that follow The project has had two mutually exclusive objectives (1) procure as much as you can in the shortest amount of time and (2) "buy American" Because of the labor and transportation cost issues, "buy American" always looks longer and was more expensive The long view is that American products are better made and will last longer and this is generally true The problem is that the Mongolian's needs are immediate, critical and massive, all of which tends to support CIS procurements Obviously, medium and long term projects are needed to compliment this short term AID project

3 0 RECOMMENDATIONS FOR EQUIPMENT AND SYSTEMS

Early in the project, the AID Mission Officer in Ulaanbaatar laid out the ground rules by which equipment procurements were to be made UE&C made evaluations of procurement needs based on site visits to the plants and discussions with O&M and Ministry personnel Later in the project, this was expanded to include similar discussion by M-K personnel with coal mine O&M and Ministry personnel The Mission officer was to be the "final approval authority" on procurements As it turned out, there were differences in priorities and project direction between the Mission Office and AID/Washington Primarily due to physical communication problems between Mongolia and the East Coast of the U S , the addition to and deletion of items from the procurement list was difficult and caused some frustration to the various parties involved

The joint power/heating plant and coal mine procurement lists were reviewed with AID and force ranked These items were put on an engineering and procurement schedule by UE&C which became a living document" as a result of numerous priority changes which, in turn, were driven by changing O&M needs and (as mentioned earlier) by conflicting objectives within the Ministry (namely, the objectives of the operating personnel and those of the procurement organizations which were not always the same)

The various procurement lists and engineering and procurement schedule are included in Attachment A

The major recommendations at this point in time are

1 Start the next procurement cycle as soon as possible, but no later than four months prior to the start of the heating season (May 15, 1993)

2 Develop prioritized procurement lists for the 1993-1994 heating season as soon as possible

3 Provide direction from either Washington or Mongolia, but not from both

4 Fund a computer based maintenance order entry and tracking system for the Ministry to use

4 0 PROCUREMENT

4 1 EQUIPMENT PROCUREMENT PROCEDURES

UE&C's procurement procedures for traditional procurements have been sent to AID previously in an earlier report transmittal These procedures are generally followed for procurement Only in extenuating circumstances were exceptions made and always with AID's written concurrence Examples include several sole source procurements such as the sole-source subcontract to Morrison-Knudson Corp (M-K) for technical assistance in the coal mine sector This, and a number of equipment sole-source procurements were made, with AID's written authorization or at AID's written direction

All U S procurements (including several from U S subsidiary companies in Europe and Japan) were purchased on a F O B factory basis UE&C's freight forwarder, AN-MAR, arranged for rail, truck, air and ocean transport, as appropriate, to Mongolia AN-MAR's transportation and related costs are included in the equipment cost numbers for U S Procurement reported elsewhere in this report

Commonwealth of Independent States (CIS) procurements were purchased F O B Mongolia (Ulaanbaatar and, in some cases, various coal mine sites) The prime reasons for this were that (1) even with AN-MAR's assistance, there were enough unknowns with which to be concerned and (2) the Ministry's procurement organizations, NUURS and Erchim Impex, both assured UE&C that making the CIS Original Equipment Manufacturer's (OEM's) responsible for rail freight had always worked in the past and was the best way to proceed

For most, but not all, CIS procurements, NUURS or Erchim Impex personnel provided UE&C with CIS OEM "contract information" (names, phone and FAX or Telex numbers, factory addresses, etc) and in many cases prior "contracts" which had been negotiated with the CIS OEM's As noted earlier in this report, these "contracts" were inexecutable because the Ministry did not have the funds to pay for the procurement items Nonetheless, the "contracts" served the project well as UE&C procurement personnel were generally able to obtain unit pricing which was lower than that contained in the "contracts "

Because of the time zone differences (generally, 7 to 8 hours), poor (and in some cases non-existent) telephone and FAX communications, and language barrier, the CIS procurements were extremely difficult The task of obtaining competitive bids was long and arduous In many cases sole-source contracts had to be negotiated UE&C ultimately was forced to send procurement personnel to Moscow to conduct negotiations and sign purchase orders (on two separate occasions) The UE&C procurement team included a purchasing agent and a project engineer who was fluent in Russian UE&C developed many valuable personal contacts in and outside of Moscow who ultimately made the CIS procurement effort successful The inclusion of UE&C's project engineer, who had lived and worked in the Soviet Union for 22 years, on the procurement team was essential to our success A number of techniques was developed by this engineer which served the project well, the most notable being the preparation of brief (1 to 3 page) "demi-purchase" orders which were split down the middle of the page, the left hand portion in English, the right hand portion in Russian To the maximum extent possible, these and other procurement documents were transmitted to the bidders in advance of UE&C's procurement team arrival in Moscow This maximized their efforts (minimized wasted time)

UE&C made a total of three separate trips to the CIS to prepare for and make CIS procurements In February 1993 the Russian railroad system became congested to the point of almost total stoppage UE&C was aware of some of the reasons for this prior to making the third procurement related trip One of the main objectives of this trip was to understand and try to alleviate some of these problems which are causing significant slippage in shipping/delivery dates Subsequent to issuing this report, UE&C will issue a brief report dealing with this situation in detail At this writing, the prime reasons for the blockage include the following (not necessarily listed in order of importance)

1 Due to the independence from central planning and control by Moscow, all of the former Soviet Republics now have their own customs and railroad systems, thus coordination and traffic problems have developed

2 There is a significant increase in trade between China and the CIS There are only three points where rail traffic can pass directly between China and Russia and all three are backed up due to the rail gauge differences between the Chinese and Russian tracks Mongolia is attempting to take some of this traffic by opening up a fourth point at the Chinese/Mongolian border

3 Relatively low level rail yard (and probably upper level) personnel are using the new conditions they find themselves operating in to insist on direct payments in order to move rail freight through the yards and other switching points

4 Vandalism and rail car (and train) hijackings occur in the road system

4 2 EQUIPMENT SHIPPING AND ACCEPTANCE PROCEDURES

4 2 1 General

The delivery procedure depends upon the source of origin and method of shipment However, all deliveries have these common elements

1 Packaging must suit the means of transport (air versus ocean and/or rail) Packaging requirements are more stringent/sturdy for ocean and/or rail shipments In either case, packaging should be suitable to protect the contents from damage from the elements

2 Packages must be properly marked, indicating AID label, country of origin, package number (1 of N, 2 of N, --N of FN), package dimension and weight, and P O Number

3 The following documentation should accompany the shipment and be forwarded ahead to the receiving party

- Bill of Lading
- Commercial Invoice
- Packing List
- Certificate of Origin
- Shipping Inspection Certificate (at origin)
- Export License (if applicable)

4 The shipment must be insured and the consignee is the Ministry of Fuel & Energy in Ulaanbaatar

4 2 2 Current Shipping and Acceptance Procedures - CIS Shipments

a Upon presentation (via FAX) of shipping documents (commercial invoice, bill of lading from rail/air/truck carrier, packing list, etc) to UE&C, UE&C does the following

1 Issues partial payment (10 to 20%) to vendors's designated bank account

2 Sends shipping documents (via FAX or express courier) to AN-MAR so that they arrange for insurance at 110% of the purchase order price AN-MAR then sends shipping documents (via FAX) to Mongoltrans

b When Mongoltrans receives shipping documents from AN-MAR, they will immediately notify both NUURS and UE&C's Jerry Paradysz

c When Mongoltrans (the "notify party") receives notification from the rail authorities that a shipment has cleared the border with Russia (or is about to do so), Mongoltrans notifies NUURS and UE&C's Jerry Paradysz of the anticipated time and location of arrival Jerry Paradysz then confirms that he will jointly inspect the shipment with the NUURS representative (hopefully Altangeral or another person fluent in English)

d Jerry Paradysz contacts the local insurance surveyor (Mrs Chulunsetseg) and attempts to have her present during the inspection

e Mongoltrans clears the shipment through customs

f The people noted above make a joint inspection and the NUURS representative receives and signs for the shipment on behalf of the Ministry of Fuel & Energy certifying that it is complete and in good condition, and provides this certification to UE&C (Jerry Paradysz) NUURS keeps a copy of this certification for the Ministry's records NOTE If there is a shortage or damage in the shipment, the insurance surveyor must file a claim to cover the loss or shortage If a claim has to be filed, the insurance surveyor must be present to make an independent inspection (**before** the packing is tampered with, **before** the shipment is moved from its arrival site and **before** the equipment is operated or used

g After the following actions have occurred, Jerry Paradysz provides UE&C, Boston (via FAX) with a copy of his signed inspection certification and the Ministry's signed receipt certification If partial shipments arrive and are inspected and signed for, those partial certifications must be FAXED to UE&C, Boston without holding them up for the balance of the shipment

h Upon receipt of the "inspection and receipt" certifications referred to above, UE&C releases the remainder of the purchase price to the vendor In cases where insurance claims are filed, UE&C will work with the insurance carrier to settle the case and release partial payments as appropriate subject to insurance requirements

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i After taking receipt of the shipments, NUURS is responsible for all remaining transportation costs

4 2 3 Current Shipping and Acceptance Procedures - U S (and other Western origin) Shipments

a Upon presentation of shipping documents (commercial invoice, bill of lading from rail/air or truck carrier, packing list, etc) to An-MAR, AN-MAR does the following

1 Arranges for insurance at 110% of the purchase order price

2 Ships the equipment/material via ocean or air and rail and/or truck

3 Provides copies of shipping documents to UE&C, Boston UE&C then pays 100% of the purchase price to the vendor

4 Sends shipping documents (via FAX) to Mongoltrans

b When Mongoltrans receives shipping documents from AN-MAR, they will immediately notify both NUURS and UE&C's Jerry Paradysz

c When Mongoltrans receives notification from AN-MAR that a shipment is due to arrive in Ulaanbaatar, Molgoltrans notifies NUURS and UE&C's Jerry Paradysz of the anticipated time and location of arrival Jerry Paradysz then confirms that he will jointly inspect the shipment with the NUURS representative (hopefully Altangeral or another person fluent in English)

d Jerry Paradysz contacts the local insurance surveyor (Mrs Chulunsetseg) and attempts to have her present during the inspection

e Mongoltrans clears the shipment through customs

f The people noted above make a joint inspection and the NUURS representative receives and signs for the shipment on behalf of the Ministry of Fuel & Energy certifying that it is complete and in good condition, and provides this certification to UE&C (Jerry Paradysz) NUURS keeps a copy of this certification for the Ministry's records NOTE If there is a shortage or damage in the shipment, the insurance surveyor must file a claim to cover the loss or shortage If a claim has to be filed, the insurance surveyor must be present to make an independent inspection (**before** the packing is tampered with, **before** the shipment is moved from its arrival site and **before** the equipment is operated or used

g After the following actions have occurred, Jerry Paradysz provides UE&C, Boston (via FAX) with a copy of his signed inspection certification and the Ministry's signed receipt certification If partial shipments arrive and are inspected and signed for, those partial certifications must be FAXED to UE&C, Boston without holding them up for the balance of the shipment

h In cases where insurance claims are filed, UE&C will work with the insurance carrier to settle the case

i After taking receipt of the shipments, NUURS is responsible for all remaining transportation costs

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4 2 4 Miscellaneous

a If shipments are received and accepted without UE&C or the insurance surveyor being present, then either NUURS or UE&C in consultation with NUURS, as applicable, must document, in writing, the reasons for noncompliance with the procedures outlined above In no cases, regardless of the circumstances, should the requirements outlined above be waived After-the-fact certification should be avoided, but may be provided in extenuating circumstances if there are no shortages or damages

b NUURS may be called on from time to time to provide additional services, such as assisting with incoming shipments (as for the commercial air charter unloading, prior to customs clearance, and delivering equipment to UE&C's Mongolian office) Their compensation for these services will be from their operating budget or via the Ministry and not by project funds

c Some of the CIS vendors wish to accompany their shipments into Mongolia to witness the inspection and receiving process Given that their final payment is tied to the successful inspection and receiving function, they have every right to do so Because NUURS is the Ministry's official representative, they must accommodate the CIS vendors in this regard This means that NUURS should expedite letters of invitation, including follow up if this task is delegated to others, which are needed for visas, and assist with suitable in-country accommodations for them Note that the CIS vendors' Mongolian expenses are for their account, not the Ministry's, UE&C's, Mongoltrans' or AIDS

d Regarding problem resolution, any difficulties should be resolved between Mongoltrans and/or NUURS and Jerry Paradysz in Mongolia If problems cannot be resolved in this manner, UE&C's Boston office should be contacted at (617) 422-5266, FAX (617) 338-6239 The personnel to contact, in order of precedence, are Rick Kelley, Phil Cabral and Paul Klisiewicz

4 3 OTHER POWER PLANT EQUIPMENT

Power plant equipment was engineered, procured and delivered in accordance with the order of priority lists for needed power plant equipment, components, replacement parts and consumable items

The order of priority in these lists were revised from time to time as problems arose and failures occurred in the plants

The work was accomplished in accordance with the funds available and allotted for the effort and resulted in the procurement and delivery of the following items

- Pulverizer gear parts
- Boiler tubing
- Bearings
- Conveyor belting
- Chemicals including Na_3PO_4, NaOH, CAC_2, Activated Coal, Cationite, NH_3

- Strip chart recording paper
- Babbitt ingots for plain bearings
- Test equipment for UE&C's start-up crew
- Satellite communications dish for UE&C's in-country office
- Computer hardware and software for UE&C's in-country office
- FAX machine for UE&C's in-country office
- Miscellaneous office equipment for UE&C in-country office
- 5K diesel generator set for UE&C's in-country office
- Two-way radios for I&C effort
- Power plant pinion bearings

The installation of all items of equipment (other than I&C components for Power Plant No 3) and use of the consumable items is the responsibility of the Ministry and various power plant management and staff UE&C does not provide field personnel to supervise or assist in this work

4 4 MINING EQUIPMENT

The engineering, procurement and delivery of mining equipment and replacement parts to assure an adequate supply of coal for the power plant was integrated into the project after the power plant effort began Based on the recommendations of UE&C's sub-contractor for technical assistance for coal mines, Morrison-Knudson Co , and Parsons-Main, Inc (under a separate contract with AID) order of priority lists for needed coal mining equipment and replacement parts were developed

The procurement and delivery of these items was accomplished in accordance with the funds available and allotted for the effort and resulted in the procurement and delivery of the following items

- A Variety of Different Diameter Wire Ropes
- A Variety of Various Widths of Conveyor Belting
- Flexible Ventilation Pipe or Ducting
- Portable Gas Detectors
- Bull Dozers
- Detonation Cord
- Copper Wire for Rewinding Motors
- House Rollers/Shafts for Draglines
- Generators for Draglines
- Excavator Compressor
- Brushes for Electric Motors
- Trailing Cable for Draglines, Excavators and Drill Rigs

- Truck Engine Spare Parts
- Excavator Spare Parts
- Locomotive Rebuilds
- Explosives
- New Excavator and Parts
- Tires and Tubes for Haul Trucks
- Vehicle Batteries for Haul Trucks
- Excavator Motors
- Dragline Bearings

The installation of the items of equipment for the coal mines is the responsibility of the Ministry, and its staff and personnel UE&C does not provide field personnel to supervise or assist in this work

4 5 INSTRUMENTATION AND CONTROLS MODIFICATIONS

4 5 1 Overview

Power Plant No 3 in Ulaanbaatar, Mongolia is designed to generate electricity and to provide hot water to the central heating system in Ulaanbaatar which provides heat during the winter time and domestic hot water all year long The plant is a coal fired plant and is built with all Russian equipment including the boilers and turbine - generators The plant has six (6) low pressure boilers, seven (7) high pressure boilers, four (4) high pressure turbines, each rated at 25 MWe, and four (4) low pressure turbines, each rated at 12 MWe

The plant provides steam to heat the water for the heating requirements of the city, industrial steam to local industry, and electrical power to the central power grid

The TDP studies performed by UE&C determined that the physical condition of Power Plant No 3 is in a deplorable state due to the lack of availability of spare parts from Russia and the lack of hard currency by the Mongolian Government to make purchases on the world market

The condition of the plant has resulted in numerous shutdowns in the recent past which resulted in loss of heat to the inhabitants of the capital city The shutdowns were caused by individual pieces of equipment failing and especially by explosions in the coal pulverizers which prepare the coal for firing in the boilers

It was determined that the explosions in the pulverizers are the result of inadequate and non-functioning instrumentation and controls which operate the entire coal feed system and the pulverizers This instrumentation should, among other things, control the amount of air used to transport the fuel and its temperature which plays an important part in the prevention of explosions in the system

Therefore, to keep this plant operational during the winter of 1992-1993, the work scope required the replacement of individual items of equipment which were on the verge of failure, the provision of urgently needed consumable items deemed necessary for plant maintenance and upkeep and the provision of instrumentation and control equipment and systems which would be integrated with and enhance the existing coal feed system to correct the cause of of, minimize or eliminate the explosions

Based on engineering studies, on-site evaluations and discussion with O&M and Ministry personnel, specific recommendations were developed to identify and reduce or eliminate the cause of explosions at Power Plant No 3 in Ulaanbaatar, The corrective actions indicated the requirement for an automatic control/instrumentation system to reduce explosion frequency and resulting down time

The recommendations and procurement plan for the work effort in the area of instruments and controls at the No 3 Power Plant are

- New transmitters to replace the current units
- Replacement motors for the damper drives
- Provide loss of coal flow alarm for feeders
- New RTDs for pulverizer outlet temperature
- New RTDs and meters to monitor transport air temperature
- New controllers for pulverizer temperature and pressure
- New damper operators for the coal pulverizing mill flow control dampers on low pressure boilers
- New scanners and cooling air fans for the high pressure boilers

The above recommendations for the work effort in the area of instruments and controls were based on the following

1 Motors are required to make the damper drives work The operator now opens and closes the pulverizer dampers by hand During meetings with power plant personnel it was stated that the gear box was in working condition but the electric motor drives did not work The pulverizer outlet pressure and temperature controls require these drives to be operational

2 RTDs and Pressure transmitters were added to provide information on the pulverizer outlet temperature If the pulverizer outlet temperature goes high, a coal explosion may occur If the temperature is low then the coal is not dry and will eventually hang up in the pulverizer coal bunker In the mean time boiler combustion efficiency will be low

3 Pulverizer outlet temperature and pressure controllers try to maintain a given setup This will not work without item one and two above

4 When the pulverizer is out of service, the transport air bypasses the pulverizer and enters the system just before the pulverizer air fan (primary air fan) An indication of the transport air temperature was not available Therefore, an RTD and indicator has been added to display this temperature to the operator

5 Low pressure boilers now have an air flow control damper which is operated manually A damper drive needs to be added to make it automatic This makes the control philosophy the same as that of the high pressure boilers and keeps the logic simple The logic needed to control or drive the hot air and tempering air dampers by both flow and temperature could be programmed using programmable logic controllers However, an attempt has been made to keep this logic as simple and inexpensive as possible

6 An alarm is not included in the existing system to alert the operator of a blockage of coal within the raw coal supply bunkers Studies show that pulverizer explosions occur during the start up or shut down of a pulverizer The operator currently does not have indication that fuel is not flowing into the pulverizer This is the first step to alert the operator The feeder controls are not automatic and upgrading them to automatic was not part of this change, but can be done at a later date as part of a control system upgrade

7 Scanners should be added to the high pressure boilers to alert the operators of the blockage of coal to the burners This would indicate a problem with the coal feeder, transport air or hang up in the pulverized coal bunker The operator on a high pressure boiler is unable to view the flame from the control room A few boilers do have furnace scanners but this would require both pulverizers to fail at the same time The scanners being added to the system are at each burner The operator will see three lights appear and will have to take the correct action to shut down the pulverizer system This information/alarm system is a first step to avoid the loss of coal and subsequent re-ignition, a major cause of explosions

8 A detailed look at the number of 1991 explosions indicates that poor operation and maintenance may be a major cause of explosions Power Plant No 3 has some boilers that had no major explosions However, pulverizer No 7A had eleven major explosions, No 1 had six and No 10A also had six explosions

In the area of the instrumentation and controls, the current modifications and changes being carried out are designed to permit expansion in the future Therefore, it is recommended that the following equipment be considered for future procurement for the boiler control systems

- Boiler drum level control
- Superheater temperature control
- Air flow control
- Furnace pressure control

These additional controls will permit the plant operators to gain control of the steam header pressure by way of the boiler master controls to enhance the current arrangement of automatic control of boiler drum level only These additional controls will permit smooth efficient automated operation of the boilers including their fuel supply and steam output

It is noteworthy that much of the controls work indicated above needs to be accomplished at other plants (especially the Darkhan Power Plant) However, even though other plant control systems are in an equally dilapidated state, UE&C focused on the No 3 Power Plant because it was the only one with severe explosion problems

4 5 2 Existing Conditions

The current control system offers little more than a remote indication of the boiler operation UE&C reviewed the operation of the ball mill coal pulverizers in an attempt to reduce the number of explosions based on 1991 data

Project funding available for controls improvement was projected to be on the order of $750,000 for 1992 Funds were not available for improvements at the Darkhan Power Plant The approach to this limited project scope was to furnish some basic devices to alert the operator of problems and provide basic control of the pulverizer systems

Steam generators in operation in the United States normally have a burner management system (BMS) which requires the operator to follow a fixed and safe procedure to start a boiler Predetermined safety logic and controls are the heart of these systems Such a system will also stop fuel flow to the boiler, if a predetermined unsafe condition is found During the review of the plant in Mongolia, it was found that the Russian designed systems required a fifteen minute purge of the boiler A boiler in the United States would normally require five minutes for purge During this purge period fuel cannot be fired and fuel valves have to be proven closed The boilers at Power Plant No 3 had a BMS at some point The high pressure boilers still have flame scanners which view the furnace flame However, the fuel trip valves no longer operate Except for the remains of the fuel trip valves on the low pressure boilers, little remains of the safety system The boiler operator is left to start the boiler with as much or as little safety as he or she believes is necessary The plant has a basic training course available, but the skill of the operator is a part of the overall problem A fixed start-up sequence would improve safety, but would also cause boiler trips

Installation of a complete burner management system for every boiler cannot be considered at this time because the cost of one complete burner management system would deplete the available funds

The plant (I&C) staff makes every attempt to keep the indicators on the control board operational However, new transmitters are required to provide a workable system The motor operators on the damper drives are in very poor condition and require new motors to be able to operate the system from the control board The basic control philosophy is similar to current United States coal boilers, however, these boilers are not in automatic control due to spare parts problems It is not a question of buying spare parts for the current control system The manufacturing of the damper drive motors was discontinued some fifteen years ago by the Russians The Mongolians will have to adapt motors of the same horsepower and electrical characteristics but with different shaft and mounting dimensions

The existing control systems are similar to systems manufactured in the United States during the fifties and sixties Unfortunately, some of these systems had to be changed because of lack of spare parts An example of the difference in control philosophy would be boiler drum level control While the basic control logic is the same, a United States power plant will normally have three or more ways to monitor drum level in the control room On the high pressure boilers in the Mongolian plant only one way is available which is the pen chart recorder If this one level indicator goes bad the operator is blind to a possible problem

The high pressure boilers are monitored from two (2) remote control rooms which also control/monitor the high pressure turbine-generators The low pressure boilers are monitored from local control boards or panels located at the burner fronts on the main operating floor

4 5 3 Description of Modifications

Below is a description of the modifications and changes to pulverizer controls to be implemented by the UE&C team in Mongolia These changes represent the "bare minimum" needed to obtain automatic control of key combustion systems These modifications will not only improve safety and reliability, they will also result in higher combustion efficiency This in turn will result in obtaining more steam per pound of coal consumed

1 Install flame scanners on all burners on the seven (7) high pressure boiler furnaces This system will consist of one (1) cooling air blower unit, forty-two (42) flame scanners, and two (2) free standing control panels or Main Logic Cabinets (MLC)

a The cooling air blowers will consist of (2) 100% blowers and two (2) 380 VAC 50 Hz motors which require 40 amp power sources from existing plant motor control centers This blower unit will be a pre-wired free standing package The only field wiring will be from the power sources, from the fan output low pressure switches to the fan output low pressure annunciator lamp, and to the fan A or B running annunciator lamps Also required will be a cooling air header approximately six (6) inches in diameter This header will service all seven (7) boilers and will be approximately 165 meters total length

The approximately two (2) inch cooling air connections to the scanners will be tied into the cooling air header

b The forty-two (42) flame scanners will be installed one (1) on each burner, six (6) per boiler The scanners will be mounted with a sight path through the secondary air chamber in a configuration to minimize unwanted signal detection from adjacent or opposite burners This system will require field wiring from each scanner to the MLC units

c The control panel MLCs will be mounted in the two (2) respective control rooms of the high pressure portion of the plant These panels will require a 220 VAC, 50 Hertz, 5 amp power source Other field wiring to these cabinets is from the cooling air blowers, the flame scanners, and the pulverizer coal flow detectors

This part of the system will provide remote flame condition to the operators in the control room Among the benefits will be the elimination of burners overheating and glowing cherry red due to flame/air system failure without the operators being aware of this condition (observed by the UE&C survey team during the TDP study)

2 Install twenty (20) coal flow detectors on the raw coal feed chutes to the pulverizers for the seven (7) high pressure and six (6) low pressure boilers

These detectors will be Kay-Ray nuclear flow detectors Each detector will require 220V ac, 50 Hz power sources Each detector in the high pressure boiler system will require wiring between the detectors and the MLC panels to operate the flow/no flow annunciator lamps Each detector in the low pressure boiler system will require wiring between the detectors and the flow/no flow annunciator lamps in the low pressure boiler control panels

3 Install coal pulverizer automatic pressure and temperature controls for the high and low pressure boilers There is one (1) pulverizer per boiler in the low pressure boiler system and two (2) pulverizers per boiler in the high pressure boiler system

Each pulverizer will require a temperature and a pressure controller, plus a temperature indicator which will be used to indicate the temperature at the inlet side of the primary air fan for each boiler

The controllers and indicators for the high pressure boiler system will be in a free standing panel that will require a 220V ac, 50 Hertz power source Interconnecting wiring will be required between the resistance temperature detectors (RTD's) and the temperature controllers and indicators Interconnecting wiring will also be required between the pressure transmitters and the pressure controllers The output of the controllers will require wiring to the pulse relays necessary to energize the drive motors on the associated damper actuators

4 Install air damper control drive units for low pressure boilers The existing damper controls are manual drive units which are not suitable for automatic control

4 5 4 Installation Plan

The controls will not replace but will be in addition to the current equipment in the high pressure boiler control rooms and on the low pressure boiler panel boards

Low Pressure Boilers The new controllers and indicators will be mounted in a section of the panel which is not currently used This should permit the installation of the equipment, with the boiler on line The pulverizer fan temperature controls will be mounted in a common section of the panel Each control board is located between two boilers, with a portion of the board dedicated to the control of each boiler A section in the middle of the two individual boiler portions has common instrumentation for both boilers

The power supplies and temperature transmitters will be mounted in an unused section within the control board

The current indication of pulverizer outlet pressure and temperature will remain as is In some cases these indicators work The new controllers will also indicate the pressure and temperature, which will provide the operator with two readings

High Pressure Boilers The instrumentation and controls by Moore Products Co will be mounted in a new rack located in each of the two control rooms This will permit the installation of the equipment to be completed without any impact to the boilers in operation

The scanners arrangement will be similar, with a new cabinet located and wired without impact on the boilers in operation The current furnace scanners (as opposed to burner scanners) which view the overall furnace condition can be left in place The new scanners will be mounted on each burner to indicate the loss of individual burner flame (not currently possible)

The boiler will have to be off-line for several hours when the scanners, RTD's and pressure connections are made to each pulverizer The wiring can be completed with the boilers on line

4 5 5 Testing/Check-Out Procedures

The in-country UE&C team of test and start-up I&C engineers will supervise and instruct the power plant operations staff regarding installation, testing, checkout, and operation of instrumentation and control system modifications This effort will include O&M training

The work shall include

1 Check shaft and coupling alignment for all motor driven equipment

2 Check/confirm that all power wiring to motor drives is properly installed, including proper wire gauge

3 Check/confirm that all motor drives are properly grounded

4 For each motor drive, check that any unconnected wires which may terminate in the motor housing are properly taped and insulated and protected from shorting to the motor housing or other adjacent wiring

5 Check that all motor drive junction box housings are properly gasketed and tightly closed to meet environmental integrity requirements

6 For each motor drive check that all conduit connections are secure and meet environmental integrity requirements

7 Check that each motor circuit is individually protected by fuse or circuit breaker of proper value

8 Megger test all power wiring for insulation integrity

9 Assure that motor drive and driven equipment are free to turn

10 Assure that motor drive/driven equipment is "unloaded" (or at minimum load) for initial start

11 For each motor drive, set selector switches (as applicable) to local manual control mode

12 Power up each motor circuit individually and check for short circuits and blown fuses or circuit breakers

13 At the local control pushbutton station, individually "bump" each motor drive to confirm proper wiring connections and motor rotation

14 For each motor drive set selector switch to remote control mode and repeat "bump" operation to confirm proper wiring connections and motor rotation

15 For each motor drive, confirm that start/stop pushbuttons, remote/local and manual/auto select switches, and run/stop light indications are functional and proper

16 Check all linkage/mechanical connections between actuators and driven dampers, valves, etc and confirm operating clearances

17 Assure that actuator and driven equipment are free to stroke through the complete operating range

18 Check/confirm that all power wiring to actuators is properly installed, including proper wire gauge

19 Check/confirm that all signal wiring to actuators is properly installed, including proper wire gauge and shielding

20 Check/confirm that all actuators are properly grounded

21 For each actuator, check that any unconnected wires which may terminate in the actuator housing are properly taped and insulated and protected from shorting to the housing or other adjacent wiring

22 Check that all actuator junction box housings are properly gasketed and tightly closed to meet environmental integrity requirements

23 Check that each actuator control loop is individually protected by fuse or circuit breaker of proper value

24 Megger test all actuator power and signal wiring for insulation integrity

25 Assure that actuator and driven equipment are "unloaded" (or at minimum load) for initial start,

26 For each actuator, set selector switches (as applicable) to local manual control mode

27 Power up each actuator (power) circuit individually and check for short circuits and blown fuses or circuit breakers

28 At the local control station individually stroke each actuator through its operating range to confirm proper wiring connections and response to increase/decrease signal inputs

29 For each actuator, set selector switch to remote manual control mode and repeat actuator stroking through its operating range to confirm proper wiring connections and response to increase/decrease signal inputs

30 For each actuator, confirm that increase/decrease pushbuttons, remote/local and manual auto select switches, control panel indications including increase/decrease light indications and analog input/output feedback displays, and limit switch operation are functional and proper

31 Check mechanical installation of temperature transmitters, including thermowell for location and compatible length of transmitter sensor

32 Confirm that temperature transmitter range is compatible with process requirements

33 Confirm temperature transmitter calibration per manufacturers test instructions

34 Check temperature transmitter signal wire connections

35 Confirm that signal wire shielding connection is not terminated at the temperature transmitter

36 Confirm that signal wire shielding connection is properly terminated at the control panel

37 Confirm that signal wire from the temperature transmitter is connected to the proper terminals in the control panel

38 Confirm that temperature transmitter conduit connections are secure and meet environmental integrity requirements

39 Confirm that temperature transmitter mounting is secure and free from vibration

40 Check mechanical installation of pressure and differential pressure transmitters, including root isolation valves for each process connection

41 Confirm that all pressure instrument sensing lines are continuously "sloped" toward the instrument in accordance with manufacturer's requirements

42 Confirm that all pressure instruments include local process sensing instrument isolation and drain valves

43 Confirm that all differential pressure instruments additionally include local equalization valves

44 Confirm that pressure and differential pressure transmitter ranges are compatible with process requirements

45 Confirm pressure and differential pressure transmitter calibration per manufacturers test instructions

46 Check pressure and differential pressure transmitter signal wire connections

47 Confirm that signal wire shielding connection is not terminated at the pressure and differential pressure transmitters

48 Confirm that signal wire shielding connection is properly terminated at the control panel

49 Confirm that signal wire from the pressure and differential pressure transmitters are connected to the proper terminals in the control panel

50 Confirm that pressure and differential pressure transmitter conduit connections are secure and meet environmental integrity requirements

51 Confirm that pressure and differential pressure transmitter mountings are secure and free from vibration

52 Place all final control elements in manual mode and start system

53 Check system operation in manual mode (pressure, temperature, flow modulation response)

54 Transfer system from manual mode to automatic mode, loop by loop, while observing that system operation is proper

55 Modify system control parameters, as necessary, to achieve proper automatic operation

56 Select and start a scanner cooling/purging air blower

57 Confirm that the blower logic system indicates the correct running status of the operating blower and the correct shutdown status of the stand-by blower

58 Shutdown the operating low scanner air blower and confirm that a low discharge pressure will initiate the start-up of the stand-by blower

59 Confirm that the blower logic system indicates the correct running status of the stand-by blower and that an alarm has sounded to indicate the blower failure and transfer

60 Repeat steps 56 through 59, but select and start the opposite scanner air blower first

61 Leave one scanner air blower running

62 For each boiler, turn on scanner cooling/purging air at each burner

63 Establish each burner in operation in turn and determine that scanners in other non-operating burners do not sense flame

64 Adjust scanner sighting and sensitivity to reliably monitor associated operating burner flame

65 Simulate a no flame condition and allow the flame monitor logic system to sound alarm and indicate flame fault for the specific burner being tested

66 When all burners are operating, confirm that the logic system indicates the individual burner operate status

67 When all burners are shutdown, after having operated, confirm that the logic system indicates the shutdown status

68 Repeat steps 62 through 67 at each boiler for all burners

4 5 6 Acceptance Schedules

All I&C equipment will have been delivered to Mongolia by early March 1993 UE&C is currently assisting the Mongolians with the installation work The projected delivery dates of remaining components will support ongoing efforts to successfully complete this portion of the project

Due to the many special language, cultural, work ethic and technical skill problems associated with this project, the possibility exists that all of the planned work will not be accomplished by the end of March or mid-April when the team is currently scheduled to leave Mongolia If necessary and funds are available, the UE&C team can be extended beyond that The key is to automate the pulverizer controls on as many high pressure and low pressure boilers as possible within remaining schedule and budget constraints

The team is training the Mongolians in the installation and operation of these control systems so that they can successfully complete the installation of any pulverizer systems on boilers which might not be completely installed by the time the team leaves Mongolia Unfortunately, it is not possible to know how long it will take to convert all pulverizer controls to automatic until after the first low pressure and high pressure boiler are completed If this project were being performed in the United States, it would take approximately 10 to 12 weeks (including unit outages of one to two days for tie-ins and check-out of each boiler, one at a time) Given the uncertainties which exist on this project, only after the first several units are converted will we be able to make reliable schedule projections However, we expect that a minimum of half of the high pressure and low pressure pulverizer systems will be completed by the end of March or mid-April

It is UE&C's opinion that the installation of the envisioned pulverizer control systems will leave the Mongolians with a favorable impression of what United States technology can do for them and allow them to build on and enhance these control systems as additional funding and projects develop

APPENDIX A

PROCUREMENT LISTS

AND

ENGINEERING AND PROCUREMENT SCHEDULE

ITEM	SPEC No	DESCRIPTION / USE LOCATION	RESP DISCPLN	EST COST ($1000)		SOURCE COUNTRY	SHIP DATE	ON SITE DATE	SHIPING MODE	STATUS/COMMENTS
	COAL MINE PROCUREMENTS			FOB UB	FOB Factory					
1 1A	7419	52 MM DIA WIRE ROPE	PDC		S					Purchased In Russia
	002				F	RUSSIA	28 Feb 93	21 Mar 93		Shipment Slipped to Continued Rail Problems
	5029	BAGGA NUUR MINE	MECH	54	A					
1 1B	7419	52 MM DIA WIRE ROPE	PDC		S					Made Air Charter Received Inspected and Complete
	002				F	U S	-		AIR	
	5029A	BAGGA NUUR MINE	MECH	12 5	A		18 Dec 92	20 Dec 92		
1 2	7419	1600 MM WIDE CONVEYOR	PDC		S					
	002	BELT			F	RUSSIA			RAIL	Belting Shipped 12/26/92 Received Inspected and Complete
	267 3	BAGGA NUUR MINE	MECH	69	A		26 Dec 92	7 Jan 93		
1 3	7419	FLEXIBLE VENTILLATION	PDC		S					Partial Shipment Made Air Charter
	002	PIPE or DUCTING			F	U S			AIR	Balance Shipped via Ocean
	225 1	NILAHAH MINE	MECH	34 9	A		18 Dec 92	20 Dec 92		
1 4	7419	MULTI STAGE WATER PUMP	DEH		S					P O was Placed
	002	AND MOTOR			F	RUSSIA	24 Feb 93	10 Mar 93	RAIL	
	238 1	NILAHAH MINE	MECH	25	A					
1 5	7419	PORTABLE GAS	MAD		S					This Is a Temporary/Portable System Not the Permanent/
	002	DETECTORS			F	U S		17 Feb 93	AIR	Stationary System Originally Planned
	252 10	NILAHAH MINE	I & C	25	A		8 Feb 93			Ship via Air Contains Labeled (Hazardous) Cargo
1 6	7419	BULL DOZERS	PDC		S					Bulk of Equipment is in country
	002				F	U S			OCEAN/	
	400 1	SG or LOCAL MINES?	MECH	714	A		20 Nov 92	22 Jan 93	RAIL	
1 7	7419	ZIPPER SPLICES	PDC		S					Inquiry Forwarded Bids Received Item Deleted from Priority List
	002			10	F	U S	ITEM DELETED			
	267 4		MECH		A					
1-8	7419	LOCOMOTIVE BATTERIES	SCA		S					P O Cancelled due to Project Funding and Transport Issues
	002			18	F	U S	ITEM DELETED		AIR	(Weight limits on air shipments)
	137 2		ELEC		A	RUSSIA				
1 9	7419	COPPER WIRE FOR RE	SCA		S					P O Placed to US Manufacturer
	002	WINDING MOTORS			F	U S	2 Mar 93	10 Mar 93	AIR	
			ELEC	21	A					
1 10	7419	HOUSE ROLLERS/ SHAFTS	PDC		S					Rail Problems Cited
	002	ESH 15/90 DRAGLINE			F	RUSSIA	28 Feb 93	21 Mar 93		
	400 10		MECH	75	A				RAIL	
1 11	7419	HARD FACING WELD RODS	PDC		S					Inquiry forwarded Bids Received Item deleted from Priority List by FEM
	002			4	F	U S	ITEM DELETED		AIR	
	400 12		MECH		A					

ITEM	SPEC No	DESCRIPTION USE LOCATION	RESP DISCPLN	EST COST ($1000)		SOURCE COUNTRY	SHIP DATE	ON SITE DATE	SHIPING MODE	STATUS/COMMENTS
1 12A	7419	GENERATOR FOR	PDC		S					Estimated Best Del Date
	002	DRAGLINE			F		28 Mar 93	18 Apr 93		
		ESH 10/70	MECH	110	A	RUSSIA			RAIL	
1 12B	7419	GENERATOR FOR	PDC		S					Estimated Best Del Date
	002	DRAGLINE			F	RUSSIA	15 Mar 93	5 Apr 93		To be Confirmed at P O Placement
		ESH 20/90	MECH	100	A				RAIL	
1 13	7419	DOZER TRACKS	PDC		S					P O Unlikely Insufficient Funds and
	002			78	F	RUSSIA	ITEM DELETED			Letter of Credit Issue
	400 11		MECH		A				RAIL	
1 14	7419	BRUSHES FOR ELEC	PDC		S					Estimated Best Del Date
	002	MOTORS		9	F	RUSSIA	28 Feb 93	21 Mar 93		To be Confirmed at P O Placement
			MECH		A				RAIL	
1 15A	7419	EXCAVATOR COMPRESSOR	PDC		S					Insufficient Funds
	002	FOR ESH 10/70 13/50 6 5/45		6 1	F	RUSSIA	ITEM DELETED			
			MECH		A					
1 15B	7419	EXCAVATOR COMPRESSOR	PDC		S					Insufficient Funds
	002	FOR EKG 8I		3	F	RUSSIA	ITEM DELETED			
			MECH		A					
1 15C	7419	EXCAVATOR COMPRESSOR	PDC		S					Estimated Best Del Date
	002	FOR EKG 4 6 EKG 5A			F	RUSSIA	28 Feb 93	21 Mar 93		To be Confirmed at P O Placement
			MECH	2 1	A					
1 16	7419	DUMP CAR PARTS	PDC		S					Item deleted due to insufficient funds Vendor Contact Difficultly and position on Priority List
	002			33	F	POLAND	ITEM DELETED			
			MECH		A					
1 17	7419	BLAST INITIATION SYSTEM	PDC		S					
	002	MATERIALS			F	U S	8 Feb 93	25 Feb 93		
		(DETONATION CORD)	MECH	10 6	A					
2 1	7419	BALANCE OF WIRE ROPE	PDC		S					Partial Shipment Made Air Charter (39mm)
	002	VARIOUS SIZES			F	US	28 Feb 93	21 Mar 93	RAIL	Balance Scheduled to Ship from Russia by Rail on 2/28/93
	5026	BN SG & NILAHAH MINES	MECH	174 14	A	RUSSIA				Rail Problems Cited for Delivery Slippage
2 2	7419	TRAILING CABLE	SCA		S					Includes cabling for Installation of Instrumentation Components for Power Plant 3
	002	125 000 lb 13 Spools			F	U S			AIR	Partial Shipment Made Air Charter Balance Shipped via Ocean
	113 1	BN & SG MINES	ELECT	315 5	A		18 Dec 92	20 Dec 92		
2 3	7419	BALANCE OF CONVEYOR	PDC		S					
	002	BELTS VARIOUS WIDTHS			F	RUSSIA			RAIL	Belting Shipped 12/26/92 from Russia Received Inspected and Complete
	267 2	BN SG & NILAHAH MINES	MECH	269	A		26 Dec 92	7 Jan 93		

ITEM	SPEC No	DESCRIPTION USE LOCATION	RESP DISCPLN	EST COST ($1000)		SOURCE COUNTRY	SHIP DATE	ON SITE DATE	SHIPING MODE	STATUS/COMMENTS
2 4	7419	COAL CRUSHER PARTS	PDC		S					Supplier Failed to Provide Good Faith Bid Ministry Subsequently Arranged to
	002			0	F	RUSSIA			RAIL	Receive Parts via Trade Barter Arrangement
	400 4	SHARIN GOL MINE	MECH		A			N/A		Item deleted from list
3 1	7419	TRUCK ENGINE SPARE	PDC		S					Best Delivery Date Quoted by Supplier
	002	PARTS			F	RUSSIA	26 Mar 93	16 Apr 93	RAIL	
	5027	BN&SG MINES	MECH	219 6	A					
3 2	7419	EXCAVATOR SPARE	PDC		S					PARTS ON SITE via off Project Arrangements between Ministry and Supplier
	002	PARTS ESH 20/90 & 15/90		0	F	RUSSIA		NA		Item deleted from list
	400 2	BAGGA NUUR MINE	MECH		A					
3 3	7419	EXCAVATOR SPARE PARTS	PDC		S					Shipment Released with Corporate Guarantee 2/1/93 (Partial)
	002	ESH 10/70 13/50 & 6 5/45			F	RUSSIA	1 Feb 93	26 Feb 93	RAIL	Balance to Ship 2/15/93
	400 8	BN & SG MINES	MECH	421	A					
3-4	7419	LOCOMOTIVE REBUILDS	PDC		S					Major Overhaul in Russia
	002	DIESEL ELECTRIC			F	RUSSIA	N/A	26 Feb 93	RAIL	
	400 9	SHARIN GOL MINE	MECH	175	A					
3 5	7419	EXPLOSIVES	DEH		S					Vendor Has Slipped Shipping Date from Contracted Date
	002				F	RUSSIA	12 Feb 93	5 Mar 93	RAIL	Due to Rail Problems
	400 6	BN & SG MINES	MECH	570	A					
3-6	7419	NEW EXCAVATOR & PARTS	PDC		S					ESH-8I has been delivered via off project arrangements between Ministry & supplier
&	002	EKG 5A 10011 5112		270	F	RUSSIA			RAIL	EKG 5A purch as indicated and deliv to border 12/29/92 Models 10011 & 5112 to be ordered
3-6A	400 7	SG & LOCAL MINES	MECH	650	A		15 Dec 92	4 Jan 93		Expect 2/20/93 Ship Date On Site 3/13/93
3 7A	7419	TIRES & TUBES	RMS		S					Purchase Subject to Additional Funding and Negotiation of Terms & Conditions
	002			135	F	RUSSIA	ITEM DELETED		RAIL	Item Deleted due to Lack of Funds & Letter of Credit Issue
	5028	MINE	MECH		A					
3 7B	7419	TIRES & TUBES	RMS		S					Partial Shipment made Air Charter (174 Tires)
	002				F	U S			AIR	Balance shipped via ocean (26 Tires)
	5028	MINE	MECH	150	A		18 Dec 92	20 Dec 92		
3-8	7419	VEHICLE BATTERIES	SCA		S					Partial Shipment made Air Charter (200 182 AMP HR Batteries)
	002				F	U S			AIR	Balance to ship via ocean (290 75 and 132 AMP HR Batteries)
	137 1	MINES	ELECT	49	A		18 Dec 92	20 Dec 92		
3 9	7419	EXCAVATOR MOTORS	PDC		S					Entire Order to Ship at one time Shipment Slipped due to Rail Problems
	002				F	RUSSIA	28 Feb 93	21 Mar 93	RAIL	P O Modified due to Vendor Manuf /Delivery Problems with Item 6 of 6
	128 1	BN & SG MINES	MECH	563 4	A					
3 10	7419	DRILL RIG 1 EA	DEH		S					
	002	DIESEL		0	F	US		N/A		ITEM DELETED
	400 5	LOCAL MINES	MECH		A					NOT INCLUDED W/ FORECAST OF EXPENDITURES

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ITEM	SPEC No	DESCRIPTION USE LOCATION	RESP DISCPLN	EST COST ($1000)		SOURCE COUNTRY	SHIP DATE	ON SITE DATE	SHIPING MODE	STATUS/COMMENTS
3 11	7419	DRAG LINE BEARINGS	PDC		S					
	002				F	RUSSIA	28 Feb 93	21 Mar 93	RAIL	Vendor has slipped ship date due to railroad problems
	400 3	BAGGA NUUR MINE	MECH	4	A					
			75%	4025 8		RUSSIA COAL SECTOR				
			25%	1357 9		U S COAL SECTOR				
				5383 7		TOTAL COAL SECTOR				

ITEM	SPEC No	DESCRIPTION / USE LOCATION	RESP DISCPLN	EST COST ($1000)		SOURCE COUNTRY	SHIP DATE	ON SITE DATE	SHIPING MODE	STATUS/COMMENTS
		POWER PLANT PROCUREMENTS	FOB	FOB						
			UB	Factory						
1 1	7419	TRANSMITTERS FOR	WEC		S					Shipment Made Air Charter
	001	PC MILLS			F	U S			AIR	
	252 1	PP 3	I & C	w/1 4	A		18 Dec 92	20 Dec 92		
1 2	7419	RTD s	WEC		S					
	001	FOR PC MILS			F	U S	8 Feb 93	17 Feb 93	AIR	Ship via Air
	252 2	PP 3	I & C	w/1-4	A					
1 3 A	7419	MISC AC MOTOR DRIVES	WEC		S					Partial Shipment
	001	FOR PC MILLS			F	U S	8 Feb 93	17 Feb 93	AIR	via Commercial Air
	252 3	PP 3	I & C	25	A					From U S Balance from Germany Ship 2/8/93
1 3B	7419	MISC DC MOTOR DRIVES			S					Ship via Commercial Air
	001	FOR PC MILLS		20	F	US	8 Feb 93	17 Feb 93	AIR	(Partial Order balance Later)
	252 8	PP 3			A					
1 4	7419	CONTROLLERS FOR PC	WEC		S					Partial Shipment Made Air Charter
	001	MILLS			F	U S			AIR	Balance to Ship via Commercial Air on 2/8/93 (Power Supplies)
	252 4	PP 3	I & C	188	A		18 Dec 92	20 Dec 92		On Site 2/15/93
1 5	7419	FEEDER ALARMS FOR	WEC		S					Ship Via Commercial Air & Charter
	001	PC MILLS			F	U S	8 Feb 93	17 Feb 93	AIR	
	252 5	PP 3	I & C	43	A					
1 6	7419	DAMPER DRIVES FOR	WEC		S					These Drive Units Made First Air Charter
	001	PC MILLS			F	U S			AIR	
	252-6	PP 3	I & C	64	A		18 Dec 92	20 Dec 92		
1 7	7419	SCANNERS FOR PC	WEC		S					
	001	FIRING			F	U S	8 Feb 93	17 Feb 93	AIR	Scanners & Special Cable Ship via Commercial Air & Charter
	252 7	PP 3	I & C	129	A					Cabinets and Fans will Ship Later
1-8	7419	PULVERIZER GEAR PARTS	PDC		S					Not Enough Funds for
	001				F	RUSSIAN	31 Mar 93	21 Apr 93		6 Pairs Requested Must Prioritize Reqts
			MECH	78	A					2 Pairs Purchased
1 9	7419	ROLLER CRUSHERS	PDC		S					P O Not Executed Due to Long Lead Time (6 Months)
	001	FOR NO 4 P O		170 --	F	RUSSIAN	ITEM DELETED			
			MECH		A					
1 10	7419	ID FAN IMPELLERS	PDC		S					Estimated Best Del Date
	001	(WHEELS) FOR NO 4 P P			F	RUSSIAN	15 Jun 93	6 Jul 93		
			MECH	34	A					

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ITEM	SPEC No	DESCRIPTION USE LOCATION	RESP DISCPLN	EST COST ($1000)		SOURCE COUNTRY	SHIP DATE	ON SITE DATE	SHIPING MODE	STATUS/COMMENTS
1 11	7419	PULVERIZER DRIVE	PDC		S					Estimated Best Del Date
	001	PINION BEARINGS FOR			F	RUSSIAN	5 Mar 93	26 Mar 93		
		NO 4 P O	MECH	10 6	A					
2 1A	7419	BOILER TUBING	RMS		S					
	001				F	U S			AIR	Part of Shipment Made Air Charter
	211 1	PP 4 3 2 D & E 73 M TONS	MECH	147	A		18 Dec 92	20 Dec 92		Balance of Shipment will Ship via Ocean
2 1B	7419	BOILER TUBING	RMS		S					Vendor Slipped Shipment from Scheduled 12/20/92 Date
	001				F	RUSSIAN		15 Feb 93	RAIL	First Shipment Made 1/26/93
	211 1	PP 4 3 2 D & E 914 TONS	MECH	964	A		26 Jan 93			
2 2	7419	BEARINGS 40 TYPES	RMS		S					Shipment Delayed due to Rail Problems
	001				F	RUSSIAN	26 Jan 93	26 Feb 93	RAIL	
	259 3	PP 3	MECH	62	A					
2 3	7419	BEARINGS	RMS		S					
	001	COMBINED WITH 2 2 ABOVE		INCL.	F	RUSSIAN				
	259 3		MECH	W/ 2 2	A					
2 4	7419	AC MOTORS 3 EA	RMS		S					No longer made Substitutes for this heating season unlikely
	001	COMBINED WITH 2 13 BELOW		INCL. INCL.	F	RUSSIAN				
	128 1		MECH	W/ 2 13	A					
2 5	7419	AC MOTOR 1 EA	RMS		S					No longer made Substitutes for this heating season unlikely
	001	COMBINED WITH 2 13 BELOW		INCL. INCL.	F	RUSSIAN				
	128 1	PP 3	MECH	W/ 2 13	A					
2-6	7419	CONVEYOR BELTING			S					Shipment Made on 12/26/92 Received Inspected and Complete
	001	PARTS & MATERIAL			F	RUSSIAN			RAIL	
	267 1	D PP		281	A		26 Dec 92	7 Jan 93		
2 7A	7419	NA3PO4	RMS		S					RECEIVED QUOTE P O PLACED
	001	60 Tons			F	RUSSIAN	30 Mar 93	16 Apr 93	RAIL	
	213 1	PP 4 3 2 D E & C	MECH	9 8	A					
2 7B	7419	NAOH	RMS		S					RECEIVED QUOTE P O PLACED
	001	60 Tons			F	RUSSIAN	30 Mar 93	16 Apr 93	RAIL	
	213 2	PP 4 3 2 D E & C	MECH	30 9	A					
2 7C	7419	CAC2	RMS		S					Item Deleted
	001			0	F	RUSSIAN			RAIL	
	213 3	PP 4 3 2 D E & C	MECH		A					
2 7D	7419	ACTIVATED COAL	RMS		S					RECEIVED QUOTE P O PLACED
	001	50 Tons			F	RUSSIAN	30 Mar 93	16 Apr 93	RAIL	
	213-4	PP 4 3 2 D E & C	MECH	65	A					

ITEM	SPEC No	DESCRIPTION USE LOCATION	RESP DISCPLN	EST COST ($1000)			SOURCE COUNTRY	SHIP DATE	ON SITE DATE	SHIPING MODE	STATUS/COMMENTS
2 7E	7419	CATONITE	RMS			S					P O PLACED
	001	40 Tons				F	RUSSIAN	30 Mar 93	16 Apr 93	RAIL	
	213 5	PP 4 3 2 D E & C	MECH	95 2		A					
2 7F	7419	NH3	RMS			S					RECEIVED QUOTE P O NOT PLACED
	001	TREATING BED MEDIA		0		F	RUSSIAN			RAIL	
	213-6	PP 4 3 2 D E & C	MECH			A					
2-8	7419	DISTRICT HEAT	RMS			S					Item Deleted from Priority List
	001	EXCHANGERS 2 EA		84		F	RUSSIAN	ITEM DELETED		RAIL	
	233 1	D PP	MECH			A					
2 9	7419	STRIP CHART	RMS			S					Made First Air Charter
	001	RECORDING PAPER				F	U S			AIR	
	5005	PP 4 3 & D	MECH		80	A		18 Dec 92	20 Dec 92		
2 10	7419	BABBITTT INGOTS FOR	RMS			S					
	001	PLAIN BEARINGS				F	U S				Arrived In UB 12/14/92
	19 1	PP 4 & 3	MECH		14	A			29 Dec 92		Delivered 12/29/92
2 11	7419	MOTOR OPERATED	RMS			S					Item Deleted from Priority List
	001	REDUCING GEAR 25 EA		38		F	RUSSIAN	ITEM DELETED		RAIL	
		PP 3	MECH			A					
2 12	7419	MOTOR OPERATED	RMS			S					Item Deleted
	001	REDUCING GEAR 10 EA		8		F	RUSSIAN			RAIL	
		PP 3	MECH			A					
2 13	7419	AC MOTORS 4 EA	RMS			S					No Longer Made Substitutes for this heating season unlikely
	001			0		F	RUSSIAN		N/A	RAIL	NOT INCLUDED W/ FORECAST OF EXPENDITURES
	128 1	PP 4 & D	MECH			A					
2 14	7419	100 KW DIESEL GENER	SCA			S					Purchase Is highly unlikely due to delivery problems
	001	SETS 50 EA			0	F	U S		N/A	OCEAN	NOT INCLUDED W/ FORECAST OF EXPENDITURES
		LOCAL/REMOTE LOCALS	ELECT			A					
			68%	1807 9			RUSSIA POWER SECTOR				
			32%		832 6		U S POWER SECTOR				
					2640 5		TOTAL POWER SECTOR				

ITEM	SPEC No	DESCRIPTION / USE LOCATION	RESP DISCPLN	EST COST ($1000)		SOURCE COUNTRY	SHIP DATE	ON SITE DATE	SHIPING MODE	STATUS/COMMENTS
		GENERAL PROCUREMENTS		FOB Factor	FOB Factory					
G 1		FREIGHT FORWARDING	RHK		S					
		COMPANY		1050	F	U S				
					A			NA	NA	
G 2		RUSSIAN PROCUREMENT	RHK		S					
		REP / AGENT		0	F	RUSSIAN		NA	NA	Item Deleted
		ENERGOMONTAGE			A					
G 3	7419	SATELLITE COMMO DISH	REM		S					
	001				F	U S				Arrived in UB 12/14/92
	5015	FOR IN COUNTRY OFFICE	MECH	27	A			29 Dec 92		Delivered 12/29/92
G 4	7419	COMPUTER HDW & SFW	REM		S					
	001				F	U S				Arrived in UB 12/14/92
	5017	FOR IN-COUNTRY OFFICE	MECH	9	A			29 Dec 92		Delivered 12/29/92
G 5	7419	FAX MACHINE	REM		S					
	001				F	RUSSIAN				In UB
	5025	FOR IN COUNTRY OFFICE	MECH	1	A			9 Nov 92		
G-6	7419	PHOTOCOPIER	REM		S					
	001				F	RUSSIAN				In UB
	5024	FOR IN COUNTRY OFFICE	MECH	5	A			9 Nov 92		
G 7	7419	STANDBY DIESEL GEN	REM		S					
	001	SET 5 KW			F	U S				Arrived in UB 12/14/92
	5019	FOR IN-COUNTRY OFFICE	MECH	1	A			29 Dec 92		Delivered 12/29/92
G 8	7419	TEST EQUIPMENT	WEC		S					
	001	FOR STARTUP CREW			F	U S				Arrived in UB 12/14/92
	5022		I & C	3	A			29 Dec 92		Delivered 12/29/92
G 9	7419	2 WAY RADIOS	REM		S					
	001				F	U S				Arrived in UB 12/14/92
	5021		MECH	2	A			29 Dec 92		Delivered 12/29/92
G 10	7419	M K TECHNICAL	DEH		S					Includes 144 851 Allowance for Continuing Services & Blast Training
	001	ASSISTANCE FOR		234 8	F	U S			NA	
		COAL MINES	MECH		A			5 Nov 92		
			0%	6		RUSSIAN GENERAL				
			100%	1326 8		U S GENERAL				
				1332 8		TOTAL GENERAL				
			62%	5839 7		RUSSIA TOTAL PROJECT				
			38%	3517 3		U S TOTAL PROJECT				
				9357		TOTAL PROJECT				

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APPENDIX B

I&C TRIP REPORT

JULY 1992

APPENDIX B

I&C TRIP REPORT-JULY 1992

Pulverizer Operation

The coal pulverizers are the ball mill type, which is a low speed and high capacity machine

Plant personnel run the pulverizer and feeder at full speed until the pulverized coal (PC) bunker is full The operating instructions require three meters of coal in the pulverized coal bunker in order to fire coal Total depth of the pulverized coal in the bunker is nine meters Plant personnel manually check the bunker level every hour when the unit is in operation Bunker level checking is accomplished utilizing a fixed pulley and weight measuring system in each PC bunker (the weight is lowered to the top of the pulverized coal bed within the coal bunker) The rope is marked to indicate level

The high pressure boilers each have two pulverizers and may be operated with a single pulverizer This would mean that three (3) burners are in operation, and that two (2) burners on one wall and one burner on the other wall would be in service

It should be noted that the operation of the ball mills (pulverizers) are identical for the high pressure boilers at the Ulaanbaatar and Darkhan power plants

A difference was noted in the control philosophy of the low pressure boiler pulverizer operation at Power Plant No 3 in Ulaanbaatar The damper which controls air flow to each pulverizer is a manual damper The high pressure boilers and all the Darkhan boilers have motor driven dampers

The dampers on the high pressure boilers at Power Plant No 3 and all boilers at Darkhan are designed to be automatically controlled They maintain mill outlet pressure with a motor driven air flow control damper These pulverizers also have a hot air damper and a tempering air control damper Therefore, each pulverizer has three motor operated control dampers

It should be noted that pulverizers in the United States typically have pneumatic drives and not electrical drives All Mongolian power plants DO NOT have a compressed air system available If a control system is not properly tuned, it will cause the damper drives to hunt (cycle) This results in continuous motor operation and in time failure of the motor A pneumatic system would be more forgiving and able to maintain continuous cycling

Difference in Design of the Low Pressure Boilers

The low pressure boilers utilize the tempering air damper to control mill pressure while the hot air damper controls mill outlet temperature The air flow control damper is manual This has a direct impact on the control of pulverizer outlet temperature and pressure It is known that automatic control has not been accomplished for many years on these low pressure boilers

It should be noted that the pulverizers on low pressure boilers in the United States would have a damper operation arrangement similar to the high pressure boilers, i e , three damper operators When an attempt is made to use the tempering air damper to control flow, flexibility is relinquished along with good pressure and temperature control The operator is forced to pick either temperature or pressure control and place the system in manual The air flow control damper is located in the common air line after the hot and tempering air ducts discharge the air into this duct

Pulverizer Temperature

The pulverizer temperatures should be as follows (per design conditions on Sharingol coal) Note that these boilers burn Bagga Nuur coal which is higher in ash and moisture content and lower in heating valve than Sharingol coal

Tempering air at 214 °C 62 6%*

Hot air at 336 °C 37 4%*

Pulverizer inlet temperature 320 °C

Pulverizer outlet temperature 60 °C

*Percent of the total air flow through the pulverizer

The actual hot air temperature is approximately 318 °C, it should be around 362 °C The air temperature at the pulverizer inlet is 310 °C The pulverizer outlet thermocouple is wired directly to the controller Temperature transmitters are not required Plant personnel would like RTDs in place of the thermocouples and UE&C concurs with this

Pulverizer Pressure

The pulverizer outlet pressure should be -30 mm of water column The pressure occasionally reached -80 mm and has gone beyond the range of the meter

Pulverizer Air/Fuel Ratio

The existing control system can not compensate feeder speed for the different types of coal being fired (BTU correction & moisture)

The coal feeders to the pulverizer had AC motors which have been changed to DC drives

Pulverizer By-Pass

The Pulverizer outlet high temperature switch automatically closes the hot air damper when the temperature is high However, it does not reopen it This high temperature switch also opens the cold air damper and opens the pulverizer by pass dampers

The pulverizer air dampers, located between the pulverizer and fan, will close when the pulverizer is out of service The pulverizer by pass dampers are ducted into the system after a shutoff damper located before the pulverizer fan

During normal operation the controls are in manual with signals used as indicators only The hot air damper is full open and the tempering air damper is open about 5 to 10%

The pulverized coal bunker feeders can be controlled remotely The speed of the feeders can be controlled from the control board by the operator, i e, not automatically

The operators stated that the damper drives will work with a remote control signal if new motors can be furnished The gearing and motor controls do function and do not need replacement The pulverizer coal bunker outlet valve (feeder) motors are in poor condition and need to be replaced These feeders should be included on a future list because of the amount of work and cost involved

The speed of individual pulverized coal feeders to the burners cannot be independently changed, i e all feeders on a pulverizer will change speed at the same time A common DC generator provides the DC current for all three feeder motors on each pulverizer The speed control for the DC feeders is functional but new DC motors are required

Coal Flow

The operator cannot monitor coal flow to or from the pulverizer If the raw coal does hang up in the bunker, the pulverizer will start to deplete its coal supply

The operators have discovered that by lowering the pulverizer outlet temperature to 45 to 50 °C, the pulverizer explosions decrease However, coal transport becomes a major problem and hang ups in the pulverized coal bunker are frequent When the pulverizer outlet temperature is less than 45 °C, the coal in the pulverized coal bunker is too moist This leads to plugging problems in the pulverized coal bunker and subsequent loss of coal to the burners

During the shut down of the pulverizers, they do have explosions During the years of 1988 and 1989 coal explosions occurred almost every day Last year, the number of explosions was reduced to forty-two Explosions now occur approximately once a month When new control systems become operational, frequent explosions should become a thing of the past

UE&C has had numerous discussions and informal training sessions with plant operating and maintenance personnel regarding explosions and proper pulverizing system operation and control

The operator will try to increase the vacuum within the pulverizer after feeder shut down Pulverizer outlet temperature has dropped as low as 38 °C with VERY poor burner operation The operators would like to know if it is possible to dry the coal before it enters the pulverizer This is possible with changes to the coal handling system, but would be expensive for this project

The operators stop the pulverizer each day to examine it for build up of coal pockets If build up is found, it requires cleaning of the coal in this area It requires three days of pulverizer down time, if cleaning is required

The burner air dampers DO NOT work because the motors need replacement New motors are required but the gears and motor controls are in working condition

Pulverized Dampers

The dampers are in poor condition

The damper drives will operate in manual and do not have to be replaced However, new motors will be required in order to operate these dampers in remote manual operation

The control signal to drive units and from transmitters will be 0 - 10 V DC pulse signals

Pulverizer Design

The boiler design requires the air temperature to be 336 °C after the air heater

The Russian design requires 320 °C hot air temperature to the pulverizer inlet

However a normal temperature of only 280 °C is currently available to the pulverizer The operators have the system in manual to maintain a higher pulverizer inlet temperature At times they are able to get the inlet temperatures up to 300 to 320 °C however, a temperature of 326 °C is required for wet coal

The boilers were designed for a coal with a moisture of 17% (Sharin Gol coal) However, currently the moisture is in the 25 to 35% range (Bagga Nuur coal)

The air/coal mix leaving the pulverizer is designed for 60 °C (140 °F), but is currently 40 °C (104 °F), with 36 °C (97 °F) being on the low end

NOTE! A coal fired plant in the United States would have a pulverizer outlet temperature of approximately 82 °C (180 °F) This means lower combustion efficiency for the Mongolian boilers

An EPRI (Electric Power Research Institute) Report CS-1883 1, dated February 1987, titled **"PREVENTION, DETECTION AND CONTROL OF COAL PULVERIZER FIRES AND EXPLOSIONS"** indicates that the average overall rate of explosions for a coal fired plant is three explosions in ten years The term explosions includes severe puffs, as well as explosions This data was based on 361 individual coal fired generating plans out of the 1,333 in the United States in 1980

The report indicates that three explosions per year were found in only a few extreme cases To date, the best that No 3 Power Plant has been able to do with current controls is 12 or more per year

Purge

The operating manuals require a fifteen minute purge of the boiler before a unit can light off on any fuel However, the operators may start a boiler as they wish and purge for as long as they wish No safety interlock is in place to prevent this,

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The Russians did provide a safety system for the boilers However, time has taken a toll on the system, thus today it is without value

Type of Coal

The number of hours of pulverizer operation to provide a full twenty four hours of coal for boiler operation will differ with the type of coal The coal feeders are normally run at one speed

Sharingol Coal requires 16 hours of pulverizer operation for a 24 hour period of boiler operation

Bagga Nuur coal requires 4 hours of pulverizer operation for a 24 hour period of boiler operation

Shivee-Ovoo Coal requires 24 hours of pulverizer operation for a 24 hour period of boiler operation This was based on only three days of operation This is a new coal mine in Mongolia

No comment was made on the Nilakah coal

Safety

There was a concern raised during a meeting with operating personnel that the high pressure boilers and the building would not pass local inspection The boiler and building inspectors were at the site during the annual shutdown which occurred during July

The Chief Engineer indicated that this should not be of concern and did not believe the inspectors would shut down the high pressure plant The power plant personnel are unable to locate a large crane to repair the roof(which has panels which are failing in places) The Russians did have a crane at the plant of the required capacity, however, it has been returned to Russia The crane would have to be rented from Russia which requires hard currency

Motors

Two pulverizer motors are needed in the high pressure plant The drawing showed both motors would have clockwise rotation However these motors did not appear on the final emergency spare parts list

Oxygen Monitor

BOILER FLUE GAS OUTLET 02 - The plant is unable to continuously measure the boiler 0_2 in the flue gas outlet duct The excess air should be 16% per boiler design data It is currently estimated to be about 12%

Boiler Notes

Boilers 1 through 6 are low pressure boilers, while units 7 through 13 are high pressure

Boiler 5 - The low pressure boiler requires furnace tubing replacement The operators believe the pulverizer system can be kept in operation for one year The coal piping from the pulverizer and burner coal piping is now 3 to 4 mm in thickness and should be 6 mm It would take about two

months to replace this piping The operators believe the current piping will last through the winter season

Boiler 6 is direct fired from the pulverizer through the primary air fan to the burner A problem on this boiler is that the PA fan is in very poor condition and requires service Boilers 5 and 6 are set up for direct start-up on coal without oil ignitors This requires an additional burner located on the boiler side wall It was stated that this was not the normal start-up sequence but only an experiment

The operators connected the pulverizer outlet piping direct to the burners without classifiers to remove any heavy particles This pulverizer (like all the other pulverizers) is under negative pressure The pulverizer fan is located between the pulverizer and the burner The pulverizer coal bunker is no longer used It was not a surprise to learn that this pulverizer air fan had problems Fan parts are wearing out very quickly

NOTE! Most U S manufacturers normally pressurize ball mills to keep the fans out of the coal/air stream The ABB - Combustion Engineering (CE) medium vertical spindle type pulverizer normally has the fan in the air/coal stream The CE fan is designed to handle these very abrasive conditions However, the CE pulverizers have internal classifiers built into the pulverizer

Boiler 7 - A problem was found with pulverizer 7B inlet, which caused sparks and coal pockets build up coal resulting in a large number of explosions No explosions have occurred during 1992 on this pulverizer since changes to the housing were made to eliminate the coal pockets Pulverizer (7A) had eleven explosions in 1991

Boiler 9 - This boiler is out of service because insulation material and weld rod to complete repairs are not available

Boiler 10 - This unit is in continuous operation without required routine maintenance The operators are concerned that this unit will fail because of the lack of routine maintenance

Boiler 12 - This boiler has the same type of problem as 13, however the inspector has not shut this unit down at this time According to the operators the pulverizers on boilers 12 and 13 are in good condition It takes about two months to replace the tubes on one boiler

Boiler 13 - This boiler has been out of service for two years, and cannot be placed in operation because the tube thickness in only 2 mm and it should be 6 5 mm The boiler inspector found this to be true in the boiler back pass and in the furnace section

The operators feel that if the tube problem on boiler 13 could be corrected, it could be a very reliable unit because all other systems are in good condition

Boiler Ranking Best to Worst

Low Pressure Boilers 1, 2, 3, 4, 6, 5

High Pressure Boilers 10, 7, 9, 11, 8

High pressure boilers 9 and 11 will be 1 and 2 in availability after the capital improvements

Capital improvements were underway on boilers 9 and 11 Boiler 9 was scheduled to be completed by September 1 and boiler 11 to be completed by August 1

Boiler 8 has a large number of holes in the furnace casing which will not permit the boiler to be operated under negative pressure

During the months of December, January, and February four high pressure and five low pressure boilers are required to be in operation to meet heating demand

Two high pressure boilers (Units 12 and 13) and two low pressure (Units 5 and 6) were not operational at the time of the trip/visits reported herein

High Pressure Boilers - Control Rooms

The control room located nearest the low pressure building has the controls for boilers 7, 8 and 9 and turbines 5 and 6 The second control room has the controls for boilers 10, 11, 12 and 13 and turbines 7 and 8

Darkhan Spare Parts

No boilers are out of service due to explosions Boilers 1, 3, 5, 6, 8, and 9 are primary with boilers number 4 and 7 as secondary units Boilers 2, 4, 6 and 9 are under capital repair this summer (1992) Boiler 2 is now complete (July 28) and all other units will be available by October

Boilers 7 and 9 cannot be on line at the same time because of a shortage of a forced draft fan motor Boiler 8 also needs a new forced draft fan motor

Technical Terms (Nomenclature)

The following is a list of pulverizer terms

Ball Mill (Pulverizer) - This type of pulverizer reduces the coal to a very fine powder This is accomplished in a large drum turning at a very low speed (about 17 to 20 RPM) with small balls (40 mm) doing the crushing The balls will mix with and cause the coal to become pulverized Balls can be added during mill operation The balls do wear and become less effective These balls normally are continuously used until completely worn Riley Stoker Corporation and Foster Wheeler Energy Corporation (in the United States) manufacture pulverizers of this type

Cold Air Damper - An open/close (O/C) damper will open when the pulverizer is out of service The damper permits ambient air to enter the mill and is located downstream of the hot and tempering air dampers, which close when the pulverizer is out of service

Hot Air Control Damper - A modulating damper located in the high temperature air duct to the pulverizer The air temperature in this case should be about 336 °C (620 °F), and about 62 6% of the air flow should go through this duct

Hot Air O/C Damper - A set of dampers which permit high temperature air to bypass the pulverizer when out of service and go directly to the pulverizer air fan The air temperature in this case should be about 336 °C (620 °F) The two dampers open and a seal damper closes when the pulverizer is out of service

Manual Damper - A damper which has to be opened or closed by a handwheel and cannot be controlled directly by the boiler operator

Mod Damper - A damper which will modulate based on a control signal in order to maintain a given downstream temperature or pressure

Mill - Refer to the ball mill (or pulverizer)

O/C Damper - A damper which will automatically open or close due to control logic or by the action of the operator

Pulverizer - Refer to ball mill which is a type of pulverizer to grind the coal to a very fine powder

Pulverizer Air Fan - Located between the pulverized coal bunker and the burners This fan creates a suction pressure to transport coal from the pulverizer and pulverized coal bunker It then supplies positive pressure to transport the coal from the pulverized coal bunker to the burners

Pulverizer Air Damper before the Fan - is either opened or closed and is controlled from a switch on the control board

Pulverizer By-Pass Dampers - These o/c dampers by pass the hot and tempering air around the pulverizer to the inlet of the pulverizer air fan

Pulverizer Coal Feeders - located below the pulverized coal bunker Controls coal feed to the burners

Seal Valves - Two seal valves mounted in series are located at the top of the pulverized coal bunker These valves alternate (one closed and one open) position to permit the pulverized coal to enter the pulverized coal bunker These valves are not automatic They operate by weighted dampers counter weighing the weight of the coal

Tempering Air Control Damper - A modulating damper located in the low temperature air duct to the pulverizer The air temperature in this case should be about 214 °C (410 °F) About 37 4% of the air flow comes through this duct

Tempering Air O/C Damper - A set of open/closed dampers located in the low temperature air duct to the pulverizer air fan to by pass the pulverizer The air temperature in this case uses about 214 °C (410 °F) The two dampers open and a seal damper closes when the pulverizer is out of service

Reference Data Problem

All catalog information, blank data sheets, contract documents and records taken from Boston to Mongolia which were to be utilized during these on-site studies were lost by the airlines in shipment

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This resulted in a less effective survey trip/visit and is only one example of the many difficulties in doing a project in Mongolia

Project Goals

- New transmitters to replace the current units
- Replacement motors for the damper drives
- Provide loss of coal flow alarm for raw coal feeders
- New RTDs for pulverizer outlet temperature
- New RTDs and meter to monitor transport air temperature
- New controllers for pulverizer temperature and pressure
- New damper operators for the mill flow control dampers on low pressure boilers
- New scanners and cooling air fans

The above project goals are to be accomplished in accordance with the available funds for the project

APPENDIX C

PROJECT MEMORANDA

FURNACE EXPLOSIONS

THE MONGOLIAN EXPERIENCE

APPENDIX C
(Excerpted from TDP Feasibility Study)

Project Memoranda

FURNACE EXPLOSIONS

THE MONGOLIAN EXPERIENCE

UNITED STATES EXPERIENCE

On March 2, 1854, at the Fales and Gray Car Works, at Hartford, Connecticut, a one month old boiler, exploded with terrific force, completely destroying the boiler room and the adjoining blacksmith shop and badly shattering the main building Nine persons were killed outright, twelve died later and more than fifty others were seriously injured Like many other boiler explosions of that time, little was known about the reasons for the explosion [1]

This event did lead to the action of the Connecticut State Legislature to incorporate an agency to be called The Hartford Steam Boiler and Inspection Company, in the spring of 1866 Today, this firm is the leader in the inspection of pressure vessels for steam boilers [1]

On February 6, 1880, thirty mechanical engineers met in New York City, to form the American Society of Mechanical Engineers (ASME) This action was due to the public outcry related to the growing number of boiler explosions The ASME would have a significant influence in improving the safety of boiler design, through the ASME Boiler and Pressure Vessel Code [1]

On April 16, 1889, a group of boiler makers met in Pittsburgh, PA, to form the American Boiler Manufacturers Association (ABMA) The purpose of this new association was to create standards to "secure safety to the lives and property of all communities where boilers are used "[2]

The May 1889, issue of POWER MAGAZINE, reported the first meeting of the ABMA. By coincidence, the same issue carried a regular column headed "This Month's Accidents", because at this time boiler explosions were so common Reported in the May 1889 issue of Power were fourteen explosions, with 13 people killed and 14 injured [2]

A uniform specification for safety valves first appeared in the 1914 ASME Boiler Code [1]

The first fuel trip application occurred in 1919, on an oil pot burner The reason was to prevent the basement from becoming filled with oil if the fire went out [4] During this year, the Hartford Steam Boiler Inspection and Insurance Company, began insuring equipment against breakdown [1]

Purging of a furnace with air before any attempt to light off the fuel, dates back to the 1920's This was a prominent feature of loss experience prior to 1940 [4]

The action of these early organizations would lead to the improvement of boiler safety across the United States The creation of infra-red scanners in 1952 and ultraviolet flame scanners in 1957 to check on the status of burner flames, would offer a key alarm to the operator [2]

These developments led ABMA to work with the National Fire Protection Association (NFPA) to develop standards for prevention of boiler furnace explosions, a significant step forward in safety In 1958, reports of furnace explosions were once again increasing with alarming frequency The ABMA once again called for the need of a furnace protection standard [2]

In 1960, the NFPA created a new Committee for Boiler Furnace Explosions This action was taken at the request of the ABMA, ASME, Edison Electric Institute and others to improve boiler safety [2] The first meeting of the committee would be held at Riley Stoker Corporation in Worcester, Massachusetts, that year

The primary goal of the new NFPA committee would be to review data and the publication of furnace explosion standards It would have to be designed for laymen to control the combustion process It would offer a guideline for the basic operation of a boiler to prevent explosions

A paper by G W Kessler of Babcock & Wilcox, in 1961, reviewed the loss experience of the boiler industry There were an average of thirty one furnace explosions annually between 1956 to 1961 He pointed out that roughly nine of these furnace explosions per year were in utility boilers [4]

The first NFPA codes on boiler furnace explosions were adopted in 1964 The standards would be adopted in the following order

1964 Single burner oil and gas boilers
1964 Gas firing in multiple burner boilers
1966 Oil firing in multiple burner boilers
1968 Pulverized coal firing in multiple burner boilers
1973 Pulverizer Fuel Systems was transferred to this committee from the Committee on Dust Explosions Hazards The original standard was adopted in 1924
1976 NFPA would review the problem of high negative pressure excursions within the furnace settings The increased size of utility boiler-furnaces along with changes in technology to improve air quality introduced this problem in the late 1960's and 1970's The NFPA 85G standard was issued to prevent furnace implosions, in 1987
1988 Fluidized Bed Boilers
1989 Stoker Operation

The Electric Power Research Institute (EPRI) undertook a major report in the mid-1980's on the prevention of coal explosions in power plants [3]

A survey of some 361 power plants in the United States was performed to find out about the operation of pulverizer systems The information revealed that about 78% of the investigated plants reported low frequencies of fires and explosions About 22% of the coal fired units had major problems with fires or explosions

They also found a direct correlation between plant improvements in pulverizer maintenance programs and a reduction in fires or explosions Setting up a maintenance program was found to be an inexpensive method of reducing fires and explosions

They also found that direct fired systems have about one half the frequency of explosions as bin storage or indirect fired systems

Previous EPRI studies showed that a pulverizer explosion occurs at a rate of about one per day The annual cost to United States Utilities exceeds one billion dollars per year

> EPRI (Electric Power Research Institute) Report CS-1883-1, of February 1987, states "the average overall rate of fires and explosions at coal fired units is approximately five fires in four years and three explosions in ten years To some extent explosion value is larger because here the term "explosions" includes severe puffs (structure deformation) as well as the more limited true explosions (containment breaching) [3]
>
> The EPRI report included a survey of fires and explosions in coal fired units If coal from different sources is blended, the average number of explosions increases dramatically

The study would show the dangers of pulverizer explosions, i e that pressures within the piping systems can reach 1200 PSIG, due to these explosions

United States Summary

Pulverizer explosions remain a major concern for coal fired power plants within the United States

The explosions will normally occur during start up or shut down of the pulverizer When the pulverizer is in normal operation the atmosphere is fuel rich However, during start up or shut down, the pulverizer has to go through a period when the fuel to air ratio is correct (explosive air/fuel mixture exists) and all that is required is a source of combustion (spark or flame) to cause an explosion

A high speed pulverizer (as opposed to a rotary ball mill) shows a very low frequency of explosions because the retention time is just a few seconds The grinding area is so small that the correct fuel to air ratio cannot occur

General Information

MONGOLIAN EXPERIENCE

The following information is based on Power Plant No 3 at Ulaanbaatar, where safety and boiler availability are key problems in the operation of this plant

The Darkhan plant also has similar problems but not as severe Only one type of coal is used at this plant The plant had one explosion in 1981, four or five in 1991 and two in January 1992

Ulaanbaatar Power Plant Number 3 was built with Russian Steam Generators and Turbines, a total of 13 steam generators and 8 turbines are located in this plant

Six low pressure boilers are rated at 165,000 PPH 555 PSIG
Seven high pressure boilers are rated at 400,000 PPH 1422 PSIG

The first six boilers were commissioned around 1968
The last seven high pressure boilers were commissioned in around 1976

Four high pressure turbines are rated 25 MW and four low pressure turbines are rated 12 MW

The Ulaanbaatar plant has a nameplate generating capacity of 148 MW of electricity A total of 1,100 people work at this plant

Coal is supplied from four different mines located within Mongolia The breakdown is as follows

Sharangol	500,000 M Tons
Bagga Nuur	350,000 M Tons
Shivee-Ovoo	150,000 M Tons
Nilakah	100,000 M Tons

Electrical Output and Importance of Power Plant No 3

The normal electrical load is 50 to 60 Megawatts The winter electrical load is 120 to 136 Megawatts of power The summer load is an average of about 70 megawatts

The heating requirements for the city are as important for the plant as the electrical needs Power Plant No 4 furnishes 60 to 65% of the heating and electrical needs of the city Power Plant No 3 provides 30 to 35% of the city's heating and electrical needs and the majority of local industry's steam needs Power Plant No 2 provides approximately 2 to 3% of the city's heating and electrical needs A coal bunker explosion at Power Plant No 4 in December of 1991, caused electrical blackouts across the country

Availability

Availability information received from Power Plant No 3 at Ulaanbaatar was reviewed with the following summary information

During the year 1991, the average boiler availability of all thirteen boilers was as follows

39% of the time in operation

21% available but not in service

34% forced and scheduled unit maintenance or repair mode

Unit Number 8 was out of service all year because of an explosion the previous year

Unit Number 9 was in service for only a few weeks in January and out of service the rest of the year This was also because of an explosion in January

Unit Number 7 had the highest number (11) of explosions during the year However, it was out of service only 25% of the entire year for repair

Steam Generator and Related Systems

The low pressure boilers have the control boards located just to the right of the burner front when facing the boiler on the main operating floor The controls are in very poor condition

It was noted on both high and low pressure units that drum level appeared on the chart recorder only In the US, 2 or 3 different sources of drum level indicators would be present per boiler

The forced draft (FD) fan inlet vane damper drives were found with the control signal wires disconnected The air flow control is on manual with the operator required to adjust the damper In the winter the air is from outside the plant This is to avoid freeze up of in-plant piping systems due to nonfunctioning plant heating and ventilation systems The unit it NOT purged before start up The design should ensure that the steam coil sizing will permit a -40C air inlet and a suitable outlet temperature to the boiler to protect the furnace This will permit a purge without the possibility of freezing the furnace tubing or causing tubing stress problems because of the rapid change in temperature They do have ducts to draw FD air from the upper regions of the boiler house in the roof area, however this is used only in the summer for ventilation purposes Portions of the outside walls of the plant now have ice formations on the indoors due to a lack of heating and ventilation systems They are very concerned that using air from within the plant during the winter will cause additional freeze ups

The power relief steam valves are operated in a manual mode and manually shut down after start up

The steam lines do not have drip pots to accumulate and automatically drain any condensate in the lines Manual drain valves are shut off after start up and reopened on shut down This has caused turbine failure because of entrained water entering the turbine with the steam

The boilers do not have glass over the observation ports to prevent the furnace flame from causing personnel injury during normal operation if a puff should occur A number of openings were also present around the burner which could cause injury The ignitors were removed and the openings were not plugged At least one furnace access door showed signs of a bright flame ring around the door Normal maintenance would be for fire brick and high temperature cement to protect the door during operation

Pulverizers, Low Pressure Boilers

The pulverizers for the low pressure boilers are ball mills The ball mills made in the United States would be furnished with sound proof housing This enclosure would contain a great deal of the coal dust evident in this plant The current mills have no such housings

The coal pipes do wear out very quickly and coal dust explosions do occur within the furnace, ball mills, classifiers, cyclones and coal bunkers

Balls for the ball mills are four centimeters in diameter, when new A sample ball from a mill out of service was three centimeters in diameter

All pulverizer controls are in manual This includes the mill outlet temperature loop They should maintain the outlet temperature in the range of 170 deg F If the outlet temperature was too high the system logic (if operating) would open the cooling air damper If it goes high-high it should open a valve to permit steam to enter the mill, assuming a mill fire When the question was asked how often are the instruments checked to ensure that this will happen, the answer was never The I&C labs are unable to check thermocouples

The pulverized coal system has about 16 explosion disks located on each fuel system per high pressure boiler The enclosed table of the twenty six worst explosions in 1991 shows how many of these disks were damaged due to explosions

The coal handling equipment has magnetic metal separators which we understand are operational

Feeders do not have seals, therefore a high leakage of coal dust occurs

Pulverizer mill liners are wearing fast with the new type of coal (Bagga Nuur) Pulverizer motors and gears are generally OK. The pulverizer inlet liners typically wear out in about two years

Gear reducers typically last about 30,000 hours

Pulverizer outlet piping should be 8 millimeters thick but is now 3 millimeters thick in many places

Classifiers have erosion problems

Mill outlet temperature is manually controlled

Pulverizer fan blades have erosion, especially on one unit which has been converted to direct firing without a corresponding upgrade in fan housing and wheel materials

The motor operated pulverizer coal outlet valves are not suitable for automatic control

High Pressure Boilers

The inlet to the pulverizer has many explosions during normal operation, in addition to those during start-up

Pulverizer metal liners are wearing out fast, current liners are three years old

Outlet of pulverizer and pulverized coal transport piping have very high wear rates (due to high ash Bagga Nuur coal) Classifiers down stream of the pulverizers also have excessive erosion

Primary air (PA) fan blades are in poor condition, wear requires maintenance every six months, length of time depends on the type of coal

Coal pipes are in poor condition but pulverizer coal flow control valves are okay

Explosions

This plant (Plant No 3) had a total of forty two explosions during the year of 1991, and eight explosions occurred in the month of January 1992 The explosions occurred mostly in the pulverizers and have caused burns to employees

No one has yet died in an explosion at this plant, however, people have been injured At Power Plant No 2, two people died in 1988

At Plant No 4 a boiler had an explosion in the pulverized coal bunker at the end of December 1991

This plant (Plant No 3) provided us with a list of the top twenty six explosions of last year (26 of the 42 total explosions) The breakdown is of interest and the enclosed charts also show the time of the year the explosions occurred

11 explosions in Mill 7A
6 explosions in Mill 10A
6 explosions in Mill 1
2 explosions in Mill 3
1 explosion in Mill 93*

* It should be noted that this one explosion caused this unit to be out of service from January 1991 until the present

Boiler Control Systems

Automation of the Control Systems - The only control loops on automatic are the feedwater and steam temperature controls All other systems are on manual The combustion control system never worked in automatic The plant has Russian electronic controls The plant has two central control rooms The central control rooms in the high pressure plant has boiler and turbine control logic cabinets and main control boards The operators would like to have the controls for the low pressure boilers located within a central area The low pressure boilers are now "controlled" from panels located near the burner fronts The low pressure turbines are controlled from local panels near the turbines

The operators would like to have all high and low pressure boiler and turbine controls in one location The plant does contain a large area near the low pressure turbine deck which is now used for storage This area could be used for a new control room

It should be noted that all air, fuel, furnace pressure and mill controls are always in manual on all boilers Each boiler has three drum level indicators However, the indicators do not work in many cases and typically there is only one source of down level indication

UE&C did find on occasion that no one was at the control board There is a need for an operator to walk the boiler down on a regular basis, as well as an operator to be stationed at the control board at all times

The transmitters are electronic with a 0-5 VDC input to the control system Many transmitters do not work As an example On one unit only one of three drum level transmitters was in operation The plant is unable to obtain spare parts from Russia US firms do manufacture transmitters with a 0-5 VDC signal UE&C received a booklet in Russian on these transmitters

Damper drives are also electronic and information was obtained on them The control valves used are also motor driven

The only use of air was in the laboratory which had one air compressor for generator cooling Air dryers do not exist and at this time no critical control loops require compressed air

BURNER MANAGEMENT SYSTEM - If the operator cannot see a flame in the furnace, the operator is supposed to cause a fuel trip which will also trip the FD Fan The ID Fan will not trip The operator may restart the FD Fan at any time Once the FD Fan is in operation, the fuel can be restarted

The high pressure boilers have six burners which are opposite firing in the side walls Two burners are on the upper deck and one central burner one elevation below The burners are located on the sides of the boiler when standing in front of the boiler looking at the boiler with the back pass directly behind it

The low pressure boilers have three burners located at the front of the boiler and all are on the same elevation

The pulverized coal is ignited by heavy oil (Mazut) ignitors The heavy oil system has steam coils built into the storage tanks to keep the oil warm The oil lines are steam traced This is the only source of fuel to start up the boiler The design has a warm up requirement before coal can be fired

The high pressure boilers have both the feedwater and steam temperature controls on automatic The low pressure boilers have only the feedwater system on automatic

The stacks do NOT have any stack emission monitoring systems The boiler controls do have 0_2 monitors for the combustion control system,however, many of these probes do not work The few that work are used for indication only

Coal bunker level (Raw and pulverized) is measured using a cable and pulley system that has been installed in each bunker A weight is lowered to the top of the coal and the distance is measured

Training

Training is very poor They do not have a simulator to train the personnel They have six levels of training with a test required for each level of training to permit the operation of equipment

The plant does have a training program and they do have a number of scale models of the boiler, turbine equipment, etc to help understand the operation of the plant

Every new employee is required to undergo a training program before they enter the plant

1 Cross, Wilbur, "THE CODE" An Authorized History of the ASME Boiler Vessel Code, American Society of Mechanical Engineers, New York, 1990

2 Axtman, William, "THE AMERICAN BOILER INDUSTRY" A Century of Innovation, American Boiler Manufacturers Association, Arlington, Virginia, 1988

3 Electric Power Research Institute (EPRI), "PREVENTION, DETECTION AND CONTROL OF COAL PULVERIZER FIRES AND EXPLOSIONS" EPRI CS-5069, Project 1883-1, February 1987 EPRI, 3412 Hillview Avenue, Palo Alto, CA 94304

4 Lundberg, Robert, "PURGE RATE AIR FLOW FUNDAMENTALS PURGE RATE HISTORY AND REQUIREMENTS" 1992

APPENDIX D

BOILER AVAILABILITY ANALYSIS

(EXCEPTED FROM TPD STUDY)

BOILER AVAILABILITY

CHARTS

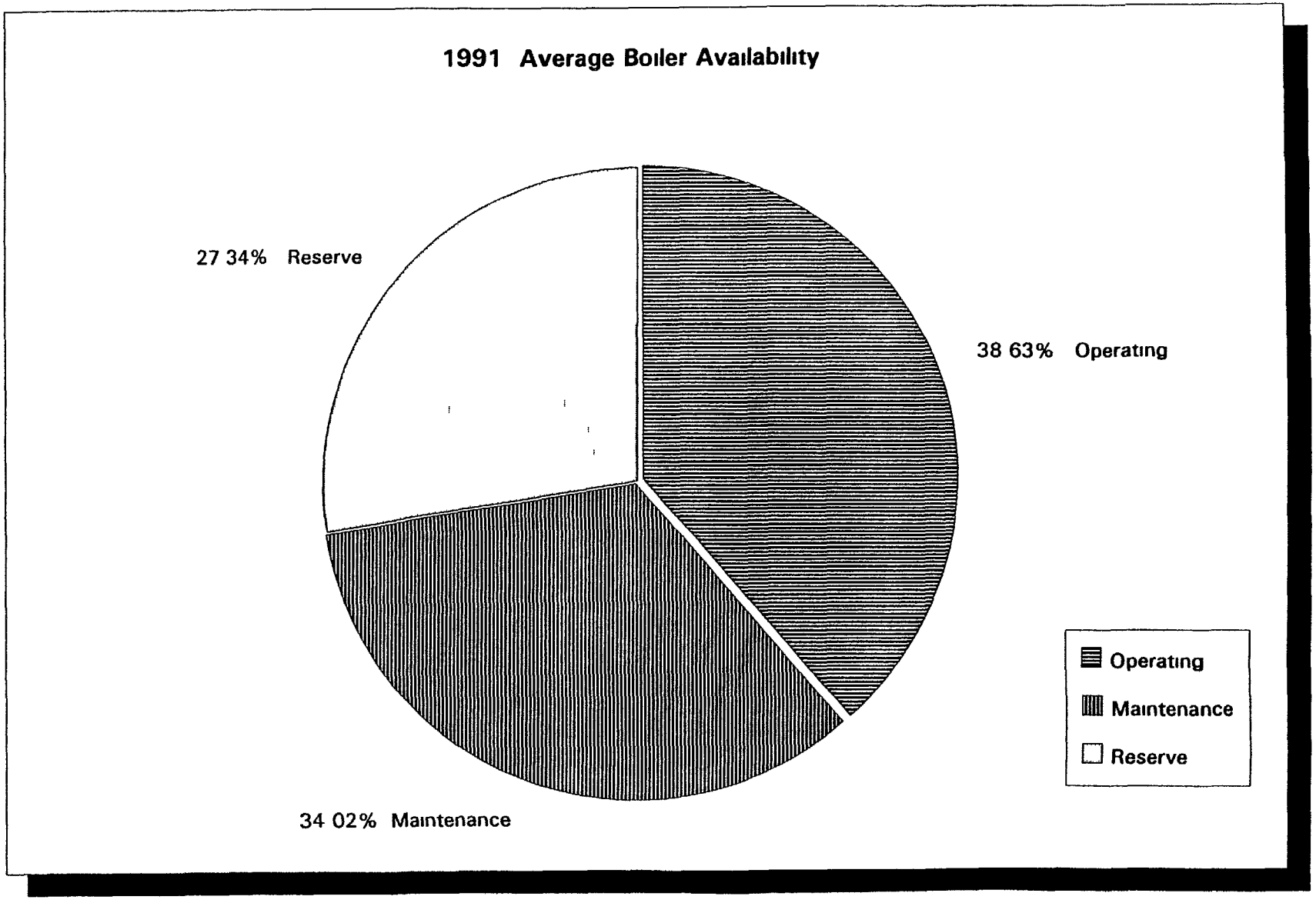
MONGOLIAN PEOPLES REPUBLIC

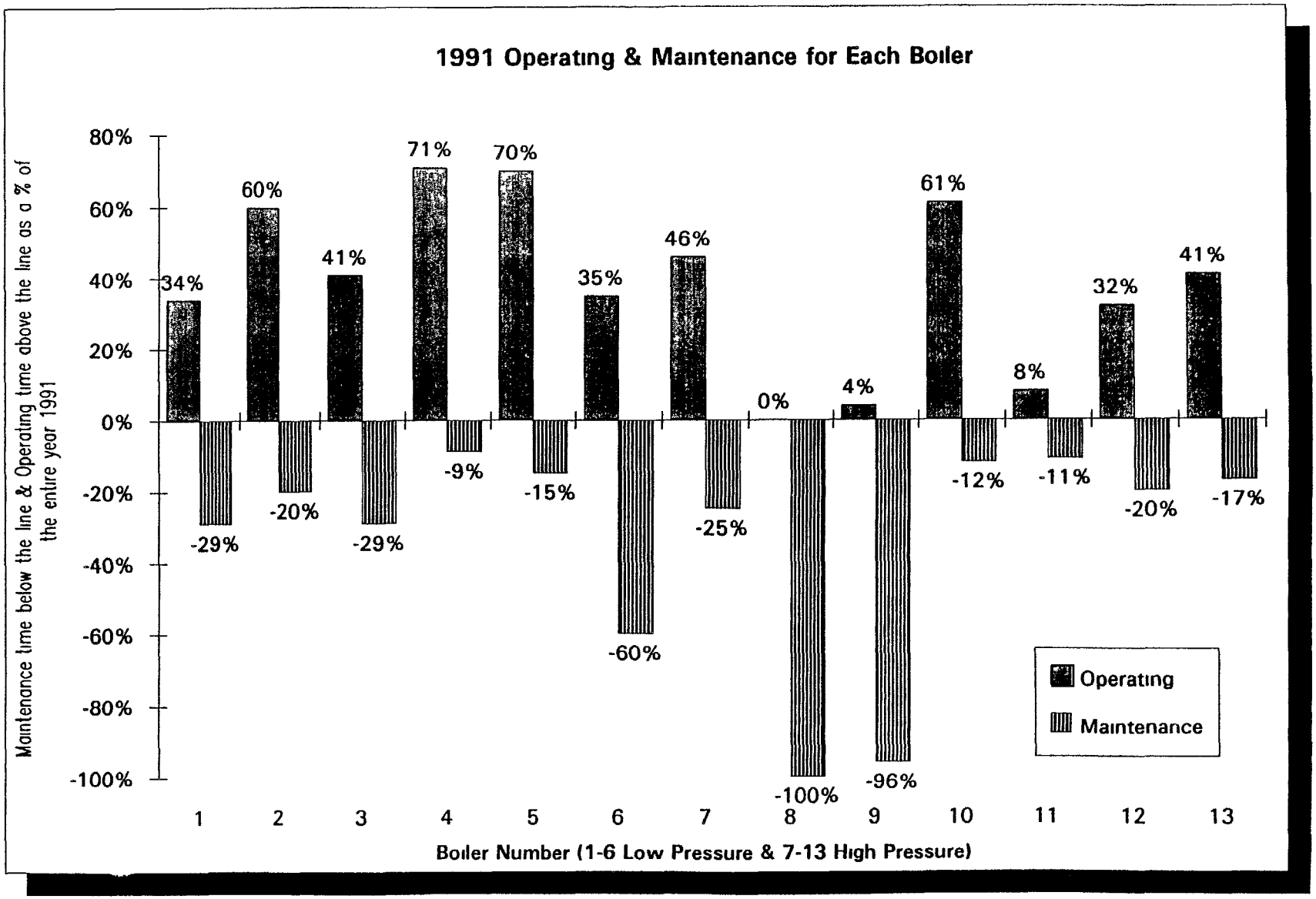
ULAN BARTAR

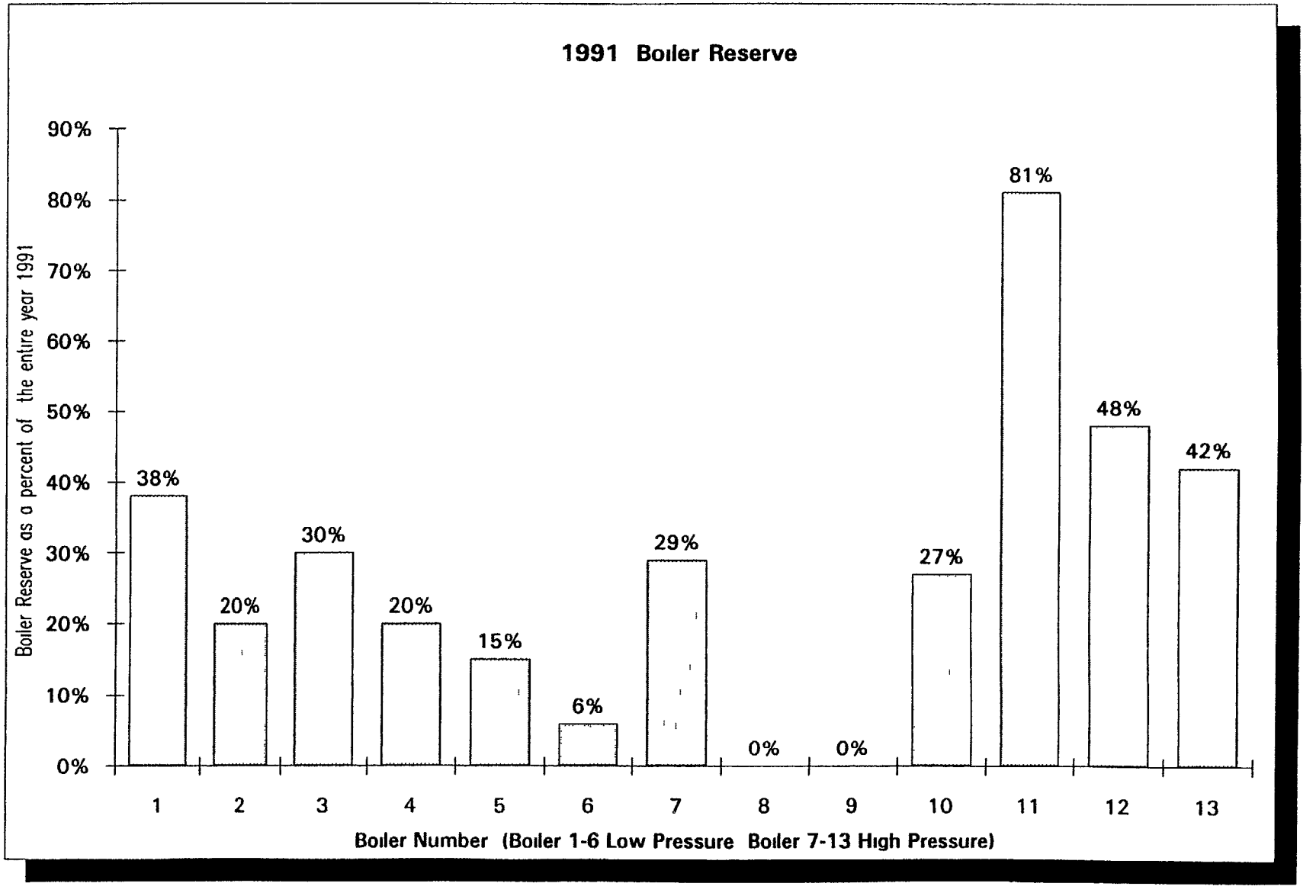
POWER PLANT No. 3

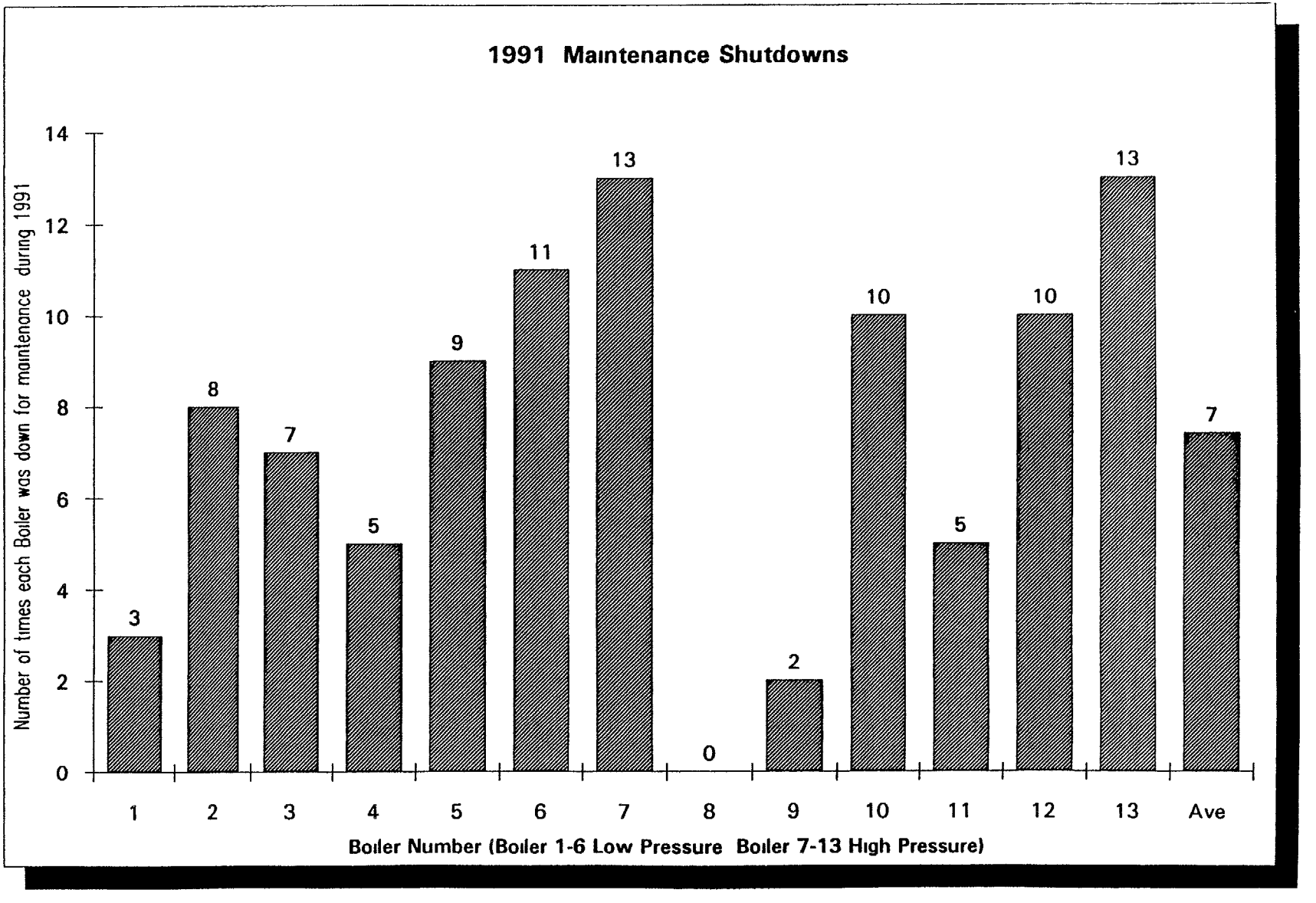
J O 6874 001

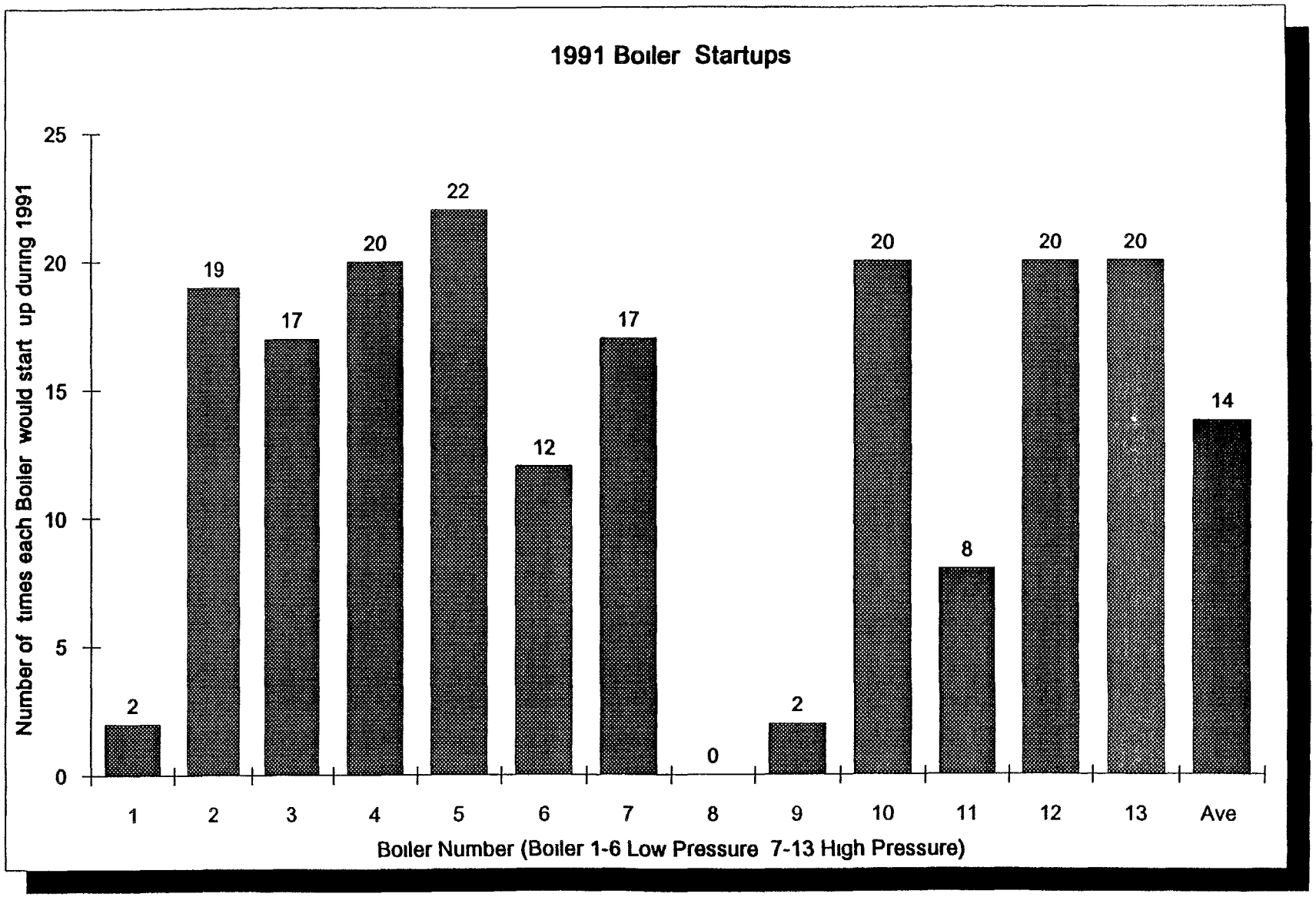
Page No	Charts
2	Average Boiler Availability
3	Operating & Maintenance
4	Boiler Reserve
5	Maintenance Shutdowns
6	Boiler Startups
7	Explosions per Pulverizer
8	Explosions per Month
9	

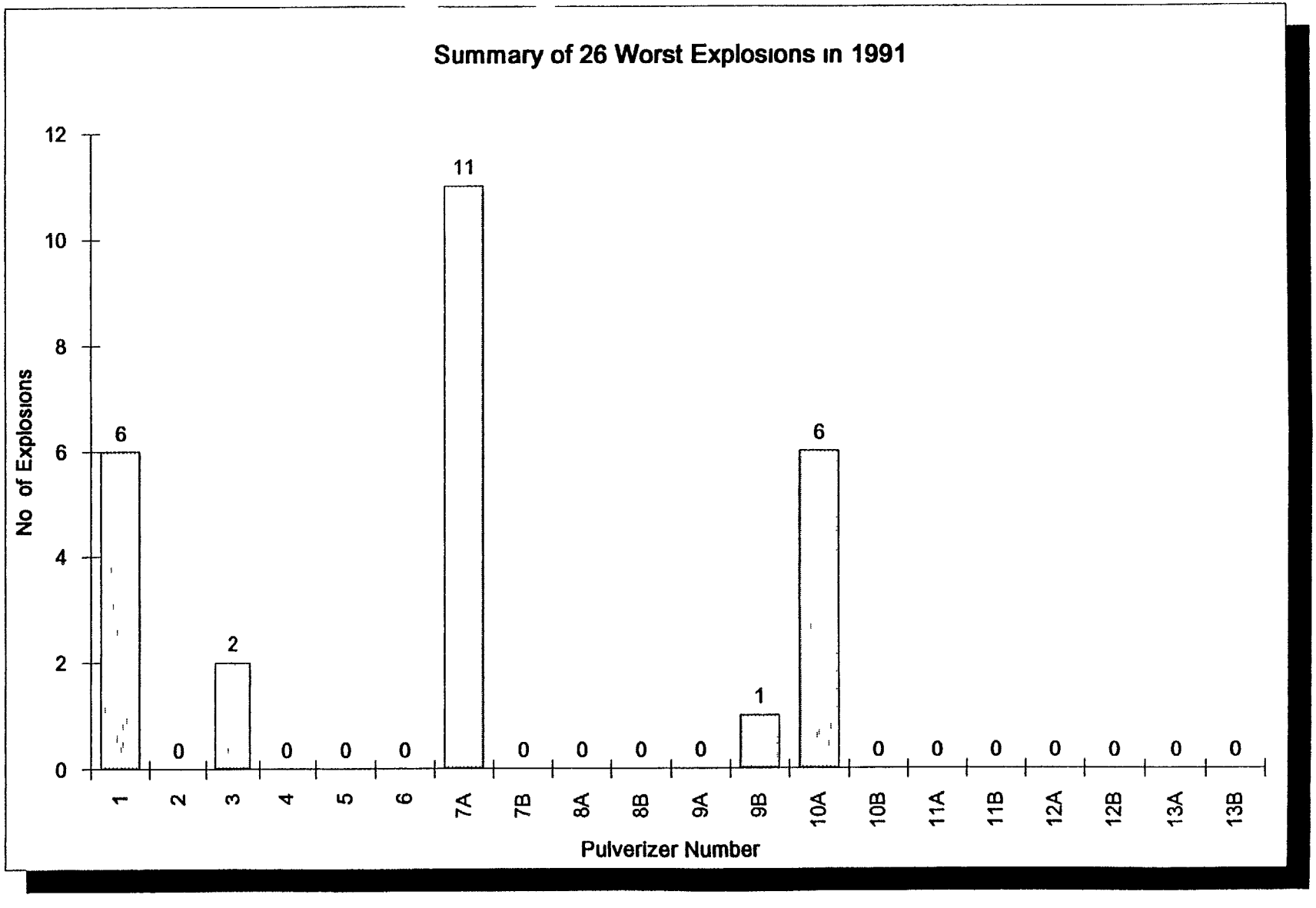

1991 Average Boiler Availability
27 34% Reserve
38 63% Operating
34 02% Maintenance
Operating
Maintenance
Reserve

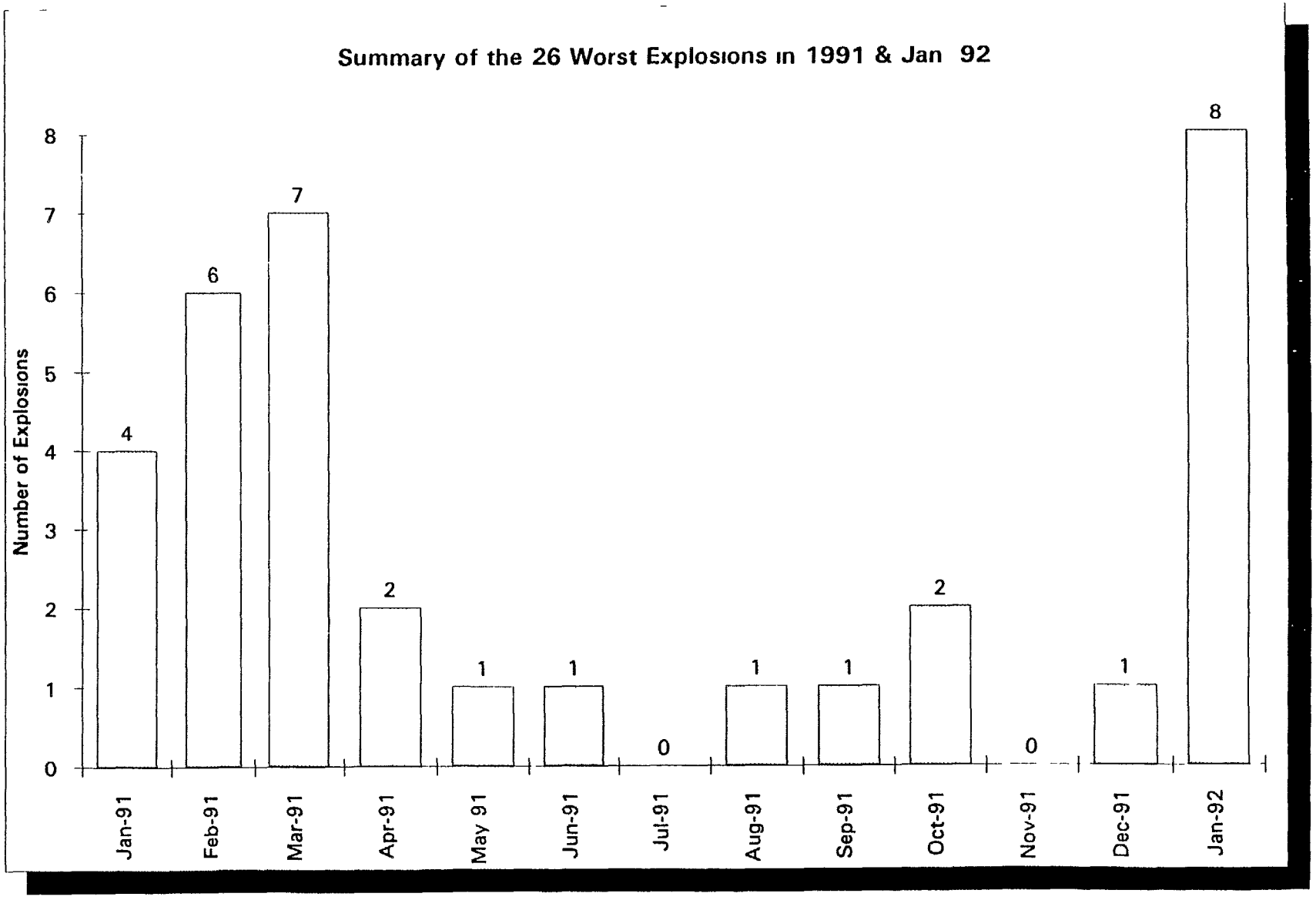

1991 Operating & Maintenance for Each Boiler
Maintenance time below the line & Operating time above the line as a % of the entire year 1991
80%
60%
40%
20%
0%
-20%
-40%
-60%
-80%
-100%
34%
-29%
60%
-20%
41%
-29%
71%
-9%
70%
-15%
35%
-60%
46%
-25%
0%
-100%
4%
-96%
61%
-12%
8%
-11%
32%
-20%
41%
-17%
1
2
3
4
5
6
7
8
9
10
11
12
13
Operating
Maintenance
Boiler Number (1-6 Low Pressure & 7-13 High Pressure)


1991 Boiler Reserve
Boiler Reserve as a percent of the entire year 1991
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
38%
20%
30%
20%
15%
6%
29%
0%
0%
27%
81%
48%
42%
1
2
3
4
5
6
7
8
9
10
11
12
13
Boiler Number (Boiler 1-6 Low Pressure Boiler 7-13 High Pressure)


1991 Maintenance Shutdowns
Number of times each Boiler was down for maintenance during 1991
0
2
4
6
8
10
12
14
3
8
7
5
9
11
13
0
2
10
5
10
13
7
1
2
3
4
5
6
7
8
9
10
11
12
13
Ave
Boiler Number (Boiler 1-6 Low Pressure Boiler 7-13 High Pressure)


1991 Boiler Startups
Number of times each Boiler would start up during 1991
25
20
15
10
5
0
2
19
17
20
22
12
17
0
2
20
8
20
20
14
1
2
3
4
5
6
7
8
9
10
11
12
13
Ave
Boiler Number (Boiler 1-6 Low Pressure 7-13 High Pressure)


Summary of 26 Worst Explosions in 1991
No of Explosions
0
2
4
6
8
10
12
6
0
2
0
0
0
11
0
0
0
0
1
6
0
0
0
0
0
0
0
1
2
3
4
5
6
7A
7B
8A
8B
9A
9B
10A
10B
11A
11B
12A
12B
13A
13B
Pulverizer Number


Summary of the 26 Worst Explosions in 1991 & Jan 92
Number of Explosions
0
1
2
3
4
5
6
7
8
4
6
7
2
1
1
0
1
1
2
0
1
8
Jan-91
Feb-91
Mar-91
Apr-91
May 91
Jun-91
Jul-91
Aug-91
Sep-91
Oct-91
Nov-91
Dec-91
Jan-92

BOILER AVAILABILITY

DATA SHEETS

MONGOLIAN PEOPLES REPUBLIC

ULAN BARTAR

POWER PLANT No. 3

J O 6874 001

OPERATION OF BOILERS
Ulan Bartar Power Plant #3
Mongolian Peoples Republic Project
19-May 92 Summary J O 6874 001

Boiler No	CONDITION	Average	Startups	Maintenance	Explosions
	OPERATING	34%	2		
1	RESERVE	38%			
	MAINTENANCE	29%		3	6
	OPERATING	60%	19		
2	RESERVE	20%			
	MAINTENANCE	20%		8	
	OPERATING	41%	17		
3	RESERVE	30%			
	MAINTENANCE	29%		7	2
	OPERATING	71%	20		
4	RESERVE	20%			
	MAINTENANCE	9%		5	
	OPERATING	70%	22		
5	RESERVE	15%			
	MAINTENANCE	15%		9	
	OPERATING	35%	12		
6	RESERVE	6%			
	MAINTENANCE	60%		11	
	OPERATING	46%	17		
7	RESERVE	29%			
	MAINTENANCE	25%		13	11
	OPERATING	0%	0		
8	RESERVE	0%			
	MAINTENANCE	100%		0	
	OPERATING	4%	2		
9	RESERVE	0%			
	MAINTENANCE	96%		2	1
	OPERATING	61%	20		
10	RESERVE	27%			
	MAINTENANCE	12%		10	6
	OPERATING	8%	8		
11	RESERVE	81%			
	MAINTENANCE	11%		5	
	OPERATING	32%	20		
12	RESERVE	48%			
	MAINTENANCE	20%		10	
	OPERATING	41%	20		
13	RESERVE	42%			
	MAINTENANCE	17%		13	
	OPERATING	39%	179		
Ave 1991	RESERVE	27%	14	7	
	MAINTENANCE	34%		96	26

OPERATION OF BOILERS
Ulan Bartar Power Plant #3
Mongolian Peoples Republic Project

19 May-92 Summary J O 6874 001 Low Pressure

MONTH	CONDITION	Blr # 1		Blr # 2		Blr # 3		Blr # 4	
Jan 91	OPERATING	94%	2	40%	2	29%	3	76%	2
	RESERVE	0%		7%		50%		11%	
31	MAINTENANCE	6%	1	52%	2	21%	2	13%	1
Feb-91	OPERATING	27%		93%	2	14%	2	77%	
	RESERVE	36%		7%		79%		0%	
28	MAINTENANCE	38%	1	0%		7%	1	23%	1
Mar-91	OPERATING	90%		84%	1	0%		52%	2
	RESERVE	10%		16%		0%		19%	
31	MAINTENANCE	0%		0%		100%		29%	1
Apr-91	OPERATING	0%		100%		0%		65%	1
	RESERVE	100%		0%		0%		10%	
30	MAINTENANCE	0%		0%		100%		25%	1
May-91	OPERATING	0%		44%	2	29%	1	100%	
	RESERVE	100%		0%		0%		0%	
31	MAINTENANCE	0%		56%	3	71%	1	0%	
Jun-91	OPERATING	0%		0%		40%	2	72%	5
	RESERVE	100%		0%		42%		17%	
30	MAINTENANCE	0%		100%		18%	1	12%	
Jul-91	OPERATING	0%		18%	3	60%	1	76%	2
	RESERVE	0%		45%		40%		19%	
31	MAINTENANCE	100%	1	37%	3	0%		5%	1
Aug-91	OPERATING	0%		61%	2	42%	3	76%	1
	RESERVE	0%		39%		58%		24%	
31	MAINTENANCE	100%		0%		0%		0%	
Sep-91	OPERATING	0%		77%	3	70%	1	72%	1
	RESERVE	0%		23%		27%		28%	
30	MAINTENANCE	100%		0%		3%	1	0%	
Oct-91	OPERATING	56%		58%	0	73%	1	66%	3
	RESERVE	44%		42%		0%		34%	
31	MAINTENANCE	0%		0%		27%	1	0%	
Nov-91	OPERATING	52%		68%	2	57%	1	68%	1
	RESERVE	48%		33%		43%		32%	
30	MAINTENANCE	0%		0%		0%		0%	
Dec-91	OPERATING	87%		73%	2	76%	2	53%	2
	RESERVE	13%		27%		24%		47%	
31	MAINTENANCE	0%		0%		0%		0%	
Ave 1991	OPERATING	34%	2	60%	19	41%	17	71%	20
	RESERVE	38%	0	20%	0	30%	0	20%	0
	MAINTENANCE	29%	3	20%	8	29%	7	9%	5

Note 1 - Reserve mode - Able to operate Maintenance mode - Unable to operate

OPERATION OF BOILERS
Ulan Bartar Power Plant #3
Mongolian Peoples Republic Project

19-May-92 Summary J O 6874 001 Low Pressure

MONTH	CONDITION	Blr # 5		Blr # 6					
Jan-91	OPERATING	76%	2	87%	3				
	RESERVE	11%		5%					
31	MAINTENANCE	13%	1	8%	3				
Feb-91	OPERATING	77%		77%	2				
	RESERVE	0%		7%					
28	MAINTENANCE	23%	1	16%	3				
Mar-91	OPERATING	79%	2	74%	3				
	RESERVE	0%		0%					
31	MAINTENANCE	21%	0	26%	4				
Apr-91	OPERATING	93%	3	0%					
	RESERVE	0%		0%					
30	MAINTENANCE	7%	2	100%					
May-91	OPERATING	3%	1	0%					
	RESERVE	3%		0%					
31	MAINTENANCE	94%	1	100%					
Jun-91	OPERATING	85%	2	0%					
	RESERVE	8%		0%					
30	MAINTENANCE	7%	1	100%					
Jul-91	OPERATING	61%	2	0%					
	RESERVE	39%		0%					
31	MAINTENANCE	0%	0	100%					
Aug-91	OPERATING	92%	1	0%					
	RESERVE	8%		0%					
31	MAINTENANCE	0%	0	100%					
Sep-91	OPERATING	45%	2	0%					
	RESERVE	45%		0%					
30	MAINTENANCE	10%	1	100%					
Oct-91	OPERATING	77%	3	13%	1				
	RESERVE	21%		21%					
31	MAINTENANCE	2%	1	66%	1				
Nov-91	OPERATING	77%	2	77%	2				
	RESERVE	17%		23%					
30	MAINTENANCE	7%	1	0%					
Dec-91	OPERATING	71%	2	89%	1				
	RESERVE	29%		11%					
31	MAINTENANCE	0%	0	0%					
Ave 1991	OPERATING	70%	22	35%	12	0%	0	0%	0
	RESERVE	15%	0	6%	0	0%	0	0%	0
	MAINTENANCE	15%	9	60%	11	0%	0	0%	0

Note 1 - Reserve mode - Able to operate Maintenance mode - Unable to operate

OPERATION OF BOILERS
Ulan Bartar Power Plant #3
Mongolian Peoples Republic Project

19 May-92 Summary J O 6874 001 High Pressure

MONTH	CONDITION	Blr # 7		Blr # 8		Blr #9		Blr # 10	
Jan-91	OPERATING	61%	3	0%		50%	2	31%	2
	RESERVE	6%		0%		0%		53%	
31	MAINTENANCE	32%	2	100%		50%	2	16%	2
Feb-91	OPERATING	79%	4	0%		0%		96%	1
	RESERVE	0%		0%		0%		4%	
28	MAINTENANCE	21%	4	100%		100%		0%	
Mar-91	OPERATING	31%	0	0%		0%		69%	3
	RESERVE	13%		0%		0%		3%	
31	MAINTENANCE	56%	2	100%		100%		27%	3
Apr-91	OPERATING	65%	3	0%		0%		53%	1
	RESERVE	18%		0%		0%		2%	
30	MAINTENANCE	17%	1	100%		100%		45%	1
May-91	OPERATING	52%	2	0%		0%		71%	3
	RESERVE	24%		0%		0%		8%	
31	MAINTENANCE	24%	3	100%		100%		21%	1
Jun-91	OPERATING	0%		0%		0%		95%	1
	RESERVE	0%		0%		0%		5%	
30	MAINTENANCE	100%	1	100%		100%		0%	
Jul-91	OPERATING	0%		0%		0%		19%	1
	RESERVE	45%	0	0%		0%		45%	
31	MAINTENANCE	55%	0	100%		100%		35%	2
Aug-91	OPERATING	24%		0%		0%		26%	2
	RESERVE	76%		0%		0%		74%	
31	MAINTENANCE	0%	0	100%		100%		0%	
Sep-91	OPERATING	25%	1	0%		0%		28%	2
	RESERVE	75%		0%		0%		72%	
30	MAINTENANCE	0%	0	100%		100%		0%	
Oct-91	OPERATING	53%	2	0%		0%		82%	3
	RESERVE	47%		0%		0%		15%	
31	MAINTENANCE	0%	0	100%		100%		3%	1
Nov-91	OPERATING	58%	2	0%		0%		75%	
	RESERVE	42%		0%		0%		25%	
30	MAINTENANCE	0%	0	100%		100%		0%	
Dec-91	OPERATING	100%		0%		0%		85%	1
	RESERVE	0%		0%		0%		15%	
31	MAINTENANCE	0%	0	100%		100%		0%	
Ave 1991	OPERATING	46%	17	0%	0	4%	2	61%	20
	RESERVE	29%	0	0%	0	0%	0	27%	0
	MAINTENANCE	25%	13	100%	0	96%	2	12%	10

Note 1 - Reserve mode - Able to operate Maintenance mode - Unable to operate

OPERATION OF BOILERS
Ulan Bartar Power Plant #3
Mongolian Peoples Republic Project
19 May-92 Summary J O 6874 001 High Pressure

MONTH	CONDITION	Blr #11		Blr # 12		Blr # 13			
Jan-91	OPERATING	24%	1	31%	4	69%	2		
	RESERVE	34%		42%		16%			
31	MAINTENANCE	42%	1	27%	4	15%	1		
Feb-91	OPERATING	0%		7%	2	45%	3		
	RESERVE	100%		14%		14%			
28	MAINTENANCE	0%		79%	2	41%	4		
Mar-91	OPERATING	42%	2	0%		71%	2		
	RESERVE	11%		0%		0%			
31	MAINTENANCE	47%	2	100%		29%	2		
Apr-91	OPERATING	8%	1	27%	2	45%	3		
	RESERVE	80%		70%		35%			
30	MAINTENANCE	12%	1	3%	1	20%	2		
May-91	OPERATING	16%	3	47%	4	44%	2		
	RESERVE	87%		44%		50%			
31	MAINTENANCE	0%		10%	1	6%	1		
Jun-91	OPERATING	0%		57%	1	53%	2		
	RESERVE	100%		37%		5%			
30	MAINTENANCE	0%		7%	1	42%	2		
Jul-91	OPERATIN	3%	1	47%		0%			
	RESERVE	61%		37%		48%			
31	MAINTENANCE	35%	1	16%	1	52%	1		
Aug-91	OPERATING	0%		26%	1	6%	1		
	RESERVE	100%		74%		94%			
31	MAINTENANCE	0%		0%		0%			
Sep-91	OPERATING	0%		0%		8%			
	RESERVE	100%		100%		92%			
30	MAINTENANCE	0%		0%		0%			
Oct-91	OPERATING	0%		50%	3	35%	1		
	RESERVE	100%		50%		65%			
31	MAINTENANCE	0%		0%		0%			
Nov-91	OPERATING	0%		32%	2	62%	2		
	RESERVE	100%		68%		38%			
30	MAINTENANCE	0%		0%		0%			
Dec-91	OPERATING	0%		56%	1	56%	2		
	RESERVE	100%		40%		44%			
31	MAINTENANCE	0%		0%		0%			
Ave 1991	OPERATING	8%	8	32%	20	41%	20	0%	0
	RESERVE	81%	0	48%	0	42%	0	0%	0
	MAINTENANCE	11%	5	20%	10	17%	13	0%	0

Note 1 - Reserve mode - Able to operate Maintenance mode - Unable to operate

TURBINE AVAILABILITY

DATA SHEETS

MONGOLIAN PEOPLES REPUBLIC

ULAN BARTAR

POWER PLANT No. 3

J O 6874 001

Page No	Data Sheet
2	Low Pressure
3	High Pressure

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OPERATION OF TURBINES
Ulan Bartar Power Plant #3
Mongolian Peoples Republic Project

19-May-92 Summary J O 6874 001 Low Pressure

MONTH	CONDITION	Turbine #1		Turbine #2		Turbine #3		Turbine #4	
Jan-91	OPERATING	87%	3	10%	1	89%	1	100%	1
	RESERVE	11%		71%		8%		0%	
31	MAINTENANCE	2%	1	19%	1	3%	1	0%	
Feb-91	OPERATING	93%		4%	1	0%		100%	
	RESERVE	7%		75%		100%		0%	
28	MAINTENANCE	0%		21%	1	0%		0%	
Mar-91	OPERATING	21%	1	0%		92%	3	71%	2
	RESERVE	0%		0%		3%		19%	
31		79%	1	100%	1	5%	2	10%	2
Apr-91	OPERATING	3%	1	77%	1	61%	2	15%	1
	RESERVE	72%		20%		12%		50%	
30	MAINTENANCE	25%	1	3%		27%	2	35%	
May-91	OPERATING	0%		11%	1	85%	1	5%	1
	RESERVE	100%		84%		15%		95%	
31	MAINTENANCE	0%		5%	1	0%		0%	
Jun-91	OPERATING	0%		93%	2	65%	6	15%	1
	RESERVE	93%		7%		35%		70%	
30	MAINTENANCE	7%	1	0%		0%		15%	2
Jul-91	OPERATING	0%		77%		79%	1	10%	3
	RESERVE	55%		23%		21%		84%	
31	MAINTENANCE	45%	2	0%		0%		6%	2
Aug-91	OPERATING	0%		73%	3	85%	1	55%	1
	RESERVE	100%		27%		15%		42%	
31	MAINTENANCE	0%		0%		0%		3%	1
Sep-91	OPERATING	5%	1	93%	1	85%	1	0%	
	RESERVE	95%		7%		15%		100%	
30	MAINTENANCE	0%		0%		0%		0%	
Oct-91	OPERATING	18%	2	97%	1	89%	1	53%	2
	RESERVE	82%		0%		11%		47%	
31	MAINTENANCE	0%		3%	1	0%		0%	
Nov-91	OPERATING	72%	1	28%		100%		90%	3
	RESERVE	28%		0%		0%		3%	
30	MAINTENANCE	0%		72%	1	0%		7%	2
Dec-91	OPERATING	90%	3	52%	5	92%	2	98%	1
	RESERVE	10%		48%		8%		2%	
31	MAINTENANCE	0%		0%		0%		0%	
Ave 1991	OPERATING	32%	12	51%	16	77%	19	51%	16
	RESERVE	54%	0	30%	0	20%	0	43%	0
	MAINTENANCE	13%	6	19%	6	3%	5	6%	9

Note 1 - Reserve mode - Able to operate Maintenance mode - Unable to operate

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OPERATION OF TURBINES
Ulan Bartar Power Plant #3
Mongolian Peoples Republic Project

19-May-92 Summary J O 6874 001 High Pressure

MONTH	CONDITION	Turbine #5		Turbine #6		Turbine #7		Turbine #8	
Jan-91	OPERATING	66%	4	44%	5	50%	2	97%	2
	RESERVE	34%		50%		23%		0%	
31	MAINTENANCE	0%		6%	2	27%	1	3%	1
Feb-91	OPERATING	68%	2	54%	1	23%	2	80%	1
	RESERVE	7%		29%		70%		20%	
28	MAINTENANCE	25%	1	18%	2	7%	1	0%	
Mar 91	OPERATING	98%	1	66%	1	21%	2	53%	3
	RESERVE	0%		8%		0%		47%	
31	MAINTENANCE	2%	1	26%	1	79%	2	0%	
Apr-91	OPERATING	44%	1	80%	4	52%	1	17%	
	RESERVE	48%		18%		23%		75%	
30	MAINTENANCE	8%	1	2%	1	25%	1	8%	1
May-91	OPERATING	74%	1	94%	3	37%	3	37%	2
	RESERVE	26%		6%		15%		21%	
31	MAINTENANCE	0%		0%		48%	1	42%	1
Jun-91	OPERATING	57%	3	98%	1	52%	5	0%	
	RESERVE	21%		2%		13%		0%	
30	MAINTENANCE	22%	2	0%		35%	5	100%	
Jul-91	OPERATING	45%	1	5%	1	24%		0%	
	RESERVE	55%		90%		0%		0%	
31	MAINTENANCE	0%		5%	1	76%	1	100%	
Aug-91	OPERATING	42%	1	40%	1	39%	2	0%	
	RESERVE	58%		60%		58%		0%	
31	MAINTENANCE	0%		0%		3%	1	100%	
Sep-91	OPERATING	42%	1	0%		12%	1	0%	
	RESERVE	58%		100%		88%		0%	
30	MAINTENANCE	0%		0%		0%		100%	
Oct-91	OPERATING	90%	2	32%	2	87%	2	0%	
	RESERVE	5%		15%		10%		0%	
31	MAINTENANCE	5%	1	53%	1	3%	1	100%	
Nov-91	OPERATING	73%	1	27%	1	97%	2	0%	
	RESERVE	27%		73%		0%		0%	
30	MAINTENANCE	0%		0%		3%	2	100%	
Dec-91	OPERATING	87%	1	56%	1	71%	2	0%	
	RESERVE	13%		44%		29%		0%	
31	MAINTENANCE	0%		0%		0%		100%	
Ave 1991	OPERATING	66%	19	50%	21	47%	24	24%	8
	RESERVE	29%	0	41%	0	27%	0	14%	0
	MAINTENANCE	5%	6	9%	8	26%	16	63%	3

Note 1 - Reserve mode - Able to operate Maintenance mode - Unable to operate

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BOILER AVAILABILITY

CHARTS

MONGOLIAN PEOPLES REPUBLIC

DERKHAN

POWER PLANT

J O 6874 001

Page No	Charts
2	Explosions

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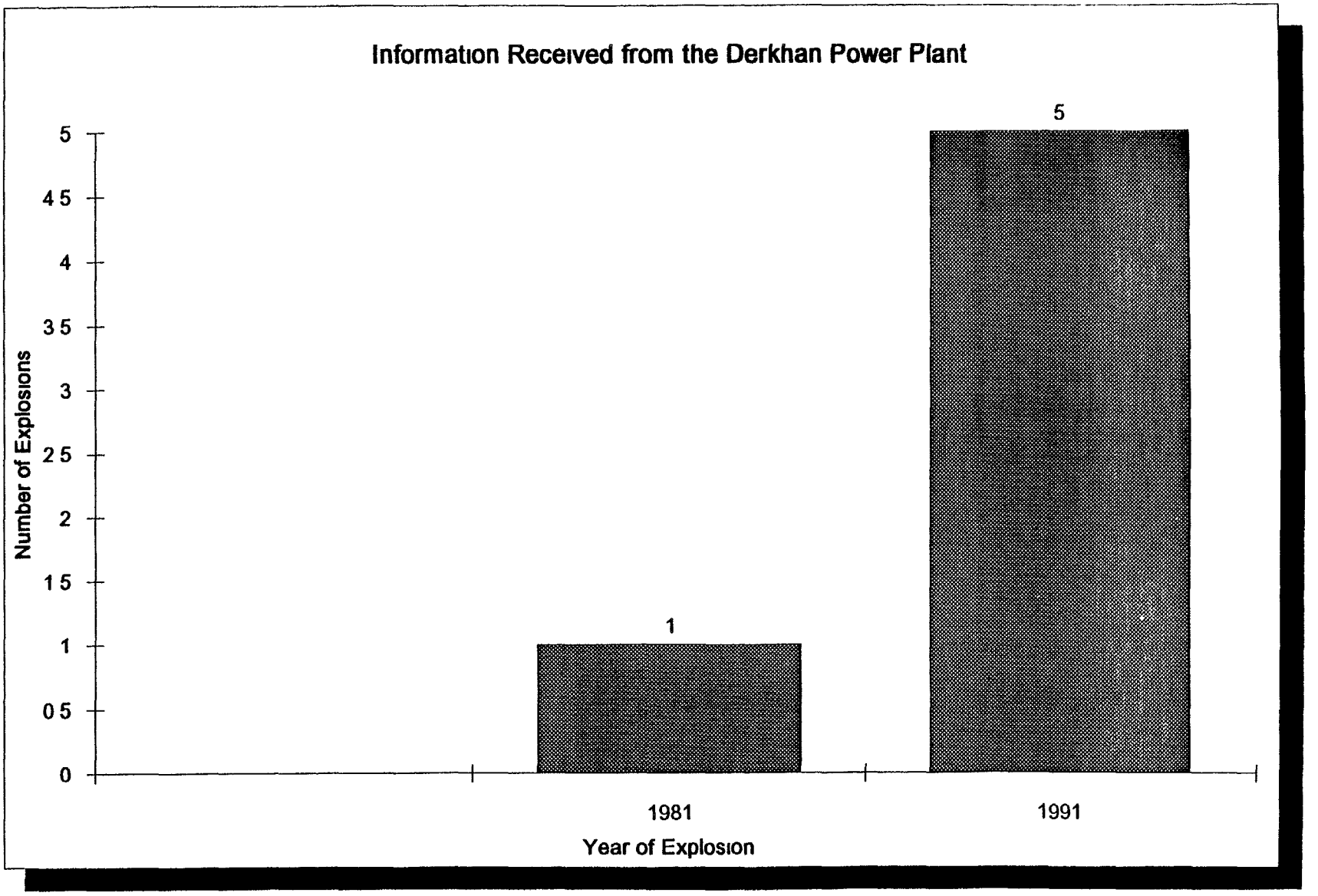
Information Received from the Derkhan Power Plant
Number of Explosions
5
4 5
4
3 5
3
2 5
2
1 5
1
0 5
0
1
5
1981
1991
Year of Explosion

BOILER AVAILABILITY

CHARTS

MONGOLIAN PEOPLES REPUBLIC

Operating - Reserve - Maintenance

POWER PLANT No. 3

J O 6874 001

Page No	Charts
2	Data Table
3	Low Pressure Boiler
4	High Pressure Boiler
5	All Boilers at Power Plant #3

Operating Boiler on line
Reserve - Boiler off line but available
Maintenance - Boiler not available - Down for repair

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	Mongolian Peoples Republic			
	Ulan Bartar Power Plant #3			
	J O No 6874 001			
	Low Pressure Boilers			
	Operating	Reserve	Maintenance	
Jan-91	67%	14%	19%	
Feb-91	61%	21%	18%	
Mar 91	63%	8%	29%	
Apr 91	43%	18%	39%	
May-91	29%	17%	53%	
Jun-91	33%	28%	39%	
Jul-91	36%	24%	40%	
Aug-91	45%	22%	33%	
Sep-91	44%	21%	36%	
Oct-91	57%	27%	16%	
Nov-91	66%	33%	1%	
Dec-91	75%	25%	0%	
Ave	52%	22%	27%	
	High Pressure Boilers			
	Operating	Reserve	Maintenance	
Jan-91	38%	22%	40%	
Feb-91	32%	19%	49%	
Mar-91	30%	4%	66%	
Apr-91	28%	29%	42%	
May-91	33%	30%	37%	
Jun-91	29%	21%	50%	
Jul-91	10%	34%	56%	
Aug-91	12%	60%	29%	
Sep-91	9%	63%	29%	
Oct-91	32%	39%	29%	
Nov-91	32%	39%	29%	
Dec-91	43%	28%	29%	
Ave	27%	32%	40%	
	Average of All Boilers			
	Operating	Reserve	Maintenance	
Jan 91	52%	18%	30%	
Feb-91	47%	20%	33%	
Mar-91	47%	6%	47%	
Apr-91	36%	24%	40%	
May-91	31%	24%	45%	
Jun-91	31%	24%	45%	
Jul-91	23%	29%	48%	
Aug-91	28%	41%	31%	
Sep-91	26%	42%	32%	
Oct 91	44%	33%	22%	
Nov-91	49%	36%	15%	
Dec-91	59%	27%	14%	
Ave	39%	27%	34%	

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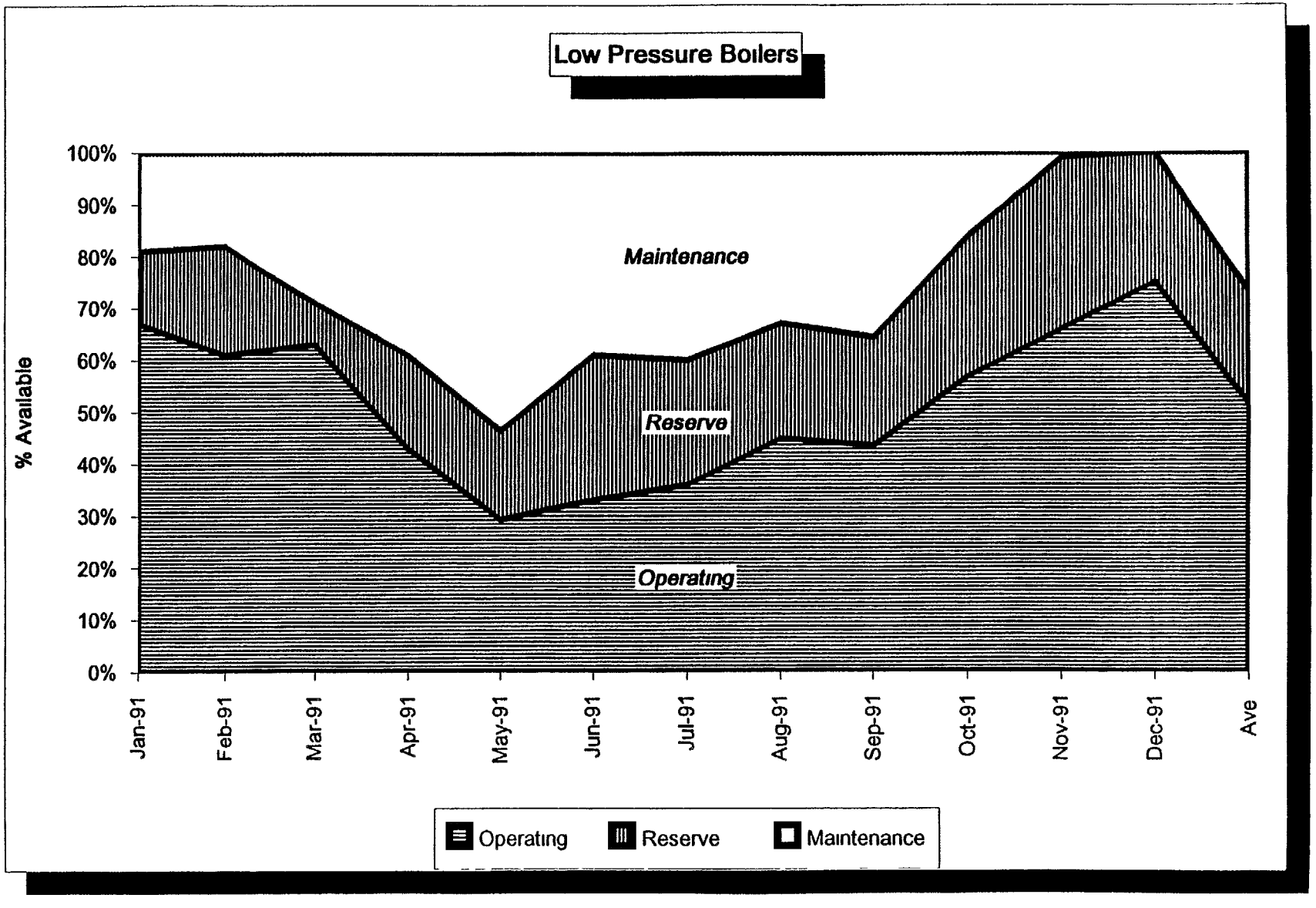
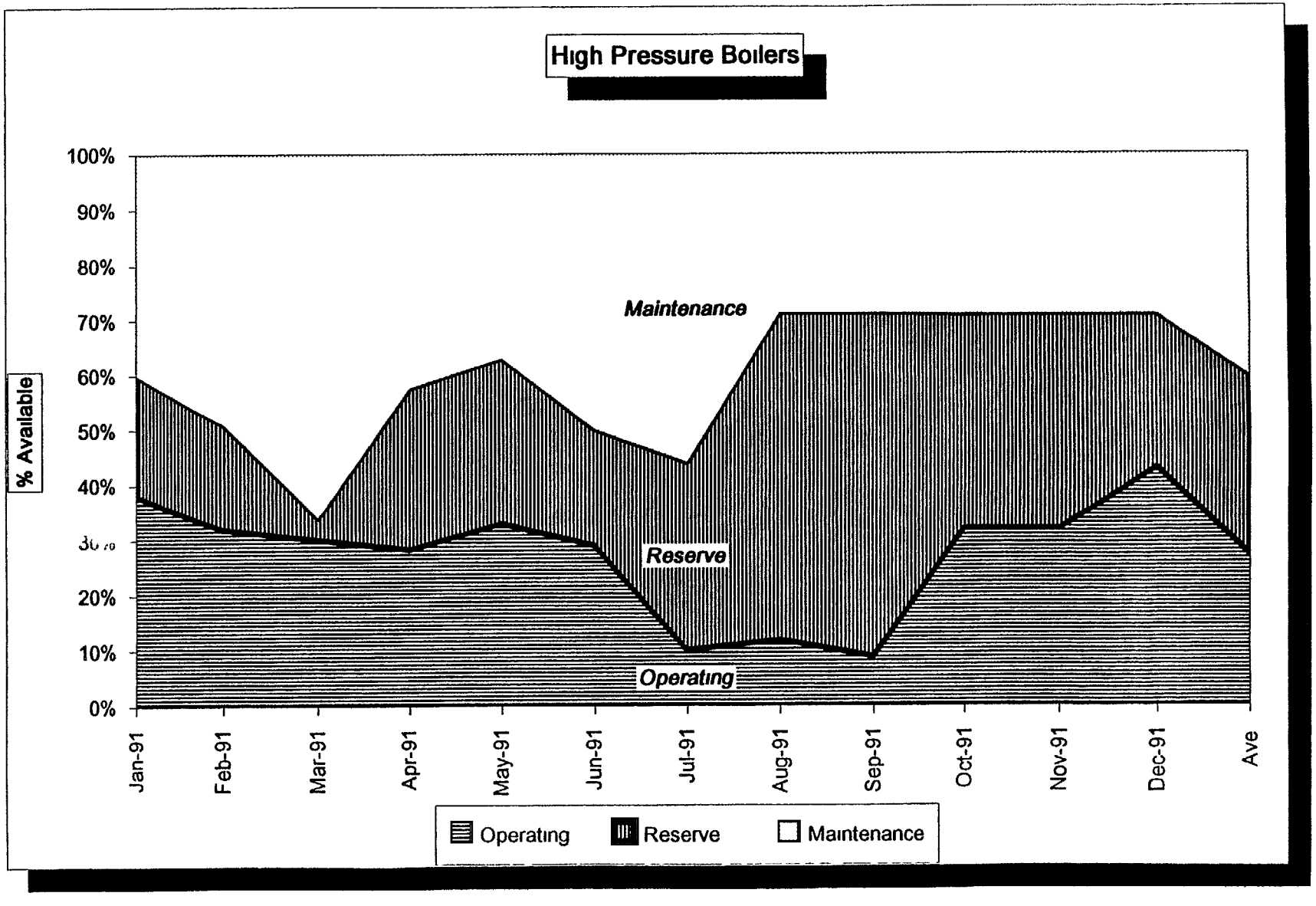
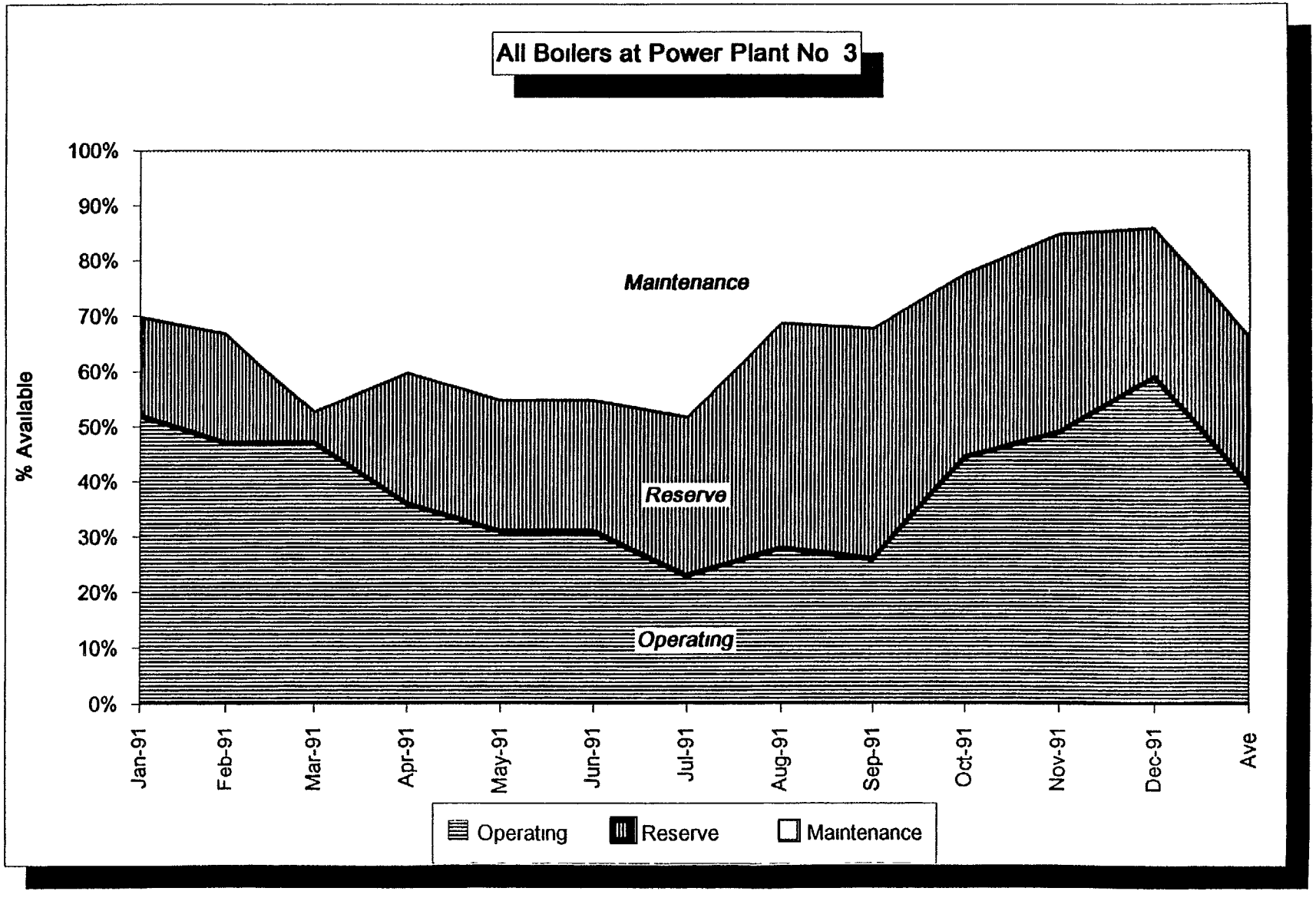

Low Pressure Boilers
% Available
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Maintenance
Reserve
Operating
Jan-91
Feb-91
Mar-91
Apr-91
May-91
Jun-91
Jul-91
Aug-91
Sep-91
Oct-91
Nov-91
Dec-91
Ave
Operating
Reserve
Maintenance


High Pressure Boilers
% Available
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Maintenance
Reserve
Operating
Jan-91
Feb-91
Mar-91
Apr-91
May-91
Jun-91
Jul-91
Aug-91
Sep-91
Oct-91
Nov-91
Dec-91
Ave
Operating
Reserve
Maintenance


All Boilers at Power Plant No 3
% Available
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Maintenance
Reserve
Operating
Jan-91
Feb-91
Mar-91
Apr-91
May-91
Jun-91
Jul-91
Aug-91
Sep-91
Oct-91
Nov-91
Dec-91
Ave
Operating
Reserve
Maintenance

APPENDIX E

NILAKAH MINE GAS DETECTORS

APPENDIX E

NILAKAH MINE GAS DETECTORS

SUMMARY

At the direction of US-AID, United Engineers and Constructors has purchased twelve portable methane/oxygen gas detectors for use by Nilakah Mine personnel A verbal Purchase Order No 7419 002-252-11 (subsequently confirmed in writing on December 9, 1992) for twelve MICROGARD™ Portable Alarms with sample pump module, batteries, battery chargers, calibration kits, and calibration gas cylinders was issued to MSA (Mine Safety Appliances Company) on December 8, 1992 in order to meet a required shipping date of December 16, 1992 Unfortunately, they did not make the air charter and, instead, were shipped via commercial air cargo, (via Russia), in early January The portable gas detectors will monitor and alarm high concentration of methane-in-air and high/low concentration of oxygen, both in the immediate vicinity of the device

BACKGROUND

In order to protect personnel entering or working in the mine, monitoring devices to detect and alarm the presence of increasing concentrations of methane gas and/or a deficiency of oxygen are necessary The protective devices may be furnished as a fixed installation, including a microprocessor based control system with personal computer interface, for remotely monitoring the mine atmosphere, and/or as portable alarms carried or worn by individuals entering the mine

The fixed installation includes permanently mounted sensors within the mine at strategic locations with an external (to the mine) controller which includes the software and indications for remote monitoring of mine atmospheric conditions The system would be energized by available electrical power with a battery back-up system in the event of power interruption All equipment mounted within the mine would be intrinsically safe and/or contained in explosion proof housings, depending upon distance to the controller unit The primary advantage of this system is 24-hour monitoring of mine conditions using remote sensors The application of this equipment, however, requires engineered software for programming the logic controllers, an engineered installation for the sensors, and a higher level of technical expertise in the operation and maintenance of the system than that required for portable alarms The primary disadvantage of this system is its higher cost and the inflexible nature of fixed sensor locations as the mine is developed and corridors/ shafts are extended This type of system would have to be designed to accommodate future corridors and shafts
The portable alarms, which are carried by individual personnel, provide the same monitoring functions (methane gas and oxygen concentrations), but are off-the-shelf components available for immediate shipment Since the portable alarms move with personnel, they can be conveniently used as the mine is extended and are always at the location of the worker, as opposed to preset fixed sensor locations within the mine There are two primary disadvantages of the portable alarms (a) they are powered by rechargeable batteries, and (b) they enter the mine with the worker, i e , they do not monitor mine atmospheric conditions on a twenty four hour basis <u>These disadvantages mean that personnel may not be aware of a dangerous situation until it is too late</u>

The first disadvantage is overcome by providing adequate batteries and battery chargers to assure sufficient power for operation for the duration of an 8-hour shift New, fully charged batteries are required each time the unit is used The second disadvantage can be mitigated, but not eliminated, by recognizing the limits of the device and training personnel to enter the mine in a cautious manner, allowing the unit sufficient time to respond to off-normal or alarm conditions

The need to provide a modicum of safety in a timely manner as directed by AID precluded the delay which would be necessary for purchasing and installing an engineered fixed system, UE&C's initial focus The portable alarms will provide a higher degree of safety than currently exists, but we recommend the future installation of a fixed system with appropriate allowances to accommodate the extension of the mine corridors/shafts

Telephone communication with personnel at the site has indicated that the current mine conditions include a methane-in-air concentration greater than 2% and that the ventilation fans are inoperative The condition of the ventilation fans is confirmed in a report written by Mr P McCandless, dated October 30, 1992, page 1, Item 3), as follows

> 3) Regarding ventilation fans, there are two, one of which normally runs, and one that is for stand-by They are the same size fans, and are rated to circulate three thousand cubic meters per second of air The "clean" air is pushed down into the mine using the vent piping, and is exhausted out the shaft as "dirty" air Presently, both fans are "down " I do not have the figure for the static pressure on these fans, but will try and call the ministry this AM, and include that with this letter (Vent pipe needs 2000m x 600mm immediate and 4000m x 600mm by year end) It is believed that this pipe is "blower bag "

If the methane-in-air concentration is greater than 2%, as stated, the portable monitors will be in "constant" alarm, as the factory preset limit for warning personnel is 2% With this scenario, the monitors will, at best, only indicate the methane-in-air concentration, up to a maximum range of 5%, but without the benefit of an effective warning alarm due to a change/further increase of the methane-in-air concentration The need to repair/correct the fans and/or motor drives, ventilation ducts, and dampers to improve fresh air flow is, therefore, imperative Further, we have been advised, verbally, of the existence of three active fires in the mine No degree of monitoring will, of itself, improve personnel safety under these operating conditions

OPERATION - Portable Alarms

It is intended that each individual "wear" or carry a MICROGARD portable alarm when entering and/or working in the mine The portable alarm device must be totally exposed to the mine atmospheric conditions at all times, i e , totally uncovered, to afford reliable and responsive monitoring of the methane and oxygen concentrations Calibration of each portable alarm device should be checked on a regular basis in accordance with MSA recommendations, preferably each time the unit is used The portable alarm is limited to monitoring only the immediate vicinity around the individual

> **CAUTION** The MICROGARD portable alarm does not have the capacity, nor is its purpose by design or use, intended to provide alarms or indication of mine conditions in advance of the individual wearing the device

The MICROGARD portable alarm will provide an audible alarm and visual indication of the following conditions

- An increase in the concentration of methane-in-air (by volume) to 2 % or more
- A decrease in the concentration of oxygen (as measured by the partial pressure of oxygen) to 19 5% or less
- An increase in the concentration of oxygen (as measured by the partial pressure of oxygen) to 23 5% or more
- Sensor failure (if the monitor indicates methane concentrations less than zero)
- Out-of-range concentration of methane-in-air greater than 5%
- Low battery condition

NOTE All alarm limits for gas concentrations noted above are preset at the factory

PERIPHERAL EQUIPMENT

The following peripheral components are provided (along with the twelve portable units) to improve the monitoring functions of the portable alarm units

- An earphone for high noise locations
- An integral plug-in pump module to aspirate the sample to the sensing element and improve speed of response
- (24) spare rechargeable Nicad (nickel-cadmium) battery packs to assure twenty-four hour availability
- (12) battery chargers
- (2) calibration check kits
- (12) 95-liter bottles of 2 5% methane-in-air calibration gas

PERFORMANCE CHARACTERISTICS

•	ACCURACY	±0 5% oxygen @ temperature range 0-40 °C ±0 3% methane	
•	RANGES	Oxygen	1 - 25%
		Methane-in-air	0 - 5%

NOTE The Lower Explosion Limit (LEL) of methane-in-air is 5% The factory preset alarm for methane-in-air at 2% is 40% of the LEL value

- RESPONSE TIME Oxygen 90% of final reading in 10 seconds at temperature range of 0-40 °C
  Methane 90% of final reading in 8 seconds

- OPERATING TIME
  8-10 hours nominal continuous usage at temperature range of 0-40 °C with fully charged Nicad battery

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APPENDIX F

INSTRUMENTATION AND CONTROL DRAWINGS

APPENDIX F

DRAWINGS

DRAWING LIST

Instrumentation and Control

PULVER	Pulverizer & Feeder Arrangement
PULVER 2	Pulverizer Fan Arrangement
IC-10-03	Pulverizer Air Temp Logic
IC-11-02	Pulverizer Air Flow Write Up
IC-12-01	Control Board Area
IC-13-02	Pulverizer Pressure Control
IC-14-01	Pulverizer Pressure Control Write Up
IC-15-01	HP Pulverizer Feeder
IC-16-01	LP Pulverizer Feeder
IC-17-01	Burner Scanner
IC-18-Sh 1	HP Boilers Scanner Cabinets Sh 1 of 2
IC-18-Sh 2	HP Boilers Scanner Cabinets Sh 2 of 2
IC-19	High Pressure Boiler Control Room Cabinets & Racks
IC-20 Sh 1	HP Controller Arrangement
IC-20 Sh 2	HP Controller Arrangement
IC-21	LP Controller Arrangement

Mechanical

M-001	HP Plant Boiler Flame Scanner Cooling Air Piping Plan at Elevation 9600
M-002	HP Plant Boiler Flame Scanner Cooling Air Piping Section Looking East

Electrical

E-001	Pulverizer Damper Controls Block & Elementary Diagrams
E-002	High Pressure Pulverizer Damper Controls Wiring Diagram
E-003	Low Pressure Pulverizer Damper Controls Wiring Diagram
E-004	High Pressure Pulverizer Damper Controls Mounting Configuration

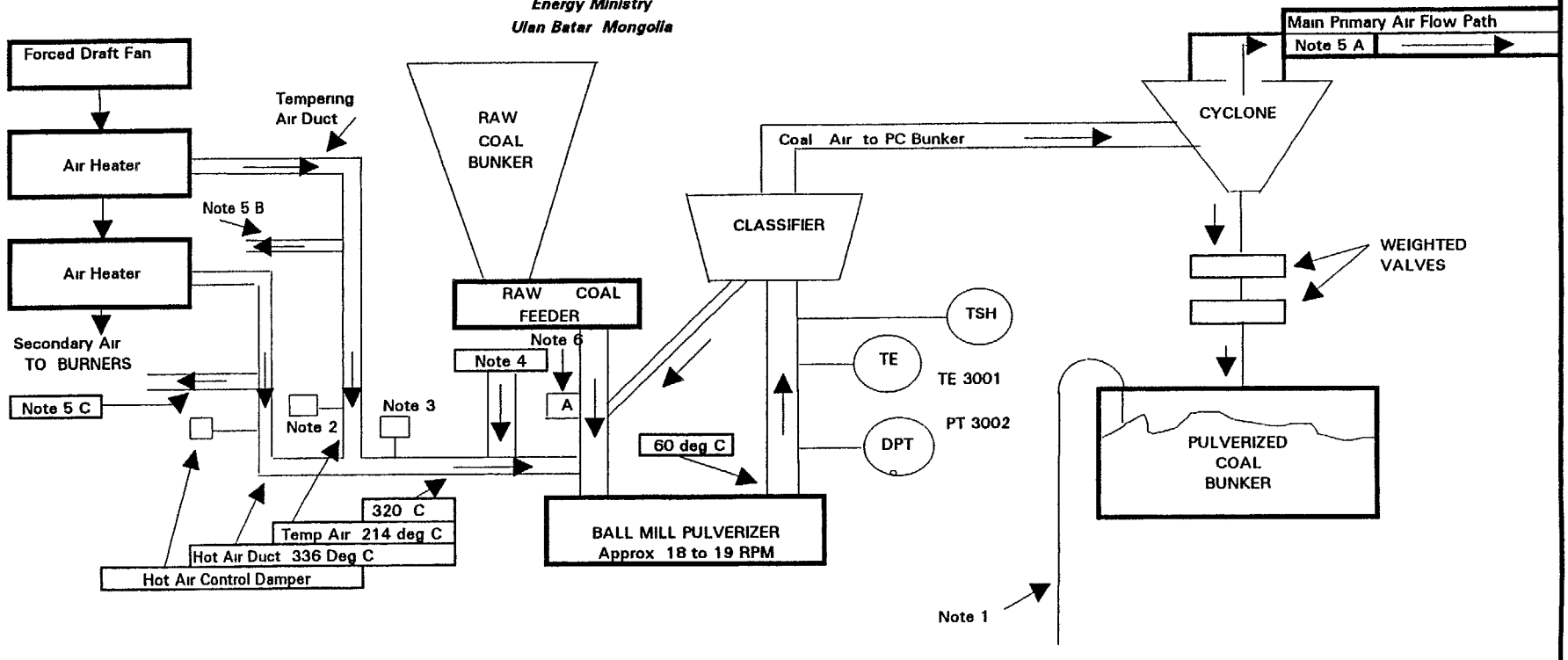
Dwg No	TITLE
PULVER	Pulverizer & Feeder Arrg't
PULVER2	Pulverizer Fan Arrg't
IC-10 02	Pulverizer Air Temp Logic
IC-11	Pulverizer Air Flow Write Up
IC-12	Control Board Area
IC-13	Pulverizer Pressure Control
IC-14	Pulverizer Pressure Control Write Up
IC-15	HP Pulverizer Feeder
IC-16	LP Pulverizer Feeder
IC-17	Burner Scanner
IC-18 Sh 1	Scanner Cabinet
IC-18 Sh 2	Scanner Cabinet
IC-19	HP Boilers Racks & Cabinets
IC-20 Sh 1	HP Controller Arrangement
IC-20 Sh 2	HP Controller Arrangement
IC-21	LP Controller Arrangement

Mongolian Energy Ministry
Critical Spare Parts

Drawing INDEX

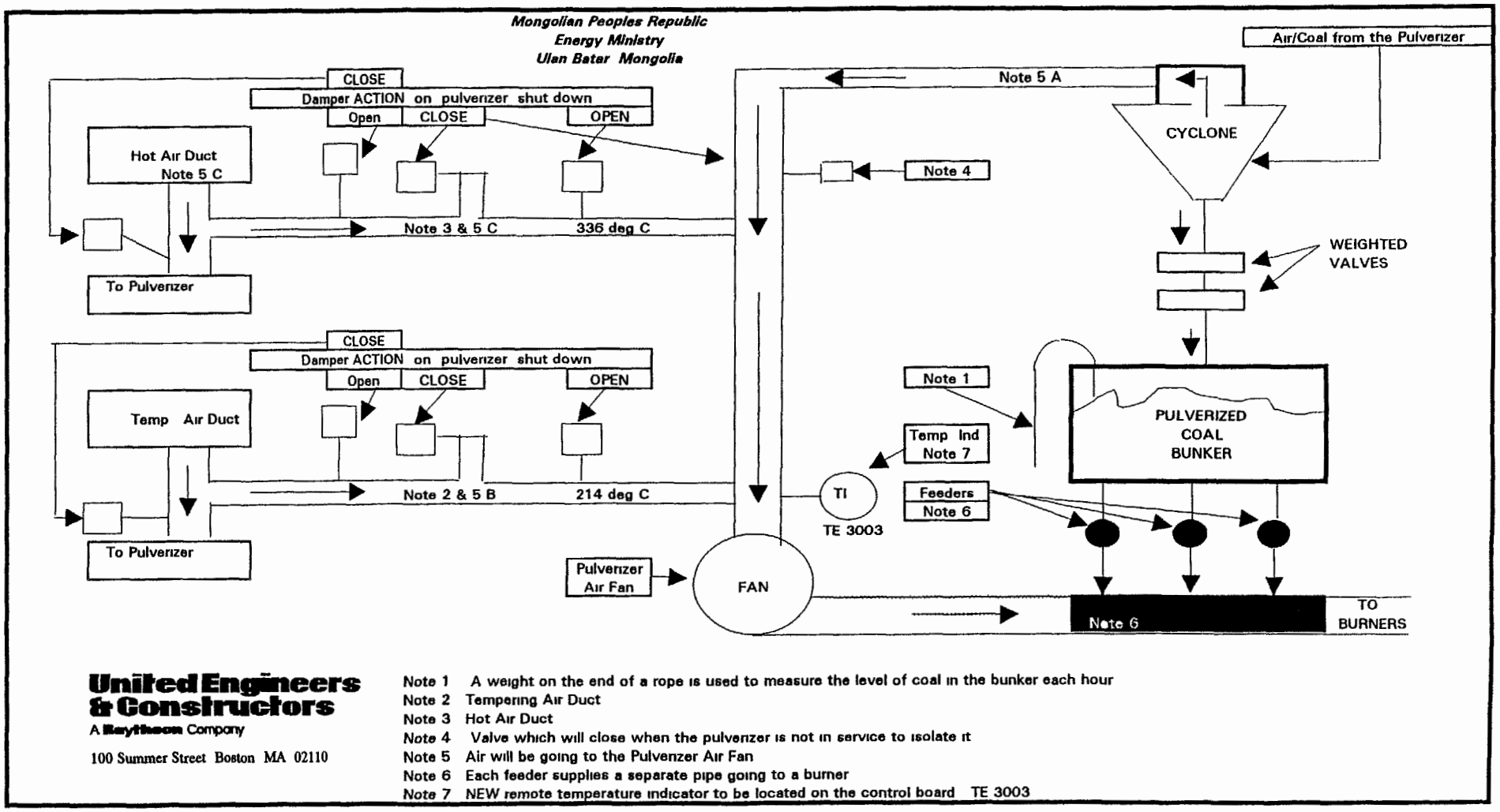
Dwg No
7419-001-IC-INDEX

Mongolian Peoples Republic
Energy Ministry
Ulan Batar Mongolia



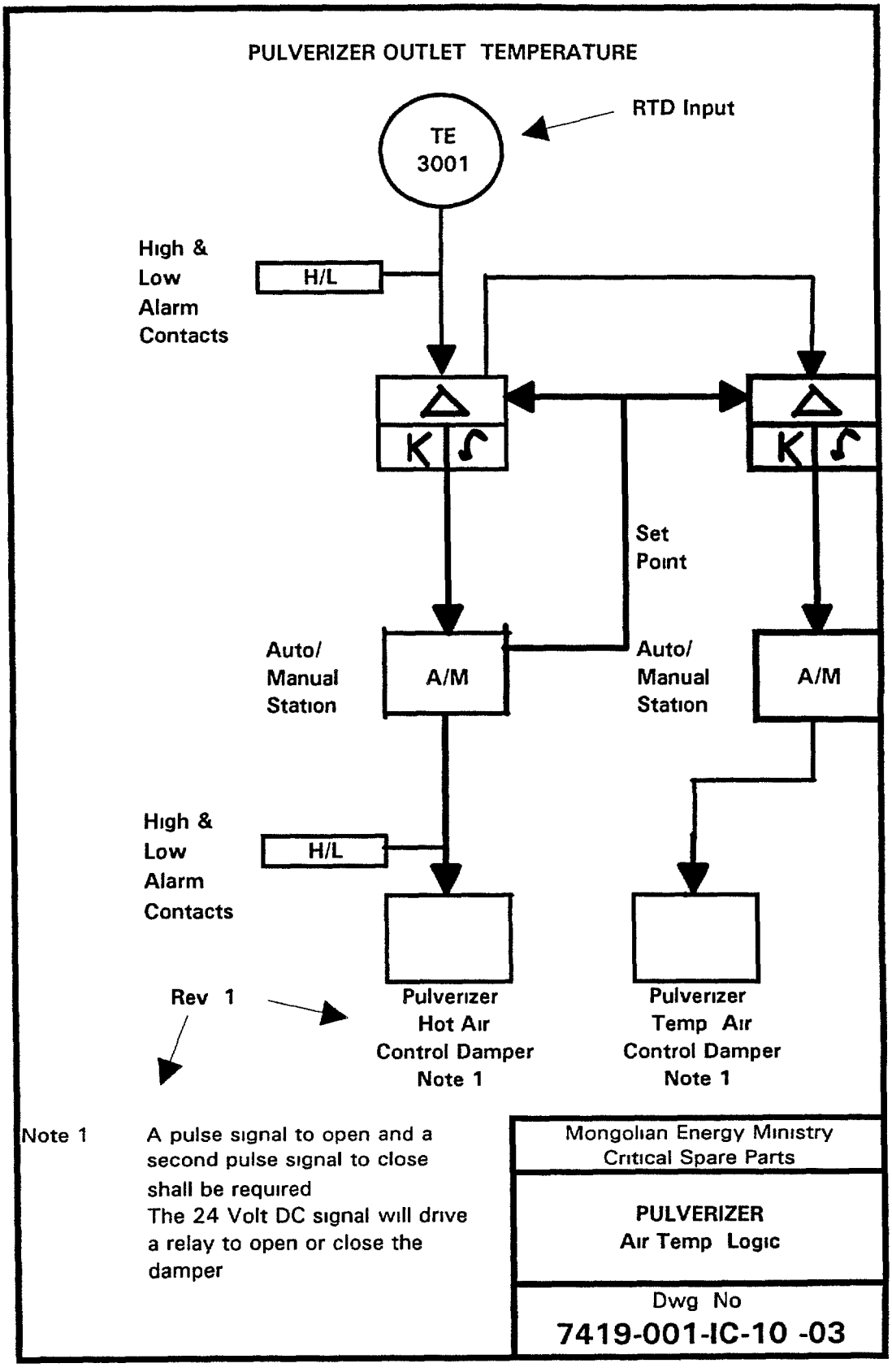
United Engineers & Constructors
A Raytheon Company
100 Summer Street, Boston MA 02110

Note 1 A weight on the end of a rope is used to measure the level of coal in the bunker once each hour
Note 2 Tempering Air Control Damper
Note 3 Flow Control Damper (Low Pressure Boilers have a manual damper)
Note 4 Valve which will open when the pulverizer is shut down Permits plant air to enter the pulverizer
Note 5 Air will be going to the Pulverizer Air Fan
Note 6 Adding a NO coal alarm (Current system does not have an a NO coal alarm)



United Engineers & Constructors
A Raytheon Company
100 Summer Street Boston MA 02110

Note 1 A weight on the end of a rope is used to measure the level of coal in the bunker each hour
Note 2 Tempering Air Duct
Note 3 Hot Air Duct
Note 4 Valve which will close when the pulverizer is not in service to isolate it
Note 5 Air will be going to the Pulverizer Air Fan
Note 6 Each feeder supplies a separate pipe going to a burner
Note 7 NEW remote temperature indicator to be located on the control board TE 3003


PULVERIZER OUTLET TEMPERATURE
RTD Input
TE
3001
High &
Low
Alarm
Contacts
H/L
K
K
Set
Point
Auto/
Manual
Station
A/M
Auto/
Manual
Station
A/M
High &
Low
Alarm
Contacts
H/L
Rev 1
Pulverizer
Hot Air
Control Damper
Note 1
Pulverizer
Temp Air
Control Damper
Note 1
Note 1
A pulse signal to open and a second pulse signal to close shall be required
The 24 Volt DC signal will drive a relay to open or close the damper
Mongolian Energy Ministry
Critical Spare Parts
PULVERIZER
Air Temp Logic
Dwg No
7419-001-IC-10 -03

PULVERIZER AIR TEMP WRITE UP

1 The type of pulverizer being controlled is a ball mill
2 This controller will replace current solid state devices
3 Controllers are for eighteen pulverizers

4 High and low alarm output contacts shall be available on the input signal and hot air damper output signal
5 Each of the six high pressure boilers have two pulverizers Each pulverizer will be independent of the other
6 Each of the six low pressure boilers have one pulverizer
7 The controller shall maintain the mill outlet temperature based on a manual set point
8 The logic as shown will require two controllers

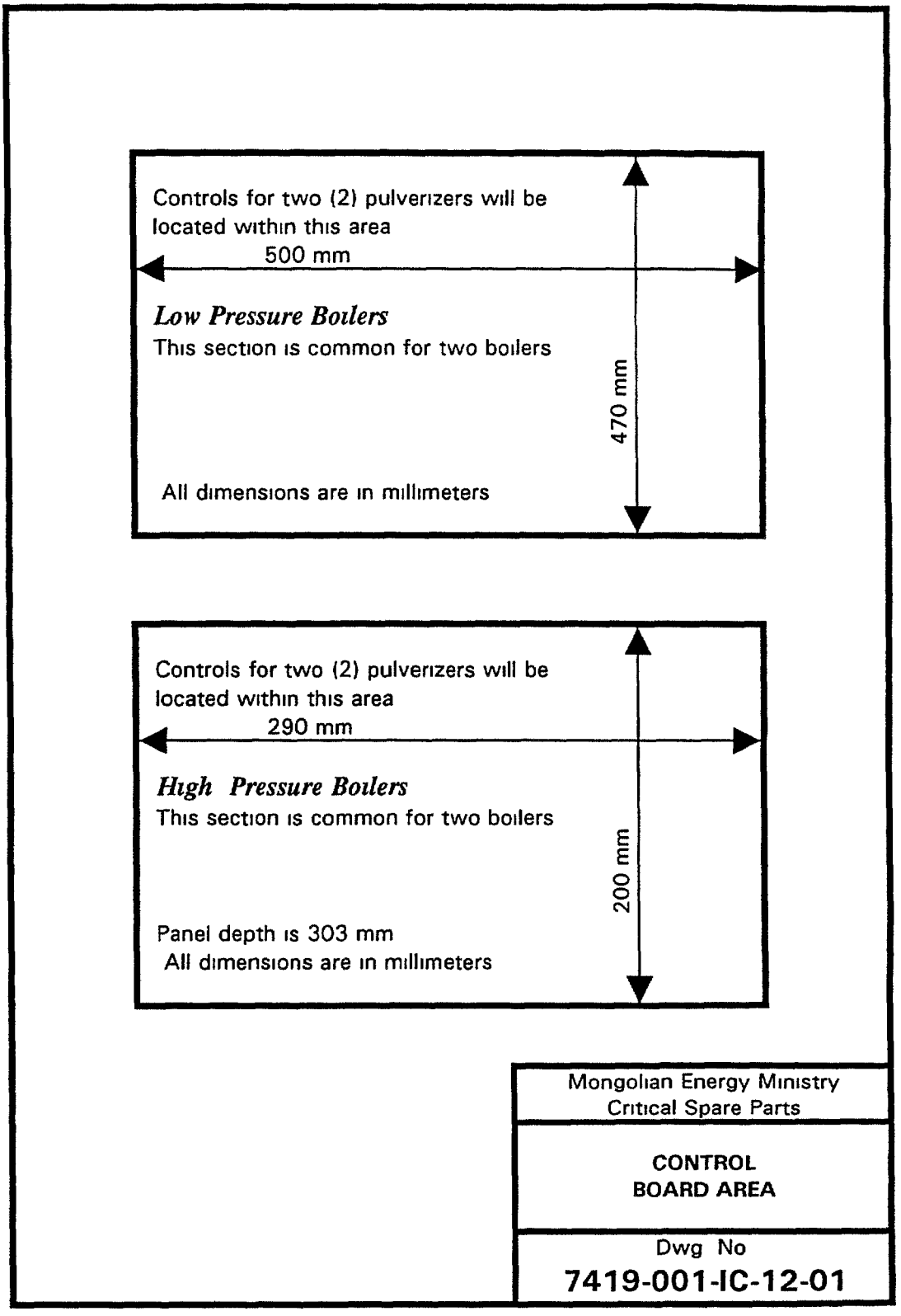
9 Panel insert Notes on area available
Low Pressure Boilers have space available on a common section of the board for a pulverizer from for two different boilers
High Pressure Boilers will have an rack assembly

10 Note the input and the output signals as shown on the control loop drawing
11 The controller shall be capable of being reprogrammed at the job site The controller offered shall have logic to create a function generator, for each output, if required
12 The pulverizer hot air damper shall open (if in auto) as the pulverizer outlet temperature decreases
The operator shall be able to drive the hot air damper open or closed in manual
13 The pulverizer temp air damper shall close (if in auto) as the pulverizer outlet temperature decreases
The operator shall be able to drive the temp air damper open or closed in manual This willl permit the operator to adjust the temperature for one of four types of coal being fired

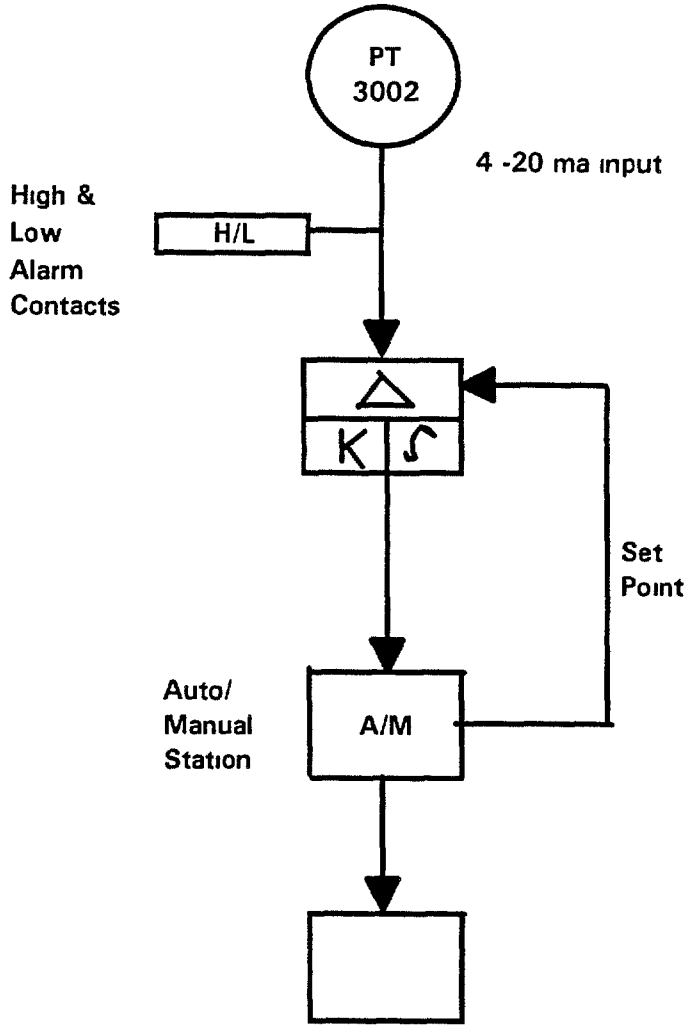
Mongolian Energy Ministry
Critical Spare Parts

PULVERIZER
Air Flow Write-Up

Dwg No
7419-001-IC-11-02


Controls for two (2) pulverizers will be located within this area
500 mm
Low Pressure Boilers
This section is common for two boilers
470 mm
All dimensions are in millimeters
Controls for two (2) pulverizers will be located within this area
290 mm
High Pressure Boilers
This section is common for two boilers
200 mm
Panel depth is 303 mm
All dimensions are in millimeters
Mongolian Energy Ministry
Critical Spare Parts
CONTROL BOARD AREA
Dwg No
7419-001-IC-12-01

PULVERIZER OUTLET PRESSURE



Pressure Control Damper
Note 1

Rev 1

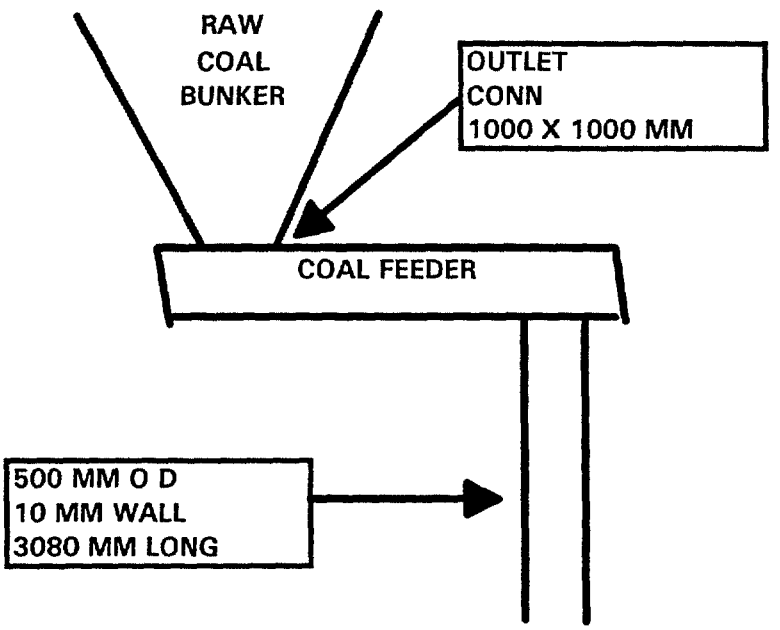
Note 1 The output signal to the control damper will be 4-20 ma for the low pressure boilers
The output signal to the control damper will be 24 VDC pulse signal (1each for open & close) for the high pressure boilers

Mongolian Energy Ministry Critical Spare Parts
PULVERIZER **Pressure Control**
Dwg No **7419-001-IC-13 -02**

PULVERIZER OUTLET PRESSURE CONTROL WRITE UP

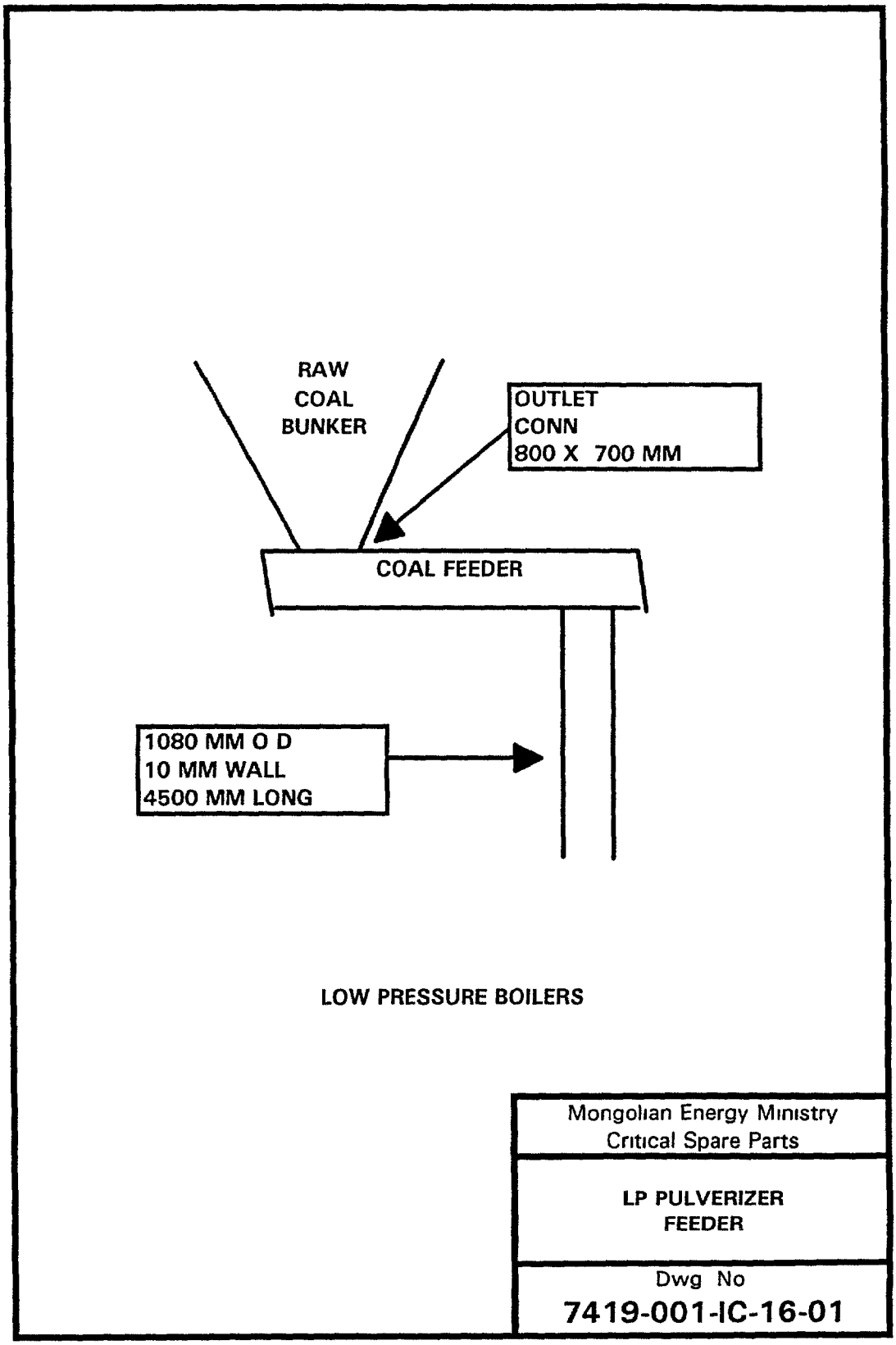
1 The type of pulverizer being controlled is a ball mill
2 This controller will replace current solid state devices
3 Controllers are for twelve pulverizers with an option for an additional six pulverizers
4 High and low alarm output contacts shall be available on the input signal and hot air damper output signal
5 Each of the six high pressure boilers have two pulverizers Each pulverizer will be independent of the other
6 Each of the six low pressure boilers have one pulverizer
7 The controller shall maintain the mill outlet pressure based on a manual set point
8 The logic shown may require more then one controller, the Seller shall furnish all hardware and software required to complete the logic
9 Panel insert Notes on area available
Low Pressure Boilers have space available on a common section of the board for a pulverizer from for two different boilers
High Pressure Boilers have space available for the two pulverizers on that boiler
10 Note the input and the output signals as shown on the control loop drawing
11 The controller shall be capable of being reprogrammed at the job site The controller offered shall have logic to create a function generator, for each output, if required
12 The pulverizer air control damper shall open (if in auto) as the outlet pressure decreases

Mongolian Energy Ministry Critical Spare Parts
PULVERIZER **Pressure Control Write-Up**
Dwg No **7419-001-IC-14-01**



HIGH PRESSURE BOILERS

Mongolian Energy Ministry Critical Spare Parts
HP PULVERIZER FEEDER
Dwg No **7419-001-IC-15-01**



LOW PRESSURE BOILERS

Mongolian Energy Ministry Critical Spare Parts
LP PULVERIZER FEEDER
Dwg No 7419-001-IC-16-01

Notes

Complete mounting hardware will be required

It is very difficult to obtain materials in Mongolia

All required pipe nipples and fittings shall be furnished

The vendor may advise of improvements to the sketch below

This is what we require the vendor to furnish

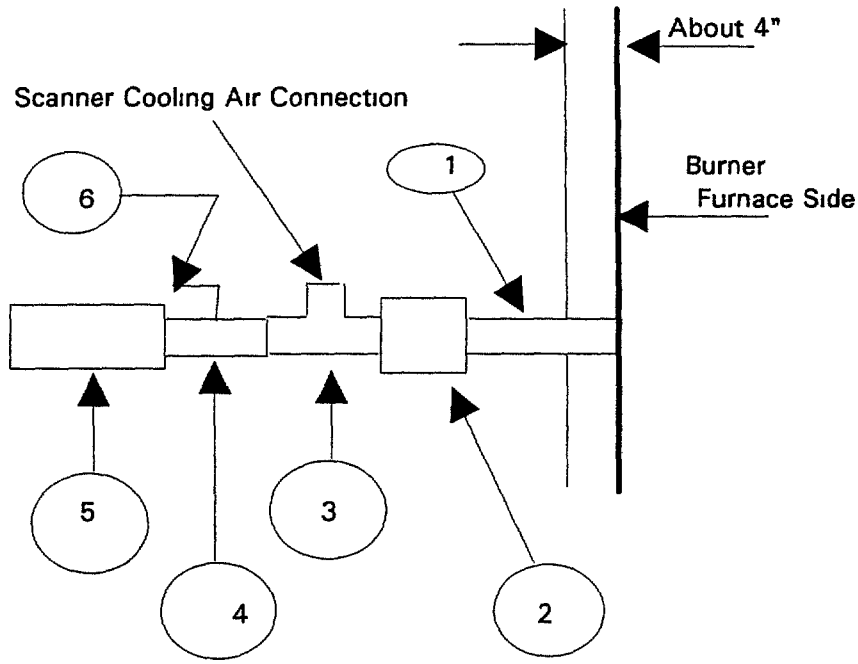
One scanner assembly is shown below

The coal nozzle is located at the burner center

The burner does NOT have any obstructions

The seller shall furnish an oversized pipe to retain the insulation and not block the scanner Seller shall furnish a pipe size as required to permit viewing (Item #1)

The purpose of the lens is to protect the scanners on loss of both scanner cooling air fans (Item #6)



HIGH PRESSURE BOILERS

Six Burners per Boiler

6 Heat resistance lens
5 Scanner
4 Ball Valve
3 Tee for the scanner cooling air connection
2 Swivel Mount
1 Pipe one foot long (304 8 mm)

Mongolian Energy Ministry Critical Spare Parts
BURNER **SCANNER**
Dwg No **7419-001-IC-17-01**

HIGH PRESSURE BOILERS
Scanner Cabinet

1 One cabinet will be required each each of the two control rooms
2 The scanner cabinets shall be NEMA 12
3 Will be located against a wall, front access will be required
4 Mount all amplifiers, power supplies etc within the cabinet
5 Mount the meter, lights & horn on the cabinet door
These devices shall be grouped per boiler
6 Furnish all power supplies required
7 Please note that one cabinet will control four boilers
and the second cabinet will control only three boilers
8 The scanners shall be used for indication only
9 A switch on the cabinet, shall be available to stop the alarm
on boilers out of service
10 The scanner fans shall be started and shutdown at the fan
A light shall appear on EACH panel to indicate that these fans
are in service and pressure is proven The required logic
shall be included with the fan start logic
A second light shall indicate that the second fan has started
A reset button may be used to clear these signals
Each control room shall be provided with fan status lights
as indicated above, loss of pressure, fan or auto fan
start shall be alarmed
11 Please note that the location makes it difficult to obtain materials
Therefore, all required fittings shall be furnished
12 The vendor shall wire all devices to terminal strips
13 Cabinet shall include the following features -
Free standing cabinet
Door with handle and three point latch
Lock with four keys
Light mounted within the cabinet, 220 VAC
Color of the cabinet shall be gray

Two (2) cabinets will be required
One cabinet for each control room

	Control Room	
Room #	1	2
Boiler No	7	10
Boiler No	8	11
Boiler No	9	12
Boiler No	----------	13

Mongolian Energy Ministry
Critical Spare Parts

HP Boilers
SCANNER
Cabinets
Sheet 1 of 2

Dwg No
7419-001-IC-18-01

HIGH PRESSURE BOILERS

Scanner Cabinet

14 Logic shall be furnished to maintain each light on when an alarm should occurred and until the reset button is depressed

15 A no coal flow alarm and light shall be required
The no coal alarm device is not part of this order
Two (2) no coal alarms will be required per boiler

16 Items mounted on the cabinet door for EACH boiler
The following devices are a minimum number

- (6) Flame On Lights
- (6) Flame Off Lights
- (6) Flame Meters
- (1) Coal Flow to Pulverizer
- (1) No Coal Flow to Pulverizer
- (1) Alarm Silence
- (1) Reset button
- (1) Switch to turn off alarms - Boiler Out of Service
- (1) Switch to turn off alarms - Feeder Out of Service

Common lights & Switch - one set per cabinet

- (1) Scanner Cooling Air Fan A On
- (1) Scanner Cooling Air Fan A Off
- (1) Scanner Cooling Air Fan B On
- (1) Scanner Cooling Air Fan B Off
- (1) Fan Running and Pressure Not Correct
- (1) Auto Fan Start
- (1) Fan Alarm Reset

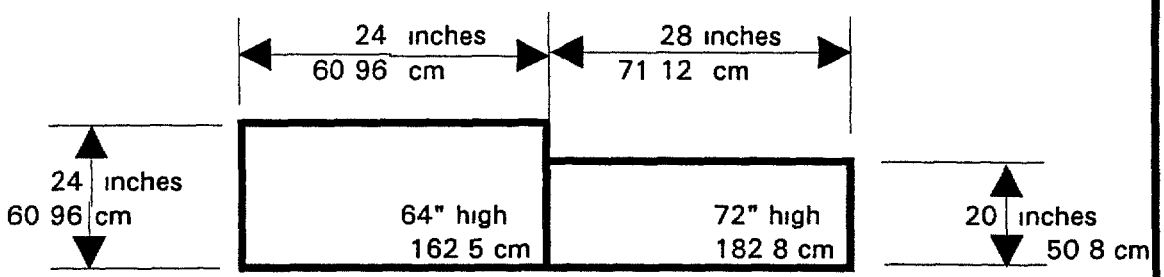
Two (2) cabinets will be required
One cabinet for each control room

	Control Room	
Room #	1	2
Boiler No	7	10
Boiler No	8	11
Boiler No	9	12
Boiler No	-------- -	13

Mongolian Energy Ministry
Critical Spare Parts

SCANNER
Cabinet
Sheet 2 of 2

Dwg No
7419-001-IC-18



Scanner Cabinet

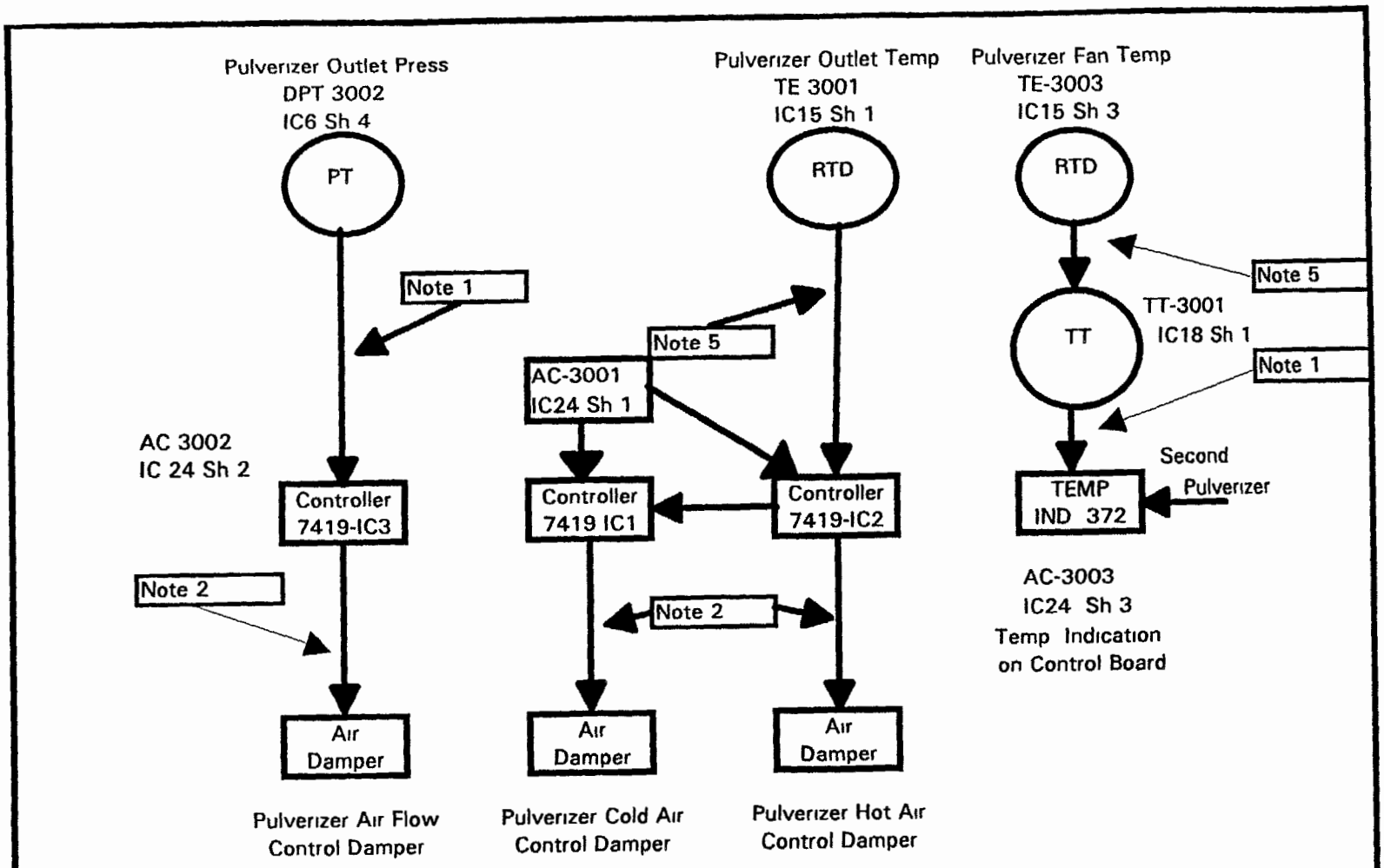
Rack for field mounting the Moore hardware

The above cabinets will be located in each of the two High Pressure Boiler Control Rooms

The Moore Rack will require some field wiring between the power supply and controllers The pulse output from the controller will have to be wired to a interposing relay

The scanner cabinet is limited to front access only

Mongolian Energy Ministry Critical Spare Parts
High Pressure Boiler Control Rooms Cabinets & Racks
Dwg No **7419-001-IC-19-01**



Notes

The ABOVE logic is for one pulverizer

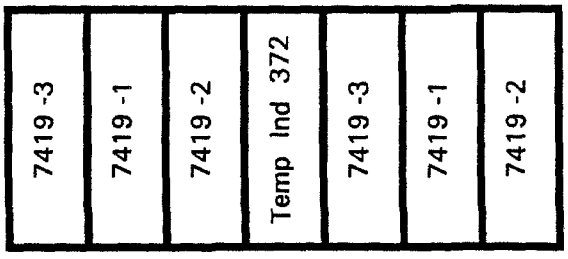
1. A 4-20 ma Signal
2. Two pulse signals (one to open & one to close)
3. Not Used
4. Not Used
5. RTD Input Signal
6. A low pressure boiler will have one pulverizer
7. A high pressure boiler will have two pulverizers

Mongolian Energy Ministry
Critical Spare Parts

High Pressure Boilers
CONTROLLER ARRANGMENT
Sheet 1 of 2

Dwg No
7419-001-IC-20

High Pressure Boilers
Controller Arrangement



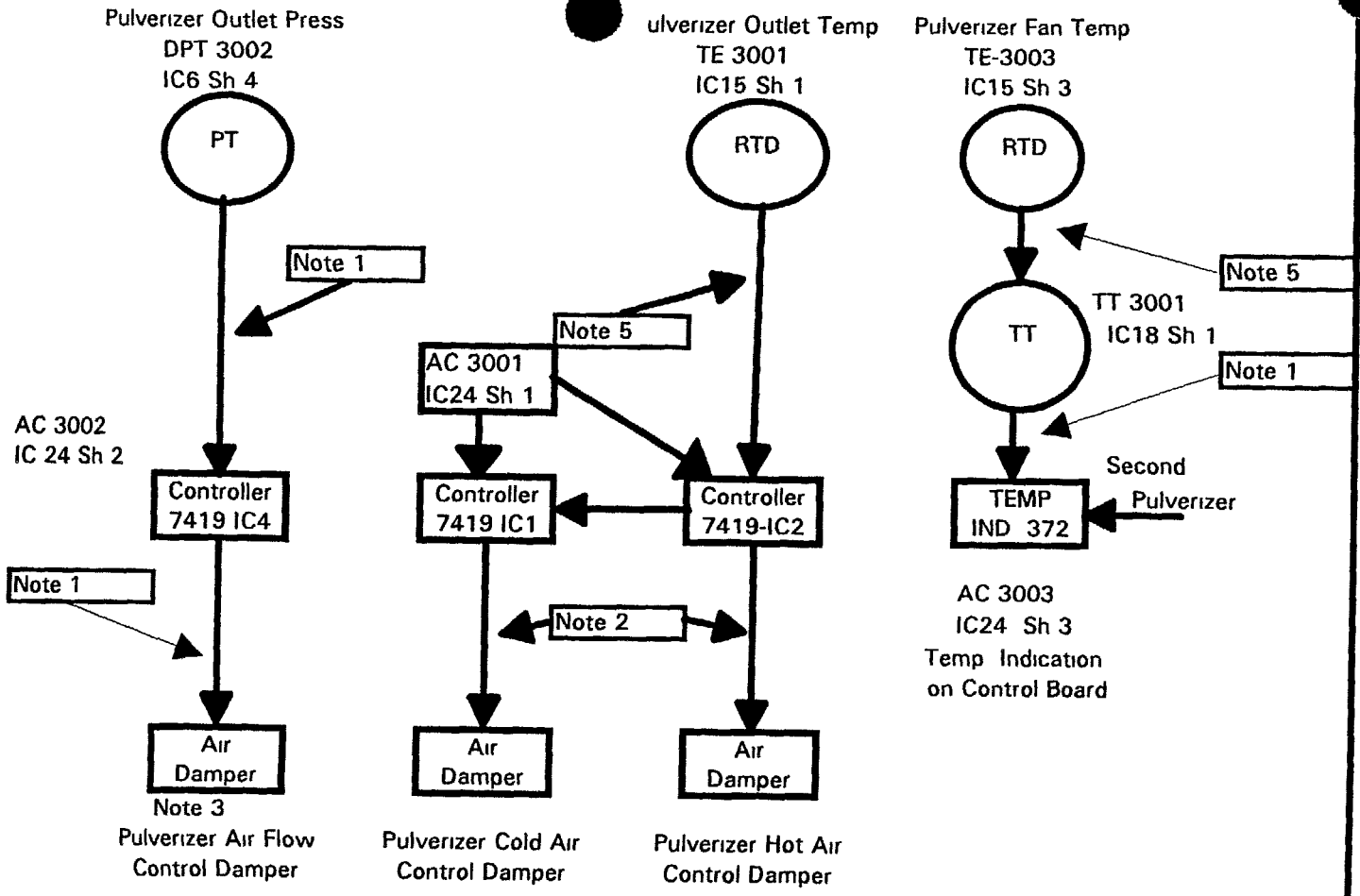
Each boiler will have all of the above
The rack in each HP Control Room
will have three shelves as shown above

7419-3 Controller for the Pulverizer Pressure
7419-1 Controller for the Temp Controller with an RTD input and signal to the Hot Air Damper
7419-2 Controller for the Temp Controller signal to the Temp Air Damper
372 Temperature Indicator for the Pulverizer Fan Outlet Temp The indicator shows two temperatures, one for each pulverizer

The controllers are then repeated for the second pulverizer

The controllers will be shipped with these tag numbers and will be programmed

Mongolian Energy Ministry Critical Spare Parts
High Pressure Boilers **CONTROLLER ARRANGEMENT** Sheet 2 of 2
Dwg No **7419-001-IC-20**



Notes ***The ABOVE logic is for one pulverizer***

1. A 4-20 ma Signal
2. Two pulse signals (one to open & one to close)
3. New damper drives are being purchased for the six low pressure pulverizers
4. Not Used
5. RTD Input Signal
6. A low pressure boiler will have one pulverizer
7. A high pressure boiler will have two pulverizers

Mongolian Energy Ministry Critical Spare Parts
Low Pressure Boilers **CONTROLLER ARRANGMENT**
Dwg No **7419-001-IC-21**

APPENDIX F

PHASE III ACTIVITY SUMMARY REPORT

ACTIVITY SUMMARY REPORT

FOR

EMERGENCY HEAT AND POWER PROJECT NO. 1

FOR

MONGOLIAN FUEL AND ENERGY MINISTRY

MAY 1993

UNITED ENGINEERS & CONSTRUCTORS, INC

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EMERGENCY HEAT AND POWER PROJECT NO. 1

ACTIVITY SUMMARY REPORT

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0 INTRODUCTION

During the winter and spring of 1992, United Engineers & Constructors, Inc (RE&C) prepared feasibility studies funded by a US Trade and Development Program Grant (TDP), for the Mongolia Fuel and Energy Ministry (Ministry) to evaluate conditions and needs of the energy sector, including power plants, electric power transmission, and dispatch facilities, and district heating systems

These studies concluded that rehabilitation of the power plants evaluated in the study was indeed feasible, however it would not be possible to complete the recommended rehabilitation work in time to be of value for the 1992/1993 and 1993/1994 heating seasons

The feasibility studies projected that without short term emergency assistance, Mongolia would face the prospect of further power blackouts and continued degradation of the district heating systems

A contract was subsequently issued to RE&C by US AID, titled or known as the Mongolia Emergency Heat and Power Project No 1 The initial intent of this contract was to provide emergency assistance for the power plant sector for the 1992 1993 heating season After evaluation of existing conditions in-country, AID issued a modification to the contract to also provide assistance for the coal mine sector Technical services for the coal mine sector were provided by RE&C with assistance from the Morrison-Knudsen Corporation (M-K)

The project initially involved the engineering, design, procurement, delivery and installation of equipment for all of the Ministry's major power plants plus an effort to provide instrumentation and controls for the coal pulverizing systems at Plant No 3 in Ulaanbaatar during the winter heating season of 1992-1993 This effort was subsequently changed to focus on improvements to Power Plant No 3

Power Plant No 3 in Ulaanbaatar, Mongolia is designed to generate electricity and to provide hot water to the central heating system in Ulaanbaatar which provides heat during the winter and domestic hot water all year long The plant is a coal fired plant and is built with all Russian equipment including the boilers and turbine -generators The plant has six (6) low pressure boilers, seven (7) high pressure boilers, four (4) high pressure turbines, each rated at 25 MWe, and four (4) low pressure turbines, each rated at 12 MWe

The plant provides steam to heat the water for the district heating system, industrial steam to local industry, and electrical power to the central power grid

The condition of the plant has resulted in numerous shutdowns in the recent past which in turn has caused an interruption in the supply of heat to the inhabitants of the capital city The shutdowns were caused by failure of individual pieces of equipment and especially by explosions in the coal pulverizers which prepare the coal for firing in the boilers

It was determined that the explosions in the pulverizers are the result of inadequate and non-functioning instrumentation and controls which operate the entire coal feed system and the pulverizers This instrumentation should, among other things, control the amount of air used to transport the fuel and its temperature which plays an important part in the prevention of explosions in the system

Based on engineering studies, on-site evaluations and discussion with O&M and Ministry personnel, specific recommendations were developed during Phase I of this project to identify the cause of explosions at Power Plant No 3 in Ulaanbaatar and provide measures to reduce the frequency of explosions The corrective actions indicated the requirement for an automatic control/instrumentation system to reduce explosion frequency and resulting down time

A procurement plan for the work effort in the area of instruments and controls at the No 3 Power Plant was developed during Phase I Instrumentation and Control hardware was purchased during Phase II Items purchased using project funds included

- New transmitters to replace the current units
- Replacement motors for three (3) damper drives on each pulverizer
- Provide loss of coal flow alarm for raw coal feeders
- New RTDs for pulverizer outlet temperature
- New RTDs and meters on control board to monitor transport air temperature
- New controllers for pulverizer temperature and pressure
- New damper operators for the coal pulverizing mill flow control dampers on lowpressure boilers
- New scanners and cooling air fans for the high pressure boilers

During the period from January to April 1993 a Raytheon Engineers and Constructors (RE&C) field team provided Phase III engineering services which included supervision of installation, testing, and checkout of the instrumentation and control system hardware

2 0 PURPOSE

This report is a summary report noting the accomplishments of Phase III technical services performed to support installation and testing of plant instrumentation and control modifications at Power Plant No 3

Major accomplishments of Phases I, II, and III in the areas of power sector and coal mine equipment and commodity procurements were previously addressed in the Installation Strategy Report issued during March 1993 and will not be repeated within this document

The Installation Strategy Report was a summary document which encompassed not only Phase II activities such as equipment shipping and acceptance procedures, installation plan, testing and checkout procedures, and instrumentation and control acceptance schedules, but also included the following project summary material for Phases I, II and III

1 An Executive Summary which compiled the complete project chronology

2 A detailed discussion of equipment procurement procedures defined during Phase I which were enacted to ensure transparency and conformity to AID purchasing requirements

3 An up-to-date list of power plant and mining equipment procurements including additional items purchased with supplemental funds

4 A detailed discussion of instrumentation and controls modifications including

- Overview
- Existing Plant Conditions
- Description of Modifications
- Recommendations for future procurements for boiler control systems

5 A complete set of installation plans and control schematics covering Phase III instrumentation and controls installation work

This report summarizes the installation work completed during the months of January thru April 1993, discusses operating improvements provided by the new control hardware, reviews status of the system testing and turnover, and describes aspects of the on-the-job training and formal classroom training provided by the RE&C field team

Problem areas affecting power plant operations are highlighted in Section 4 0 Section 5 0 discusses three categories of equipment supply needs including

Category I Critical Equipment and supplies for 1993/1994 and 1994/1995 heating seasons

Category II Spare parts required to support future operation of instrumentation and control systems

Category III Recommended equipment to improve the plant working environment

3 0 INSTRUMENTATION AND CONTROLS MODIFICATIONS

1 Installation Work Accomplished

The following is a description of the modifications and changes to pulverizer controls completed by the RE&C team in Mongolia during Phase III These changes represent the "bare minimum" needed to obtain automatic control of key combustion systems

1 Installation of flame scanners on all burners of six (6) high pressure boiler furnaces This system consists of one (1) cooling air blower unit, thirty-six (36) flame scanners, and two (2) free standing control panels or Main Logic Cabinets (MLC)

This flame scanner system provides remote flame condition to the operators in the control room Among the benefits will be the elimination of burners overheating and glowing cherry red due to flame/air system failure without the operators being aware of this condition (observed by the RE&C survey team during the TDP study)

a The scanner cooling air system has been installed and consists of (2) 100% blowers and two (2) 380 VAC 50 Hz motor drives which are mounted on a common channel frame skid, complete with intake filters, silencers, discharge check valves, y-type discharge tee, cooling air header, and branch piping Power for the drive motors are obtained from two different sources and routed via existing plant motor control centers, thus insuring power to one motor drive in the event of a failure of the other power source Field wiring has been completed from the power sources, from the fan output low pressure switches to the fan output low pressure annunciator lamps, and to the fan A or B running annunciator lamps The cooling air header, approximately six (6) inches in diameter, has been installed This header services all seven (7) boilers and is approximately 150 meters (495 feet) total length

Two (2) inch cooling air connections to the scanners have been installed connecting the cooling air header to each furnace front

b The flame scanner housing tubes have been installed for each of the thirty-six (36) flame scanners The scanners are mounted with a sight path through the secondary air chamber in a configuration to minimize unwanted signal detection from adjacent or opposite burners Field wiring from each scanner to the MLC units has been completed

c The control panel MLCs are mounted in the two (2) respective control rooms of the high pressure portion of the plant These panels utilize a 220 Volt, 50 Hertz, 5 amp power source Field wiring to these cabinets is complete from the cooling air blowers, the flame scanners, and the pulverizer coal flow detectors

2 Installation of coal flow detectors on the raw coal feed chutes to the pulverizers for the six high pressure and six (6) low pressure boilers

These detectors are Stock nuclear flow detectors Each detector has been provided with a 220 Volt ac, 50 Hz power source For the high pressure boiler system, the field wiring between each detector and the corresponding MLC panel to operate the flow/no flow annunciator lamps has been completed For the low pressure system the field wiring between each detector and the corresponding control panel to operate the no flow annunciator lamp has been completed Refer to Photographs No 3 and 4 for view of work in progress on the installation of No Coal Flow Alarms The electronic receiver card has been borrowed from Boiler 12, pulverizer A and pulverizer B to replace failed cards on the low pressure side

3 Installation of coal pulverizer automatic pressure and temperature controls for the high and low pressure boilers There is one (1) pulverizer per boiler in the low pressure boiler system and two (2) pulverizers per boiler in the high pressure boiler system Each pulverizer has been provided with a temperature and a pressure controller, plus a temperature indicator which is used to indicate the temperature at the outlet side of the primary air fan for each boiler

The controllers and indicators for the high pressure boiler system are in a free standing panel that uses a 220 Volt, 50 Hertz power source Interconnecting wiring between the resistance temperature detectors (RTD's) and the temperature controllers and indicators has been completed Interconnecting wiring between the pressure transmitters and the pressure controllers is also complete Wiring of the output of the controllers to the pulse relays necessary to energize the drive motors on the associated damper actuators is complete

4 Installation of air damper control drive units for low pressure boilers is complete The existing damper controls are manual drive units which are not suitable for automatic control

5 The new controls provided will supplement the current equipment in the high pressure boiler control rooms and on the low pressure boiler panel boards

A Low Pressure Boilers The new controllers and indicators are mounted in a section of the panel which is not currently used This permitted the installation of the equipment, with the boilers kept on line The pulverizer fan temperature controls are mounted in a common section of the panel Each control board is located between two boilers, with a portion of the board dedicated to the control of each boiler A section in the middle of the two individual boiler portions has common instrumentation for both boilers

B The power supplies and temperature transmitters are mounted in an unused section within the control board

C The existing complement of pulverizer outlet pressure and temperature indicators shall be left in place In some cases these indicators work The new controllers will also indicate the pressure and temperature, which will provide the operator with two readings

D High Pressure Boilers The instrumentation and controls provided by Moore Products Co are mounted in two new racks, one located in each of the two control rooms This permitted the installation of the equipment to be completed without any impact to the boilers in operation Refer to photographs Nos 6 through 9 which depict progress work on the Pulverized Coal Control System racks

6 The scanner arrangement is similar, with a new cabinet located and wired to eliminate impact on the boilers in operation The current furnace scanners (as opposed to burner scanners) which view the overall furnace condition have been left in place The new scanners are mounted on each burner to indicate the loss of individual burner flame (not previously possible)

3 2 Operating Improvements

The previous instrumentation and control system essentially provided little more than remote indication of boiler operations

Following field survey of the existing conditions in the Summer of 1992, and discussions with operating and maintenance personnel, the Ministry, and AID, it was determined that additional instrumentation and systems, focused in the area of pulverizer controls, should be provided to reduce the potential for pulverizer and furnace explosions at Power Plant No 3 and to improve boiler availability

A minimum cost program was developed which would require the least amount of expenditure and field modifications, provide protection for the power plant boilers, and improve boiler availability Project funding available for control improvements was limited to be approximately $750,000 Funds were not available for improvements at the Darkhan Power Plant

Given the funding limitations, the approach taken was to furnish basic control devices/systems to alert the plant operators of problems and provide basic control of the pulverizer systems

All modifications were designed to permit expansion in the future, as additional funds become available for control system improvements

The following is a listing of some of the operating improvements which will result from the Phase III modification work

1 New Resistance Temperature Detectors (RTD's) and pressure transmitters were installed to provide input information on the pulverizer outlet temperatures and pressures, to the new process controllers Control of pulverizer outlet temperature is important because if the outlet temperature runs high, a coal explosion could result If the outlet temperature is low, this is an indication that the coal is not dry and will eventually hang up in the pulverized coal bunker Continued operation of the pulverizers with low outlet temperatures results in loss of boiler combustion efficiency

2 New controllers were provided to control pulverizer outlet temperature and pressure As stated in Item 1 above, control of pulverizer outlet temperature is critical to maintain boiler combustion efficiency and to prevent possible coal explosions

3 New scanners and a cooling air system were provided for the high pressure boilers to alert the boiler operators of a loss of burner flame which could be caused by a blockage of coal flow to the burners Flow blockage can be caused by a number of problems such as loss of a coal feeder, problems with transport air or hang-up in the pulverized coal bunker

The central control rooms for the high pressure boilers have no visible line of sight to the boiler area and therefore do not allow the operator any view of the burner flame A few of the boilers have Russian built scanners which are operable and were designed to focus on the furnace flame and not individual burner flames There scanners are inadequate for monitoring the high pressure boilers which are fed by two pulverizers In order for a problem to be alarmed, both pulverizers would have to fail at the same time

The new scanners are provided at each burner This arrangement will enable the operator to monitor individual burner flames and individual pulverizer coal flow status A trip of any scanner will light alarm lights on the scanner systems panel and enable the operator to take action to correct the problem, and if necessary, shut down the appropriate pulverizers This information /alarm system is a first step to avoid loss of coal and subsequent re-ignition which is a major cause of boiler furnace explosions

4 Loss of coal flow alarms were provided to alert the operator of a blockage of coal within the raw coal supply bunkers Prior to the Phase III installation work, the operator had no means to indicate lack of flow from the bunker into each pulverizer The addition of the alarms will provide valuable information to the operator to minimize the potential situation of pulverizer operation without an adequate supply of coal Studies have shown that pulverizer explosions occur during start-up and shut-down of pulverizers when the pulverizer operates with an air rich environment with minimum coal flows

5 New RTD's and meters were provided to monitor transport air temperature When the pulverizer is out of service, the transport air bypasses the pulverizer and enters the system just before the pulverizer air fan (primary air fan) An indication of the transport air temperature was not available and is required for proper monitoring of pulverizer operation

6 Motors were provided for existing Russian made damper drives Prior to Phase III, the damper drives were manually operated From our meetings with plant personnel last summer, it was learned that the damper drive gear boxes were functional , however new electric motors were required

The replacement electric motors allowed for remote operation of air dampers for pulverizer outlet pressure and temperature control and should also re-instate remote operation capability of other boiler systems from the system control panels

7 New damper operators were provided for coal pulverizer mill air flow control for the low pressure boilers Prior to Phase III, damper operation was manual The installation to the damper operators (drives) has provided for automatic pulverizer outlet pressure and temperature control Control philosophy for the low pressure boilers is now the same as the philosophy used with the high pressure units

3 3 Status of System Testing/Checkout and Turn-Over

3 3 1 Testing/Check-out Procedures

3 3 1 The in-country RE&C team of test and start-up I&C engineers have supervised and provided on the job instruction to power plant operations staff regarding installation, testing, checkout, and operation of instrumentation and control system modifications

The following is a description of the methods used to align and adjust the equipment that was installed

1 Beck Damper Actuators

The six (6) actuators were received into the instrument shop where they were bench checked During the bench check 220 volt, 50 hertz power was applied to the actuator, and the manual switch was used to determine that the arm movement was in the proper direction and that the motion stopped at one hundred (100) degrees The automatic operation was checked by using the Transmation 1040 to send a variable current signal (4ma - 20ma) to the actuator control terminals It was noted that the arm travel was at zero degrees at 4ma and was at one hundred degrees at 20ma The position feed back current was measured to determine that the current was the proper value for the arm at zero degrees, fifty degrees and one hundred degrees

The actuator alignment was accomplished after the actuator was set in the position where it would be utilized The pivot length of the damper arm that was to be controlled was measured, and the pivot arm of the actuator was adjusted so that it is the same length The connecting rod and actuator position was adjusted so that the two pivot arms are always parallel through the complete range of motion

Using the manual positioner on the actuator, the damper was placed in the full close position and then in the full open position, setting the appropriate limit motion switch for each position Power was applied to the actuator, and using the manual switch, the operation of each limit motion switch was checked to insure that the controller could not drive the actuator arm past the position indicated by the limit motion switch

The automatic operation was verified using the variable current signal (4ma - 20ma) from the Transmation 1040 At this time the span potentiometer and zero potentiometer were adjusted so that the damper full close position was reached at a 4ma control signal and the damper full open position was reached at a 20ma control signal in as much as possible

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The actuator was then wired to the control wires of the pressure controller, and with the pressure controller in the manual mode, the actuator operation was verified

2 Moore Controllers, Moore Indicators, Pressure Transmitters, Temperature Transmitters and Resistance Temperature Devices (RTD's)

The components necessary for the Pulverizer Coal Control Systems (PCCS) were received in the instrument shop

The pressure transmitters were recalibrated The RTD's and the pressure transmitters were installed in the field The Controllers, Indicators and Temperature Transmitters were installed in the racks provided for the High Pressure Boilers, and in an unused area of the existing control panel for the Low Pressure Boilers Inter-connecting wiring was installed

The two racks for the High Pressure boilers were assembled/wired while still located in the instrument shop When completed the racks were bench checked to insure that with a simulated field input signal, the proper drive relay was pulsed or that the proper output signal was obtained

In a similar fashion, a bench check was made on the Low Pressure Boiler circuits

Next the racks were moved to their respective High Pressure Control Rooms The field wiring was installed and connected for both the High Pressure and the Low Pressure circuits

On the Low Pressure side the pressure controller wires were hooked to the corresponding actuator, and the actuator was run in "Manual" from the Moore Controller

The interface wiring was installed from the pulsed drive relays to the coils of the Russian relays that they drive, and the control function was taken over by the Moore Controller, at first operated in "Manual" and later operated in "Automatic" for both the high pressure side and the low pressure side

3 Stock Nuclear Level Detectors (No Coal Flow Alarm)

The level detectors were received in the electrical shop where they were bench checked Each unit was inspected to insure there was no physical damage and that all "select" switches were in the proper position Then 220 volt, 50 hertz power was applied A nuclear source was aimed at the "receiver" at a distance of approximately four (4) meters, with an approximate 20kg box of coal between the source and the receiver The push button calibration was checked by removing the box of coal from the beam path and "calibrating" Then the operation was checked by inserting and then removing the box of coal from the beam path several times and insuring that the relay contacts toggled both open and closed

The No Coal Flow Alarm circuits were wired in the low pressure control cabinets in the same area as the PCCS circuits, and dust-proof enclosures were added to the relays, push-buttons, alarm horns, and other areas where coal dust contamination was a problem The circuits were function checked without the level detector and later, after the level detector was aligned, installed and supplied with 220 volt, 50 hertz power, were verified using the actual function of the level detector

4 No Burner Flame Alarm and No Coal Flow Alarm - High Pressure Boilers

The Scanner Cooling Air Skid (SCA-Skid) was received and placed immediately in position All bolts were checked for tightness and the unit was checked for lubrication The cooling air header was connected, and two feeders, each having a separate source of power, were connected to the two control boxes The control logic circuits were checked by disconnecting the "T" leads from both the "A" fan motor and the "B" fan motor, and using simulated signals for "pressure OK" and "loss of pressure" insuring that a transfer from the selected primary fan to the standby fan would be accomplished if any one of three conditions were to exist If the selected primary fan suffered a loss of power, a loss of control power or if the pressure switch indicated a loss of pressure, it was verified that a transfer would take place Next, the "T" leads were reconnected, and the fan motors were "bumped" to insure proper rotation Finally, the fans were given a twenty-four hour "run-in" before being placed in service

The two No Coal Flow Alarm and No Burner Flame Alarm cabinets (Scanner cabinets) were received at their intended locations, in their respective high pressure control room A 220 volt, 50 hertz source of power was supplied to each cabinet A bench check of each cabinet was performed which included powering up the PLC and the associated I/O Open and then closed contacts were simulated representing the nuclear level detector outputs using jumpers across the appropriate scanner cabinet input terminals and insuring that the proper outputs were obtained for the different inputs (The field wiring had not been connected at this time) Each No Coal Flow circuit was checked in this manner The scanner circuits were checked by connecting a scanner via jumpers to the appropriate scanner cabinet input terminals, and using a candle for a source of flame, insuring that the output circuit gave the proper indication of "flame on" and varying "flame intensity" Each burner circuit was checked in this fashion Next, each separate scanner was checked in this fashion Finally, the field wiring was installed and connected Each No Coal Flow circuit was further checked by using a jumper at the detector location to simulate open or closed contacts and insuring that the proper output was obtained at the scanner cabinet Finally, the nuclear detectors were calibrated, and then checked using actual coal levels in the raw coal hopper The scanners were checked placing the scanners in the "housing tube" and adjusting the signal strength by using an "orifice plate" and then turning off the burners one at a time to insure that the proper output indication is obtained

Testing and check-out work completed also included performance of a number of step-by-step procedures The procedures followed included

1 Checking shaft and coupling alignment for all motor driven equipment

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2 Checking/confirmation that all power wiring to motor drives were properly installed, including proper wire gauge

3 Checking/confirmation that all motor drives were properly grounded

4 For each motor drive, checking that any unconnected wires which may terminate in the motor housing were properly taped and insulated and protected from shorting to the motor housing or other adjacent wiring

5 Checking that all motor drive junction box housings were properly gasketed and tightly closed to meet environmental integrity requirements

6 For each motor drive checking that all conduit connections were secure and met environmental integrity requirements

7 Checking that each motor circuit was individually protected by fuse or circuit breaker of proper value

8 Megger tested all power wiring for insulation integrity

9 Assured that motor drive and driven equipment are free to turn

10 Assure that motor drive/driven equipment were "unloaded" (or at minimum load) for initial start

11 For each motor drive, set selector switches (as applicable) to local manual control mode

12 Power up each motor circuit individually and checked for short circuits and blown fuses or circuit breakers

13 At the local control pushbutton station, individually "bumped" each motor drive to confirm proper wiring connections and motor rotation

14 For each motor drive set selector switch to remote control mode and repeat "bump" operation to confirm proper wiring connections and motor rotation

15 For each motor drive, confirmed that start/stop pushbuttons, remote/local and manual/auto select switches, and run/stop light indications are functional and proper

16 Checked all linkage/mechanical connections between actuators and driven dampers, valves, etc and confirm operating clearances

17 Assured that actuator and driven equipment were free to stroke through the complete operating range

18 Checking/confirmation that all power wiring to actuators was properly installed, including proper wire gauge

19 Checking/confirmation that all signal wiring to actuators was properly installed, including proper wire gauge and shielding

20 Checking/confirmation that all actuators were properly grounded

21 For each actuator, checked that any unconnected wires which terminated in the actuator housing were properly taped and insulated and protected from shorting to the housing or other adjacent wiring

22 Checking that all actuator junction box housings were properly gasketed and tightly closed to meet environmental integrity requirements

23 Checking that each actuator control loop was individually protected by fuse or circuit breaker of proper value

24 Megger tested all actuator power and signal wiring for insulation integrity

25 Assured that actuator and driven equipment was "unloaded" (or at minimum load) for initial start,

26 For each actuator, set selector switches (as applicable) to local manual control mode

27 Power up each actuator (power) circuit individually and checked for short circuits and blown fuses or circuit breakers

28 At the local control station, individually stroked each actuator through its operating range to confirm proper wiring connections and response to increase/decrease signal inputs

29 For each actuator, set selector switch to remote manual control mode and repeated actuator stroking through its operating range to confirm proper wiring connections and response to increase/decrease signal inputs

30 For each actuator, confirmed that increase/decrease pushbuttons, remote/local and manual auto select switches, control panel indications including increase/decrease light indications and analog input/output feedback displays, and limit switch operation were functional and proper

31 Checked mechanical installation of temperature transmitters, including thermowell for location and compatible length of transmitter sensor

32 Confirmed that temperature transmitter range is compatible with process requirements

33 Confirmed temperature transmitter calibration per manufacturers test instructions

34 Checked temperature transmitter signal wire connections

35 Confirmed that signal wire shielding connection was not terminated at the temperature transmitter

36 Confirmed that signal wire shielding connection was properly terminated at the control panel

37 Confirmed that signal wire from the temperature transmitter was connected to the proper terminals in the control panel

38 Confirmed that temperature transmitter conduit connections were secure and meet environmental integrity requirements

39 Confirmed that temperature transmitter mounting was secure and free from vibration

40 Checked mechanical installation of pressure and differential pressure transmitters, including root isolation valves for each process connection

41 Confirmed that all pressure instrument sensing lines were continuously "sloped" toward the instrument in accordance with manufacturer's requirements

42 Confirmed that all pressure instruments include local process sensing instrument isolation and drain valves

43 Confirmation that all differential pressure instruments additionally include local equalization valves

44 Confirmed that pressure and differential pressure transmitter ranges are compatible with process requirements

45 Confirmed pressure and differential pressure transmitter calibration per manufacturers test instructions

46 Checked pressure and differential pressure transmitter signal wire connections

47 Confirmed that signal wire shielding connection was not terminated at the pressure and differential pressure transmitters

48 Confirmed that signal wire shielding connection was properly terminated at the control panel

49 Confirmed that signal wire from the pressure and differential pressure transmitters were connected to the proper terminals in the control panel

50 Confirmed that pressure and differential pressure transmitter conduit connections were secure and meet environmental integrity requirements

51 Confirmed that pressure and differential pressure transmitter mountings were secure and free from vibration

52 Placed all final control elements in manual mode and started system

53 Checked system operation in manual mode (pressure, temperature, flow modulation response)

54 Transferred system from manual mode to automatic mode, loop by loop, while observing that system operation is proper

55 Modified system control parameters, as necessary, to achieve proper automatic operation

56 Selected and started a scanner cooling/purging air blower

57 Confirmed that the blower logic system indicated the correct running status of the operating blower and the correct shutdown status of the stand-by blower

58 Shutdown the operating low scanner air blower and confirmed that a low discharge pressure initiated the start-up of the stand-by blower

59 Confirmed that the blower logic system indicated the correct running status of the stand-by blower and that an alarm sounded to indicate the blower failure and transfer

60 Repeated steps 56 through 59, selected and starting the opposite scanner air blower first

61 Left one scanner air blower running

62 For each boiler, turned on scanner cooling/purging air at each burner

63 Established each burner in operation in turn and determined that scanners in other non-operating burners did not sense flame

64 Adjusted scanner sighting and sensitivity to reliably monitor associated operating burner flame

65 Simulated a no flame condition and allowed the flame monitor logic system to sound alarm and indicate flame fault for the specific burner being tested

66 With all burners operating, confirmed that the logic system indicated the individual burner operating status

3 3 2 Status of the controls work

A Flame Scanner System

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1 The flame scanners are functioning, however, due to plant operational constraints and the need to keep boilers on line during the heating season there was insufficient time to complete the checkout and turnover of all boilers Scanner system equipment is functional and the only problem we are aware of is the requirement to periodically clean the metallic scanner cooling air filters due to the high levels of coal dust found in the plant air Plant O&M personnel will also have to clean the lens on each scanner, when the unit is off line (out of service)

B Pulverizer Controls

1 The Moore controllers are controlling pulverizer outlet pressure on High Pressure Boilers Nos 7, 8, 9 and 11 Low pressure direct fired boiler No 6 will operate with the pressure control and hot air damper in the full open position The hot air temperature is in the 40° to 50 C range due to insufficient air temperature caused by air heater deterioration Therefore the tempering air dampers are not functioning at this time Repairs to the air heaters will have to be made to increase the hot primary air temperature before controllers can be placed in service

It now appears that over the years each boiler has been changed, some by linking hot air and tempering air dampers Other boilers use no tempering air This information is recent and was not properly translated during the 1992 summer survey

2 On boilers Nos 2, 3 & 4 our field team found that the hot air and tempering air dampers are mechanically linked together Proper primary (hot) air temperature and delinking of the hot and tempering air dampers are required before the hot and tempering air dampers can be modulated (controlled)

3 The tuning of controls was under way for a period of approximately two and a half weeks during April This was not a long period of time, based on the number of boilers and the problems encountered RE&C was not aware that some of the dampers had been linked together and also that some were welded shut until the controls upgrade was well along

4 Work on providing new motors and restoring damper drives was completed This work required a significant effort as relay contacts on many of the drives had to be cleaned and brought back into service to drive the motor open and closed Bearings on the dampers sometimes caused problems requiring more maintenance effort

5 Each pulverizer control is therefore slightly different and required additional engineering and startup effort Trying to keep the coal dust out of the enclosures is a maintenance problem and new gaskets will be required

6 RE&C did make a logic change which will limit the open and closed position under automatic control of the pressure control dampers This change will permit the operator to drive the damper full open or closed in the manual mode

7 The pulverizer outlet temperature control loop is the more important of the two loops However, it is our understanding that no boiler currently has the capability of exceeding 60°C at full feeder speed We did make a logic change to allow temperature to override the pressure controller on the pulverizer However, the controller on the low pressure boilers are basic and not extended controllers Problems were encountered transferring the controls from manual to automatic and as a consequence our team did not have enough time to complete start-up We therefore removed this logic addition, to avoid any problems for the plant operators

8 The field team was limited to experiment with only one boiler (Boiler No 1) to attempt any logic changes This is because eight boilers run with the hot air damper in the full open position The three boilers that have dampers linked together are out of service The team was unable to mount the new pulverizer pressure control damper drive on boiler number five until the week of April 26 It is understood that boiler number one also had fan problems

A major problem faced on this project was the length of time since these boilers were operated in automatic Additional field time is required to gather information and review problems The Component III Contractor will need to update the logic while air heater repairs are being made

C No Coal Flow Alarms

1 The no coal flow alarms are working but two new cards are required to replace present damaged boards Stock Equipment Company (OEM) has provided replacement cards under the warranty provisions and would like the damaged cards returned Stock has indicated that this is the first card failure that they have experienced New cards have been received in Boston and will be shipped to Mongolia

D The following boilers were not available for tuning due to boiler availability (or lack thereof) and other equipment problems

Boilers 4, 8, 11 & 12 are down for major repairs
Boilers 2 & 3 are out of service because of broken shafts on the pulverizers
Boiler 5 has been on line continuously and the Mongolian's do not have a planned shut down for this boiler

3 3 3 The following is a listing of the systems that can operate automatically and a listing of those systems for which testing and tuning could not be completed to permit fully automatic operation due to equipment problems and boiler outages

1 The following systems can operate automatically

No Coal Flow Alarm - Boiler 1
No Coal Flow Alarm - Boiler 2
No Coal Flow Alarm - Boiler 3
No Coal Flow Alarm - Boiler 5

No Coal Flow Alarm - Boiler 6
No Coal Flow Alarm - Boiler 7
No Coal Flow Alarm - Boiler 8
No Coal Flow Alarm - Boiler 9
No Coal Flow Alarm - Boiler 10
No Coal Flow Alarm - Boiler 11
No Burner Flame Alarm - Boiler 7
No Burner Flame Alarm - Boiler 8
No Burner Flame Alarm - Boiler 9
No Burner Flame Alarm - Boiler 10
No Burner Flame Alarm - Boiler 11

2 The following systems cannot operate automatically

No Coal Flow Alarm - Boiler 4
Not Calibrated (Boiler down)
No Coal Flow Alarm - Boiler 12
Not Calibrated (Boiler down)
No Burner Flame Alarm - Boiler 12
Not Calibrated (Boiler down)

Pulverizer Automatic Temperature and Pressure Controls - Boiler 1/Pulverizer A
Function Auto Temp /Press Control-Satisfactory
Operation Auto Press Control - Satisfactory
Auto Temp Control - Non-Operational
Hot Air Damper 100% open/Tempering Air Damper 100% closed during normal operation

Pulverizer Automatic Temperature and Pressure Controls - Boiler 2/Pulverizer A
Function Auto Temp /Press Control-Satisfactory
Operation Auto Press Control - Satisfactory
Auto Temp Control - Not tested
Boiler down for extended time period

Pulverizer Automatic Temperature and Pressure Controls - Boiler 3/Pulverizer A
Function Auto Temp /Press Control-Satisfactory
Operation Auto Press Control - Satisfactory
Auto Temp Control - Not tested
Boiler down for extended time period

Pulverizer Automatic Temperature and Pressure Controls - Boiler 4/Pulverizer A
Function No Tests performed
Operation No Tests performed
Boiler down for extended time period

Pulverizer Automatic Temperature and Pressure Controls - Boiler 5/Pulverizer A
Function No Tests performed
Operation No Tests performed
Boiler in continuous operation

Pulverizer Automatic Temperature and Pressure Controls - Boiler 6/Pulverizer A
Function No Tests performed
Operation No Tests performed
Hot Air/Pressure Damper 100% open during normal operation (Direct Fired)
No Tempering Air Damper exists

Pulverizer Automatic Temperature and Pressure Controls - Boiler 7/Pulverizer A
Function Auto Press Control-Satisfactory
Operation Auto Press Control - Satisfactory
Auto Temp Control -Non-Operational
Temp Air Damper Welded Close

Pulverizer Automatic Temperature and Pressure Controls - Boiler 7/Pulverizer B
Function Auto Press Control-Satisfactory
Operation Auto Press Control - Satisfactory
Auto Temp Control -Non-Operational
Temp Air Damper non-operational

Pulverizer Automatic Temperature and Pressure Controls - Boiler 8/Pulverizer A
Function No Tests Performed
Operation No Tests Performed
Boiler down for extended time period

Pulverizer Automatic Temperature and Pressure Controls - Boiler 8/Pulverizer B
Function No Tests Performed
Operation No Tests Performed
Boiler down for extended time period

Pulverizer Automatic Temperature and Pressure Controls - Boiler 9/Pulverizer A
Function Auto Press Control-Satisfactory
Operation Auto Press Control - Satisfactory
Auto Temp Control -Non-tested
Temp Air Damper non-operational

Pulverizer Automatic Temperature and Pressure Controls - Boiler 9/Pulverizer B
Function Auto Press Control-Satisfactory
Operation Auto Press Control - Satisfactory
Auto Temp Control -Non-tested
Temp Air Damper non-operational

Pulverizer Automatic Temperature and Pressure Controls-Boiler 10/Pulverizer A
Function No Tests Performed
Operation No Tests Performed
Pressure Control Damper Non-Operational

Pulverizer Automatic Temperature and Pressure Controls-Boiler 10/Pulverizer B
Function Satisfactory
Operation Satisfactory
Auto Temp Control - Non-Operational
Temp Air Damper welded closed

Pulverizer Automatic Temperature and Pressure Controls-Boiler 11/Pulverizer A
Function Auto Press Control - Satisfactory
Operation No Tests Performed
Boiler down for extended time period

Pulverizer Automatic Temperature and Pressure Controls-Boiler 11/Pulverizer B
Function Auto Press Control - Satisfactory
Operation No Tests Performed
Boiler down for extended time period

Pulverizer Automatic Temperature and Pressure Controls-Boiler 12/Pulverizer A
Function No Tests Performed
Operation No Tests Performed
Boiler down for extended time period

Pulverizer Automatic Temperature and Pressure Controls-Boiler 12/Pulverizer B
Function No Tests Performed
Operation No Tests Performed
Boiler down for extended time period

Note Simultaneous operation of Automatic Control of Pulverizer Pressure and Temperature Control of "air-pulverized coal mixture" is not possible at this time due to the use of low quality "non-design" coal and the "poor" condition of the low and the high pressure boilers

In order to ensure proper function of the Moore Controllers,the power plant should carry out the following measures

- Upgrade preheater operation and increase hot air temperature
- Upgrade furnace process (Firing condition)
- Eliminate air leakage into air duct and pulverized coal transferring system
- Put into service all tempering air dampers of the high pressure boilers

3 4 Training

The RE&C team has provided on-the-job (OJT) training and formal classroom operations training for the plant staff

Initially, due to the many language, cultural, and technical skill problems associated with the project, as well as schedule constraints, this effort consisted mainly of on-the-job training focused to complete installation of control system hardware, electrical components and wiring

On the job training included a number of sessions with the plant's lead instrumentation and control technicians regarding the following aspects of controls installation and maintenance

- Flame Scanner System Control Cabinet Operation This session covered a variety of topics including
  - Review of the basics of the Allen Bradly programmable controller
  - How to trace Input/Output
  - Basics of Flame Scanners and Coal Flow Circuits

- Flame Scanner System cooling air supply skid logic, operation and maintenance procedures

- Flame Scanner System operations

- Scanner Circuit Check-out

- No Coal Flow Alarm Nuclear level detector circuit check-out

During the month of April, the RE&C team's work emphasis shifted from installation to system checkout, testing, and turn-over As part of this work, both formal and informal training sessions were presented so that the Mongolians would be capable of satisfactorily maintaining and operating the new equipment

Formal training sessions included presentations to plant management and operators explaining various aspects of automatic control, including how automatic control is accomplished, and screening of a manufacturer's training video

In January, a special showing of the training video prepared by Moore Products, Inc , the supplier of the pressure and temperature control hardware, was given for Purservean, an engineering consultant, and Batrigching, supervisor of the IE&C department

A subsequent formal training seminar was presented to plant personnel which focused on the use of the electronic Moore Products Co pressure and temperature controllers

A follow-up session was presented to further detail the basics of the pressure and temperature controllers and to review the operation of the flame scanner cooling air system and in particular the cooling skid control logic

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4 0 PROBLEM AREAS AFFECTING POWER PLANT OPERATIONS DURING FUTURE HEATING SEASONS

1 Instrumentation and Control

During the course of completing installation of the pulverizer control system hardware, a number of problems became evident which our field supervisory team has identified and attempted to correct during their limited stay

The following is a brief summary of areas which should be addressed to maintain future plant operations

a Ambient Coal Dust Levels

Coal dust escaping from the pulverized coal system becomes airborne and manages to settle on all surfaces within the plant, including electrical control panels, instrument racks, and even within the interiors of isolated plant control rooms

RE&C was aware of the poor operating ambient conditions found in the plant and attempted to provide for this problem by furnishing equipment and enclosures suitable for operating in this harsh environment In spite of our efforts, difficulties were encountered keeping electrical hardware and controls protected from the airborne coal dust

Given the condition and design of the pulverized coal feed and ash removal systems, we believe that coal dust and fly ash will continue to present electrical and maintenance problems One possible solution to correct the electrical control enclosure problem is the implementation of a plant pneumatic system discussed in item B, below

b Plant Pneumatic System

We recommend that serious consideration be given to incorporation of pneumatic operators for system positioners and drives This retrofit would require installation of a plant air system (which presently does not exist) including plant air compressors, air dryers, and filters The air compressors would probably have to be located in a area away from potential dust sources Freeze protection of system piping would also be required

The use of pneumatic operators would eliminate the need for motor operators and associated relays Dust entry into relays and motor enclosures is a major cause of premature motor and relay failure Pneumatic operators will have a longer life in this dusty atmosphere due to the simplicity of construction In the event of a loose connection, compressed air escapes, avoiding the endemic coal dust contamination which currently plagues plant operations

In addition, a plant pneumatic system would also provide a source of clean purge air which could be used to pressurize electronic enclosures and prevent coal dust entry We found that relays and control circuit cards for some of the new components of the flame scanner systems failed in a very short time due to excessive ambient coal dust

c Plant Master Control

A request was made of our field personnel for a plant master control which would automatically adjust boiler firing to steam demand Provision of plant master control would require that the individual boiler masters be capable of operating in automatic control Given the existing conditions and general lack of functioning control equipment, this would require the installation of a complete new control system

Each boiler master would require that the feedwater, fuel, air and furnace pressure controls be capable of being set in automatic before the boiler master could be set to automatic

RE&C projects that this effort would require a significant investment and require a number of years before the work could be completed given the need to maintain boiler operations during the heating season

d Air Heater Problems

The condition of the heat recovery equipment has deteriorated with the passage of time Our field team found that hot primary air exiting the air heaters ranged from 40 to 50 degrees C, for some boilers, well below the 330°C temperature typically expected for hot primary air

Coal pulverizer exit temperatures should be in the range of 52 to 60 C for the type of coal being fired at this plant

To overcome the lack of temperature, the plant operators have discontinued the use of tempering air to control pulverizer outlet temperature on all high pressure Boilers and low pressure boiler No 6 Tempering air dampers are not operable at this time and the respective controllers are not in service Repairs to the respective air heaters must be made to obtain hotter primary and secondary air, before the controllers can be placed in service

e Boiler performance tests should be completed to accurately determine each boiler's furnace or exit O2 level, airheater outlet temperatures, airheater flows and stack conditions The problem encountered in the plant is that due to their physical condition and changes made by the staff over the years to keep the units running, each High Pressure or Low Pressure boiler has substantially different operating parameters from the other identical units These differences need to be considered to properly design future control system additions and adjust and tune control systems

f Control Drives & Valve Motor Operators

In the United States a coal fired plant designed today would use pneumatic drives for control drives and valve operators It would be uncommon to use the electric motor operators, as the Russians used for the Mongolian plants The advantage of pneumatic drives are lower cost, greater reliability and ease of maintenance

A typical damper drive unit found in the plant is a gear box, which has a handwheel mounted on one side, a motor mounted on an opposite side, a drive arm to the linkage, and a control box mounted above It is within this control box that the relays, brake, and position feedback are located

RE&C tried to reuse the current damper gear drives by replacing the motors It was our understanding that the motors were inoperable and the relays were in working order These relays are located at the damper drive and their function is to drive the damper either open or closed and to drive the damper for the length of the pulse signal It took a considerable effort in the field to restore these motor drives back to a working condition

With motor drives, a position feedback should be provided The Russian drives do not have a working position feedback A position feedback would make the control of the drive more responsive, however it was considered doubtful last summer that we could make a feedback signal work on the existing drives

Another problem which was found during the course of our work with the motor drives was the need to improve the brake, which is used to stop and hold the damper in place In retrospect we believe that for future work it would be less expensive to replace these drives than to try to find repair parts for the old Russian drives or to adapt new components to this type of drive

g The present control logic retains the existing Russian philosophy The temperature control logic is common to pulverizer logic used in the United States, however, in this country, we try to use equally sized ducts for hot primary air and tempering air RE&C provided two controllers, one for the hot primary air and a second for tempering air This offers maximum flexibility however, we subsequently found that many of the dampers are linked together or the hot primary air is at too low a temperature We found in some cases that the tempering air damper was welded closed on high pressure boilers

h The pressure control logic retains the Russian concept to maintain pulverizer outlet pressure The normal logic used in this country would require an air flow element and a fuel demand signal (feeder speed) If one attempted to use an air flow element, major problems would include

1 The lack of a reasonable straight run of pipe

2 Even in the United States, where velocities are known, we have a very small differential pressure (1 to 2 inches w c) for a control signal The information available to date would indicate that the current air flow is (far) less than design probably due to deterioration of fan wheels and therefore the differential pressure reading would be very small

3 During the summer season, inside ambient air is used to supply the FD Fans Use of air taken from the plant could clog a flow element because of the high level of ambient coal dust in the air

4 Access to the flow element, for maintenance is very poor, due to the fact that no walkway is available in that area

1 A raw coal feeder demand signal would be desirable to incorporate in the future but this retrofit posses significant problems RE&C was able to purchase and install some replacement D C motors for the coal feeders but the entire speed control scheme should be reviewed and may require replacement We would caution that if these controls are replaced then a method would have to be found, such as compressed air, to keep coal dust away from the sensitive control components

RE&C understood that the current mode of operation required the feeders to remain at full speed in order to complete pulverization of the coal and then shut down If this interpretation was correct, then the fuel demand, which acts as the set point, should be constant We therefore intended to tune the pressure control loop to be a very slow acting loop The different sized hot primary and tempering air ducts, in conjunction with linked hot and tempering air controls, had a major adverse impact on the ability to control pulverizer outlet pressure in some of the units

We attempted to create a temperature override loop but this requires an extended pressure controller, which we have installed only on the high pressure boilers and not on the low pressure boilers

J RE&C tried to work with limited funding to solve the many boiler instrumentation and control problems An alternative approach would be to focus additional efforts on a few boilers each year and bring those units up to date A first step would be to provide a modern, direct fired Pulverized coal feed system This would require a burner/pulverizer safety system The pulverizers would have to be checked to make sure that they were able to handle a high positive pressure This would require changing the ductwork of the primary air fan to discharge into the inlet of the pulverizers This would solve many problems in the pulverizer system but also add a few new problems to boiler operation Loss of coal to the pulverizer would mean a flame out and a low pressure boiler would be out of service (or a high pressure boiler would operate at reduced load on a single pulverizer)

4 2 Pulverized Coal Piping

Pulverized coal piping is badly worn and requires replacement The condition of this piping is a major cause of pulverized coal dust escaping to the plant

Prior to replacement of this piping, a review of pulverizer and classifier condition and performance should be made If the pulverizers and the classifiers are not operating properly, replacement of the pulverized coal piping will be in vain

RE&C recommends that velocities in the pulverized coal feed pipes be reviewed and that ceramic lined elbows be installed

3 10

We caution that if the velocities in the fuel pipes exceed 110 to 120 feet per second or if the pulverized coal particle fineness is not in accordance with standard industry specifications (70% passing through a 200 mesh screen), then excessive wear will continue to be a problem, and any ceramic lined elbow installation will not last

4 3 Plant Lighting

Visibility in the Power Plant continues to be extremely poor This condition was noted in the feasibility study prepared by RE&C in 1992, and continues to this date

Lack of proper lighting affects worker morale and has a direct adverse impact on any plant maintenance and housekeeping efforts

RE&C recommends a limited program for direct replacement of existing incandescent lighting fixtures within the power plant building with high pressure sodium fixtures This program and costs are explained in detail in Section 5 0 "Near Term Equipment Supply Needs"

5 0 NEAR TERM EQUIPMENT SUPPLY NEEDS

5 1 General Requirements - Power Plants

Requirements for equipment spare parts and consumable materials to sustain power plant operations can be grouped into three categories

Category I Power Plant Spare Parts for 1993/1994 and 1994/1995 Heating Seasons
Category II Instrument and Controls Spare Parts
Category III Equipment for Plant Improvements

5 2 Category I

This category includes spare parts, systems, tools and consumables to maintain operation of Power Plant No 3 and the Darkhan power plant during the 1993/1994 and 1994/1995 heating seasons These materials are to be procured by the Component III Contractor These items were identified by RE&C as a result of Value Engineering work completed during Phase III and from meetings held with plant operations and maintenance staffs, representatives of Erchim Impex, and the Ministry

A complete listing of the items, together with estimated costs for procurement from either U S or CIS sources and projections of transportation costs are included for reference in Appendix C

These lists were presented and reviewed during the Value Engineering Session held in Ulaanbaatar with AID and the Ministry at the end of April 1993

5 3 Category II

Items included under Category II include spare parts required to support continued operation of instrumentation and control systems installed under RE&C supervision during Phase III

Due to the constraints of project funds, only minimal quantities of spare parts were provided with the compliment of control hardware purchased under Phases I and II

It is anticipated that additional spare parts may be required in the event that High Pressure Boiler No 13 is returned to service RE&C initially had been informed that this boiler would be placed out of service for a period of two years Recent discussions with plant operations indicate that Boiler No 13 may be returned to service within the near future In the event that Boiler No 13 is bought back on-line, parts which were scheduled for installation on Boiler No 13 and intended to function as interim spares would have to be utilized This would be applicable to the flame scanner system which was designed for operation of all seven High Pressure boilers and provided with parts for installation on seven boilers

For the case of pulverizer pressure and temperature controls, additional controllers, power supplies, transmitters, and miscellaneous materials would have to be provided to complete the installation of systems hardware on Boiler No 13

A list of spare parts procured under Phases I and II has been compiled and is included in Appendix D

Lists of spare parts recommended for consideration for future procurement by the ESP Component III Contractor are included in Appendix E

5 3 Category III

This Category includes recommended equipment and systems to provide safer and healthier environments for plant personnel and provide for improvements to plant operations and maintenance

Two areas which were identified for consideration during our Phase III value engineering survey include

- Upgrade of Plant Lighting Systems
- Installation of Central Plant Vacuum Systems to facilitate plant housekeeping

5 3 1 Upgrade of Plant Lighting Systems

A large proportion of the existing lighting fixtures in Power Plant No 3 and the Darkhan Plant have either no lamps or burned out lamps Poor illumination is a personnel safety hazard and is detrimental to worker performance Most of the existing fixtures are incandescent High pressure sodium lamps produce approximately four times as much light as incandescent for the same input watts The project has proposed that high pressure sodium fixtures be provided in the future to replace existing incandescent fixtures in selected locations in the boiler plants, including the ground floor level (from the pulverizer area through the boiler area, to the particulate control area), the operating floor level (surrounding the boiler proper), and the upper drum level

Costs for this lighting retrofit have been estimated for Power Plant No 3 and Darkhan assuming fixture replacement utilizing existing lighting circuits Engineering assistance would be included to support the installation work provided by each plant's maintenance staff The costs for procurement and shipping have been estimated and summarized in table 5 1

5 3 2 Plant Vacuum Systems

Housekeeping within Power Plant No 3 and the Darkhan Plant would be greatly improved by the use of plant vacuum systems to remove accumulations of pulverized coal, and ash from the boiler plant, including areas around the boilers, mills, heat recovery equipment at rear of the boilers, and the electrostatic precipitators

For Power Plant No 3 a total of two systems are recommended One system for the high pressure boiler plant and a second for the low pressure facility For Darkhan, a single plant system would be provided

Each plant system will consist of headers extending around the periphery of each plant building at the ground floor and operating levels Separate branches would be piped to service platforms surrounding each boiler Each plant vacuum system would terminate at a separator and discharge hopper assembly located in the yard area The dust and air mixtures would be separated using centrifugal separators

Vacuum system equipment would include electric motor driven vacuum producers, primary centrifugal separators, fabric filters, discharge silencers, discharge hoppers, and control panels

System installation work including piping, foundations, and electrical power supply would be provided by the Fuel and Energy Ministry

Costs for procurement and shipping have been estimated summarized in Table 5 2

TABLE 5 1

PLANT LIGHTING RETROFIT COSTS

POWER PLANT NO 3

LOW PRESSURE PLANT

180 - 70W HPS @ $260 =	$46,800
20 - 250W HPS @ $260 =	$5,200
32 - 400W HPS @ $265 =	$8,480
	$60,480

HIGH PRESSURE PLANT

210 - 70W HPS @ $260 =	$54,600
16 - 250W HPS @ $260 =	$4,160
55 - 400W HPS @ $265 =	$14,575
	$73,335

FIXTURE COST POWER PLANT NO 3	$134,000
ALLOWANCE FOR SHIPPING	$13,000
ALLOWANCE FOR ENGINEERING ASSISTANCE	$13,000
TOTAL BUDGETARY COST	$160,000

DARKHAN PLANT

270 - 70W HPS @ $260 =	$70,200
30 - 250W HPS @ $260 =	$7,800
48 - 400W HPS @ $265 =	$12,720
	$90,720
FIXTURE COST DARKHAN	$90,720
ALLOWANCE FOR SHIPPING	$9,000
ALLOWANCE FOR ENGINEERING ASSISTANCE	$9,000
TOTAL BUDGETARY COST	$109,000

TABLE 5 2

PLANT VACUUM SYSTEM COST SUMMARY

SYSTEM COSTS

POWER PLANT NO 3

PRE-PACKAGED VACUUM SKID W/FILTERS FOR LOW PRESSURE PLANT	$94,000
PRE-PACKAGED VACUUM SKID W/FILTERS FOR HIGH PRESSURE PLANT	$94,000
MISCELLANEOUS EQUIPMENT INCL HOSE VALVES	$10,000
TOTAL EQUIPMENT COST	$198,000
FREIGHT (OCEAN)	$7,000
ENGINEERING ALLOWANCE	$12,000
TOTAL BUDGETARY COST	$217,000

DARKHAN

PRE-PACKAGED VACUUM SKID W/FILTERS	$94,000
MISCELLANEOUS EQUIPMENT INCL HOSE VALVES	$5,000
TOTAL EQUIPMENT COST	$99,000
FREIGHT (OCEAN)	$3,600
ENGINEERING ALLOWANCE	$6,000
TOTAL BUDGETARY COST	$109,000

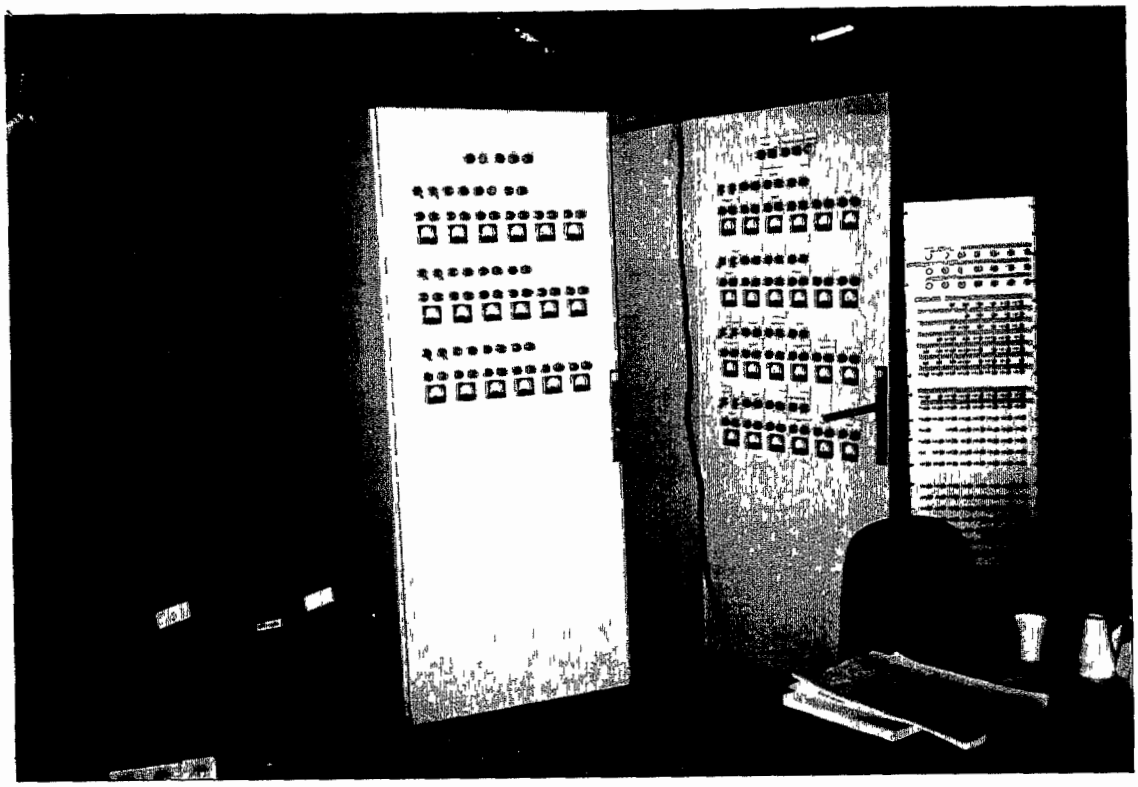
APPENDIX A

PHOTOGRAPHS

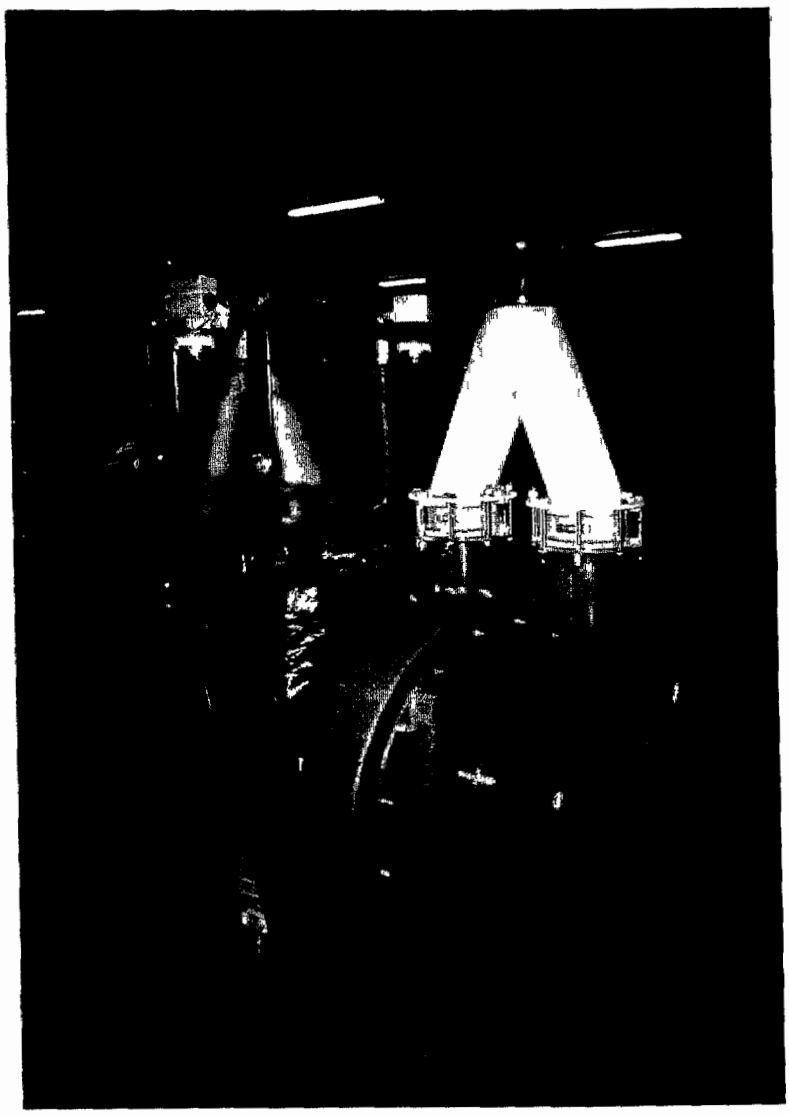
PHOTOGRAPHS FOR
EMERGENCY HEAT AND POWER PROJECT NO 1 FOR

MONGOLIAN FUEL AND ENERGY MINISTRY

PHOTOGRAPH NO.	DATE TAKEN	REMARKS
1	1993	View of Flame Scanner System Control Cabinets after Completion of Shop Testing and Prior to Shipment
2	1993	View of Scanner System Cooling Air Supply Skid after Completion of Shop Tests and Prior to Shipment
3	1993	View of Interior of Flame Scanner and No Coal Flow Alarm Panel after Shipment to Mongolia
4	1993	View of Installation Work of No Coal Flow Alarm Circuit for Boilers Nos 1 & 2
5	1993	View of Flame Scanner System/ No Coal Flow Alarm Panel During Testing
6	1993	View of Pulverized Coal Control System Rack for Boilers 7,8, & 9 prior to mounting Power Supplies
7	1993	View of Pulverized Coal Control System Rack for Boilers 7,8, & 9 with Moore Controllers in Place
8	1993	View of Pulverized Coal Control System Rack for Boilers 7, 8, & 9 with field cables routed
9	1993	View of Relay Installation for Pulverized Control System Rack for Boilers 10, 11 & 12

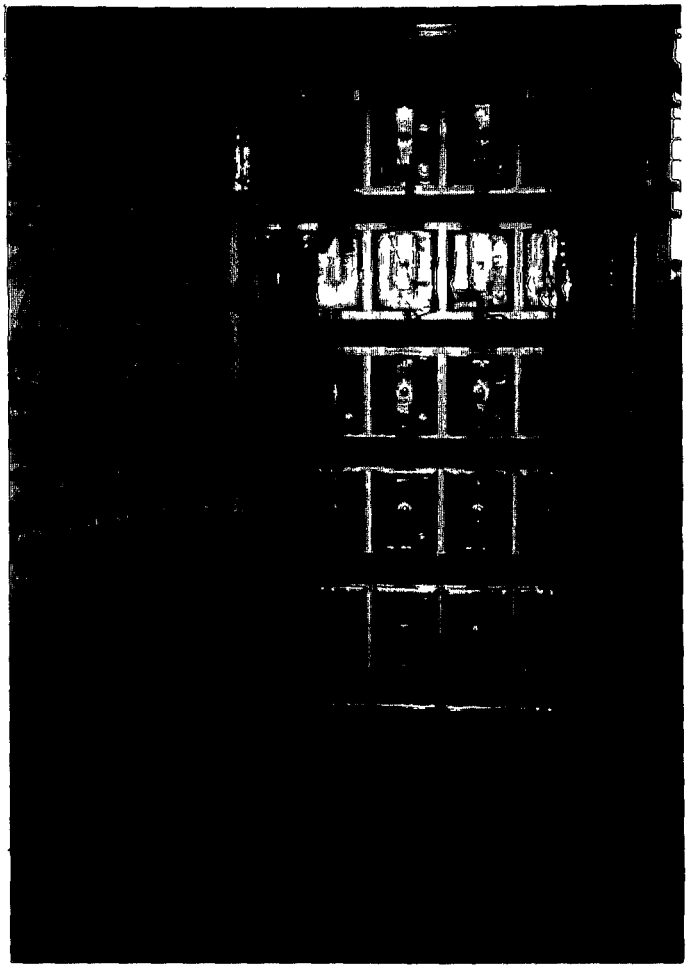


Photograph # 1



Photograph # 2

Photograph # 3



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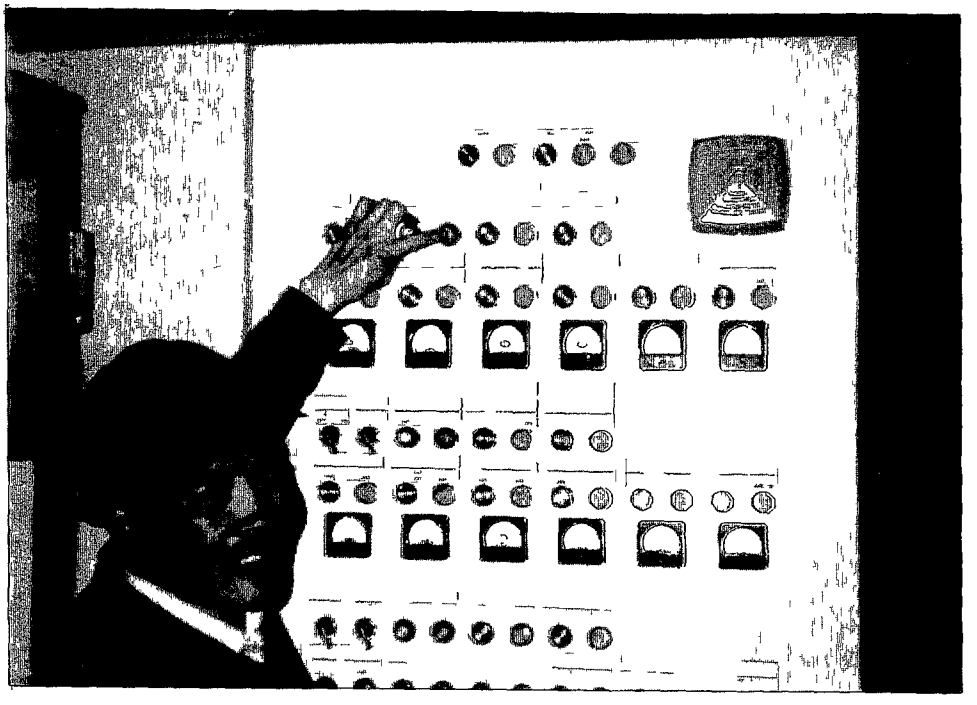

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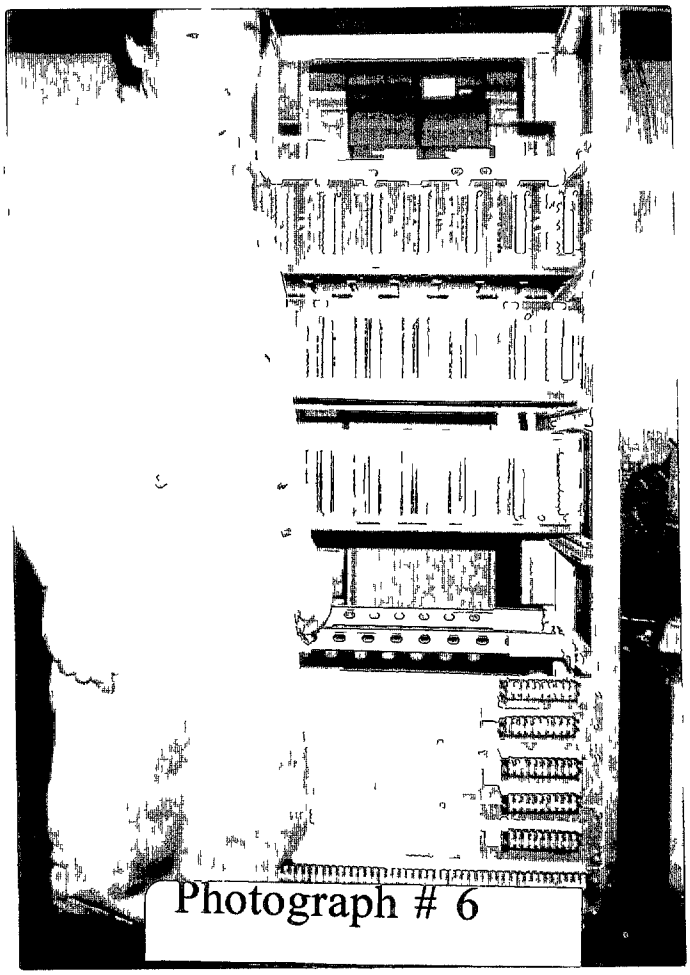
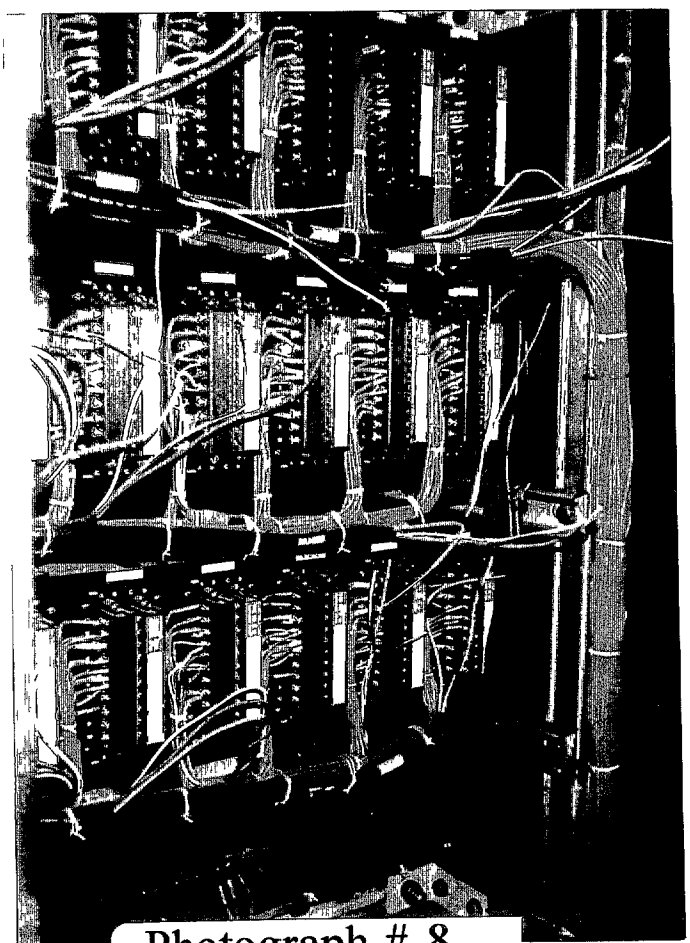
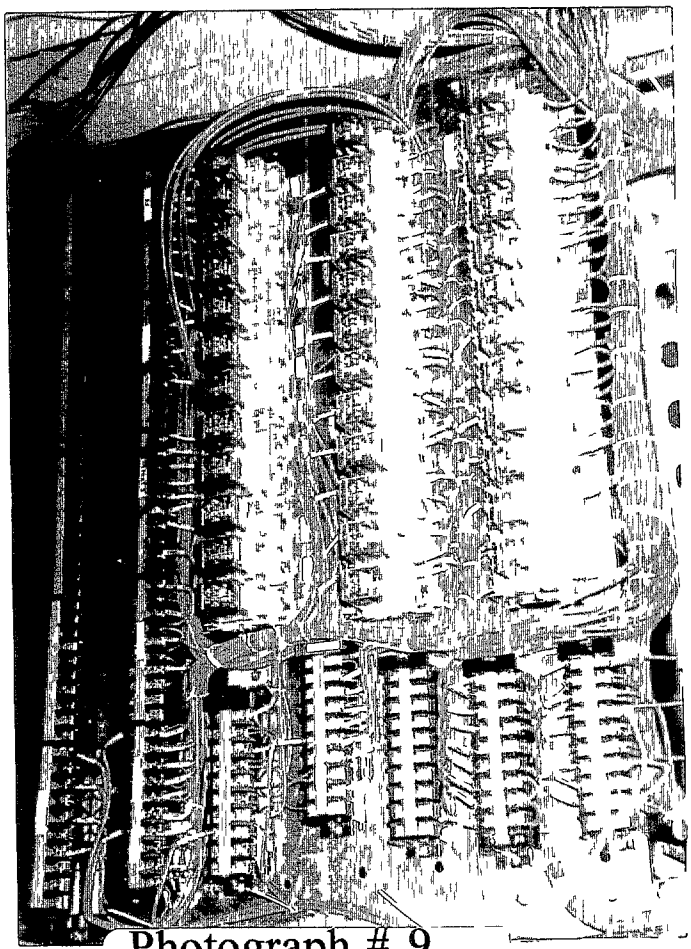


Photograph # 6

Photograph # 7



Photograph # 8



Photograph # 9

APPENDIX B

INSTRUMENTATION AND CONTROL DRAWINGS

APPENDIX B

INSTRUMENTATION AND CONTROL DRAWINGS

This section contains record drawings noting modifications made in the field during Phase III These drawings supersede electrical drawings sheets E-001 through E-004 and Mechanical Drawings Sheets M-001 and M-002 which were included in Appendix F of the Phase II Installation Strategy Report

APPENDIX C

PROCUREMENT LISTS FOR NEAR TERM EQUIPMENT NEEDS

ITEM NO	DESCRIPTION	QUANTITY		UNIT COST($)	TOTAL COST $	SHIP COST $	TOTAL INCL. SHIP COST$	UNIT WT (M TONS)	DIMENSNS EA (M)	SOURCE COUNTRY	STATUS/COMMENTS
	POWER PLANT NO 3										
1	Fireproof Bricks Diatomaceous for Brick Work around Boiler	400	M^3	$1 = 1 Brick	240 000	397 215	637 215	2 1825	N/A	U S	Ship via Ocean
	Class A 250 x 123 x 65 Gost 2574 78										Est on Site Date Oct 93
	US Type 9 x 4 1/2 x 2 1/2										
2	Insulating bricks M400 Gost 6788 74 500 x 170 x 60	360	M^3	$1 1 = 1 Brick	253 800	143 325	397 125	0 875	N/A	U S	Ship via Ocean
	(Sovelete plate) US Type 9 x 4 1/2 x 2 1/2										Est on Site Date Oct 93
3	Cement for 1&2 above	80	Tns	$0 6 1 KG	48 000	36 400	84 400	1	N/A	U S	Ship via Ocean
											Est on Site Date Oct 93
4	Crown Gear for Ball Mills Type	3		132 000	396 000	7 508	403 508	5 5	4 5x4 5x45	U S	Ship via Ocean
	WB M 287 410 Year 1967										Est on Site Date Aug 94
5	Pinion Gear for Ball Mills as above	4		23 000	92 000	1 593	93 593	0 875	65x 65x 45	U S	Ship via Ocean
											Est on Site Date Aug 94
6	Crown Gear for Ball Mills Type	3		132 000	396 000	7 508	403 508	5 5	4 5x4 5x 45	U S	Ship via Ocean
	WB M 286/470 Year 1976										Est on Site Date Aug 94
7	Pinion Gear for Ball Mills as above	3		23 000	69 000	1 194	70 194	0 875	65x 65x 45	U S	Ship via Ocean
											Est on Site Date Aug 94
8	Boiler Feed Water Pumps Type [illegible] 150 53	2	Cmp	140 000	280 000	73 937	353 937	10 5	5x1 7x2 2	U S	Ship via Air
	Q 150 M3/h H=580M 500 kwt 2970 RPM										Est on Site Date Dec 93
											for Expedited Del
9	Brass Tubing OD 19 x 1 x 4545 Mark [illegible] -68	25	Tn	7 000	175 000	11 375	186 375	1		U S	4 6 M Long
											Ship via Ocean
											Est Onsite Date Sept 93
10	Gear for Coal Powder Feeder Type [illegible] 7 Year 1976	12	pc	345	4 140	0	4 140	0	N/A	C I S	N/A
11	Electrical Motors Type [illegible] 61 Y2	5	pc	5 400	27 000	352	27 352	0 02		U S	Ship Via Air
	0 9 KWT 450 1500 RPM DC 220 Volt										Est Onsite Date Dec 93
	for Coal Powder Feeders 20 Kg Ea										

ITEM NO	DESCRIPTION	QUANTITY		UNIT COST($)	TOTAL COST $	SHIP COST $	TOTAL INCL. SHIP COST$	UNIT WT (M TONS)	DIMENSNS EA (M)	SOURCE COUNTRY	STATUS/COMMENTS
12	Electrical Motors Type 15-62 Y2	12	pc	9 550	114 600	845	115 445	0 02			Ship Via Air
	4 0 KWT 450 1500 RPM DC 220 Volt										Est Onsite Date Dec 93
	for Coal Powder Feeders 20 Kg Ea										
13	Electrical Motors Type AC 3 Phase	4	pc	53 100	212 400	63 375	275 775	4 5	2 4x1 4x1 4		Ship Via Air
	Type A30 4 450Y-8YI 6000 Volt										Est Onsite Date Dec 93
	500 KWT 735 RPM										
14	Ash Sluice Pump Type PT 400/40 Q=400 M^3/h	1	Cmp	30 000	30 000	8 802	38 802	2 5	1 x 1 5 x 1		Ship Via Air
	H = 40M 132 KWT 960 RPM										Est Onsite Date Dec 93
15	High Pressure Heater (H/E Type B 30)	1	Cmp	120 000	120 000	28 167	148 167	8 0	Dia 1 5x7 5		Ship Via Air
	Bundle Only										Est Onsite Date Dec 93
16	District Water Pump Type C 2500 180	1	Cmp	200 000	200 000	35 208	235 208	10			Ship Via Air
											Est Onsite Date Dec 93
17	Primary Fan Gear Housing	2	pc	12 492	24 900	0	24 900	0	N/A	C I S	N/A
	(Fan Type BM 18A-4 Year 1978)										
For Low Pressure Turbine	**T-12-35/IOM 378/I Year 1967**										
18	Diaphragm Compression Ring	30	pc	236	7 080	0	7 080			C I S	
	Dwg No 126 C 378/I										
19	Diaphragm Compression Ring	6	pc	225	1 800	0	1 800			C I S	
	Dwg No 126 C 381/I										
20	Compressed End Flat Spring	338	pc	1 00	338	0	338			C I S	
	Dwg No 185 M-643										
21	Compressed End Flat Spring	24	pc	1 20	28 20	0	28 20			C I S	
	Dwg No 185 M-640										
22	Compressed End Flat Spring	132	pc	1 20	158 40	0	158 40			C I S	
	Dwg No 185 M-644										
23	Compressed Tendril to Rotors	90	pc	1 20	108	0	108 00			C I S	
	Dwg No 126 C 245/1										

ITEM NO	DESCRIPTION	QUANTITY		UNIT COST($)	TOTAL COST $	SHIP COST $	TOTAL INCL. SHIP COST$	UNIT WT (M TONS)	DIMENSNS EA (M)	SOURCE COUNTRY	STATUS/COMMENTS
24	Compressed Tendril to Rotors	100	pc	1 20	120	0	120 00	0	N/A	C I S	
	Dwg No 126-C 245/3										
25	Compressed Tendril to Rotors	300	pcdd	1 20	360	0	360 00	0	N/A	C I S	
	Dwg No 126-C 245/12										
For High Pressure Turbine T-25-90/IOM Year 1976											
26	Compressed End Flat Spring	66	pc	1	66	0	66 00	0	N/A	C I S	
	Dwg No 185 M-643										
27	Compressed Ring	30	pc	290	8 700	0	8700 00	0	N/A	C I S	
	Dwg No 126 C 328										
28	Compressed End Flat Spring	132	pc	1 20	158	0	158 00	0	N/A	C I S	
	Dwg No 185 M 644										
29	Compressed End Flat Spring	368	pc	1	368	0	368 00	0	N/A	C I S	
	Dwg No 185 M 637										
30	Compressed End Flat Spring	312	pc	0 70	218 40	0	218 40	0	N/A	C I S	
	Dwg No 185 M-639										
31	Compressed Tendril to Rotors	208	pc	1 20	249 60	0	249 60	0	N/A	C I S	
	Dwg No 126 C 245/10										
32	Compressed Tendril to Rotors	24	pc	1	24	0	24 00	0	N/A	C I S	
	Dwg No 126-C 245/11										
33	Rotor Assembly for Hammer Crusher	1	Cmp	113 693 50	113 639 50	0	113639 50	0	N/A	C I S	
	Type M20 20										
	Dwg No 3591 02 00 0										
34	Flexible Coupling for Hammer Crusher	1		3 960	3 960	0	3 960	0	N/A	C I S	
	Type M20 20										
	Dwg No 3591-09-080										
35	Heatproof Stainless Steel	6	Tn	3 000	18 000	2 730	20 730	1		U S	Ship via Ocean
	12 x 18H9T GOST 5332 72 Thickness from 6 to 10 mm										Est Onsite Date Sept 93
	For Boiler Repair Deaerator Trays										

ITEM NO	DESCRIPTION	QUANTITY		UNIT COST($)	TOTAL COST $	SHIP COST $	TOTAL INCL. SHIP COST$	UNIT WT (M TONS)	DIMENSNS EA (M)	SOURCE COUNTRY	STATUS/COMMENTS
36	Bearing Russian No 2222	40	pc	189 25	7 570	704	8 274	0 005		U S	Ship via Air
	US # N222 ENI										Est Onsite Date Sept 93
	5 kg ea										
37	Bearing Russian No 2317	40	pc	155 35	6 214	732	6 946	0 0052		U S	Ship via Air
	US # N317 ENI										Est Onsite Date Sept 93
	5 2 kg ea										
38	Bearing Russian No 2319	20	pc	200	4 000	493	4 493	0 007		U S	Ship via Air
	US # N 319										Est Onsite Date Sept 93
	7 kg ea										
39	Bearing Russian No 2324	50	pc	427 90	21 395	2 465	23 860	0 014		U S	Ship via Air
	US # N324EMI										Est Onsite Date Sept 93
	14 kg ea										
40	Bearing Russian No 2326	30	pc	414 15	12 424 50	1 901	14 326	0 018		U S	Ship via Air
	US # N326 EMI										Est Onsite Date Sept 93
	18 kg ea										
41	Bearing Russian No 3616	20	pc	108 95	2 179	352	2 531	0 005		U S	Ship via Air
	US # 22316										Est Onsite Date Sept 93
	5 kg ea										
42	Bearing Russian No 7630	30	pc	3 180	95 400	2 112	97 512	0 02		U S	Ship via Air
	US # 32330A										Est Onsite Date Sept 93
	20 kg ea										
43	Bearing Russian No 8216	40	pc	35 45	1 418	141	1 559	0 001		U S	Ship via Air
	US # 51216										Est Onsite Date Sept 93
	1 kg ea										
44	Bearing Russian No 46330	40	pc	2 374	94 960	3 662	98 622	0 026		U S	Ship via Air
	US # B7330E TPA P4UL										Est Onsite Date Sept 93
	26 kg ea										
45	Bearing Russian No 50306	60		20	1 200	211	1 411	0 001		U S	Ship via Air
	US # 6306N										Est Onsite Date Sept 93
	1 kg ea										
46	Bearing Russian No 60306	40		23	920	141	1 061	0 001		U S	Ship via Air
	US # 6306 ZR										Est Onsite Date Sept 93
	1 kg ea										
47	Bearing Russian No 3530	20		266 20	5 324	1 408	6 732	0 02		U S	Ship via Air
	US # 222 30										Est Onsite Date Sept 93
	20 kg ea										
48	Electrical Motor A A 3012 55-4MYI	2	pc	39 700	79 400	21 829	101 229	3 1	2x1 3x1 2	U S	Ship via Air
	6000 Volt 500 KWT 1500 RPM										Est Onsite Date Dec 93

ITEM NO	DESCRIPTION	QUANTITY		UNIT COST($)	TOTAL COST $	SHIP COST $	TOTAL INCL. SHIP COST$	UNIT WT (M TONS)	DIMENSNS EA (M)	SOURCE COUNTRY	STATUS/COMMENTS
49	Electrical Motor A A 302 17 69 8/10 YI	1	pc	235 200	235 200	39 433	274 633	11 2	3 4x2 3x2 1	U S	Ship via Air
	6000 Volt 1000/500 KWT 742/594 RPM										Est Onsite Date Dec 93
50	Electrical Motor 4 A 315M 4Y3	3	pc	21 000	63 000	26 406	89 406	2 5		U S	Ship via Air
	380 Volt 200 KWT 1475 RPM										Est Onsite Date Dec 93
51	Electrical Motor MTH 612 10Y2	2	pc	12 500	25 000	12 675	37 675	1 8	1 5 x 85x1 1	U S	Ship via Air
	380 Volt 60 KWT 565 RPM										Est Onsite Date Dec 93
52	Electrical Motor 4AM 225 M8/6/4Y2	6	pc	7 500	45 000	16 900	61 900	0 8	1 3x 66x 84	U S	Ship via Air
	15/17/25 KWT 380 Volt										Est Onsite Date Dec 93
	740/990/1480 RPM										
53	Electrodes YoHH 13/55 Dia 3MM	15	Tn	3 190	47 850	6 825	54 675	1		U S	Ship via Ocean
											Est Onsite Date Sept 93
54	Winch 5 Ton Type YA 5M	3	Cmp	2 000	6 000	410	6 410	0 3		U S	Ship via Ocean
											Est Onsite Date Sept 93
55	Portable Electrical Drill	10	pc	160	1 600	14	1 614	0 003		U S	Ship via Ocean
	Type HS-1019 HS 1017A 220 Volt										Est Onsite Date Sept 93
	3 kg ea										
56	Portable Electrical Grinder	10	pc	160	1 600	27	1 627	0 006		U S	Ship via Ocean
	HS 2004A 220 Volt										Est Onsite Date Sept 93
	6 kg ea										
57	Current Frequency Converter	10	pc	1 000	10 000	59	10 059	0 013		U S	Ship via Ocean
	13 kg ea										Est Onsite Date Sept 93
58	Belt Scales Width 1000 MM	2	Cmp	15 000	30 000	455	30 455	0 5	3 x 0 65x1 4	U S	Ship via Ocean
	For Coal Weight Measurement										Est Onsite Date Sept 93
59	Turbine Oil Centrifuge	1	Cmp	95 000	95 000	4 401	99 401	1 25	2 x 1 5 x 2	U S	Ship via Air
	Type TCM-3000 for Turbine Lubrication Oil Purification										Est Onsite Date Dec 93
60	Electrical Motor A12 52-4	1		44 150	44 150	11 971	56 121	3 4	2 2x1 3x1 25	U S	Ship via Air
	630 KWT 6000 Volt 1500 RPM										Est Onsite Date Dec 93
	Q=1000 M^3/h H= 180M										
					3 775 020 60	975 261 18	4 750 281 78				
	Total Power Plant #3 =			**$**	**4,750 281 78**	**and 1398 M Ton Shipment from US to Mongolia**					

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ITEM NO	DESCRIPTION	QUANTITY		UNIT COST($)	TOTAL COST $	SHIP COST $	TOTAL INCL SHIP COST$	UNIT WT (M TONS)	DIMENSNS EA	SOURCE COUNTRY	STATUS/COMMENTS
	DARKHAN POWER PLANT										
1	Water Feed Pumps Type 150 53	2	Cmp	140 000	280 000	73 937	353 937	10 5	5 x 1 7 x 2 2	U S	Ship via Air
	Q = 150 M^3/H H= 580 M 500 KWT 2970 RPM										Est Onsite Date Dec 93
	US 7 Stages 500 HP Pump										
2	Ash Sluice Bager Pump Type PT 400/40	1	Cmp	30 000	30 000	8 802	38 802	2 5	1 x 1 5 x 1	U S	Ship via Air
	Q= 400 M^3/H H=40M US Sluce 1761 GPM										Est Onsite Date Dec 93
	131 Feet										
3	Ash Sluice Bager Pump Type PT-800 800 71	1	Cmp	80 000	80 000	22 533	102 533	6 4	2 x 2 x 1	U S	Ship via Air
	Q= 800 M3/H H = 71M US 3038 GPM										Est Onsite Date Dec 93
	220 Feet										
4	Fireproof bricks Diatomaceous for brick work around boiler	200	M^3	$1 = 1 brick	120 000	198 608	318 608	2 1825		U S	Ship via Ocean
	Class a 250 x 123 x 65 mm										Est Onsite Date Oct 93
	Mark 600 Gost 2674 78 US 9 x 4 1/2 x 2 1/2										
5	Insulation Bricks M 400 Gost 6788 74	200	M^3	$1 1 = 1 brick	141 000	79 625	220 625	0 875		U S	Ship via Ocean
	500 x 170 x 60 mm (Sovelete plate)										Est Onsite Date Oct 93
	US 9 x 4 1/2 x 2 1/2										
6	Cement for Nos 4 & 5 Above	80	Tn	$0 6 = 1 KG	48 000	36 400	84 400	1		U S	Ship via Ocean
											Est Onsite Date Oct 93
7	Brass Tubing O D 19 x 1 x 4545 mm	30	Tn	7 000	210 000	13 650	223 650	1		U S	4 6 M Long
											Ship via Ocean
											Est Onsite Date Sept 93
8	Electrical Motor for Forced Draft Fan	2	pc	10 600	21 200	14 787	35 987	2 1	1 7x0 82x1 1	U S	Ship via Air
	Type 4A 3555S 8Y3 132 kwt 380/660 v										Est Onsite Date Dec 93
	252/145 amper 735 rpm										
9	CB 500 3 23 District H/E/ bundle	1		85 000	85 000	28 167	113 167	8	D 1 2 x 7	U S	Ship via Air
	Shell P 3kgf/cm^2 T=400 C										Est Onsite Date Dec 93
	Tubes P=23kgf/cm^2 T=Inlet 70 C Outlet 120 C										
10	CB 500 14 23 District H/E Complete	1		120 000	120 000	42 250	162 250	12	D 1 5 x 7 6	U S	Ship via Air
	Shell P 3kgf/cm^2 T=400 C										Est Onsite Date Dec 93
	Tubes P=23kgf/cm^2 T=Inlet 70 C Outlet 120 C										
11	CB 500 14 23 District H/E bundle	1		93 000	93 000	28 167	121 167	8	D 1 4 x 7	U S	Ship via Air
	Shell P=14kgf/cm^2 T=400 C										Est Onsite Date Dec 93
	Tubes P= 23kgf/cm^2 T=Inlet 70 C Outlet 120 C										

ITEM NO	DESCRIPTION	QUANTITY		UNIT COST($)	TOTAL COST $	SHIP COST $	TOTAL INCL. SHIP COST$	UNIT WT (M TONS)	DIMENSNS EA	SOURCE COUNTRY	STATUS/COMMENTS
12	n CB 500 14 23 District H/E Complete	1		130 000	130 000	42 250	172 250	12		U S	Ship via Air
	Shell P=14kgf/cm^2 T=400 C										Est Onsite Date Dec 93
	Tubes P= 23kgf/cm^2 T=Inlet 70 C Outlet 120 C										
13	Crown Gear for Ball Mills Type	4	pc	132 000	528 000	10 010	538 010	5 5	4 5x4 5x 45	U S	Ship via Ocean
	WGM-287 410 Year 1984										Est Onsite Date Aug 94
14	Pinion Gear for Ball Mills as above	4	pc	23 000	92 000	1 593	93 593	0 875	65x 65x 45	U S	Ship via Ocean
											Est Onsite Date Aug 94
15	Electrical Motor Type A 304 400Y 6YI	2	pc	43 100	86 200	23 237	109 437	3 3	2 2x1 3x1 25	U S	Ship via Air
	400 KWT 6000 Volt 1000 RPM										Est Onsite Date Dec 93
	for Ash Pump (Bager Pump)										
16	Gear for Coal Powder Feeder	3	cmp	345	N/A	0	0	0	N/A	C I S	N/A
	nnA 3 5 Year 1986										
17	Bearing Russian No 307/US # 6307	80	pc	7 50	600	124	724	0 00044		U S	Ship via Air
	44 kg ea										Est Onsite Date Sept 93
18	Bearing Russian No 2317/US # N317	20	pc	155 35	3 107	366	3 473	0 0052		U S	Ship via Air
	5 2 kg ea										Est Onsite Date Sept 93
19	Bearing Russian No 366322/US # 7322 B MP 00	16	pc	2 000	32 000	1 014	33 014	0 018		U S	Ship via Air
	18 kg ea										Est Onsite Date Sept 93
20	Bearing Russian No 46330/US # B7330E TPA P4 UL	20	pc	2 374	47 480	1 831	49 311	0 026		U S	Ship via Air
	26 kg ea										Est Onsite Date Sept 93
21	Generator for batteries recharging Batteries type CK 24 (Russia	1	pc	10 000	10 000	3 521	13 521	1	1 65x0 85x2 2	U S	Ship via Air
	Russian Generator Type n 92 Y4 70kwt 230 320v nominal I=30										Est Onsite Date Sept 93
	Used for Emergency Lighting instrumentation signalization pow										
22	Welding Electrodes for piping and boiler repair	20	tn	3 190	63 800	9 100	72 900	1		U S	Ship via Ocean
	Russian type YoHn 13/55 Dia 3mm										Est Onsite Date Sept 93
23	Bearing Russian No 46234/US # B723 4E TPA P4 UL	10	pc	2 064	20 640	775	21 415	0 022		U S	Ship via Air
	22 kg ea										Est Onsite Date Sept 93

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ITEM NO	DESCRIPTION	QUANTITY		UNIT COST($)	TOTAL COST $	SHIP COST $	TOTAL INCL. SHIP COST$	UNIT WT (M TONS)	DIMENSNS EA.	SOURCE COUNTRY	STATUS/COMMENTS
24	Bearing No 7510/US # 32210A	10	pc	24	240	23	263	0 00064		U S	Ship via Air
	0 64 kg ea										Est Onsite Date Sept 93
25	Bearing Russian No 7306/US # 30306	10	pc	6 90	69	16	85	0 00046		U S	Ship via Air
	0 46 kg ea										Est Onsite Date Sept 93
26	Bearing Russian No 7310/US # 30310A	20	pc	37	740	92	832	0 0013		U S	Ship via Air
	1 3 kg ea										Est Onsite Date Sept 93
27	Circuit Breakers Type ∋ 16B Y3	2	pc	15 000	30 000	7 042	37 042	1		U S	Ship via Air
	I nom =1600A up to 660 Volt AC										Est Onsite Date Sept 93
28	Chain Bp 40/6300 for scraper feeder type 500 x 4060	24	pc	1 547	37 100	0	37 100	0	N/A	C I S	N/A
29	Scraper chain for feeder as above	12	pc	90	1 080	0	1 080	0	N/A	C I S	N/A
30	Bearing Russian No 7516	10	pc	63	630	76	706	0 00215	2 15 KG	U S	Ship via Air
	2 15 kg ea										Est Onsite Date Sept 93
31	Bearing Russian No 3618	10	pc	151 85	1 518 50	327	1 846	0 0093	9 3 KG	U S	Ship via Air
	9 3 kg ea										Est Onsite Date Sept 93
					2 313 404 50	648 321 39	2 961 725 89	79 31			
	Total Power Plant Darkhan =			**$**	**2,961,725 89**	**and 821 Tons of Shipment from US to Mongolia**					

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ITEM NO	DESCRIPTION	QUANTITY		UNIT COST($)	TOTAL COST $	SHIP COST $	TOTAL INCL. SHIP COST$	UNIT WT (M TONS)	DIMENSNS EA (M)	SOURCE COUNTRY	STATUS/COMMENTS
	POWER PLANT NO 3										
1	Fireproof Bricks Diatomaceous for Brick Work around Boiler	400	M^3	$1 = 1 Brick	240 000	397 215	637 215	2 1825	N/A	U S	Ship via Ocean
	Class A 250 x 123 x 65 Gost 2574 78										Est on Site Date Oct 93
	US Type 9 x 4 1/2 x 2 1/2										
2	Insulating bricks M400 Gost 6788 74 500 x 170 x 60	360	M^3	$1 1 = 1 Brick	253 800	143 325	397 125	0 875	N/A	U S	Ship via Ocean
	(Sovelete plate) US Type 9 x 4 1/2 x 2 1/2										Est on Site Date Oct 93
3	Cement for 1&2 above	80	Tns	$0 6 1 KG	48 000	36 400	84 400	1	N/A	U S	Ship via Ocean
											Est on Site Date Oct 93
4	Crown Gear for Ball Mills Type	3		132 000	396 000	7 508	403 508	5 5	4 5x4 5x45	U S	Ship via Ocean
	Ш 6 M 287 410 Year 1967										Est on Site Date Aug 94
5	Pinion Gear for Ball Mills as above	4		23 000	92 000	1 593	93 593	0 875	65x 65x 45	U S	Ship via Ocean
											Est on Site Date Aug 94
6	Crown Gear for Ball Mills Type	3		132 000	396 000	7 508	403 508	5 5	4 5x4 5x 45	U S	Ship via Ocean
	Ш 6 M 286/470 Year 1976										Est on Site Date Aug 94
7	Pinion Gear for Ball Mills as above	3		23 000	69 000	1 194	70 194	0 875	65x 65x 45	U S	Ship via Ocean
											Est on Site Date Aug 94
8	Boiler Feed Water Pumps Type Л 3 150 53	2	Cmp	140 000	280 000	9 555	289 555	10 5	5x1 7x2 2	U S	Ship via Ocean
	Q-150 M3/h H=580M 500 kwt 2970 RPM										Est on Site Date Feb 94
											for Expedited Del
9	Brass Tubing OD 19 x 1 x 4545 Mark Л -68	25	Tn	7 000	175 000	11 375	186 375	1		U S	4 6 M Long
											Ship via Ocean
											Est Onsite Date Sept 93
10	Gear for Coal Powder Feeder Type ПМ 7 Year 1976	12	pc	345	4 140	0	4 140	0	N/A	C I S	N/A
11	Electrical Motors Type П6 61 Y2	5	pc	5 400	27 000	352	27 352	0 02		U S	Ship Via Air
	0 9 KWT 450 1500 RPM DC 220 Volt										Est Onsite Date Dec 93
	for Coal Powder Feeders 20 Kg Ea										

ALTERNATE

ITEM NO	DESCRIPTION	QUANTITY		UNIT COST($)	TOTAL COST $	SHIP COST $	TOTAL INCL. SHIP COST$	UNIT WT (M TONS)	DIMENSNS EA (M)	SOURCE COUNTRY	STATUS/COMMENTS
12	Electrical Motors Type AC 62 Y2	12	pc	9 550	114 600	845	115 445	0 02			Ship Via Air
	4 0 KWT 450 1500 RPM DC 220 Volt										Est Onsite Date Dec 93
	for Coal Powder Feeders 20 Kg Ea										
13	Electrical Motors Type AC 3 Phase	4	pc	53 100	212 400	8 190	220 590	4 5	2 4x1 4x1 4		Ship via Ocean
	Type A30 4 450Y 8YI 6000 Volt										Est on Site Date Feb 94
	500 KWT 735 RPM										
14	Ash Sluice Pump Type PT 400/40 Q=400 M 3/h	1	Cmp	30 000	30 000	1 138	31 138	2 5	1 x 1 5 x 1		Ship via Ocean
	H = 40M 132 KWT 960 RPM										Est on Site Date Feb 94
15	High Pressure Heater (H/E Type B 30)	1	Cmp	120 000	120 000	3 640	123 640	8 0	Dia 1 5x7 5		Ship via Ocean
	Bundle Only										Est on Site Date Feb 94
16	District Water Pump Type C 2500 180	1	Cmp	200 000	200 000	4 550	204 550	10			Ship via Ocean
											Est on Site Date Feb 94
17	Primary Fan Gear Housing	2	pc	12 492	24 900	0	24 900	0	N/A	C I S	N/A
	(Fan Type BM 18A 4 Year 1978)										
For Low Pressure Turbine	**T-12-35/IOM 378/I Year 1967**										
18	Diaphragm Compression Ring	30	pc	236	7 080	0	7 080			C I S	
	Dwg No 126 C 378/I										
19	Diaphragm Compression Ring	6	pc	225	1 800	0	1 800			C I S	
	Dwg No 126-C 381/I										
20	Compressed End Flat Spring	338	pc	1 00	338	0	338			C I S	
	Dwg No 185 M-643										
21	Compressed End Flat Spring	24	pc	1 20	28 20	0	28 20			C I S	
	Dwg No 185 M-640										
22	Compressed End Flat Spring	132	pc	1 20	158 40	0	158 40			C I S	
	Dwg No 185 M-644										
23	Compressed Tendril to Rotors	90	pc	1 20	108	0	108 00			C I S	
	Dwg No 126-C 245/1										

ITEM NO	DESCRIPTION	QUANTITY		UNIT COST($)	TOTAL COST $	SHIP COST $	TOTAL INCL SHIP COST$	UNIT WT (M TONS)	DIMENSNS EA (M)	SOURCE COUNTRY	STATUS/COMMENTS
24	Compressed Tendril to Rotors	100	pc	1 20	120	0	120 00	0	N/A	C I S	
	Dwg No 126-C 245/3										
25	Compressed Tendril to Rotors	300	pcdd	1 20	360	0	360 00	0	N/A	C I S	
	Dwg No 126-C 245/12										
For High Pressure Turbine T-25-90/IOM Year 1976											
26	Compressed End Flat Spring	66	pc	1	66	0	66 00	0	N/A	C I S	
	Dwg No 185 M 643										
27	Compressed Ring	30	pc	290	8 700	0	8700 00	0	N/A	C I S	
	Dwg No 126-C 328										
28	Compressed End Flat Spring	132	pc	1 20	158	0	158 00	0	N/A	C I S	
	Dwg No 185 M 644										
29	Compressed End Flat Spring	368	pc	1	368	0	368 00	0	N/A	C I S	
	Dwg No 185 M-637										
30	Compressed End Flat Spring	312	pc	0 70	218 40	0	218 40	0	N/A	C I S	
	Dwg No 185 M-639										
31	Compressed Tendril to Rotors	208	pc	1 20	249 60	0	249 60	0	N/A	C I S	
	Dwg No 126 C 245/10										
32	Compressed Tendril to Rotors	24	pc	1	24	0	24 00	0	N/A	C I S	
	Dwg No 126 C 245/11										
33	Rotor Assembly for Hammer Crusher	1	Cmp	113 693 50	113 639 50	0	113639 50	0	N/A	C I S	
	Type M20 20										
	Dwg No 3591 02 00 0										
34	Flexible Coupling for Hammer Crusher	1		3 960	3 960	0	3 960	0	N/A	C I S	
	Type M20 20										
	Dwg No 3591-09-080										
35	Heatproof Stainless Steel	6	Tn	3 000	18 000	2 730	20 730	1		U S	Ship via Ocean
	12 x 18H9T GOST 5332 72 Thickness from 6 to 10 mm										Est Onsite Date Sept 93
	For Boiler Repair Deaerator Trays										

ITEM NO	DESCRIPTION	QUANTITY		UNIT COST($)	TOTAL COST $	SHIP COST $	TOTAL INCL. SHIP COST$	UNIT WT (M TONS)	DIMENSNS EA (M)	SOURCE COUNTRY	STATUS/COMMENTS
36	Bearing Russian No 2222	40	pc	189 25	7 570	704	8 274	0 005		U S	Ship via Air
	US # N222 ENI										Est Onsite Date Sept 93
	5 kg ea										
37	Bearing Russian No 2317	40	pc	155 35	6 214	732	6 946	0 0052		U S	Ship via Air
	US # N317 ENI										Est Onsite Date Sept 93
	5 2 kg ea										
38	Bearing Russian No 2319	20	pc	200	4 000	493	4 493	0 007		U S	Ship via Air
	US # N 319										Est Onsite Date Sept 93
	7 kg ea										
39	Bearing Russian No 2324	50	pc	427 90	21 395	2 465	23 860	0 014		U S	Ship via Air
	US # N324EMI										Est Onsite Date Sept 93
	14 kg ea										
40	Bearing Russian No 2326	30	pc	414 15	12 424 50	1 901	14 326	0 018		U S	Ship via Air
	US # N326 EMI										Est Onsite Date Sept 93
	18 kg ea										
41	Bearing Russian No 3616	20	pc	108 95	2 179	352	2 531	0 005		U S	Ship via Air
	US # 22316										Est Onsite Date Sept 93
	5 kg ea										
42	Bearing Russian No 7630	30	pc	3 180	95 400	2 112	97 512	0 02		U S	Ship via Air
	US # 32330A										Est Onsite Date Sept 93
	20 kg ea										
43	Bearing Russian No 8216	40	pc	35 45	1 418	141	1 559	0 001		U S	Ship via Air
	US # 51216										Est Onsite Date Sept 93
	1 kg ea										
44	Bearing Russian No 46330	40	pc	2 374	94 960	3 662	98 622	0 026		U S	Ship via Air
	US # B7330E TPA P4UL										Est Onsite Date Sept 93
	26 kg ea										
45	Bearing Russian No 50306	60		20	1 200	211	1 411	0 001		U S	Ship via Air
	US # 6306N										Est Onsite Date Sept 93
	1 kg ea										
46	Bearing Russian No 60306	40		23	920	141	1 061	0 001		U S	Ship via Air
	US # 6306 ZR										Est Onsite Date Sept 93
	1 kg ea										
47	Bearing Russian No 3530	20		266 20	5 324	1 408	6 732	0 02		U S	Ship via Air
	US # 222 30										Est Onsite Date Sept 93
	20 kg ea										
48	Electrical Motor A 3012 55-4MYI	2	pc	39 700	79 400	2 821	82 221	3 1	2x1 3x1 2	U S	Ship via Ocean
	6000 Volt 500 KWT 1500 RPM										Est on Site Date Feb 94

ITEM NO	DESCRIPTION	QUANTITY		UNIT COST($)	TOTAL COST $	SHIP COST $	TOTAL INCL. SHIP COST$	UNIT WT (M TONS)	DIMENSNS EA (M)	SOURCE COUNTRY	STATUS/COMMENTS
49	Electrical Motor A A 302 17-69-8/10 YI	1	pc	235 200	235 200	5 096	240 296	11 2	3 4x2 3x2 1	U S	Ship via Ocean
	6000 Volt 1000/500 KWT 742/594 RPM										Est on Site Date Feb 94
50	Electrical Motor 4 A 315M 4Y3	3	pc	21 000	63 000	3 413	66 413	2 5		U S	Ship via Ocean
	380 Volt 200 KWT 1475 RPM										Est on Site Date Feb 94
51	Electrical Motor MTH 612 10Y2	2	pc	12 500	25 000	1 638	26 638	1 8	1 5 x 85x1 1	U S	Ship via Ocean
	380 Volt 60 KWT 565 RPM										Est on Site Date Feb 94
52	Electrical Motor 4AM 225 M8/6/4Y2	6	pc	7 500	45 000	2 184	47 184	0 8	1 3x 66x 84	U S	Ship via Ocean
	15/17/25 KWT 380 Volt										Est on Site Date Feb 94
	740/990/1480 RPM										
53	Electrodes YOHM 13/55 Dia 3MM	15	Tn	3 190	47 850	6 825	54 675	1		U S	Ship via Ocean
											Est Onsite Date Sept 93
54	Winch 5 Ton Type YI 5M	3	Cmp	2 000	6 000	410	6 410	0 3		U S	Ship via Ocean
											Est Onsite Date Sept 93
55	Portable Electrical Drill	10	pc	160	1 600	14	1 614	0 003		U S	Ship via Ocean
	Type IZ-1019 IZ-1017A 220 Volt										Est Onsite Date Sept 93
	3 kg ea										
56	Portable Electrical Grinder	10	pc	160	1 600	27	1 627	0 006		U S	Ship via Ocean
	IZ 2004A 220 Volt										Est Onsite Date Sept 93
	6 kg ea										
57	Current Frequency Converter	10	pc	1 000	10 000	59	10 059	0 013		U S	Ship via Ocean
	13 kg ea										Est Onsite Date Sept 93
58	Belt Scales Width 1000 MM	2	Cmp	15 000	30 000	455	30 455	0 5	3 x 0 65x1 4	U S	Ship via Ocean
	For Coal Weight Measurement										Est Onsite Date Sept 93
59	Turbine Oil Centrifuge	1	Cmp	95 000	95 000	4 401	99 401	1 25	2 x 1 5 x 2	U S	Ship via Air
	Type ACM-3000 for Turbine Lubrication Oil Purification										Est Onsite Date Dec 93
60	Electrical Motor A12 52-4	1		44 150	44 150	1 547	45 697	3 4	2 2x1 3x1 25	U S	Ship via Ocean
	630 KWT 6000 Volt 1500 RPM										Est on Site Date Feb 94
	Q=1000 M^3/h H= 180M										
					3 775 020 60	680 328 33	4 455 348 93				
	Total Power Plant #3 =			**$**	**4,455,348 93**	**and 1398 M Ton Shipment from US to Mongolia**					

ALTERNATE

RAYTHEON ENGINEERS and CONSTRUCTORS, INC. EMERGENCY HEAT and POWER PROJ. No. 1 MATERIALS AND SPARE PARTS LIST

ITEM NO	DESCRIPTION	QUANTITY		UNIT COST($)	TOTAL COST $	SHIP COST $	TOTAL INCL. SHIP COST$	UNIT WT (M TONS)	DIMENSNS EA	SOURCE COUNTRY	STATUS/COMMENTS
	DARKHAN POWER PLANT										
1	Water Feed Pumps Type n 3 150 53	2	Cmp	140 000	280 000	9 555	289 555	10 5	5 x 1 7 x 2 2	U S	Ship via Ocean
	Q = 150 M^3/H H= 580 M 500 KWT 2970 RPM										Est Onsite Date Feb 94
	US 7 Stages 500 HP Pump										
2	Ash Sluice Bager Pump Type r PT 400/40	1	Cmp	30 000	30 000	1 138	31 138	2 5	1 x 1 5 x 1	U S	Ship via Ocean
	Q= 400 M^3/H H=40M US Sluce 1761 GPM										Est Onsite Date Feb 94
	131 Feet										
3	Ash Sluice Bager Pump Type r PT 800-800 71	1	Cmp	80 000	80 000	2 912	82 912	6 4	2 x 2 x 1	U S	Ship via Ocean
	Q= 800 M3/H H = 71M US 3038 GPM										Est Onsite Date Feb 94
	220 Feet										
4	Fireproof bricks Diatomaceous for brick work around boiler	200	M^3	$1 = 1 brick	120 000	198 608	318 608	2 1825		U S	Ship via Ocean
	Class a 250 x 123 x 65 mm										Est Onsite Date Oct 93
	Mark 600 Gost 2674 78 US 9 x 4 1/2 x 2 1/2										
5	Insulation Bricks M-400 Gost 6788 74	200	M^3	$1 1 = 1 brick	141 000	79 625	220 625	0 875		U S	Ship via Ocean
	500 x 170 x 60 mm (Sovelete plate)										Est Onsite Date Oct 93
	US 9 x 4 1/2 x 2 1/2										
6	Cement for Nos 4 & 5 Above	80	Tn	$0 6 = 1 KG	48 000	36 400	84 400	1		U S	Ship via Ocean
											Est Onsite Date Oct 93
7	Brass Tubing O D 19 x 1 x 4545 mm	30	Tn	7 000	210 000	13 650	223 650	1		U S	4 6 M Long
											Ship via Ocean
											Est Onsite Date Sept 93
8	Electrical Motor for Forced Draft Fan	2	pc	10 600	21 200	1 911	23 111	2 1	1 7x0 82x1 1	U S	Ship via Ocean
	Type 4A 3555S 8Y3 132 kwt 380/660 v										Est Onsite Date Feb 94
	252/145 amper 735 rpm										
9	n CB 500 3 23 District H/E/ bundle	1		85 000	85 000	3 640	88 640	8	D 1 2 x 7	U S	Ship via Ocean
	Shell P 3kgf/cm^2 T=400 C										Est Onsite Date Feb 94
	Tubes P=23kgf/cm^2 T=Inlet 70 C Outlet 120 C										
10	n CB 500 14 23 District H/E Complete	1		120 000	120 000	5 460	125 460	12	D 1 5 x 7 6	U S	Ship via Ocean
	Shell P 3kgf/cm^2 T=400 C										Est Onsite Date Feb 94
	Tubes P=23kgf/cm^2 T=Inlet 70 C Outlet 120 C										
11	n CB 500 14 23 District H/E bundle	1		93 000	93 000	3 640	96 640	8	D 1 4 x 7	U S	Ship via Ocean
	Shell P=14kgf/cm^2 T=400 C										Est Onsite Date Feb 94
	Tubes P= 23kgf/cm^2 T=Inlet 70 C Outlet 120 C										

ALTERNATE

ITEM NO	DESCRIPTION	QUANTITY		UNIT COST($)	TOTAL COST $	SHIP COST $	TOTAL INCL. SHIP COST$	UNIT WT (M TONS)	DIMENSNS EA	SOURCE COUNTRY	STATUS/COMMENTS
12	П CB 500 14-23 District H/E Complete	1		130 000	130 000	5 460	135 460	12		U S	Ship via Ocean
	Shell P=14kgf/cm^2 T=400 C										Est Onsite Date Feb 94
	Tubes P= 23kgf/cm^2 T=Inlet 70 C Outlet 120 C										
13	Crown Gear for Ball Mills Type	4	pc	132 000	528 000	10 010	538 010	5 5	4 5x4 5x 45	U S	Ship via Ocean
	ШБМ-287 410 Year 1984										Est Onsite Date Aug 94
14	Pinion Gear for Ball Mills as above	4	pc	23 000	92 000	1 593	93 593	0 875	65x 65x 45	U S	Ship via Ocean
											Est Onsite Date Aug 94
15	Electrical Motor Type A 304 400Y-6YI	2	pc	43 100	86 200	3 003	89 203	3 3	2 2x1 3x1 25	U S	Ship via Ocean
	400 KWT 6000 Volt 1000 RPM										Est Onsite Date Feb 94
	for Ash Pump (Bager Pump)										
16	Gear for Coal Powder Feeder	3	cmp	345	N/A	0	0	0	N/A	C I S	N/A
	ПЛ-3 5 Year 1986										
17	Bearing Russian No 307/US # 6307	80	pc	7 50	600	124	724	0 00044		U S	Ship via Air
	44 kg ea										Est Onsite Date Sept 93
18	Bearing Russian No 2317/US # N317	20	pc	155 35	3 107	366	3 473	0 0052		U S	Ship via Air
	5 2 kg ea										Est Onsite Date Sept 93
19	Bearing Russian No 366322/US # 7322 B MP 00	16	pc	2 000	32 000	1 014	33 014	0 018		U S	Ship via Air
	18 kg ea										Est Onsite Date Sept 93
20	Bearing Russian No 46330/US # B7330E TPA P4 UL	20	pc	2 374	47 480	1 831	49 311	0 026		U S	Ship via Air
	26 kg ea										Est Onsite Date Sept 93
21	Generator for batteries recharging Batteries type CK 24 (Russia	1	pc	10 000	10 000	455	10 455	1	1 65x0 85x2 2	U S	Ship via Ocean
	Russian Generator Type П 92 Y4 70kwt 230 320v nominal I=30										Est Onsite Date Nov 93
	Used for Emergency Lighting Instrumentation signalization pow										
22	Welding Electrodes for piping and boiler repair	20	tn	3 190	63 800	9 100	72 900	1		U S	Ship via Ocean
	Russian typeУОНИ 13/55 Dia 3mm										Est Onsite Date Sept 93
23	Bearing Russian No 46234/US # B723 4E TPA P4 UL	10	pc	2 064	20 640	775	21 415	0 022		U S	Ship via Air
	22 kg ea										Est Onsite Date Sept 93

ITEM NO	DESCRIPTION	QUANTITY		UNIT COST($)	TOTAL COST $	SHIP COST $	TOTAL INCL. SHIP COST$	UNIT WT (M TONS)	DIMENSNS EA	SOURCE COUNTRY	STATUS/COMMENTS
24	Bearing No 7510/US # 32210A	10	pc	24	240	23	263	0 00064		U S	Ship via Air
	0 64 kg ea										Est Onsite Date Sept 93
25	Bearing Russian No 7306/US # 30306	10	pc	6 90	69	16	85	0 00046		U S	Ship via Air
	0 46 kg ea										Est Onsite Date Sept 93
26	Bearing Russian No 7310/US # 30310A	20	pc	37	740	92	832	0 0013		U S	Ship via Air
	1 3 kg ea										Est Onsite Date Sept 93
27	Circuit Breakers Type→ 16B Y3	2	pc	15 000	30 000	910	30 910	1		U S	Ship via Ocean
	I nom =1600A up to 660 Volt AC										Est Onsite Date Sept 93
28	Chain Bp 40/6300 for scraper feeder type 500 x 4060	24	pc	1 547	37 100	0	37 100	0	N/A	C I S	N/A
29	Scraper chain for feeder as above	12	pc	90	1 080	0	1 080	0	N/A	C I S	N/A
30	Bearing Russian No 7516	10	pc	63	630	76	706	0 00215	2 15 KG	U S	Ship via Air
	2 15 kg ea										Est Onsite Date Sept 93
31	Bearing Russian No 3618	10	pc	151 85	1 518 50	327	1 846	0 0093	9 3 KG	U S	Ship via Air
	9 3 kg ea										Est Onsite Date Sept 93
					2 313 404 50	391 711 42	2 705 115 92	79 31			
	Total Power Plant Darkhan =			**$**	**2,705,115 92**	**and 821 Tons of Shipment from US to Mongolia**					

ITEM NO	DESCRIPTION	QUANTITY	UNIT COST($)	TOTAL COST *	UNIT WT (M TONS)	DIMENSIONS (EA)(M)	SOURCE COUNTRY	STATUS/COMMENTS
	POWER PLANT NO 3							
1	Fireproof Bricks Diatomaceous for Brick Work around the Boiler	400 M^3	150 00	60 000 00			C I S	
	Class A 250 x 123 x 65 Gost 2574 78							
2	Insulating bricks M400 Gost 6788 74 500 x 170 x 60 (Sovelete plate)		119 00	42 840 00			C I S	
		360 M^3						
3	Cement for 1&2 above	80 Ton	150 00	12 000 00			C I S	
4	Crown Gear for Ball Mills Type	3	39 602 00	118 806 00			C I S	
	W 6 M 287 410 Year 1967							
5	Pinion Gear for Ball Mills as above	4	6 291 00	25 164 00			C I S	
6	Crown Gear for Ball Mills Type	3	40 767 00	122 301 00			C I S	
	W 6 M 286/470 Year 1976							
7	Pinion Gear for Ball Mills as above	3	6 291 00	18 873 00			C I S	
8	Boiler Feed Water Pumps Type П 3 150 53	2 Comp	60 000 00	120 000 00			C I S	
	Q 150 M3/h H=580M 500 kwt 2970 RPM							
9	Brass Tubing OD 19 x 1 x 4545 Mark Л 68	25 Ton	4 180 00	104 500 00			C I S	
10	Gear for Coal Powder Feeder Type ПЛ 7 Year 1976	12 pc	345 00	4 140 00			C I S	
11	Electrical Motors Type П 6 61 Y2	5 pc	1 080 00	5 400 00			C I S	
	0 9 KWT 450 1500 RPM DC 220 Volt							
	for Coal Powder Feeders							

***General Note The above prices include transportation cost(FOB Mongolian Border)**

852

ITEM NO	DESCRIPTION	QUANTITY	UNIT COST($)	TOTAL COST *	UNIT WT (M TONS)	DIMENSIONS (EA)(M)	SOURCE COUNTRY	STATUS/COMMENTS
12	Electrical Motors Type 16-62 Y2	12 pc	1 080 00	12 960 00			C I S	
	4 0 KWT 450 1500 RPM DC 220 Volt							
	for Coal Powder Feeders							
13	Electrical Motors Type AC 3 Phase	4 pc	40 340 00	161 400 00			C I S	
	Type A30 4 450Y 8YI 6000 Volt							
	500 KWT 735 RPM							
14	Ash Sluice Pump Type PT-400/40 Q=400 M^3/h	1 Comp	16 200 00	16 200 00				
	H = 40M 132 KWT 960 RPM							
15	High Pressure Heater (H/E Type B 30)	1 Comp	70 000 00	70 000 00			C I S	
	Bundle Only							
16	District Water Pump Type CE 2500 180	1 Comp	70 000 00	70 000 00			C I S	
17	Primary Fan Gear Housing	2 pc	12 492 00	24 900 00			C I S	
	(Fan Type BM 18A-4 Year 1978)							
For Low Pressure Turbine T-12-35/IOM 378/I Year 1967								
18	Diaphragm Compression Ring	30 pc	236 00	7 080 00			C I S	
	Dwg No 126 C 378/I							
19	Diaphragm Compression Ring	8 pc	225 00	1 800 00			C I S	
	Dwg No 126-C 381/I							
20	Compressed End Flat Spring	338 pc	1 00	338 00			C I S	
	Dwg No 185 M 643							
21	Compressed End Flat Spring	24 pc	1 20	28 80			C I S	
	Dwg No 185 M 640							
22	Compressed End Flat Spring	132 pc	1 20	158 40			C I S	
	Dwg No 185 M-644							
23	Compressed Tendril to Rotors	90 pc	1 20	108 00			C I S	
	Dwg No 126 C 245/1							

***General Note The above prices include transportation cost(FOB Mongolian Border)**

360

ITEM NO	DESCRIPTION	QUANTITY	UNIT COST($)	TOTAL COST *	UNIT WT (M TONS)	DIMENSIONS (EA)(M)	SOURCE COUNTRY	STATUS/COMMENTS
24	Compressed Tendril to Rotors	100 pc	1 20	120 00			C I S	
	Dwg No 126 C 245/3							
25	Compressed Tendril to Rotors	300 pc	1 20	360 00			C I S	
	Dwg No 126 C 245/12							
For High Pressure Turbine T-25-90/IOM Year 1976								
26	Compressed End Flat Spring	66 pc	1 00	66 00				
	Dwg No 185 M-643							
27	Compressed Ring/I	30 pc	290 00	8 700 00				
	Dwg No 126 C 328							
28	Compressed End Flat Spring	132 pc	1 20	158 40				
	Dwg No 185 M 644							
29	Compressed End Flat Spring	368 pc	1 00	368 00				
	Dwg No 185 M-637							
30	Compressed End Flat Spring	312 pc	0 70	218 40				
	Dwg No 185 M 639							
31	Compressed Tendril to Rotors	208 pc	1 20	249 60				
	Dwg No 126 C 245/10							
32	Compressed Tendril to Rotors	24 pc	1 00	24 00				
	Dwg No 126-C 245/11							
33	Rotor Assembly for Hammer Crusher	1 Comp	113 693 50	113 693 50			C I S	
	Type M20 20							
	Dwg No 3591 02 00 0							
34	Flexible Coupling for Hammer Crusher	1	3 960 00	3 960 00			C I S	
	Type M20 20							
	Dwg No 3591 09-080							
35	Heatproof Stainless Steel	6 Ton	1 900 00	11 400 00			C I S	
	12 x 18H9T GOST 5332 72 Thickness from 6 to 10 mm							
	For Boiler Repair Diarator Trays							

***General Note The above prices include transportation cost(FOB Mongolian Border)**

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ITEM NO	DESCRIPTION	QUANTITY	UNIT COST($)	TOTAL COST *	UNIT WT (M TONS)	DIMENSIONS (EA)(M)	SOURCE COUNTRY	STATUS/COMMENTS
36	Bearing Russian No 2222	40 pc	19 32	772 80			C I S	
37	Bearing Russian No 2317	40 pc	17 23	689 20			C I S	
38	Bearing Russian No 2319	20 pc	33 13	662 60			C I S	
39	Bearing Russian No 2324	50 pc	65 56	3 278 00			C I S	
40	Bearing Russian No 2326	30 pc	79 09	2 372 00			C I S	
41	Bearing Russian No 3616	20 pc	28 15	563 00			C I S	
42	Bearing Russian No 7630	30 pc	30 01	900 00			C I S	
43	Bearing Russian No 8216	40 pc	5 84	233 60			C I S	
44	Bearing Russian No 46330	40 pc	206 83	8 273 20			C I S	
45	Bearing Russian No 50306	60	1 69	101 40			C I S	
46	Bearing Russian No 60306	40	1 92	76 80			C I S	
47	Bearing Russian No 3530	20	73 63	1 472 60			C I S	
48	Electrical Motor A 3012 55-4MYI 6000 Volt 500 KWT 1500 RPM	2 pc	33 300 00	66 600 00			C I S	

*General Note The above prices include transportation cost(FOB Mongolian Border) Page 4 of 5

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ITEM NO	DESCRIPTION	QUANTITY	UNIT COST($)	TOTAL COST *	UNIT WT (M TONS)	DIMENSIONS (EA)(M)	SOURCE COUNTRY	STATUS/COMMENTS
49	Electrical Motor A A 302 17 69-8/10 YI	1 pc	88 000 00	88 000 00			C I S	
	6000 Volt 1000/500 KWT 742/594 RPM							
50	Electrical Motor 4 A 315M 4Y3	3 pc	3 400 00	10 200 00			C I S	
	380 Volt 200 KWT 1475 RPM							
51	Electrical Motor MTH-612 10Y2	2 pc	6 900 00	13 800 00			C I S	
	380 Volt 60 KWT 565 RPM							
52	Electrical Motor 4AM 225 M8/6/4Y2	6 pc	1 065 00	6 390 00			C I S	
	15/17/25 KWT 380 Volt							
	740/990/1480 RPM							
53	Electrodes УОНИ 13/55 Dia 3MM	15 ton	930 00	13 950 00			C I S	
54	Winch 5 Ton Type УЛ 5M	3 Comp	315 00	945 00			C I S	
55	Portable Electrical Drill	10 pc	23 00	230 00			C I S	
	Type ИЭ 1019 ИЭ 1017A 220 Volt							
56	Portable Electrical Grinder	10 pc	19 00	190 00			C I S	
	ИЭ 2004A 220 Volt							
57	Current Frequency Converter	10 pc	1 000 00	10 000 00			C I S	
	ИЭ 9401							
58	Belt Scales Width 1000 MM	2 Comp	3 000 00	6 000 00			C I S	
	For Coal Weight Measurement							
59	Turbine Oil Centrifuge	1 Comp	11 000 00	11 000 00			C I S	
	Type ПСМ 3000 for Turbine Lubrication Oil Purification							
60	Electrical Motor A12 52 4	1	27 000 00	27 000 00			C I S	
	630 KWT 6000 Volt 1500 RPM							
	Q=1000 M^3/h H= 180M							
								(%15 added to represent approx price difference between old
	Total Power Plant No 3 =			$1 412 015 30	**+ 15% =**	$1 623 817 60		favorable Mongolian contracts and today s estimated prices)

***General Note The above prices include transportation cost(FOB Mongolian Border)**

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ITEM NO	DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST *	UNIT WT (M TONS)	DIMENSIONS (EA)(M)	SOURCE COUNTRY	STATUS/COMMENTS
	DARKHAN POWER PLANT							
1	Boiler Feed Pumps Type ПЭ 150 53	2 comp	60 000 00	120 000 00			CIS	
	Q = 150 M^3/H H= 580 M 500 KWT 2970 RPM							
2	Ash/Water Sluice Bager Pump Type ГРТ 400/40	1 Comp	16 200 00	16 200 00			CIS	
	Q= 800 M^3/H H=40M							
3	Ash/Water Sluice Bager Pump Type ГРТ 800 800 71	1 Comp	62 000 00	62 000 00			CIS	
	Q= 800 M3/H H = 71M							
4	Fireproof bricks Diatomaceous for brick work around boiler	200 M^3	150 00	30 000 00			CIS	
	Class a 250 x 123 x 65 mm							
	Mark 600 Gost 2674 78							
5	Insulation Bricks M 400 Gost 6788 74	200 M^3	119 00	23 800 00			CIS	
	500 x 170 x 60 mm (Sovelete plate)							
6	Cement for Nos 4 & 5 Above	80 Ton	150 00	12 000 00			CIS	
7	Brass Tubing O D 19 x 1 x 4545 mm	30 Ton	4 180 00	125 400 00			CIS	
8	Electrical Motor for Forced Draft Fan	2 pc	2 500 00	5 000 00			CIS	
	Type 4A 3555S 8Y3 132 kwt 380/660 v							
	252/145 amper 735 rpm							
9	ПСВ 500 3 23 District H/E/ bundle	1	50 000 00	50 000 00			CIS	Drawing Tech Specs
	Shell P 3kgf/cm^2 T=400 C							and calculations attached
	Tubes P=23kgf/cm^2 T=Inlet 70 C Outlet 120 C							
10	ПСВ 500 23 District H/E Complete	1	70 000 00	70 000 00			CIS	Drawing Tech Specs
	Shell P 3kgf/cm^2 T=400 C							and calculations attached
	Tubes P=23kgf/cm^2 T=Inlet 70 C Outlet 120 C							
11	ПСВ 500 14 23 District H/E bundle	1	50 000 00	50 000 00			CIS	Drawing Tech Specs
	Shell P=14kgf/cm^2 T=400 C							and calculations attached
	Tubes P= 23kgf/cm^2 T=Inlet 70 C Outlet 120 C							

*General Note The above prices include transportation cost (FOB Mongolian Border)

ITEM NO	DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST *	UNIT WT (M TONS)	DIMENSIONS (EA)(M)	SOURCE COUNTRY	STATUS/COMMENTS
12	ПСВ 500 14-23 District H/E Complete	1	70 000 00	70 000 00			C I S	
	Shell P=14kgf/cm^2 T=400 C							
	Tubes P= 23kgf/cm^2 T=Inlet 70 C Outlet 120 C							
13	Crown Gear for Ball Mills Type	4 pc	39 602 00	158 408 00			C I S	
	ШБМ 287 410 Year 1984							
14	Pinion Gear for Ball Mills as above	4 pc	6 291 00	25 164 00			C I S	
15	Electrical Motor Type A 304-400Y 6YI	2 pc	31 014 00	62 000 00			C I S	
	400 KWT 6000 Volt 1000 RPM							
	for Ash Pump (Bager Pump)							
16	Gear for Coal Powder Feeder	3 Comp	345 00	1 035 00			C I S	
	ПЛ 3 5 Year 1986							
17	Bearing Russian No 307	80 pc	2 34	187 20			C I S	
	Intl 6307							
18	Bearing Russian No 2317	20 pc	17 23	344 60			C I S	
	Intl N317							
19	Bearing Russian No 366322	16 pc	159 14	2 546 20			C I S	
20	Bearing Russian No 46330	20 pc	206 83	4 136 60			C I S	
21	Generator for batteries recharging Batteries type CK 24 (Russian)	1 pc	6 600 00	6 600 00			C I S	
	Russian Generator Type П 92 Y4 70kwt 230 320v nominal I=304 amp nominal							
	Used for Emergency Lighting instrumentation signalization power back up							
22	Welding Electrodes for piping and boiler repair	20 ton	930 00	18 600 00			C I S	
	Russian type УОНИ 13/55 Dia 3mm							
23	Bearing Russian No 46234	10 pc	115 14	1 151 40			C I S	

*General Note The above prices include transportation cost (FOB Mongolian Border)

SOLE&P XLS 4/23/93

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ITEM NO	DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST *	UNIT WT (M TONS)	DIMENSIONS (EA.)(M)	SOURCE COUNTRY	STATUS/COMMENTS
24	Bearing No 7510	10 pc	3 48	34 80			C I S	
25	Bearing Russian No 7306	10 pc	2 37	23 70			C I S	
26	Bearing Russian No 7310	20 pc	4 61	92 20			C I S	
27	Circuit Breakers Type ➔ 16B Y3	2 pc	7 000 00	14 000 00			C I S	
	I nom =1600A up to 660 Volt AC							
28	Chain Bp 40/6300 for scraper feeder type 500 x 4060	24 pc	1 547 00	37 100 00			C I S	
29	Scraper chain for feeder as above	12 pc	90 00	1 080 00			C I S	
30	Bearing Russian No 7516	10 pc	8 11	81 10			C I S	
31	Bearing Russian No 3618	10 pc	36 21	362 10			C I S	
	Total Darkhan Power Plant	=		$967 346 90	**+ 15% =**	$1 112 448 94		
		(15% added to represent approx price difference between old favarable Monolgan contracts and todays estimated prices)						

*General Note The above prices include transportation cost (FOB Mongolian Border)

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APPENDIX D

PULVERIZER OUTLET TEMPERATURE & PRESSURE SPARE PARTS FURNISHED WITH PROCUREMENT

4	RTD's with wells for the pulverizer
2	Pressure transmitters for the pulverizer
2	Pulverizer temperature transmitters
1	Extra handheld communicator
6	Single Loop Controllers (Moore Products)
1	Redundant Power Supply (Acopian)

No Coal Flow Alarm (Stock Equipment) - No spare parts were provided
Damper Drive for L P Boilers (Beck) - No spare parts were provided
Flame Scanner System (Detector Electronics)- System was designed for a 7 H P boiler configuration Sufficient materials were provided for the 7 boilers, with parts for Boiler No 13 designated as spares

APPENDIX E

RECOMMENDED FUTURE PROCUREMENTS

FOR

INSTRUMENTATION AND CONTROL SPARE PARTS

Raytheon Engineers & Constructors, Inc.

A Raytheon Company
100 Summer Street
Boston MA 02110-2103 USA

Phone No 617 422 5200
Fax No 617 338 6239

Memo to. P Cabral

Mongolian Emergency Heat & Power
7419.001

The following will be required for the boiler number 13, which was out of service

Two Stock Nuclear Coal Monitor Model 4800X Cost about $2,500 each plus shipping.

The Detector Electronics equipment and scanners have been furnished, intended to be spare parts if required

Moore Products

1 - Pulverizer Fan Outlet Temperature Electronic Indicasting Station which will accept two 4-20 ma inputs and display both temperatures. Model 372E11NN (About $520)

4- Moore Model 352EAN1NNF Single Loop Controller with a pulse output, (About $1700 each)

2 - Moore Model 352EAN1NDF Single Loop Controller with a pulse output and a RTD input (about $2000 each)

1 - Acopian R24M9-230 Redundant power supplies 220 VAC 50 HZ to 24 VDC rack mount (About $1600)

1 - Industrial Module Rack P/N 16052-42 for seven modules (about $1500)

2 - Pulverizer outlet Pressure - Moore Model 340D1AS12BNNNNN Mycro XTC differential pressure transmitter with a 4 to 20 ma output. (About $1,100 each)

2 - Temperature Transmitter Model 344DNNNNN Mycro XTC Temperature Transmitter Output 4 to 20 ma (two wire) and range of 0 to 100 deg C (About $740 each)

4 - RTD Thermal Element P/N 20028-48 (About $200 each RTD with SS well)

Instrument rack to mount this equipment (about $2700)

The following for Boilers 1 thru 6
6 - Moore Part No.
6 - Moore Part No. Change to ext controller

Raytheon Engineers & Constructors, Inc.

A Raytheon Company
100 Summer Street
Boston MA 02110 2103 USA

Phone No 617 422-5200
Fax No 617 338-6239

The following list of spare parts should be furnished under the next phase of the project

Attached is a list from Harold Beck & Sons for the new damper drive spare parts

Attached is a list from Stock Equipment Company for the nuclear monitors.

Description	*Quantity*	*Cost*
Fan Air Filter From Endustra air filter for the scanner cooling air fans	*1*	*411 00*
GE 755 Miniature Lamp	*10*	*5 10*
GE 757 Miniature Lamp	*10*	*5 30*
Buss GXA-1 Fuse	*25*	*9 50*
Buss GXA-2 250V Fuse	*25*	*9 50*
Buss ABC-1 250V Fuse	*20*	*9 00*
A-B 4746-F2 Fuses for 1746-P2	*10*	*7 80*
Buss XDL 6/10 250V Fuse	*10*	*5 60*
Fireye 35-69	*5*	*7 70*
IN4002 Diode	*100*	*3 38*
Buss FND-R6/10 500V Midset TD Fuse	*3*	*15 57*
3/4" Tap	*1*	*8 29*
Pipe Plugs	*20*	*11 00*
Total		*$508 74*

Pulverizer outlet temperature & pressure spare parts for detail information refer to note on boiler number 13 above
4 RTD's with wells for the pulverizers
2 Pressure transmitters for the pulverizers
2 Pulverizer temperature transmitters
6 Moore single loop controllers
1 Acopian redundant power supply

I have requested a formal spare parts list from Detector Electronics.

Bill Cunningham

BECK® HAROLD BECK & SONS INC
2300 TERRY DRIVE NEWTOWN PENNSYLVANIA 18940 USA
PHONE 215 968-4600 FAX 215 860 6383 TELEX 831 607

DATE 12/04/92	QUOTATION NO P05-7490	PAGE 1	OF 1

UNITED ENGINEERS & CONSTRUCTORS, INC
100 Summer Street
Boston, MA 02110-2103

ATTN Bill Cunningham

YOUR REFERENCE

X061230
7419 001-252-6

ITEM	QTY	DESCRIPTION	NET PRICE EA
1		RECOMMENDED SPARE PARTS FOR THE BECK 11-408-061230-01-(01-06) ACTUATOR	
	1	20-3200-03 RH Switch Assy	$ 58 30
	1	20-3200-04 LH Switch Assy	$ 58 30
	1	15-1500-02 Ball Driver	$ 6 10
	1	20-3400-12 CPS Module	$ 698 50
	1	13-2245-03 ESR 4 Circuit Board	$ 753 50
	1	13-2230-03 Fuse for ESR 4 Circuit Board, 6 AMP (sold only in packs of 5) Pack of 5	$ 19 80
	1	20-3110-03 Gasket Replacement Kit	$ 4 80
	1	12-8060-01 Repair Kit	$ 69 20
	1	20-2201-22 Motor	$2,929 30
	1	20-1971-04 Resistor	$ 114 40
	1	14-2840-15 Capacitor	$ 48 40
	1	14-2840-05 Capacitor	$ 29 20

"Please include the quotation number and date shown at the top of this page when ordering "

Payment Terms Net 30 Days
F O B Newtown, PA

cc David J Vrobel, Sales Engineer

SIGNED E Piper Ed S Piper, Customer Service/tls

Thank you for the oppportunity to provide this quotation Orders placed with Harold Beck & Sons Inc are subject to the terms and conditions of sale shown below and on the reverse side of this sheet.

The prices shown are firm for the periods indicated below provided your order is received by 02/04/93

Prices are firm for the items and quantities quoted provided shipment is permitted on or before 10/08/93

Changes in quantities and specifications received after the order is received will carry the price in effect at the time the change is received

Delivery date estimate below is based on receipt, with order of complete specifications and release for production Orders which require Buyer's print approval and/or release for production may have a longer delivery than shown below

Estimated delivery 1 Week

360

2 1 RECOMMENDED SPARE PARTS

It is recommended that the following replacement parts be purchased and held in reserve to reduce any downtime that might occur due to component failure Having these replacement parts on hand would allow for the equipment to return to operational status with minimal downtime

The list is based on eighteen (18) nuclear monitors

Replacement parts can be purchased by contacting our National Parts Manager at (216) 543-6000 in the U S A When ordering parts, always provide the Stock Equipment Company shop order number located on the title page of the instruction manual provided with the equipment

Description	Part Number	Quantity	Cost
GLS Detector Electronics	B13280-10	3	$2187 00
Connector	B13280-11	2	117 50
GM Tube	B13280-12	2	415 00

APPENDIX G

INVENTORY OF OFFICE EQUIPMENT, TOOLS AND TEST EQUIPMENT

United Engineers & Constructors, Mongolia
Office Equipment List

Item	Quantity	Description	Serial No.
1	2 ea	Hyundai HCM - 423E Super VGA Color Monitor FCC ID CKLHCM-421	SN MBQHA 207108733 SN MBQHA 207108716
2	2 ea	BBC 486 Computer (1 UNIT DID NOT WORK WHEN INSTALLED IN M-K OFFICE) FCC ID JZSBBC-486-D	SN 20710-5216486D SN 20710-5217486D
3	2 ea	NMB Tech ~~BBC-486~~ Computer Keyboard FCC ID AQ6RT-72511 Model No RT1014	SN 02206062 SN 02196062
4	2 ea	Serial PS/2 Compatible Mouse FCC ID C3K5K5COMB	PN 28898 SN 3559629 SN 3559491
5	1 ea	HP LaserJet III Printer	SN 3221A57040
6	1 ea	Rank Xerox Copier 2TR01 Module 5017 RXTTM	PN 499K91354 SN 29925255919
7	3 ea	Bretford ES4 Computer Workstation	
8	1 ea	Scotch Dispenser C-40	
9	1 ea	Heavy Duty Punch	
10	1 ea	Bostitche BATES-550	
11	4 ea	Keys to the BBC 486 Computer	
		Computer Books and Diskettes	
12	2 copies	X-Tree Gold (books & diskettes)	
13	2 copies	d-BASE IV (books & diskettes)	
14	2 copies	WordPerfect 5 1 (books & diskettes)	
15	2 copies	Microsoft EXCEL (books & diskettes)	
16	2 copies	Microsoft Mouse & Windows (books & diskettes)	
17	2 copies	VGAWonder XL24 (book & 2 diskettes)	
18	2 copies	Microsoft MS-DOS 5 0 (books & diskettes)	
19	1 copy	Norton pcAnywhere (book & diskettes)	
20	29 ea	Nashua Formatted MF2-HD 3½" Diskette	
21	49 ea	Nashua Formatted MF2-HD 5¼" Diskette	

File OFCINV
April 10, 1993

Item	Quantity	Description	Serial No.
		Toners and Papers	
22	2 boxes	HP 92275A Toner Cartridge (for the Printer)	PN R64-1001-010
23	3 boxes	HP 92295A Toner Cartridge (for the Printer)	PN R64-0002-010
24	8 boxes	Toner 5017 (for the Xerox) + 1 PARTIAL	PN 6R90169
25	8 rolls	Thermal Recording Paper Xerox Telecopier 7006/7009 (For Fax)	PN 3R96486
26	10 reams	8½ x11 Nekoosa White Paper	
27	9 reams	8½ x14 Nekoosa White Paper	
28	4 reams	11'x17' Nekoosa White Paper	
		Communication Equipment	
29	1 ea	Magnavox Satelite Dish 8607-800	PN 600021 SN 912
30	1 ea	Magnavox Tripod AWB/BL 6593224131	PN 140138
31	1 ea	Carrying Case for Magnavox Tripod	
32	1 ea	Magnavox Transceiver MX 2020P XCVR (NOT WORKING)	SN 1417
33	1 ea	Magnavox Compass	
34	1 ea	Container for Magnavox Sattelite System	
35	1 ea	Hayes V-Series Smartmodem 9600 Model No 1004AM	SN V00410043104
36	1 ea	Rank Xerox Fax Machine Model No 7009	PN 100K8540 SN 3101033251
37	1 ea	Panasonic Easa Phone Model No KX-T2315	SN 2ACHA 050500
38	1 ea	NAN BAO Answering Machine/Adaptor ACD-3-012	SN NBD-101
		Power Equipment	
39	1 ea	Briggs & Stratton Generator Model LLC5000/52	PN 15537-002 SN 41100 92
40	1 ea	Belkin Components Auto Switch Plus Power Supplier	SN 37852
41	1 ea	SANTAK UPS-500 Line Conditioner (NOT WORKING)	SN 0007919
42	1 ea	ZDF4 1000V Transformer (Green)	
43	1 ea	Hayes Class 2 Transformer Model No W414-9800-BT/HY (For Modem)	PN 52-00042
44	1 ea	Sino-America Class Transformer Model No 41C-3 (Auto)	

Item	Quantity	Description	Serial No.
45	6 ea	III Woods 100ft Outdoor Cord No 627	
46	~~6~~ ea	Gemini 1600 Watt Foreign Electricity Converter EP603	
47	3 ea	Archer 50 Watt Foreign Travel Voltage Converter	
48	2 ea	Franzus Dual Converter/Adaptor Set Model FR-1650E	
49	1 ea	Remington International Voltage Converter/Adaptor Kit	
50	1 ea	Leviton 15A & 20A Adaptor (White)	
51	3 ea	Leviton 15A & 12A Adaptor (Grey)	
52	3 ea	Archer Adaptor (Grey)	
53	3 ea	QVS Commercial Power Protector ~~PP14~~ PT-FD2	
54	2 ea	Russian Adaptor Kzil-19	
		User s Manual	
55	1 packet	HCM-423E Super VGA Monitor User's Quide	
56	1 packet	LaserJet III Printer User s Manual	
57	1 packet	Bretford ES4 Computer Workstation Installation Quide	
58	1 packet	Rank Xerox Fax & Copy Machine User's Manual	
59	1 packet	Magnavox Sattelite System User's Manual	
60	1 packet	Hayes V-Series Smartmodem 9600 User's Manual	
61	1 packet	Briggs & Stratton Generator User s Manual	
62	1 packet	MIo-400KF Input-Output Board User s Manual	
63	1 packet	Baby Gemini-486 System Manual	
64	1 ea	Brinkmann Flashlight Model 150	

RECEIVED

From United Engineers & Constructors
Samuel Bailey Sam Bailey
Uyanga Uyanga
Date 5 27 93

To Morrison Knudsen Corporation
Dennis Price Dennis C. Price
John O'Neill John J. O'Neill
Date 27 May 93

File OFCINV
April 10, 1993

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List of Tools
(Delivered to PP No 3, 3/18/93)

No	Name	Quantity
1	Drive Torque Wrench (Micro-Adjusting Torque Wrench)	1
2	6-Piece Philips Screwdriver Set 6x2 1/2, 1x3, 2x1.1/2, 3x6, 4x8, 2x4	6
3	6-Piece Round Shank Screwdriver Set 1/4x1 1/2, 1/4x4, 5/16x6, 3/8x8, 3 8x10, 7/2x12 81001 81002 81003 81004 81005 81006	6
4	5-Piece Tradesman Screwdriver Set 50530 T30, 50525 T25, 50520 T20, 50515 T15, 50510 T10	5
5	Deluxe Feeler Gauge Set	1
6	27-Piece Set No 94527 3/8 Drive Fractional Socket Set	27
7	Wrenches No 508 Open End Wrenches 1/4x5/16, 3/8x7/16, 7/16x1/2, 1/2x9/16 9/16x5/8, 11/16x3/4, 13/16x7/8, 15/16x1	8
8	Box End Wrenches No 311R 3/8x7/16, 1/2x9/16, 3/8x7/16, 5/8x11/16, 7/16x1/2, 1/2x9/16, 9/16x5/8, 5/8x3/4, 11/16x3/4, 13/16x7/8, 15/16x1	11
9	Tube Deburring Tool MS-TDT-24	5
10	Tube Cutter MS-TS-308	4
11	Ratchet Wrench	2
~~12~~	~~Deluxe Feeler Gange~~	~~1~~
13	Mycro XTC Communicator Moore 133473	1

Tools received by: Mrs. Gantsetseg
Mr. Borkhuu
Mr. Batrenchin

File Tools
Printed. April 27, 1993

List of Test Equipment for the Power Plant No.3

Item	Quantity	Description	Serial No.
		Communication Equipment	
1	3 ea	Motorola Radios Model No. H44QPU7120BN	
		Model No H44QPU7160BN	
		Model No H44QPU7160BN	
2	3 ea	Motorola Battery Charger Model No. NTN4864B	
3	3 ea	Motorola Radio Holder	
4	6 ea	Motorola Batteries NTN5451 B	
		Test Equipment	
5	1 ea	Fluke Thermocouple Module 80 TK	
6	2 ea	Fluke 87 TRUE RMS Multimeter with protective case	PN 4-940-204
7	2 ea	Fluke Industrial Test Lead Set TL20	
8	1 ea	Fluke 801-600 AC Current Probe	PN 844365
9	2 ea	Moore Mycro XTC Communicator	SN 133467
10	1 ea.	Moore Mycro 352 Single Lop Digital Controller	SN 15738-119
11	1 ea	Biddle Megger Model 212159	
12	1 ea.	Transmation PPS Digital Calibrator Model No 1040	PN 3-817-105 SN 6525508SP
13	1 ea.	Transmation line Transformer (For Calibrator)	
14	2 ea.	MAG-Lite (Flash light)	SN 33833387
			SN 33897786
15	6 ea	Panasonic Rechargeable Ni-Cd Battery (For Flash lights)	
15	1 ea	Ni-Cd Battery Charger Model No MV398	
17	3 ea	Hammand Plastic Instruments (Black box)	

File TSTEQP
Printed: April 29, 1993

Item	Quantity	Description	Serial No.
		Test Equipment User's Manual	
18	5 copies	Moore Installation & Service Instruction for Mycro XTC Model 344 Temperature Transmitter-Controller SD344-1	
19	5 copies	Moore Installation & Service Instruction for Mycro XTC Model 340 Differential Pressure Transmitter-Controller SD340-2	
20	5 copies	Moore Installation & Service Instruction for Mycro 352 Single Loop Digital Controller SD352-6	
21	6 copies	Moore Installation & Service Instruction for Model 372 Indicator Station SD372-3	
22	3 copies	Moore Mycro 352 Single Loop Digital Controller User's Manual AD352-10	
23	1 copy	Moore Mycro 352 Single Lop Digital Controller Installation, Configuration & Service SD352-1	
24	1 copy	Moore Mycro XTC Communicator User's Manual	
25	1 copy	Transmation Instruction Manual for Model 1040/1040SD Digital Calibrator 100724-905	
26	1 copy	Biddle Instruction Manual for Major Megger Insulation Testers 21-25Ja	
27	1 copy	Det Tronics Flame Safeguard System Operation & Maintenance Instruction Manual	
28	1 copy	Fluke Instruction Sheet for Thermocouple Module 80 TK	
29	1 copy	Fluke Instruction Sheet for 80i-600 AC Current Probe	
30	1 copy	Fluke Instruction Sheet for 12 Multimeter	
31	3 copies	Allen Bradley Installation & Operational Manual for SLC 500 Modular Hardware Style Programmable Controller	
32	1 ea	Allen Bradley Hand Held Terminal User's Manual	
33	3 copies	Motorola Radios Operating Instruction	
34	1 copy	Stock Equipment Manual	
35	1 copy	Instruction Manual for Model 11-150	
36	1 copy	Instruction Manual for Model 11-200	
37	1 copy	Instruction Manual for Model 11-300	
38	1 copy	Instruction Manual for Model 11-400	
39	10 copies	Det Tronict Russian Translation	
40	1 copy	Swagalok Tube Fitting and Installation Manual	
41	1 copy	Safety Tractices for Users/Installers of Industrial and Commercial Fans	

Item	Quantity	Description	Serial No.
		Miscellaneous Equipment	
42	4 rolls	Scotch 88 Electricla Tape	
43	1 roll	Rosin Core Solder	
44	6 ea	Alligator Clip Boots	
45	6 ea	Alligator Clips	
46	1 ea	Duct Putty	
47	1 ea.	Monometer and Fittings	
48	6 ea	Patch Cord	
49	2 sets	Test Probe	
49	1000 ea	200 OHN 1/4W 5% resistor	
50	1 ea	Curtis Surge Protector SP#3	

RECEIVED.

From UE&C Philip McCandless
Robert Beck

By PP No 3 Ganbaatar

APPENDIX H

POWER PLANT VALUE ENGINEERING DOCUMENTATION INCLUDING OUTLINES AND ESTIMATES SEE PHASE III ACTIVITY SUMMARY REPORT APPENDIX FOR EQUIPMENT PRIORITY LISTS PRESENTED AT VALUE ENGINEERING SESSION.

MONGOLIA
ULAANBAATAR NO 3 AND DARKHAN
POWER PLANTS
INTERIM O&M TRAINING

General

The O&M training program outlined herein focuses on the needs of the two power plants (Darkhan and Ulaanbaatar No 3) during the 2 1/2 year interim period of ESP Component III The O&M training program for this interim period will focus on maintenance Operator training will mainly be done during the rehabilitation phase

It is imperative that all personnel to receive training be taught to read and write English prior to formal training In fact, this should be taking place now There will be a technical English course given by the Component III Contractor in Mongolia before formal training begins

The goals of the interim O&M training are as follows

1 Develop administrative procedures
2 Develop technical procedures
3 Develop plan for improving maintenance
4 Train maintenance personnel

Existing Training Program

There is a formal operator training program and at least a one time safety training session Plant management expressed concern that they do not have enough qualified teachers to effectively provide technical training

The existing operator training program follows a structured sequence of progressive learning levels Each student receives classroom training for each phase of the qualification process The student must take and pass a written exam to move on the next phase of training After this, he must complete a number of practical exercises and, depending on the operating station he is qualifying for, pass an oral board conducted by plant management as well as representatives of the Fuel & Energy Ministry Once qualified, the operator must submit to a re-qualification test annually If a student fails any of the written tests or the practical tests he must repeat the portion of the training he has failed The longest training/qualification period is for the shift engineer which takes six months to complete According to plant personnel, there are written procedures that govern the training program including level of knowledge requirements, practical training, and allotted time requirements They get teachers from the plant engineering department These teachers make-up all the exams and the Chief Engineer approves the exams Periodically, he will administer these exams to the teachers as a method of evaluating their knowledge level If an operator qualifies at one plant, and then goes to another plant, he must repeat the training program for that plant Drills are run once every three months on the staff Student are allowed to observe Based on RE&C field visits there is a skill level structure in place for maintenance personnel but there appears to be no formal maintenance training program other than learning by watching others

There are some administrative procedures in place but it is not known if they are followed by all departments There seems to be a lack of written technical procedures covering such things as maintenance, calibration and test equipment operation

NOTE All existing administrative and technical procedures should be compiled by the Plant Manager and Fuel & Energy Ministry personnel They should then be translated to English for review by the Component III Contractor and use during the training outlined herein

Training Program Outline

Following is a six step program for training after the prerequisite technical English course All training will take place in Mongolia

Step 1 An integral part of the training program is a course in basic management techniques for selected power plant and Fuel & Energy Ministry personnel This part of the training will consist of a one month course in basic management techniques It will focus on methods of motivating personnel utilizing incentive techniques and programs

Step 2 This step of training will be to develop uniform administrative procedures for preventive maintenance, general house keeping, emergency maintenance, overhaul maintenance and record keeping including development of inspection and preventive maintenance schedules and standard reporting forms

NOTE Equipment needs to support an effective housekeeping program are addressed elsewhere

Step 3 This step will be to develop technical procedures for calibration/testing, preventive and routine maintenance for all plant equipment and systems, welding/brazing/soldering and specific house keeping practices

NOTE Test/calibration equipment testing needs are addressed elsewhere

Step 4 Develop a specific plan to improve the current maintenance program based on applying the management skills learned in Step 1 and utilizing the procedures developed in Steps 2&3

Step 5 Applying the skills, procedures and improvement plan at the power plants

Step 6 In-plant technical training of plant maintenance personnel This would be conducted by Mongolians, but the component III Contractor's personnel would be available for technical back-up and assistance It is assumed that at least one plant maintenance person has the technical skills to perform maintenance on each piece of existing equipment These persons should do the technical training Baseline technical skills of maintenance personnel at the various levels will be evaluated relative to managements expectations This information would be utilized and augmented in developing technical training programs for any future plant rehabilitations/upgrades

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Steps 2 through 4 will be set up as hands-on type training Existing procedures will be reviewed for effectiveness New procedures will be developed perhaps based on the existing procedures Following the training program the Component III Contractor will evaluate existing administrative procedures in advance of the training and will develop outlines for new and/or supplemental procedures The Component III Contractor will also evaluate existing technical procedures and prepare new procedures as appropriate Following the training sessions, Component III Contractor will produce two bound manuals, one containing all administrative procedures and one containing all technical procedures These manuals will be translated to Russian/Mongolian and reproduced for distribution to the power plants

Who Should Attend?

It would be appropriate for certain Fuel & Energy Ministry personnel to attend the management training sessions (Step 1) and the development of administrative procedures sessions (Step 2) as a minimum

All sessions (Steps 1 through 4) should be attended by the following plant personnel

- Plant Managers
- Chief Engineers
- O&M Department Heads (Engineers/Managers)
- Selected Shift Engineers

Schedule

During the period of May 1993 to May 1994, the RE&C personnel in Mongolia will conduct informal on-the-job training session These sessions may cover areas such as motor maintenance and instrument calibration for example The RE&C will also be observing operations and maintenance and offer suggestions for improvements in these areas and at the same time, they will be evaluation the skill levels of plant personnel as input to the O&M training programs outlined herein The RE&C will also show maintenance and repair video tapes where available from US equipment manufacturers

The technical English course ideally should last approximately 3 months This course should be completed by May 15, 1994, so it will be given on a part time basis during the last 3 months of the 1993-1994 heating season The formal training program should begin on May 16, 1994 The formal training, Step 1 through 4 will last 4 months Training would be completed before the beginning of the 1994 - 1995 heating season

The schedule allows approximately 9 months for Mongolians to learn English, gather existing administrative and technical procedures, have them translated to English and transmitted to the U S These procedures will be reviewed and incorporated into the lesson plans for the formal training Preparation of training material normally would take 3 months Following the 3 month training period one Component III Contractor training person should remain in Mongolia for 3 months of assistance

Estimate

A detailed estimate is provided in Attachment A

ATTACHMENT A

ESTIMATE

Task	Person	Rate	Duration	Bare Labor	Expenses	Task Total
1	TT	$28	3 mo	$14 448	$11 000	$25,448
2	TM	$30	3 mo	$15 480	$11,000	
	TT	$28	3 mo	$14,448	$11,000	
	TT	$28	3 mo	$14,448	$11,000	
				$44 376	$33 000	$77 376
3	TT	$28	3 mo	$14 448	$11 000	
	TT	$28	3 mo	$14,448	$11,000	
				$28,896	$22 000	$50,896
4	TT	$28	3 mo	$14,448	$11,000	$25,448
5	TT	$28	2 mo	$9,632	$7 500	$17,132
6	TT	$28	2 mo	$9,632	$7,500	$17 132
	Labor and Expense Subtotals			$121,432	$92 000	
7	Subcontract				$35 000	$35 000
8	Materials	-	-	-	$10,000	$10,000

Total [(Bare Labor x 1 67) + (Expenses + Subcontract + Materials) x 1 07] x 1 10
[(121,432 x 1 67) + (92 000 + 35 000 + 10 000) x 1 07] x 1 10 = $384,320

ESTIMATE KEY

TM = training mgr
TT = training tech

Task	Duration (Months)	Description
1	3	Teach technical English
2	3	Prepare training materials (U S)
3	3	Balance of training - Steps 2 through 4
4	3	Technical assistance - Step 5 & 6
5	2	Translation of existing procedures from Russian/Mongolian to English
6	2	Translation of final procedures to Russian/Mongolian and preparation of manuals
7	1	Management training - Step 1 (Subcontract)
8	-	Miscellaneous supplies - computer w/printer overhead projector office supplies

MONGOLIA
ULAANBAATAR NO. 3 AND DARKHAN
POWER PLANTS
INTERIM SPARE PARTS ORDERING IMPROVEMENTS

GENERAL

The recommended improvement to the spare parts ordering system involves implementation of the Total Resource Allocation and Control (TRAC) System The TRAC system integrates spare part and equipment management data with responsive, preventive and outage maintenance and planning The system that is currently in place has many of the necessary elements for effective control, but they are not being utilized and are not effective The TRAC system will provide the element of automation and validation missing from the current system

THE TRAC SYSTEM

The TRAC system is a computer based database and maintenance management system Figure 1 displays the key elements of the system The work order database provides the key by which all other components are arranged and provides the reference by which information is transferred from one program to another The integrated modular design of the TRAC system will provide extensive real-time reporting, budgeting and forecasting, flexible scheduling of preventive maintenance, complete equipment history tracking and related maintenance for all departments It is in use worldwide in over fifty organizations and it can be customized to meet the specific needs of Ulaanbaatar No 3 and Darkhan Power Plants

CUSTOMIZING AND SET-UP OF TRAC

Five basic steps are involved in customizing and setting up a TRAC system for the power plants They are as follows

Step 1 — Systems Audit - This activity includes the examination of the existing maintenance system and maintenance practices at the facility Translation of all pertinent documents in-country and preparation of the audit summary in the United States This task will require one TRAC group person to travel to Mongolia

Step 2 — System Specification - This activity will construct programming specifications to modify the system in accordance with the audit summary The Mongolian system administrators & experts should be present during this phase This task as with the following related tasks are based on six Mongolian personnel being trained, one database administrator and two system experts per plant This task will be performed in the United States

Step 3 — System Modification - This activity provides the actual programming code changes in accordance with the revised specifications The Mongolian system administrators & experts should be present during this phase This task will be performed in the United States

Step 4 — System Testing - This activity provides all quality control interlocks to ensure the system modifications are performing to specification The Mongolian system administrators & experts should be present during this phase This task will be performed in the United States

Step 5 — Hardware Acquisition & Set-up - This activity includes the set-up, testing, configuration, software loading, and shipping the hardware The Mongolian system experts should be present during this phase

TRAINING IN THE UNITED STATES

Three areas of training will be necessary They are database management system (DBMS), TRAC system and hardware training These activities are described below

DBMS Training - This activity provides Informix training to the Mongolia database administrators & experts Informix is the database software vendor This training will be conducted in the United States

TRAC System Training - This activity will be conducted in three phases An introduction to the TRAC system will be given in the United States followed by a practical training period in a power generating facility that is using the TRAC system, then advanced TRAC user training given in the United Sates The training at the operational facility will require one TRAC person to travel with the U S trained Mongolian experts

Hardware Training - This activity will provide training on system hardware This includes minor component and configuration troubleshooting This task requires one Mongolian expert per plant and will be performed in the United States

The training, the system itself and the documentation will be in English Optional conversion to Russian of computer graphics, reports and documentation is available

TRAINING IN MONGOLIA

This activity provides TRAC system training to the facility personnel dedicated to system operation The training program will be established by the TRAC system specialist with input from the Mongolia system experts The bulk of the training will be conducted by the Mongolian system experts

DATA COLLECTION

This activity will develop and implement the procedures for data collection The collection program will be established by the TRAC system specialist with input from the Mongolia system expert Data collection efforts will be Mongolian

IMPLEMENTATION AND ACTIVATION

This activity evaluates all system procedures and processes as well as marks the activation of the system The TRAC system specialist along with the Mongolian system expert shall overlook system operations to ensure proper implementation

SCHEDULE

The entire process of customizing, set-up, training, data collection and implementation support will take about 14 months

Customizing and set-up of TRAC will take just over 4 months Training will take just under 8 months for a total of 12 months before the system would be ready for delivery Follow on services in Mongolian will last 2 months

This process should begin after the six Mongolians involved have received English language training This must include the three month technical English course described in the Interim O&M Training Report

Four Mongolians would be in training for about 8 months in the United States and two in Mongolia for 7 months

One TRAC person would be in Mongolia on two occasions for about 3 5 months total

The optional screen and report conversion to Russian will take 6 months Documentation conversion to Russian will take 3 5 months

ESTIMATE

A detailed estimate is provided as Attachment "A"

SIMPLIFIED TRAC FLOW CHART

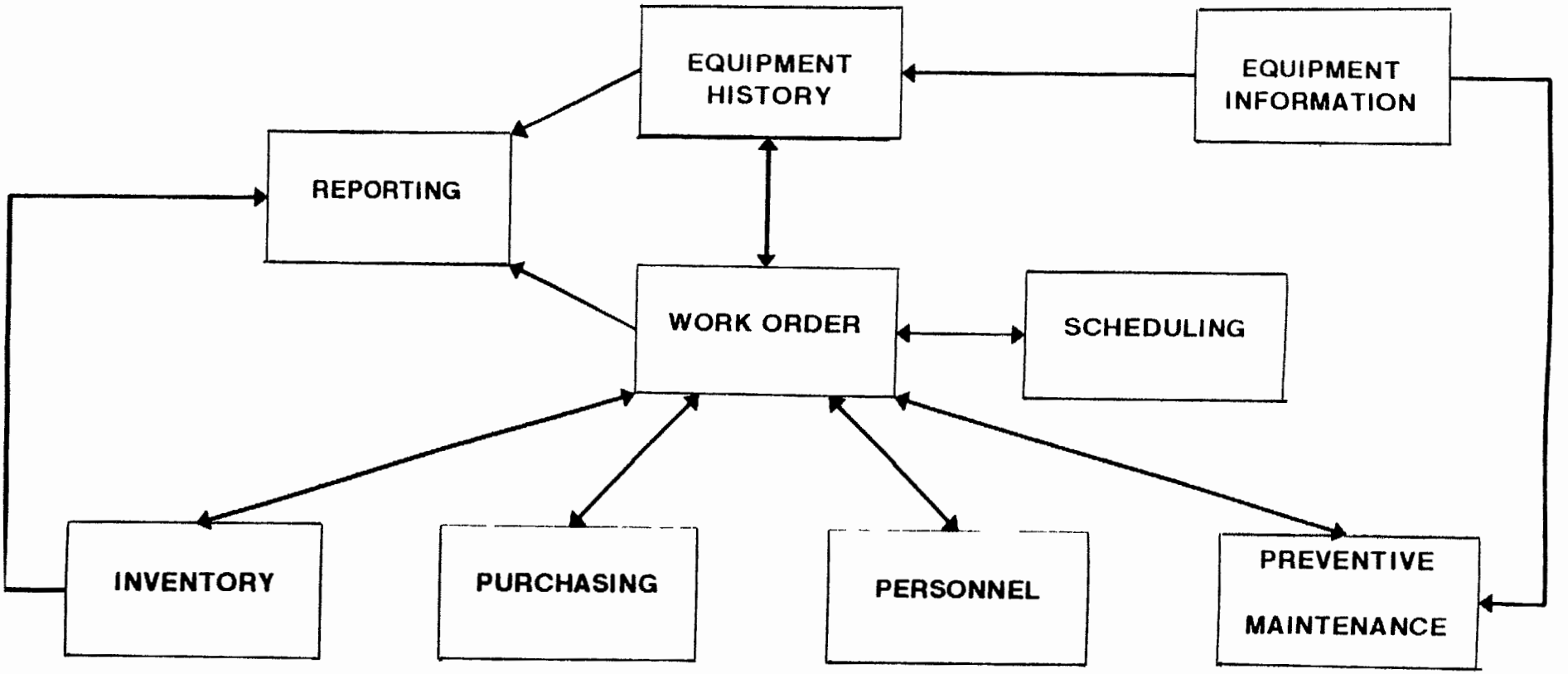

FIGURE 1

Attachment "A"

Project Tasks		Ulaanbaator Manhours	Ulaanbaator Cost	Darkhan Manhours	Darkhan Cost
System Audit					
	One TRAC Person	240 0	$14,400 00	N/A	N/A
	Expenses		$6,000 00	N/A	N/A
System Specification					
	One TRAC person	80 0	$4,400 00	N/A	N/A
	Three Mongolian Personnel	0 0		N/A	N/A
System Modification					
	One TRAC person	240 0	$12,000 00	N/A	N/A
	Three Mongolian Personnel	0 0		N/A	N/A
System Testing					
	One TRAC person	160 0	$8,000 00	N/A	N/A
	Three Mongolian Personnel	0 0		N/A	N/A
DBMS Training (US)					
	Three Mongolian Personnel	500 0		500 0	
	Class Cost		$15,000 00		$15,000 00
TRAC Training (US)					
	One TRAC Person	600 0	$30,000 00	400 0	$20,000 00
	Expenses		$1,800 00		
	Three Mongolian Personnel	1800 0		1800 0	
Hardware Training (US)					
	One TRAC person	160 0	$8,000 00	160 0	$8,000 00
	Two Mongolian Personnel	320 0		320 0	
Hardware Acquisition & Set-up					
	One TRAC person	60 0	$2,700 00	60 0	$2,700 00
	Two Mongolian Personnel	80 0		80 0	
	IN COUNTRY TRIP				
System Training (Mongolia)					
	One TRAC person	120 0	$7,200 00	120 0	$7,200 00
Data Collection					
	One TRAC person	120 0	$7,200 00	120 0	$7,200 00
Implementation Support					
	One TRAC person	120 0	$7,200 00	80 0	$4,800 00
	Expenses		$6,000 00		$6,000 00
SUBTOTALS					
	TRAC Personnel	1900 0	$101,100 00	940 0	$49,900 00
	Expenses & Classes	N/A	$28,800 00	N/A	$21,000 00
	Mongolian Personnel	2700 0		2700 0	
	Mongolian Expenses		$60,000 00		$40,000 00
TOTALS		4600 0	$189,900 00	3640 0	$70,900 00
COMBINED TOTALS			$300,800 00		

Product Expenses				
Hardware (IBM)	N/A	$60,000 00	N/A	$60,000 00
DBMS (Informix)	N/A	$30,000 00	N/A	$30,000 00
TRAC Vision	N/A	$84,000 00	N/A	$64,000 00
SUBTOTALS	N/A	$174,000 00	N/A	$154,000 00
COMBINED TOTAL PRODUCTS		$328,000 00		

Options				
Screen & Report Conversion to Russian				
Translation	800 0	$40,000 00	N/A	N/A
Programming	1000 0	$50,000 00	N/A	N/A
TRAC Specialist	700 0	$35,000 00	N/A	N/A
Documentation Conversion to Russian				
One TRAC person	600 0	$27,000 00	N/A	N/A
Translation	600 0	$27,000 00	N/A	N/A
TOTALS	3700 0	$179,000 00	N/A	N/A

COMBINED TOTAL SUMMARY	
LABOR & EXPENSES	$300,800 00
HARDWARE & SOFTWARE	$328,000 00
GRAND TOTAL	$628,800 00
OPTIONS	$179,000 00
GRAND TOTAL with OPTIONS	$807,800 00

Notes

TRAC Vision modules will be installed essentially as is, with no major modifications

TRAC Vision work order, equipment, PM, inventory, budget, employee and labor tracking modules will be installed (licensed) Licensed for 16 users per cpu

Hardware will consist of (3) IBM RISC /6000 multiuser computers set up with a total of 12 terminals each and four printers One CPU to used as spare

FINAL REPORT

FOR

ENERGY SECTOR PROJECT

EMERGENCY HEAT AND POWER PROJECT NO. 1

PROJECT NO 438-0003

VOLUME II

JULY 1993

Prepared by Raytheon Engineers & Constructors

Under Contract No 438-0003-C-00-2350-00 with US AID/Mongolia

EMERGENCY HEAT AND POWER PROJECT NO. 1
FINAL REPORT

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REPORT VOLUME II

APPENDIX I SUBCONTRACTOR TECHNICAL SERVICES REPORTS

Prepared for:

UNITED ENGINEERS & CONSTRUCTORS

In Accordance With:

"MK CONTINUING SERVICES"
For
Technical Assistance of Mongolian Emergency Heat and Power Project No. 1

Contract No 7419 002 49-2

TECHNICAL REPORTS

- ***Coal Mine Procurement for 1993/1994 Heating Season***
- ***Operations and Maintenance (O & M) Training***
- ***Maintenance Order Entry and Tracking System***
- ***Shivee Ovoo Management Overview***
- ***Blasting Training Sessions and Evaluation***

March 1993

MORRISON KNUDSEN® CORPORATION

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REVISED

FINAL REPORT FOR PHASE 1

Mongolian Emergency Heat & Power Project No. 1

MORRISON KNUDSEN CORPORATION

March 11, 1993

In accordance with the stipulations and conditions contained in the Morrison Knudsen Corporation (MK) subcontract agreement with United Engineers & Constructors (UE&C), this is **the revision** *to the FINAL REPORT of MK's efforts in Mongolia during the months of November and December 1992*

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SECTION 1
GENERAL AND SUMMARY

Morrison Knudsen Corporation (MK) was subcontracted by United Engineers and Constructors (UE&C) to work with the Mongolian coal industry to define and coordinate that portion of US-AID Emergency Funding directed to assist coal mining operations in Mongolia The assignment was to determine the type and quantity of critical spare parts and supplies necessary for the continuation of coal mining in Mongolia A priority list of mines aid was also established MK assigned Messrs Bruce P DeMarcus and Arthur F Helbig to this project Both are senior managers and mining engineers with extensive experience in coal mining and overseas mining projects Mr Helbig is recognized as a drilling and blasting authority within the MK organization

Mr DeMarcus spent more than six months this past year in Mongolia, prior to this assignment, visiting coal mines and working on a mining joint venture with the Mongolian government During this time, Mr DeMarcus established personal contact with senior staff members of the Mongolian Ministry of Fuel & Energy These relationships were particularly useful in accomplishing the objectives of the Emergency Funding

MK representatives Messrs DeMarcus and Helbig arrived in Ulaanbaatar (capital city of Mongolia) on November 9, 1992 After observing the arrival of the first air shipment of critical spare parts and supplies from the U S A , they departed on December 23, 1992 Additional shipments followed by rail thereafter, a signal that relief supplies had finally started to flow

Unlike the manufacturing industry where raw materials form the primary component of a manufactured product, the mining industry relies on a continuous stream of operating supplies and spare parts to extract minerals These operating supplies and spare parts are viewed as consumables with various, finite operating lives These consumables, used in large quantities, make up the major portion of the cost to produce coal Control of spare parts and other consumables is the essence of economic success of coal mining Extending the life of spare parts and minimizing the cost of other consumables are the primary ways in which a mine lowers the cost of production For example

1) Adequate road maintenance has the express purpose of extending the operating life of a haul truck and all of its individual parts Tires were included as part of the emergency air shipment of spare parts supplied from the U S A The haul roads in the Mongolian coal mines are constructed inadequately and poorly maintained which result in reduced tire life along with many other costly repairs to the haul trucks

2) Use of high cost nitro-based blasting agents versus low cost ammonium nitrate blasting prill contributes additional cost to an operation The nitro-based blasting agents used by the Mongolian mines are more powerful than ammonium nitrate blasting prill mixed with fuel oil (ANFO) prior to the blast but are three to four times more expensive

3) Use of hard-facing processes on ground engaging tools to extend operating life is an accepted maintenance procedure at mining operations Life of the digging teeth on Mongolian dragline and shovel buckets could be extended by hard-facing the teeth, thus cutting down on the number of replacement teeth Without hard-facing, the Mongolian mines consume approximately 100 teeth per week This number could be reduced to approximately 50 per week if hard-facing electrodes were available

The first aspect of the assignment was to identify and verify those spare parts and operating supplies essential to the continuation of production at the coal mines Next was the gathering of detailed descriptions of how parts were to be used and detailed specifications to determine possible alternatives Some spare parts were being purchased inappropriately for multiple applications For example, some wire ropes required for draglines were also intended for use on cable shovels However, draglines and shovels have different specifications and sheave sizes so cables that were meant for one could not be applied to the other Once the critical parts and supplies were identified, they had to be quantified and their acquisitions expedited

Quantifying was a difficult assignment if one did not understand Mongolian purchasing logic Mongolians are accustomed to purchasing items in large unit quantities that will meet the industries' needs for up to one year "Just-in-time"

inventory control is foreign to the Mongolian logic and may not work in the long term in Mongolia However, this type of inventory control was necessary for the Emergency Winter Period

The Mongolian coal industry has a centralized purchasing organization, Nuurs Company P L C ("Nuurs"), perform all of the purchasing of materials for the industry "Nuurs" was set up as a private company but is in fact a government subsidiary in charge of purchasing and subsidizing the coal industry Assessment of the competency of "Nuurs" was vital to MK's efforts "Nuurs" proved to be well organized and extremely valuable in identifying spare parts, obtaining detailed parts descriptions, providing previous suppliers' addresses, and furnishing the cost of parts previously purchased After clearing customs, the spare parts purchased by UE&C were to be surrendered to "Nuurs" "Nuurs" would then supervise the allotment of the parts and supplies within the coal industry MK worked very closely with "Nuurs" throughout its Phase I efforts

Messrs DeMarcus and Helbig toured and inspected the Sharyn Gol and Baga Nuur coal mines during their first week in Mongolia to personally identify and verify the need for the most critical spare parts and supplies These two mines account for nearly 85% percent of central Mongolia's current coal production Because of the major coal contributions of these two mines, they were deeded as top priority for receipt of US-AID emergency funding MK included senior staff either from the Ministry of Fuel & Energy or from "Nuurs" on the tours to the mines to guarantee support and participation from the Mongolian government Other coal mines were visited in the following weeks These included Shivee Ovoo, Nalaikh and Ulan Ovoo (Erdenet)

Prior to MK's involvement, all assessments of the coal industry's needs were performed in the capital city of Ulaanbaatar at the Ministry of Fuel & Energy In Mongolia there exists friction between the interests of the power plant industry and the coal mining industry Historically, these two industries have competed against one another for government funding The coal mining sector of the Ministry of Fuel & Energy exhibited frustration in their encounters with American engineers who were unfamiliar with the dynamic needs of the coal mines and essential spare parts and operating supplies As a result, confusion and inadequate communications existed between the many parties involved

The central factors for this situation were (1) the late start of the procurement effort (contract signed September 30, 1992, work started October 1, 1992), (2) the initial involvement of the Parsons-Main Firm which had coal mining expertise but did not understand the relationship between the Ministry's coal mine operations/technical personnel and coal mine equipment procurement personnel ("Nuurs"), and (3) the withdrawal of Parsons-Main from the project, resulting in the transfer of coal mine procurements to UE&C without adequate technical support from Parsons-Main, given that UE&C lacked the necessary coal mine sector technical expertise

With the passage of time, the condition at the mines became desperate as critical parts and supplies were not forthcoming to repair inoperative equipment Due to this shortage some equipment sat idle There were no drag or hoist ropes for draglines and no batteries for haul trucks or locomotives Underground miners were laid off as ventilation tubing, shaft hoist (lift) ropes, and water pumps were not available

MK's investigations centered around confirming the needs of all previously identified materials and parts and, as necessary, the identification of additional requirements A number of priority lists were prepared prior to MK's arrival which were reviewed for accuracy and completeness Some items on the priority lists were modified, such as the gas detection system for an underground coal mine Other items on the lists were eliminated after further investigation Messrs DeMarcus and Helbig personally inspected some of the equipment for which the spare parts were requested In-depth discussions were held with the individual mine managers and their respective senior staff Detailed, specific questions were asked about mining plans as well as inquiries made concerning immediate equipment difficulties Questions were asked from various perspectives concerning spare parts and operating supplies previously identified as priority items The in-depth discussions were followed by tours of the mine operations and maintenance facilities at which time additional questions surfaced All of this resulted in a better understanding of the immediate needs of the individual mines at the time of discussion Also, a clear insight into the future needs of the coal mines was developed Communications were encouraged at the mine level where the problems are most acute As a result,

the mine operators began to acknowledge and appreciate that their needs and requirements were being addressed

Attached to this final report, as appendices, are twelve documents submitted to UE&C's Mongolian office throughout MK's visit to Mongolia during November and December 1992 Briefly these are

1) Progress Report EMERGENCY HEAT AND POWER PROJECT NO 1 dated 11/16/92 and covering the first week's effort

2) Interoffice Correspondence to Phil McCandless (UE&C) from Bruce DeMarcus (MK) dated 11/17/92 wire ropes and conveyor belts ordered for the coal mines

3) Interoffice Correspondence to Phil McCandless (UE&C) from Bruce DeMarcus (MK) dated 11/20/92 top priority items and quantities for the mines requiring special attention for possible air freight delivery

4) Progress Report No 2 dated 11/22/92 continuing efforts during the second week including inspections of Shivee Ovoo and Nalaikh mining operations

5) Progress Report No 3 dated 11/26/92 inspection of records for the Ulan Ovoo coal mine operated by Erdenet

6) Interoffice Correspondence to Phil McCandless (UE&C) from Bruce DeMarcus (MK) dated 11/28/92 meeting notes and various issues related to spare parts ordered by UE&C

7) Interoffice Correspondence to Phil McCandless (UE&C) from Bruce DeMarcus (MK) dated 12/2/92 meetings and events of the prior week concerning spare parts being ordered

8) Tabulation of COAL MINE COAL QUALITY STATISTICS AND POWER PLANT COAL DEMAND STATISTICS dated 12/4/92

9) Interoffice Correspondence to Phil McCandless (UE&C) from Bruce DeMarcus (MK) dated 12/4/92 clarified spare parts descriptions and ordering status

10) Interoffice Correspondence to Phil McCandless (UE&C) from Bruce DeMarcus (MK) dated 12/6/92 training sessions initiated by MK with the Mongolians pertaining to new technology and management methods

11) Interoffice Correspondence to Phil McCandless (UE&C) from Bruce DeMarcus (MK) dated 12/12/92 close inspection of operational practices observed at the Sharyn Gol Mine and reactions to the training sessions

12) Interoffice Correspondence to Phil McCandless (UE&C) from Bruce DeMarcus (MK) dated 12/15/92 specific items identified for the first air shipment due to arrive 12/20/92 Last minute questions

SECTION 2
SHARYN GOL MINE

The Sharyn Gol Mine is unique in that it is a multi-bench open pit mine rather than a conventional strip mine The principles that apply to this mine are more common to the large open pit copper mines in the U S A than to the coal mines Comparable mines of this type can be found in the Kemmerer coal field in southwestern Wyoming, U S A , and in the Elk River Valley area of British Columbia, Canada MK was the contract miner for one of the coal mines in the Kemmerer coal field, Kemmerer Coal Mine, for 25 years and, therefore, has experienced the problems encountered at the Sharyn Gol Mine

To appreciate and adequately discuss the Sharyn Gol Mine it is necessary to condense the discussion into manageable units These units are

- STRUCTURAL GEOLOGY
- MINE PLANNING
- OPERATIONAL MINING METHOD

STRUCTURAL GEOLOGY

Only one coal seam is recovered at the Sharyn Gol Mine This seam is approximately 30 meters thick and dips approximately 12° from the horizontal Coal quality on an as-fired basis is 3900 - 4100 kcal/kg, in metric units, or 7,020 - 7,380 BTU/lb, in English units The quality makes it some of the premium coal mined in Mongolia At least two of the main power plants in Mongolia were designed and built at the same time the Sharyn Gol mine was started These power plants were designed for the coal quality expected to be produced at this mine

Since the seam at this mine dips at approximately 12° and mining commenced at the outcrop, the depth of the mine continues to increase as mining progresses and more of the reserve is exposed The waste material within 50 meters of the natural surface is a mixture of unconsolidated sands and clays At depths greater than 50 meters, the waste material consists consolidated sandstones and shales until the coal layer is reached

The entire coal and waste formation was subjected to major faulting One fault zone trending through the center of the pit area offsets the coal seam The faults are perpendicular to the strike and contribute to slope stability problems in the hanging wall side of the pit One recent slide buried a large quantity of coal as well as collapsing one of the dewatering tunnels used for water drainage

MINE PLANNING

The relatively flat 16° overall pit slope as designed for the Sharyn Gol Mine was most likely adopted for two reasons (1) major faulting which occurs through the center of the pit and causes overall instability of the unconsolidated rock, and (2) the decision to utilize rail haulage for waste removal

The design of this mine recognizes an ever-increasing strip ratio The strip ratio is defined as the volume of waste, in cubic meters, that must be removed to allow the recovery of one tonne of coal The mine is currently designed to operate at a 8 1 strip ratio but will increase to a 10 1 ratio as mining progresses down dip

During 1992, the mine did not operate at the design strip ratio but at a much lower ratio of approximately 5 1 The mine has a targeted production of 125,000 tonnes per month or approximately 1 4 million tonnes per year At the design strip ratio of 8 1, the target annual production would require the removal of 12 million cubic meters of waste The mine achieved coal shipment targets for 1992 but only removed approximately 6 5 million cubic meters of waste leaving a shortfall of 5 5 million cubic meters

Waste removal is the most critical element in coal mining Mining of exposed coal should be viewed as the reward for all the effort expended in waste removal and is usually accomplished with ease In fact, coal removal is only about 11% of the total extraction effort With an open pit mine such as Sharyn Gol, in which waste mined this year should be uncovering coal to be removed next year, waste not moved per the design ratio cannot be written off but must be removed in addition to the next year's waste in order to re-establish the design If additional

waste is not mined next year, short cuts taken to expose coal this year must be repeated next year to maintain coal production

During 1992, the mine was able to meet its coal targets while only removing one-half the designed waste volume This was accomplished by steepening the pit slope on the lower waste benches in which shovel and haul truck mining was performed Coal was exposed without associated waste removal The waste left intact was in the upper levels of the mine where rail haulage is utilized This technique is referred to as high grading and cannot be repeatedly performed year after year Waste removal in 1993 must exceed the normal 12-million-cubic-meter design requirement to account for the prior year's shortfall

Water is encountered on the lower waste benches of the mine and is evidenced by frozen streaks of water visible around the highwall The original mine planners for the Sharyn Gol mine designed an elaborate mine dewatering system The dewatering system was structured around the final pit design and consists of a vertical shaft, an underground sump, an adit parallel to the strike, and two underground dewatering tunnels driven from behind the final design limit The tunnels are located in the footwall side of the pit and are parallel to the coal seam These tunnels are progressively extended as the bottom of the pit advances down dip towards the final pit design An underground sump, located behind the designed final pit, collects the water which is pumped to the surface and released The primary drawback has been the build-up of methane gas in the tunnels which requires ventilation

This dewatering system had been very successful until the spring of 1992 Several years ago an explosion partially collapsed one of the tunnels and killed two mine employees After the explosion, the tunnel was inaccessible to miners but still allowed the passage of water The tunnel remained usable for dewatering until the spring of 1992 when a highwall failure collapsed the tunnel completely, thus reducing the dewatering system by 50% The highwall failure occurred in the vicinity of a major fault zone in which the rock is less stable

Prior to MK's arrival, it was known that an emergency condition existed at the mine due to a decrease in the mine's water drainage system The collapse of the dewatering tunnel had resulted in a loss of one-half of the mine's drainage

system Mr DeMarcus, who visited this mine earlier in the year and witnessed flooding conditions, recognized the disastrous consequence of failure to correct this problem The mine management also recognized the seriousness of the water problem and had implemented a course of action to correct the flooding A second dewatering tunnel parallel to the collapsed tunnel was under construction when MK visited the mine in November The cold Mongolian winter has been a benefit to the mine by freezing the water and slowing the seepage rate The new dewatering tunnel must be finished before the spring thaw when the rate at which water enters the mine will increase

The coal seam is on fire in many locations throughout the mine The smoke created by these fires fills the valleys leading to the mine As far as 40 kilometers away, the valleys are filled with smoke pollution The mine has insufficient operating dozers or other support equipment to keep these fires extinguished Flames are evident wherever the coal is exposed The heat generated by this burning coal actually raises the ambient temperature on the lower levels of the mine, melting the frozen water streaks, and contributing to the inflow of water

OPERATIONAL MINING METHOD

Drilling & Blasting

Drilling is performed by a combination of auger and rotary tri-cone drills Auger drills are used on the top three benches of the mine in unconsolidated waste material during the winter months only The average bench height is approximately 15 meters The augers drill holes 2 meters deep on a 3x3-meter pattern These holes are then lightly charged with the purpose of fracturing the frost layer which averages between 2 and 3 meters thick The frost layered material is exceptionally tough and, if improperly fractured, creates massive waste boulders of such large size and weight that the mine shovels cannot load them into the haulage units These frost chunks closely resemble solid rock To break these boulders by secondary blasting is time consuming, inefficient and costly Frost conditions such as these are a familiar condition experienced in some Wyoming, Montana and North Dakota coal mines It is even more common in coal mines located in Canada Rotary drilling on 17-meter benches is used on the other mining benches where solid rock is encountered The powder factor is varied from 0 25 kg/cubic meter to 0 50 kg/cubic meter depending upon

the rock type and prior experience in a particular area Even in the full-depth holes it was observed as necessary to place explosives in the collar portion of the blast holes to fragment the surface frost

Excavator Shovels

Waste rock and coal are all mined by electric-powered cable shovels The Mongolians prefer electric-powered mining equipment over diesel-powered equipment due to the chronic lack of adequate diesel supplies Cable shovels are very reliable excavators and normally require less maintenance than other excavating methods such as hydraulic front shovels or large rubber-tired loaders The primary weaknesses of cable shovels are the lack of mobility and flexibility and the requirement for support equipment to keep pit floor work areas clean

Utilizing a combination of a large rubber-tired front-end loader and a fleet of cable shovels is often a preferred method of mining, thus taking advantage of the strengths of each type of excavator The rubber-tired front-end loader is highly mobile and assists an electric shovel fleet by cleaning up rock that could only be inefficiently removed using cable shovels Inherent mobility enables this type of front-end loader to efficiently perform other necessary functions such as load trains with coal at the train loadout, clean up spillage around the plant area, load waste in a remote area of the pit, clean up spillage along haul roads and benches, carry heavy repair parts out to "mechanically down" equipment in the mine, and prepare drill patterns for drilling by leveling sites and removing berms

Haulage

The Sharyn Gol Mine uses a combination of rail haulage on the upper mine benches and conventional haul trucks (40-tonne) on the lower pit benches and in the coal

Some discussion of rail haulage systems is necessary Rail haulage systems in the United States and the western world were phased out of mining in the 1960's and 1970's The inflexible systems required large capital investments which were often under utilized The advent of larger haul trucks (77-tonnes and up) for mining replaced the rail haulage systems Haul truck size in Mongolia is currently 40-tonnes

The adoption of rail haulage at the Sharyn Gol Mine has a tremendous impact on mine planning and design Rail haulage forces a mine to reduce its overall highwall angle to accommodate the positioning of the tracks and allow shovel access on working benches simultaneously Thus a mine must remove, at a higher ratio, more cubic meters of waste per tonne of coal exposed than with other haulage systems Positioning of the tracks for turn radii and grade differences within the mine and outside the mine to access waste disposal areas, force the location of waste dumps at a greater distance from the mine These drawbacks to rail haulage are very evident at the Sharyn Gol Mine where rail haulage accounts for two-thirds of the 12 million cubic meters of waste designed to be moved every year The 5 5-million-cubic-meter shortfall in 1992 occurred almost entirely in the area of the mine serviced by rail haulage Another serious drawback of the rail haulage system is the rehandle required on the waste dumps in which draglines, shovels, and trucks are used to spread and remove waste material dumped along the tracks by the trains This double-handling could be eliminated if waste was hauled by trucks

The introduction of large haul trucks into the Sharyn Gol Mine and the rapid replacement of the rail haulage system could improve the efficiency of this coal mine Utilizing truck haulage would allow the establishment of waste dumps in areas closer to the mine workings

SECTION 3
BAGA NUUR MINE

The Baga Nuur Mine is the largest coal producer in Mongolia It supplies 70% of the coal demand for central Mongolia including the capital city of Ulaanbaatar The mine opened in the late 1970's and was intended to supply coal primarily to Power Plant No 4 located in Ulaanbaatar This power plant was designed and built especially for the quality of coal produced at Baga Nuur Mine

Baga Nuur is a dragline strip mine utilizing six draglines of various capacities to produce approximately 4 million tonnes of coal per year Mongolia's larger draglines are all located at this mine including their largest, a 20-cubic-meter (26-cubic-yard) Russian dragline The draglines, while small by U S A standards, are large for Mongolia Since the draglines are relatively small, prestripping is required This is performed by electric-powered cable shovels which load into either trains for rail haulage or conventional 40-tonne haul trucks

The mine stripping ratio at this mine is only 3 1 which gives the mine a cost advantage over the Sharyn Gol Mine (8 1 ratio) Another advantage for Baga Nuur is overburden that is minable without requiring drilling and blasting (frost blasting is the only winter drill and blast requirement) Also, Baga Nuur casts its waste with the draglines while Sharyn Gol must haul all of its waste to disposal sites outside of the mine area

The major difference between a dragline strip mine and an open pit mine such as Sharyn Gol, is the time lag between waste removal initiation and coal exposure At Sharyn Gol, waste removal to expose a particular block of coal begins more than one year ahead of when the coal if finally exposed and ready for mining The waste removal is performed by an entire fleet of shovels and haul trucks in accordance to long-term objectives This is dissimilar to a dragline mine where just one waste material excavator exposes coal with the time lag between initiating waste removal and exposing coal in a particular location being only a few days In an open pit mine, if one shovel operating in waste breaks down it is only a fraction of the fleet The ripple effect on the uncovering of coal may not be felt for many months When a dragline breaks down, the effect upon the uncovering of coal is immediate

Coal quality at Baga Nuur is less than that of the Sharyn Gol deposit Baga Nuur coal quality on an as-fired basis is 3000 - 3500 kcal/kg or 5,400 - 6,300 BTU/lb The coal is located in one primary seam that is overlain by unconsolidated sand and clay formations Except for large frost boulders observed around the strip pits, the waste material appears relatively easy to mine with the excavators currently utilized

Similar to the Sharyn Gol Mine, Baga Nuur utilizes some rail haulage for prestrip waste material as well as some truck haulage The rail haulage should be phased out in favor of truck haulage but its elimination at this mine is not as critical as at the Sharyn Gol Mine Transferring equipment from one mine to another is an option to consider For example, sending Sharyn Gol locomotives and railcars to Baga Nuur may utilize the last value out of the units, concurrently allowing Sharyn Gol a speedy conversion to 100% truck waste haulage

SECTION 4
SHIVEE OVOO MINE

The Shivee Ovoo Mine was visited on November 20, 1992 MK's investigations generated several impressions concerning the future importance of this mine As a very new operation, initial waste removal commenced in December 1991 with the first coal production initiated in the spring of 1992

The mine's location gives it positive infrastructure advantages The mine is located next to an abandoned Russian military town which had apartments to house 10,000 people but now houses only a couple hundred miners and their families The town infrastructure still exists The mine is also adjacent to the main rail line from China so that coal shipment can be easily accomplished, thus the need to construct rail lines to access the mine is eliminated

The Shivee Ovoo Mine is sitting on a gigantic coal reserve Exploration drilling has indicated a coal basin containing in excess of 6 billion tonnes at an overall ratio of 1 3 cubic meters of overburden to 1 tonne of coal At Mongolia's current coal demand rate, this deposit alone could supply the entire country's coal demand for 850 years

Due to the very short time this mine has operated, little in the way of mining equipment purchases or capital expenditures for facilities have been made Eventually this mine should be viewed as a dragline mine, but for the next several years it could be developed by electric-powered cable shovels, rubber-tired front-end loaders and haul trucks The mine presently ships only run-of-mine coal with no crushing or load-out facilities Coal is loaded directly over the side of the rail cars Maintenance shops and warehousing facilities are less than adequate or nonexistent The lack of old established facilities and a vast fleet of Russian equipment already on site are viewed as advantages The absence of a long mining history at this site is also an advantage since no old traits or habits should hinder new technology or mining methods

This mine is a clean slate which could be equipped with American-made equipment, supplied with American spare parts, and could become an immediate major contributor to the Mongolian coal industry With proper

instruction and management, a model mine could be developed at less overall cost than converting any of the other deposits visited in Mongolia

Coal quality at Shivee Ovoo is the most detracting feature of this deposit The heat value of the coal is less than that of Baga Nuur, most likely because of the low waste cover over the coal The coal is young with a heat value on an as-fired basis of 2800 - 3200 kcal/kg or 5,040 - 5,760 BTU/lb and must be blended with higher quality coals for use in the power plants of Ulaanbaatar To burn a higher percentage of this coal power plant revisions must be made

SECTION 5
OTHER MINES

Mongolia has more than twenty coal mines The majority of these mines are small producers which supply local villages or individual communities Their locations are often very remote from the capital city of Ulaanbaatar yet no less important to the communities they support Some emergency spare parts were designated for these mines which employ small hydraulic shovels and small haul trucks Alunchuluum, one of the mines in the far eastern portion of Mongolia, exports coal to Russia in addition to supplying local users Hence, it is a revenue generator for Mongolian trade

Touring of these mines was not accomplished during MK's two month stay in Mongolia because of the low volume of coal these mines generate and difficult access One mine, Ulan Ovoo, was investigated by reviewing exploration drill hole information on file at the operation's headquarters (Erdenet Copper Mine) This coal deposit is being developed by the copper company to supply coal for this major copper mining complex and could have a favorable impact in the future by reducing the current demand for coal from the Sharyn Gol Mine Travel to the Ulan Ovoo coal deposit was not possible through Mongolia due to rivers which blocked road access to the site Access was possible by a longer route which circled through Russia and then back into Mongolia The longer route would have required visas The Ulan Ovoo deposit is only now being developed on a small scale and is probably several years away from being a major influence on Mongolian coal production This deposit is interesting as the coal seam averages 54 meters thick with a stripping ratio of 2 6 1, coal quality of 4600 - 5800 kcal/kg (8,280 - 10,440 BTU/lb), 0 25% sulfur, and 10% ash

SECTION 6
RECOMMENDATIONS AND CONCLUSIONS

The problems of the power plants and the mines are only the endpoints of the fuel and energy emergency situation in Mongolia Connecting the mines and the power plants is the railway Railway transportation has become an area of increasing concern The mines have exposed available coal on the ground and are ready to ship it but the shortage of railcars and crushing equipment has resulted in the coal remaining at the mines to await future shipment Concurrently, the power plant feed stockpiles continue to reduce in size The Mongolian Deputy Prime Minister emphasized the magnitude of this problem in discussions with the U S Ambassador and US-AID representatives during which MK was present

The **first and foremost observation** made at each of the coal mines visited was the absolute lack of support equipment Definitions of support equipment follow

1) Bulldozers - large bulldozers which could rip the frost, construct adequate haul roads, push overburden and improve the overall cleanliness of the mines Smallest size bulldozer to be considered would be approximately 500 hp (Caterpillar D10 size)

2) Road Graders - large road graders which could maintain mine benches and roads Road graders would decrease repairs and spare parts required by all of the mining equipment Smallest size road grader to be considered would be 275 hp (Caterpillar 16G size)

3) Maintenance Trucks - maintenance should be taken to the field equipment These trucks should be equipped with a welder, compressor, vice, cutting torches and a small hoist to assist the mechanics

4) Fuel & Lubrication Trucks - some of the 40-tonne haul trucks should be converted to Fuel & Lube units, thus taking this function to the field equipment instead of bringing functioning equipment to the shop area for routine servicing

5) Explosives Trucks - the mines should discontinue their current use of high-strength military-style explosives ANFO is the world standard for economic blasting Use of ANFO requires the mixing of fuel oil 6% percent by weight with ammonium nitrate This is best and most safely accomplished in an ANFO truck designed for this purpose

6) Personnel Transport - equipment operators require prompt transportation to and from their equipment A 30 or 40-minute walk to and from a machine is unacceptable and a waste of capital assets

The necessary support equipment could be supplied from American manufacturers and then backed with American spare parts It is obvious that this type of equipment has been neglected in favor of excavators or haul trucks which have a more easily quantified production value Historically, the mines have justified equipment through the Ministry of Fuel & Energy Equipment engaged in production tasks are always easier to justify on a cost basis, hence, the support equipment has been ignored This must be remedied

The **second observation** is the complete lack of rubber-tired front-end loaders at the mines A large rubber-tired front-end loader (FEL) equipped with a minimum 13-cubic-meter bucket should be employed at each mine This unit is very mobile which allows it to perform multiple functions The FEL has a loading capacity equivalent to a similar-sized shovel but can accomplish many other essential jobs more efficiently An FEL can load low digging faces of waste or coal while simultaneously maintaining a clean and tidy digging bench for haul trucks, something a shovel can not accomplish with any efficiency The mobility of an FEL allows it to load coal into rail cars, clean up spillage on haul roads, or dig mine production faces, all with equal efficiency An FEL compliments a shovel fleet by providing shovel cleanup and bench maintenance, thus allowing the shovels to perform only those tasks which they perform efficiently

The equipment mentioned will allow a mine to re-establish order and cleanliness in the work areas Many sources can be quoted which state that order and cleanliness are the most important objectives in establishing an efficient

business or turning around an inefficient business This is equally true in the coal mining industry and would contribute the most toward assuring the coal mines meet future coal demands

The **third observation** concerns how future US-AID funding would accomplish the most for Mongolia and for the United States The coal mines of Sharyn Gol and Baga Nuur are both established operations and account for 85% percent of central Mongolia's current coal supply Each represents high capital investments of Russian mining and processing equipment Replacing all of this equipment, brought in over the past 20 years, represents a very high cost As the Russian equipment ages it requires more and more replacement parts which may or may not be readily available Some complete pieces of equipment will require replacement soon But simply replacing Russian with American equipment at existing mines may not be the best approach For example, replacing a single Russian shovel at Sharyn Gol with an American shovel may not produce any additional coal Replacing Russian haul trucks with American haul trucks may not produce more coal if the Russian shovels are not mechanically available to load the trucks At Baga Nuur, replacing a Russian dragline with an American dragline would show immediate results But the results achieved would be diminished by the lack of support equipment or the inadequacy of Russian dozers and haul trucks already on site Russian mining equipment that is inoperable due to the lack of spare parts is a huge obstacle to improving the Mongolian coal industry In time, the Russian equipment can be replaced, but not in the space of two or three years As a result, the value of improvements will be difficult to gage due to the mixed mining fleets Mechanical downtime on units of one fleet will negatively influence the performance of the available fleet thereby masking the productivity gains

A unique solution to improving the Mongolian coal industry would be to **set up** the Shivee Ovoo Mine as a model of American mining equipment and technology The stripping ratio at the mine is low and therefore large volumes of coal could be produced at low capital investment levels These large volumes of available coal would demonstrate the benefits of US-AID funding To properly equip the mine at this early stage would be relatively easy compared to any of the other mines A major obstacle to this, however, is that significant power plant retrofits would be required in order to handle the coal, with its high

ash content, and burn it effectively in existing boilers The existing boilers and auxiliary equipment have a difficult time with Baga Nuur coal

A **fourth observation** is the necessity to educate the mining industry in Mongolia This can be accomplished through training in new technology and equipment advances coupled with management responsiveness and control under a market-driven economy Training programs should include maintenance procedures, cost monitoring and control, operating procedures based on reducing cost, etc The Mongolians encountered during the inspections of the mines and in the ministries are generally astute and educated The problem lies in that they have been restricted in their exposure to new technology and their actions have been motivated by government-controlled and funded mining activities Transforming the way Mongolians view the many forms of management (operations, efficiency, and cost) is imperative if the industry is to survive in a free market economy versus the current government-subsidized system

APPENDIX A

M Storey
IOC 01/11/2042

PROGRESS REPORT
EMERGENCY HEAT AND POWER PROJECT NO 1
11/16/92

I GENERAL & Summary

As per our agreement, we are to report after the first week of our effort; the findings, current status and specifications for material supplies and equipment, for the Mongolian coal industry.

We have completed inspections of Sharyn Gol and Baga Nuur As we expected, both operations are in dreadful condition However, it would appear that Sharyn Gol has a better opportunity to achieve it production goals of 125,000 tonne/mo. than Baga Nuur has of achieving its expected production of 300,000 tonne/mo Contrary to expectations and directions received in the U S , greater attention must be directed toward Baga Nuur versus Sharyn Gol Baga Nuur is the biggest contributor to the needs of central Mongolia (Ulaanbaatar), supplying 70 per cent of the demand, and currently is in the most precarious predicament Even with the emergency procedures, we seriously question, at this time, the likelyhood that the production requirement can be achieved for this winter We do not say this lightly, recognizing that the consequences would be serious

Our investigation centered around confirming the needs of all previously identified materials and parts and where necessary identifing additional requirements We personally inspected the equipment and parts requested, to confirm the need and priority. We also surveyed inventory and storage yards to assure ourselves that needed parts were not stored and overlooked Some parts and items were found at one operation that were needed at another and this eliminated from the list Also some items on the priority list had already been received but no payment has been made Corrections to the procurement list have been made for these items This situation required investigation of possibly other supplies in transit At this time due to difficult communications and virtually no way of tracking shipments we are unable to ascertain what may be in transit. Therefore, we recommend that no orders be held up on account of what may or may be in transit

Additionally we were concerned that AID maybe funding the purchase of unnecessary operations We do not doubt that items identified are unquestionably required and even calling them a bare minimum number underestimate it In the last two years there has been virtually no preventative maintenance (i.e. engine oil changes, tune ups, etc.) performed on the equipment Typically every 400 hrs, where US standards are every 250 hrs Numerous parts have been worn out to the point that major components of the equipment may exceed the cost of replacement. If the equipment were operated in the US , it would be shut down immediately for repairs before any major failure

occurred or for safety reasons Components for such repairs have not been identified and have been limited to only those items that will get the equipment running, or as back up parts for criticalcomponents A critical component being a part that, if it failed would shut the entire operation down for weeks (i.e.load out conveyor belts).

Three items of critical importance that may be questioned are our recommendations for explosives, hard facing welding rod and bucket teeth. Current supplies of explosives are sufficient only until mid January. If inventories are not replenished by this time all coal production may well cease. The volume of explosives we have ordered is sufficient to continue operations into April With long lead times and possible shortages in Russia, this order should be made now for delivery January 1, 1993 Although hard facing rod is not a requirement for getting equipment into operation, its cost benefit (teeth will last 50 % longer) will be very significant in this Sandy/Clay environment The third item is bucket teeth There were no teeth available on our arrival and it appeared to be an emergency priority one item. Within two days 200 teeth arrived, unfortunately this will last only 3 or 4 weeks and new replacements will be need. Thus we have recommended 800 teeth be purchased which are interchangeable between draglines and shovels.

Inspection of the underground mine Nalaikh and the surface mine Shivee Ovoo have not been completed but are scheduled for November 19-22, 1992 with reports to follow. Yet some opinions can now be given It seems illogical to support operations at Nalaikh Its monthly contribution is small (7000 tonne/mo) and operating cost are reported to be 8 times higher than the other surface mine production. This mine is extremely unsafe and it is a low gas producer which needs to be shut down (in Dec 1989 twenty men were killed by a gas explosion) To our knowledge there are few mechanical gas detectors for coal,a need for [illegible] miles of ventilation bags are required to force the gas out, plus the mine is currently flooding However, if we are going to continue to work this mine it is unconscionable now to supply these materials, particularly since the investment is relatively small. Shivee Ovoo appears to have the most potential to provide the expected short fall Shivee Ovoo's current operating ratio is less than 1 cubic meter of overburden to one ton of coal, the Gas Shaft is approximately 3 to 1 and Baga Nuur is 3 to 1. This any effort to cost incurred to supply coal would appear to be much more productive and effective at Shivee Ovoo. After investigation of Shivee Ovoo, our observations will be reported immediately particularly, if Shivee Ovoo can be a major factor in resolving the dilemma.

Besides dozer, dynamite and other blasting materials, supplies, and equipment, attention must be paid will be applied to the operations of the engineers to [illegible] operating procedures, drilling and blasting techniques, [illegible] safe, management and [illegible] boring costs. This [illegible] detailed discussion of classroom sessions, and actual field demonstrations.

Attachment 1 includes purchase order forms. These forms contain the model number of the equipment and the detailed nomenclature of the part required. Additionally, the quantity to be ordered and estimated cost where available. The current Russian supplier's addresses, including telephone, fax, and personal contact if [illegible] has also been provided for each purchase order. Where USA suppliers [illegible] Russian sources could provide such materials it is so noted on the purchase orders.

Attachment 2 are clarifications, corrections and answers to questions submitted to the First United Engineers and Constructors on November 16, 1992.

II SHARYN GOL

The Sharyn Gol operation is currently operating at approximately an 8 to 1 ratio (Cubic Meters of Overburden to One Tonne of Coal). The overburden is predominantly sand on the upper benches with clay changing into shales on the lower portions of the pit. Drilling and blasting during the summer is unnecessary, other than in small areas where some permafrost exists. Essentially all material from November through April is shot, not because of rocks but because of frost. It appears that some materials are being ineffectively or in some cases unnecessarily shot. The potential for ripping this material with large bull dozers equiped with single shank rippers (D-10, D-11, 455 sizes) is plausible. If indeed this will work, drill and explosive-demands could be significantly reduced. Upon our return to Sharyn Gol, these issues will be further investigated and analized.

The haulroad conditions are much improved over what I observed in July. They could be characterized as fair to poor rather than disastrous. This is very fortunate in that the ground is now well frozen and any road repair or reconstruction is not practical. However premature tire failures have been reported. Upon inspection of the failed tires, face cuts were observed. This indicates sharp rocks or other foreign materials on the haulroads. A tour of the mine roads found numerous pieces of steel (ever a partially buried crow-bar) scattered throughout the mine. Corrective measures here would include the periodic grading of the roads or at the least a conscious effort to manually pickup all metal off the roadways. The water problem and issue of a pump to dewater the pool located in the pit has been resolved. The water level has been dropped significantly by slowly pumping the

water through another existing discharge tunnel in the floor of the pit. Engineering and mine design changes should allow for coal recovery through April without major interference due to water. By April, it is expected that the underground drainage system (tunnels) will be re-established, allowing full discharge of the water and elimination of any additional pump capacity

The railroad overburden removal system must be discontinued for this mine to operate more efficiently and cost effectively However, the major expenditure for such a fleet must be carefully engineered and consideration given to other operations, which could conceivably be better served with such an investment Additionally the selection, procurement, transportation and erection of such equipment would take weeks and possibly months to achieve This is not a timely solution to the immediate problem A minimal investment in the railroad system should be considered. We have identified in the P O's only those items that would make a considerable contribution to railroad production for a small cost (i e locomotives are down because there are no batteries) Serious consideration should be given to replacement of the railroad system before the winter of 93 & 94. A temporary measure which will in all likelyhood have to be pursued to achieve the desired production from Shanyn Gol is High Grading this deposit over the next 6 months This should allow us to get an average 100,000 to 125,000 tonne a month production from this mine This is an unusual measure and should only be taken under the most extreme circumstances, under which we unfortunately find ourselves. The consequences of high grading will lead to greater overburden demands for the subsequent following winter The resulting mine will require additional equipment and increased repairs to achieve the additional overburden movement. An additional effect of [illegible] will also be increased as well The highwall slope will be some greater than the original design of 16 deg cer (possibly up to 18 degrees) We expect that the original design of 16 degrees has a margin of safety and is designed for the ultimate pit depth. This final depth is much greater than the depth we are currently at (1225 meter vs 1275 meters) With caution we should be able to proceed but certainly there will be a greater risk of high wall failure at the [illegible] interval.

An [illegible] tunnel is being excavated under the [illegible] that [illegible] proceed at approx 22 [illegible] over 500 meters long and effectively drain the mine However this tunnel has a relatively [illegible] excavated The tunnel that is being replaced had a gas explosion in advance of the [illegible] people. Acquiring [illegible] better bag for this project as a perspective.

III. BAGA NUUR

The Baga Nuur operation is in desperate need of dragline supplies. There is essentially no coal inventory (exposed coal at the mine is approximately 40,000 tons). This operation is scheduled to produce 300,000 tons per month and is the biggest contributor to coal production for central Mongolia (including Ulaanbaatar). It is extremely unlikely, even with the emergency supplies, that this mine will achieve this production level for several months. However, since it is the major contributor, it must be given the greatest attention regardless of previous indicators.

Of primary importance are the dragline hoist and drag ropes (wire cables) and electric motors. These items should be flown in immediately. We will work on identifying partial orders for these critical items so they can be delivered in air freight quantities.

Roads are in poor condition, particularly ramp roads into the pits. They are frozen and will have to be lived with until spring. Loose clay material from fresh dragline faces could possibly be used to level the severely deteriorated spots. Significant tire failure rates were observed at Baga Nuur. However, the problem appeared to be greatest on the Bridgestone tires supplied on the new Komatsu trucks. Again, the failures seem to be face cuts. It was noticed that the Bridgestone tires had a harder rubber cover than the Russian tires, this made them more acceptable to cuts. We also suspect that the Komatsu trucks are being driven at higher speeds. This is a result of more speed capacity and shock absorbing capabilities. Regardless of the problem, the wrong tire is being supplied for the application. We recommend an 18.00/33-E4 tire should be supplied versus the 18.00/33 E3. The E4 has a thicker [illegible] face to protect against cuts. Fortunately, we understand another order has already been made by the manufacturer for these E3 tires. In the future these tires should have E-4 design tires. Our example of current tire problems and priority in ordering parts can be made with the recently obtained Caterpillar loader. The first day the machine arrived it had a tire failure due to a cut on the face of the tire. This machine has not been used since tires are of this size are available. We have not made ordered any replacements, since [illegible] of the dragline.

Drilling and blasting at Baga Nuur was again only done in the winter on the days to freeze ground. We discussed the need of blasting needs and will study the situation. Our [illegible] to be [illegible] technically, whether or not there is [illegible] Based on, we [illegible] of this objective. Current supplies of primers and accessories are good for a full [illegible]. It is [illegible]

to discard [illegible] significant [illegible] factor. A six [illegible] explosives order of [illegible] times is required (shipment should be [illegible] through mid January) to assure [illegible] effluent quality by the April, 1990 The possibility of flying in shipments this huge [illegible] but [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] extremely difficult to best [illegible] transported [illegible] loading and [illegible] loading capabilities at rail transport through China into Mongolia are unsatisfactory and will take months. We have resolved ourselves to using Russian explosives and will have [illegible] to learn to maximize their efficiency and effectiveness

An additional concern to be addressed is the lubrication [illegible] grease, transmission, hydraulic oils) for the [illegible] vehicles [illegible] They were supplied with a limited supply of such lubricants The supply will be depleted shortly and the Russian lubricants will not meet the manufacturers specifications No orders for these lubricants have been made

The pretrip railroad system utilized at Baga Nuur is again ineffective. It should be replaced with a large truck and shovel fleet The length of time to properly evaluate this expenditure of capital and resultant studies is significant To adequately evaluate other alternatives will take time and not be timely enough to effect the emergencies of the short term. Therefore as an interim measure a very select number of units have been identified to put a few locomotives and dump cars back to work.

More planning and engineering will be performed to identify areas of lower coal ratio Possibly in a different outcropping seam located in the project area

BEST AVAILABLE

ATTACHMENT 1

Item	Qty	Description	Unit	Unit cost	Location	Percent
1	303 meter	1620 mm [illegible] belt width 1524 mm load inch width Standard Fabric Conveyor Belt for Coal Rubber Mode No ZM 1420-6-TK30-0-2 MPB	meter	$ 122/m	BugaNuur	$1
2	242 meter	830 mm [illegible] 31.4 inch, cleatable abrasive 762 mm [illegible] Standard Fabric Conveyor Belt for Crushed Coal Rubber Model No ZM 63-4 TK 28/7-2 MPB	meter	$ 72/m	BugaNuur Nuur	2
3	1000 meter	1422 mm (56 inch) no k over alternate Standard Fabric Conveyor Belt for Chrome Coa Russian code: No ZM 142 [illegible] 1-438-7-ZMPB	meter	$ 72/m	BugaNuur	2
4	542 meter	1000 mm-Circumf [illegible] 1200 mm (42 inch) wide Standard Fabric conveyor belt for coa Rubber Mode No ZM 303-4-TK200 C-5-ZMPB	meter	$ 72/m	Sharyngol BugaNuur	$1
5	1300 meter	1200 mm(47.2 inch) alternative 42 inch width Standard Fabric Conveyor Belt for Coal Russia Mode No ZM 1200-7-TK430- -ZMPB	meter	$ 72/m	Sharyngol BugaNuur	$1

Current Supplier

[illegible] Chelyabinsk
str TITOV 4-21 Russia
tel (7472) 29-14-47
Fax (7472) 28-75-26

Comments

We feel that these Belts can be Supplied fro U.S A if Alternatives Selected

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ELECTRICAL HIGH VOLTAGE CABLE

Item	Qty	Description	Unit	Unit cost	Location	Percent
1-a	2 m	6300 voltage cable KFP 3x35+1x10 3 wire 35 mm copper 1 ground 10 mm copper	km	$ 1862/km	Sharyngol BagaNuur	2
1-b	2 m	KFP 3x50+1x16 3 wire 50 mm copper 1 ground 16 mm copper	km	$ 8653/km	Sharyngol Buy Nuur	2
1-c	1 km	KFP 3 70+1 25 3 wire 70 mm copper 1 ground 25 mm copper	km	$10902/km	Sharyngol BagaNuur	2

Standard insulation for conductor and grounding cable each rubber jacket

Current Supplier

Mrs ZINAIDA SHULENKOVA
TIAZPROMEXPORT
18/1 OVCHINNIKOVSKAYA NAB
MOSKOW 113324
TEL 230-15-56
TLX 411021

Comments

This trailing cable should be available in the U S A

BEST AVAILABLE

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ELECTRICAL LOW VOLTAGE CABLES

Item	Qty	Description	Unit	Unit cost	Location	Priority
2		1000 Voltage				
2-a	1 5 km	KMTCH 3x35+1x16 3 wire 35 mm copper 1 ground 16 mm copper	km	$ 6713/km	Sharyngol Bagakuur	
2-b	1 5 km	KMTCH 3 50+1 16 3 wire 50 mm copper 1 ground 16 mm copper	km	$ 7770/km	Sharyngol BagaNuur	
2-c	1 5 km	KMTCH 3x70+1 25 3 wire 70 mm copper 1 ground 25 mm copper	km	$ 1886/km	Sharyngol Bag-Nuur	
2-d	1 5 km	KMTCH 3x25+1 10 3 wire 25 mm copper 1 ground 10 mm copper	km	$ 7042/km	Sharyngol BagaNuur	

Standard insulation for conductor ad ground- flexible black rubber jacket

Current Supplier	Comments
(Same Supplier as High Voltage cable)	These trailing cable should all be available in the U S A

ELECTRICAL CABLES-UNDERGROUND

Item	Qty	Description	Unit	Unit cost	Location	Priority
3		660 voltage-three ground cables			Nalaikh (underground)	
3-a	1 5 km	KPSW 3x35+1 10-7/2 S 3 wire 35 mm copper 1 ground 10mm copper 3 wire 2 5 mm -safety wires	km			
3-b	1 5 km	KPSW 3x50+1 10-7/2 S 3 wire 50 mm copper 1 ground 10mm copper 3 wire 2 5 mm -safe , wires	km			
3-c	1 5 km	KPSW 3x70+1 10-7 2 S 3 wire 70 mm copper 1 ground 10mm copper 3 wire 2 5 mm -safety wires	km			
3-d	1 5 km	KPSW 3x95+1x10+2x2 5 3 wire 95 mm copper 1 ground 10mm copper 3 wire 2 5 mm -safety wires	km			

Current Supplier	Comments
(Same Supplier as High Voltage cable)	These cables should all be available in the U S A

COPPER WIRE TO ENVIRO MOTORS

Item	Qty	Description	Unit	Unit cost	Location	Priority
		Various Sizes			Sharyngol BagaNuur	

Sizes	Kg	Qty
Φ-0 20 MM	kr	30
Φ-0 25 MM	kr	30
Φ-0 28 MM	kr	30
Φ-0 31 MM	kr	30
Φ-0 35 MM	kr	50
Φ-0 40 MM	kr	50
Φ-0 71 MM	kr	150
Φ-0 55 MM	kr	100
Φ-0 63 MM	kr	150
Φ-0 75 MM	kr	333
Φ-0 80 MM	kr	300
Φ-0 85 MM	kr	300
Φ-0 90 MM	kr	300
Φ-1 05 MM	kr	600
Φ-1 09 MM	kr	600
Φ-1.18 MM	kr	450
Φ-1 20 MM	kr	750
Φ-1 12 MM	kr	600
Φ-1 25 MM	kr	600
Φ-1 27 MM	kr	300
Φ-1 36 MM	kr	450
Φ-1 40 MM	kr	600
Φ-1 56 MM	kr	750
Φ-1 62 MM	kr	900
Φ-1 12 MM	kr	600

Current Supplier

30 ELECTRO
1/2 SADOVO SPASSKAYA str 107078
MOSKOW RUSSIA
Tel 975-58-20
Fax 2082745
Tlx 411003

Comments

This can all be supplied from the U S A - stock item

EXPLOSIVES BULK

Item	Qty	Description	Unit	Unit cost	Location	Priority
1	300 t	Powder ammonit (43 kg bag)	tonne	504 $/t	Sharyngol BagaNuur	3
2	500 t	CARTRIDGED AMMONIT Φ 32 mm	tonne	640 $/t	Sharyngol BagaNuur	3

Current Supplier

METROVZRIV MOSKOW, 101000
str MOROSEIKA-12 Mr SISOEV V V
Tel 206-92-78
Tlx 911526 IMSOJ
Fax (095) 168-[illegible]

Comments

This is to be all supplied from Russia
Current on site quantities will be exhausted by mid January

19/21 550 tons

[illegible]

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-ALL TRUCK TIRES RUSSIAN TRUCKS

Item	Qty	Description	Unit	Unit cost	Location	Priority
1	100	Tires 21 00-33 Hc 32 with tubes Tube Type Tires	ea	$ 1300/ea	Sharyngol BagaNuur	3
2	50	Tires 18 00-25 Hc 22 with tubes Tube Type Tires	ea	$ 300/ea		
3	150	Tires IR, OCP20 HC 16 with tubes Tube Type Tires	ea	$ 143/ea		
4	100	Tubes 21 00-33	ea	$ 50/ea		
5	50	Tubes 18 00-25	ea	$ 32/ea		

Current Supplier
BOBRUISK TIRE PLANT
217624
g BOBRUISK
MOGILEVSKOJ OBL MINSKOE ROAD

Comments
Purchase in Russia

ESH EXCAVATOR SCALE PARTS
DRAGLINE / WHEEL PARTS — EO-5112 & EO-10011

lyd diesel/Electric Front Shovel - Localus e

Item	Qty	Description	Unit	Unit cost	Location	Priority
		Refer UE&C lists				3

Current Supplier

Comments
This all will come from Russia- per prior supplier lists

HALL TRUCK ENGINE PARTS
RUSSIAN TRUCKS

Item	Qty	Description	Unit	Unit cost	Location	Priority
		Refer 3 separate lists of Truck Engine Parts UNC lists				3

Current Supplier

Comments
These are to all purchased in Russia

DRAGLINE 15/90 HOUSE ROLLERS

Item	Qty	Description	Unit	Unit cost	Location	Priority
1	102	Main Frame Rollers for 15/90 Dragline Detail No 1020-04-03-1 Shaft for roller	ea	$ 93/ea	Baganuur	
2	102	Detail No 1040-04-01-1 Roller	ea	$ 672/ea	Baganuur	

Current Supplier

TOPOLPRO
620077, RUSSIA, g EKATERINBURG
str VAINER-13
Fax (3432) 510-47

Comments

Must be supplied from Russia

GENERATORS NEW

Item	Qty	Description	Unit	Unit cost	Location	Priority
1	1	Detail No [illegible] For dragline ESH 13/70	Set		Baganuur	
2	1	Detail No [illegible] For dragline ESH 20 90 Frequency 750 rpm 1200 voltage	Set		Baganuur	
3	3	Compressor Used on 10/70, 17/50, 5/45 excavators Detail No 85-06/8	ea	$ 1649/ea		
4	2	Compressor Detail No [illegible] Drawing No TY-34-39-3b1 for shovels 3KS 3I, 4V, 3K310	ea	$ 2800/ea		
5	2	Compressor Detail No 3K-4 for shovels E\34 60, 3KC5A	ea	$ 1800/ea		

Current Supplier

We suppose there is one producer (dragline)
the address could be defined

- Uralmash g Sverdlovsk 62[illegible]
Tel 37-11-99
Fax (7343-2) 21-57-85

- N MZ I AMATORS BOARET TECTOR, UKRAIN
Tel 1.9137
Tx 48049

- IJORSK EXCAVATOR PLANT
189673 LENINGRAD, KOLPINO-1
Tel 461-8110
Fax 812(4639269)

Comments

For Russian Draglines
Therefore must be purchased in Russia

CONVEYOR VULCANIZING GLUE

Item	Qty	Description	Unit	Unit cost	Location	Priority
1		Conveyor Vulcanizing Glue Russian Trade Name Tip-Top Enough to complete 15 splices of 48 inch belt			Baganuur	#1

Current Supplier

Comments

This type of glue should be available in the U S A Should be supplied with instructions on how to apply if obtained in U S A

ELECTRIC MOTOR REBUILDS

Item	Qty	Description		Unit	Unit cost	Location	Priority
	2	ДТЭ-5241	1 shaft	ea		Baganuur Sharyngol	3
	4	ДПЭ-5241	2 shaft	ea		-"-	
	4	ДПВ-52		ea		-"-	
	2	Д В-81242		ea		-"-	
	2	Дк-81642		ea		-"-	
	2	Д3-6241		ea		-"-	
	2	МТЭ-450-90047		ea		-"-	

Current Supplier

ELECTROSERVICE IMPEX, s MOSKOW 13913
at OGAPE"A-"
Tel 229-68-46
Mrs.Tatiana Tsvetkova

Comments

Unit already in Russian Rebuild Plant- must be supplied from Russia

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LOCOMOTIVE REBUILD PARTS

Item	Qty	Description	Unit	Unit cost	Location	Priority
		List of parts supplied to Ulan Bator Engineers previous Reference No 07			Sharyngol	3

Current Supplier

Comments

Must be purchased in Russia

CRUSHER PARTS

Item	Qty	Description	Unit	Unit cost	Location	Priority
		CRUSHER SMD-6A			Snaryngol	2
1	2	Bush 3460 03 005 02	ea	$ 3223/ea		
2	8	Disk 3400 03 110 02	ea	$ 332?/ea	-"-	
3	2	Trust-Plate Back 3462 00 002 02	ea	$ 8650/ea	-"-	
4	2	Trust-Plate Front 3462 00 002 02	ea	$ 8650/ea	-"-	
5	2	Left winding agregate 32-1	ea	$ 1472/ea	-"-	

Current Supplier
VVO "TJAZHPROMEXPORT"
18/1 Ovchinnikovskaya nab
Moskow, 113724, Russia
Tel 220-18-56
Tlx 411931

Comments
Must be supplied from Russia

RUSSIAN DOZER TRACKS COMPLETE

Item	Qty	Description	Unit	Unit cost	Location	Priority
1	5	Dozer Tracks Model No or Bulldozer DC-126 (3T-250 Detail No 24-22(set) (748-22-101 CH)	Sets		Shar/ngol /Bulganuur	 3 sets ptiority #1 2 sets priority 3

Current Supplier
TRACTOREXPORT 43, Leninsky st
113055, Moskow Russia
Mr STEPIN BABKO
Tel 2586523
Tlx 411277/274
Fax 288955

CHELABINSK
TRACTOR PLANT
Tel 77-79-81
Fax 77375

Comments
Must be bought in Russia

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REPAIR PARTS FOR POLISH DUMPCARS 2 BC 165

Item	Qty	Description	Unit	Unit cost	Location	Priority
1	10	Detail No 634-01-150 set - O" Ring	Set		Badaruur	3
			ea			
2	50	Detail No 45-129 O" Ring	Set			
3	2	Detail No 634-45-040 Cylinder case one side Action				
4	2	Detail No 640-45-102 A Piston-one side action	Set			
5	10	Detail No 640-45-013 Piston-two side action	ea			
6	10	Detail No 522-30-010-0 Shock absorber	ea			
7	10	Detail No CA-3(set) Car Hitch	Set			
8	20	Detail No 0C 002-2 Hitch Absorber	ea			
9	10	Detail No 483-000 Air Manito'd	ea			

Current Supplier

POLAND s ZELENESJRA
VAGON BUILDING PLANT
(BARSHAW com KOLOMEYC)

Comments

Must be purchased in Foland

VEHICLE BATTERIES
LOCOMOTIVE BATTERIES

Item	Qty	Description	Unit	Unit cost	Location	Priority
1		24 volt Batteries (Haul Trucks)	ea			3
1-a	200	6CT-182 24 volt, 182 amp/hr, 18 0 amp 11 5 litres Electrolite 143 mm height, 282 mm width, 522 mm length	ea	$ 90/ea	BAGAWUUP/ SHAR'NGOL	
1-b	200	6CT-172 24 volt, 132 amp/hr, 13 0 amp 8 0 litres Electrolite 244 mm height, 211 mm width, 514 mm length	ea	$ 67/ea	BAGAWUUP/ SHAR'NGOL	
2	64	Locomotive batteries 32 TH-450 450amp/hr 64 voltage 375 mm height, 754 mm width, 738 mm length 8 batteries to a set	ea	$ 575/ea	BAGAWUUP/ SHAR'NGOL	
3	2	Battery electrolite	tonnes			

Current Supplier	Comments
VAO "Sovelectro" Russia, Moskow 107078 Sado ay-Spasskaya 1/2 k 1 Phone - 975-58-20 Fax 2062745 Tlx 411002	You should see if these batteries can be supplied from the U S A Electrolite should be supplied with batteries purchased plus some additional electrolite

BUCKET TEETH

Item	Qty	Description	Unit	Unit cost	Location	Priority
1	800	Model No 2-160038 Bucket teeth for shovels and dragline	ea	$ 190/ea		3

Current Supplier	Comments
AO "NOVOKRAMATORSKY MACHINE-BUILDING PLANT NAMED KRASNOGO DONETSKY REGION UKRAINIA	Only utilize Russain supplier

VENTILATION BAG

Item	Qty	Description	Unit	Unit cost	Location	Priority
1	6000 metres	Model TN-Unburning Polymer Material Diam 600mm (24inch) 10 meter lengths	ea	$ 8 45/m	Sharyngol /Nalaikh	#1

Current Supplier

BOSTOK INC
151200 MOSKOW
Smolensk 98724

Comments

This item should readily available in the U S A
This is standard ventilation bag which hangs on hooks (spaisl driven into the roof It does not have a reinforced structure of springsteel It is only a bag without structure

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ELECTRIC MOTOR BRUSHES

Item	Qty	Description	Unit	Unit cost	Location	Priority
1	300	Electro Brush 3F-14 size	ea	$ 5 50/ea	All mines	3
2	1600	Electro Brush 3F-14 size		$ 6 00/ea		

Current Supplier

P/O "NOVOKRAMATORSKY"
MACHINE-BUILDING PLANT
NKMZ (KRAMATORSK)
Donetsky region UKRAINA

Comments

Only utilize Russ or Supplier

WELDING RODS

Item	Qty	Description	Unit	Unit cost	Location	Priority
1	5 tonnes	Electrodes for hardfacing 300 amp AC-DC welders 3 to 5 mm rod To be used to make drake shovel bucket and dragline bucket teeth for extended life	tonnes		All mines	#1

Current Supplier

Comments

Can be bought in the U S A

WIRE ROPE

Item	Qty	Description	Unit	Unit cost	Location	Priority
1	60 tonnes	39 mm (1 5 inch) Hoist cable Russian model No GOST 7669-80 G-1-H 0 0 160-120 U S A Model standard 125 metre lengths	tonnes	$ 1250/ tonne	All mines	#1
2	50 tonnes	52 mm (2 0 inch) Hoist cable Russian model No GOST 7669-80 G-1-H 0 0 160-120 U S A Model standard 110 metre lengths	tonnes	$ 1200/ tonne	All mines	#1
3	40 tonnes	57 mm (2 25 inch) Hoist cable Russian model No GOST 7669-80 G-1-H 0 0 160-120 U S A Model standard 165 metre lengths	tonnes	$ 1200/ tonne	All mines	#1
4	20 tonnes	45 mm (1 8 inch) Russian model No GOST 7669-80 G-1-H 0 0 160-120 U S A Mode standard 130 metre lengths	tonnes	$ 1200/ tonne	All mines	#1
5	4 tonnes	38 5 mm (1 5 inch Russian model No GOST 7669-80 GP-2-H-160 U S A Mode standard	tonnes	$ 1200/ tonne	All mines	#1
6	10 tonnes	15 mm (0 6 inch Russian mode No GOST 3083-80 U S A Mode standard	tonnes	$ 1200/ tonne	All mines	#1
7	5 tonnes	13 5 mm (0 5 inch Russian mode No GOST 7677-82 U S A Mode standard	tonnes	$ 1200/ tonne	All mines	#1

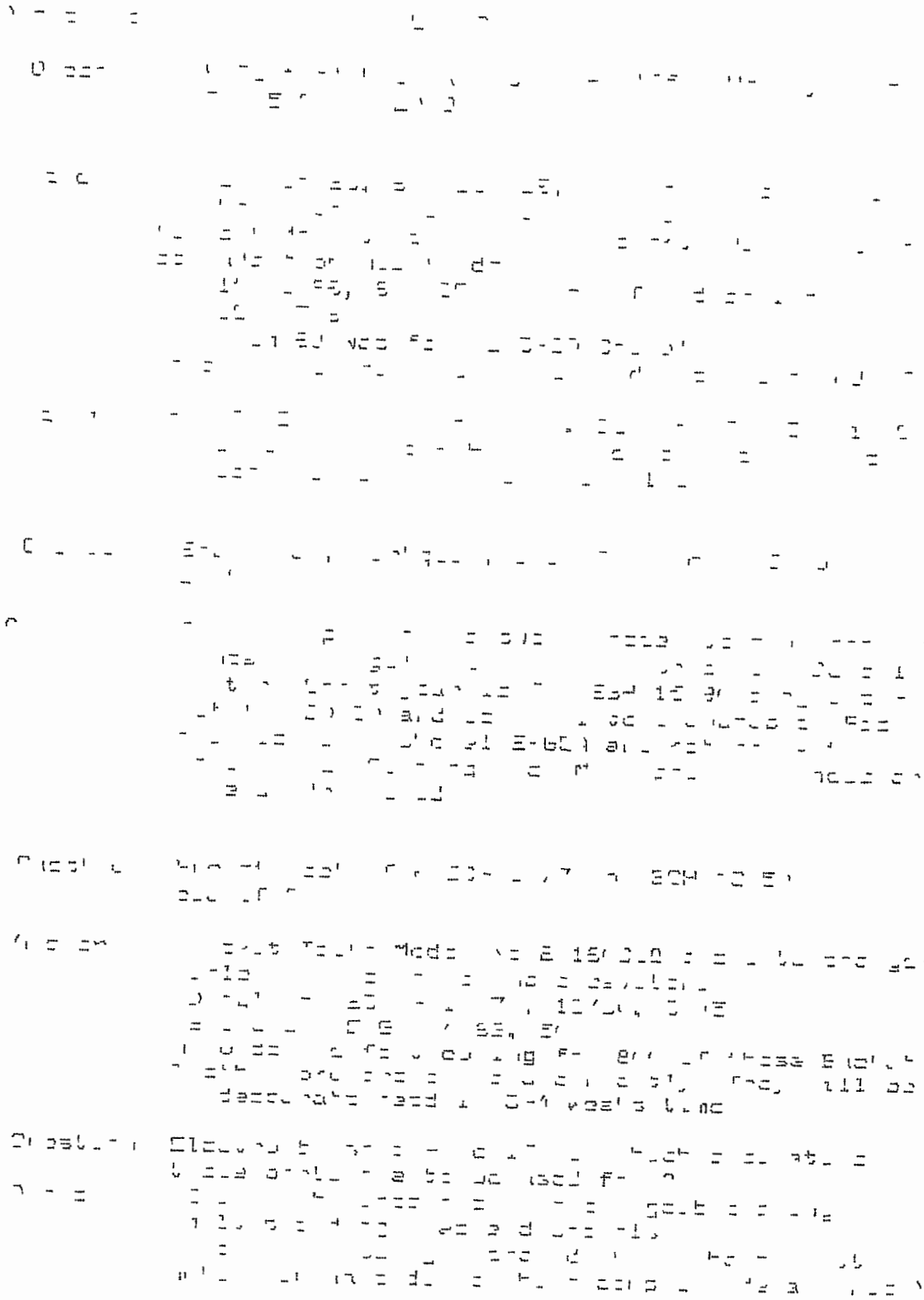
Current Supplier

[illegible] Mr General
620077 g Ekaterinburg
s Oktyabrskoi Revolutsii u 25

Too "TOPCBuRO"
620077 g Ekaterinburg
s Oktyabrskoi Revolutsii, 25
Fax 7(3431) 51324?

Comments

These ropes can be supplied from the U S A



IOL

Date 1./17/9=

T_ Phil McCardless - U ited Engineers & Constructors
Fr Bruce D DeMarcus - Monteson-Kr dsen

Subject Wire Ropes & Conveyor belt

We ha e reviewed your request and concerns c specifica-
ti s a w ro ropes a d cor c ions and offer the following
" The biggest difficulty we see is tending to m ch detail
into Russian specifications for wire rope Conver ional-
fications verbatim would be i many cases impossible.
However it is unnecessary since alternat ve U S stallion
and specification w ld be superior A prime example of
th s is try ng to match the ir dard st ndi d config -
rati s of Russian specifications w th U.S spec fica-
tions We have never seen anything like the P ssian
specification i our Mini g industry (maybe for
elevators but there are no elevator ropes to be
specified) plus at is unfair on to our stand rd confi -
rati s Part c larly are we the small d meter of the
outside wires
To properly size wire rope the following specifications
should be sufficient when noted for dragline or shovel
hoist, drag and crowd cables.

1) Maximum Suspended Load - Different for each type of
Machine (some are interchangeable see attached table).
Rope of similar size for various applications should be
ordered for the most demanding application as noted on
table.
2) Drag Power capacity of the machi e (see table)
3) Crowd Power capacity of shovels
4) Diameter of Ropes - Pipes can be somewhat smaller.
Must check with manufacturer as to what undersize
limits are We have identified alternatives we feel are
acceptable since we are not aware of U S manufacturers
making metric size ropes
5) Material Type - For determining abrasion q alities of
rope All applications in Mongolia are light to medium
abrasion characteristics Mechanical type is u consoli-
dated sa d, clay, shale and coal which is shot when
fractured or tight Virtually no rocks
6) Rope La - Left hand for all
7) Where unusual restrictions are ord sheaves e ist it
should be noted, as for the 39 and 45 5 mm ropes which
must have s fficient flexibility to go a ound
a 280-300 mm (11 inch - 12 inch) ball sheave or shovel
buckets

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All cord and rope characteristics can be defined as standard as far as cord type, corrosion resistance, safety factors, configuration and diameter of internal strands. However, since there continues to be confusion in the use we have supplied all available information which can find to assist you. This we have supplied in the attached bulletin. We suggest that you contact your purchasing department at Boise, a Mr. T J Smith or Pat Mills at (219-386-5504) who will on the basis of the above listed information be able to order proper cables and have them spliced into lengths but not on reels as long as possible since the size of the largest reel of any diameter listed is 7500 feet. The 39 mile load is 8 inches the longest of these ropes is 528 feet, the other reels should be multiples of 550 feet.

Conveyor Belts

To properly select the belts for more characteristics are considered

1) Material type - Coal 47 to 57 lb/cu yd
2) Width & Trough (see Length of belt - see table
3) Speed of belt - see table
4) Horse Power of Belt Mill
5) Nature of Internal Material - standard fabrics
6) Top and Bottom Cover Types - oil and cold weather rubber for bituminous coal - 8 oz per sq in
7) Total strength
8) Jacket requirement (top and bottom materials)

Other factors which may be useful in the specifying of idlers, configuration or profile of belt. To expedite your efforts we have supplied such information to the degree we can acquire it. Again I recommend contacting our purchasing department who will be able to supply a belt with the provided information. Where alternatives in our specifications are offered we have checked the table spaces to assure ourselves of adequate clearance. Since splicing of belts will be used primarily for patching of bad portions of the belt, we suggest two dozen Zipper splices should be supplied for each belt size.

DRAGLINE SPECIFICATIONS - 5 TYPES

Attachment to IOL date 11/17/92

DRAGLINE MODELS	ESH 6/45 1of	ESH 10/70 4of	ESH 13/50 3of	ESH 15/90 1of	ESH 20/90 1of
BUCKET SIZE	6 cubic meters	10 cubic meters	13 cubic meters	15 cubic meters	20 cubic meters
	7.85 cubic yards	13.08 cubic yards	17.00 cubic yards	19.62 cubic yards	26.16 cubic yards
BOOM LENGTH	45 meters	70 meters	50 meters	90 meters	90 meters
	147.69 feet	229.67 feet	164.05 feet	295.29 feet	295.29 feet
MATERIAL WEIGHT	2.3 TONNE/Cu. meters	2.3 TONNE/Cu Meter	2.3 TONNE/Cu Meter	2.3 TONNE/Cu. Meter	2.3 TONNE/Cu. Meter
	1.94 TON/cu.yd.	1.94 TON/cu.yd.	1.94 TON/cu.yd.	1.94 TON/cu.yd.	1.94 TON/cu.yd.
HOIST POWER	250 KN	500 KN	500 KN	850 KN	1150 KN
	56,250 lbforce	112,500 lbf	112,500 lbf	191,250 lbf	258,750 lbf
DRAG POWER	300 KN	600 KN	600 KN	920 KN	1250 KN
	67,000 lbf	135,000 lbf	135,000 lbf	207,000 lbf	281,250 lbf
MAX SUSPENDED LD				47 TONNE	63 TONNE
				51.8 TONS (SHORT)	69.4 TONS (SHORT)
MATERIAL TYPE	UNCONSOLIDATED SANDS, SHALES, AND SUB-BITUMINOUS COALS - SOME GRAVELS				
HOIST WIRE ROPES	- MOVING PARTS				
DIAMETERS (1)	39 mm (1.535 inch)	39 mm (1.535 inch)	39 mm (1.535 inch)	57 mm (2.244 inch)	64 mm (2.520 inch)
ALTERNATIVES	1.5 inch (38.1 mm)	1.5 inch (38.1 mm)	1.5 inch (38.1 mm)	2.25 inch (57.1 mm)	2.50 inch (63.5 mm)
TENSIL STRENGTH	190 Kg/mm^2	170 Kg/mm^2	170 Kg/mm^2	170 Kg/mm^2	170 Kg/mm^2
	120.9 T/in^2	120.9 T/in^2	120.9 T/in^2	120.9 T/in^2	120.9 T/in^2
LENGTH	2 x 105 meters = 210 meters	2 x 170 meters = 340 meters	2 x 120 meters = 240 meters	2 x 250 meters = 500 meters	2 x 250 meters = 500 meters
	2 x 345 ft = 680 feet	2 x 558 feet = 1,116 feet	2 x 394 ft. = 788 feet	2 x 821 feet = 1,642 ft.	2 x 821 feet = 1,642 ft.
COST:	ISOCT 7569-80 R-T-H-A-0-0-160-120		SAME ALL ROPES HERE LISTED		
LAY.	A - LEFT HAND TWIST		SAME ALL ROPES HERE LISTED		
MINIMUM SHEAVE SIZE	280-300mm or 11-12"				
DRAG WIRE ROPES	- MOVING PARTS				
DIAMETERS 3	45.5 mm (1.791 inch)	52 mm (2.047 inch)	52 mm (2.047 inch)	57 mm (2.244 inch)	64 mm (2.520 inch)
ALTERNATIVES	1.75 inch (44.5 mm)	2.0 inch (50.8 mm)	2.0 inch (50.8 mm)	2.25 inch (57.1 mm)	2.50 inch (63.5 mm)
TENSIL STRENGTH	ALL SAME AS HOIST ROPES				
LENGTH	2 x 93 meters = 186 meters	2 x 100 meters = 200 meters	2 x 75 meters = 150 meters	2 x 100 meters = 200 meters	2 x 145 meters = 290 meters
	2 x 305 feet = 610 feet	2 x 328 ft = 656 feet	2 x 246 ft = 492 feet	2 x 328 ft = 656 ft	2 x 476 ft = 952 feet
COST + LAY		SAME AS FOR HOIST ROPES			

11mm .5 | 15mm

CONVEYOR BELT SPECIFICATIONS

CONVEYOR BELTS	1600 mm	1400 mm (55in)	1200 mm	1000 mm	800 mm
ALTERNATIVE SIZE	60inch (1524mm)	No alternative	48 inch (1219 mm)	42 inch (1066 mm)	30 inch (762 mm)
LENGTH REQ'D	800 meters	1000 meters	1800 meters	540 meters	240 meters
	2625 feet	3281 feet	5906 feet	1772 feet	788 feet
MATERIAL SIZE	200 mm (8 inch) maximum coal size				
MATERIAL DENSITY	1.3 Tonnes/m³ – all sana sub-bituminous coal				
GAGE (THICKNESS)	17 mm	17 mm	16 mm	16 mm	13 mm
	3/4 inch	3/4 inch	3/4 inch	3/4 inch	1/2 inch
TENSIL STRENGTH					
FABRIC TYPE	POLIMER	MATERIAL – on all belts		SYNTHETIC POLYAMID	NON-FLAMABL NON-FREEZA
TOP THICKNESS	6 mm	6 mm	6 mm	6 mm	4.5 mm
BOTTOM THICKNESS	3.5 mm	3.5 mm	3.5 mm	3.5 mm	3.5 mm
TEMPERATURE RANGE		-45°C to +40°C	-49°F	to 104°F	
BELT SPEEDS	1.85 m/sec	or 6 ft/sec	all belts		
AVG YEARS OF OPERATION - CURRENT BELTS	=4 years to 6 years				
MAX BELT ∠	18.5° Degrees maximum – all belts				
IDLER ∠	30° Degrees	30° Degrees	22° Degrees	13° Degrees	13 Degrees
CAPACITY	58 Kg/m²	55 Kg/m²	49 Kg/m²	33 Kg/m²	33 kg/m²
	12 lb/ft²	11.2 lb/ft²	10 lb/ft²	6.7 lb/ft²	6.7 lb/ft²
PLIES	6 plys	5 plys	5 plys	5 plys	4 ply
RUSSIAN MODEL NOS. EKITERENBURG	2M 1600-6 TA300-6-2MPG	2M 1400-3 ПБ400-5-2MPG	2M 1200-3 ПБ400-5+2MPG	2M-1000-4-TK200/5-5-2H-PK	2M-800-4TK 200/5-2H

16

SHOVEL SPECIFICATIONS — TOTAL SHOVELS 37 of — 4 types

ELS	EKG 8I 14 of	EKG 4Y 5 of	EKG 46 7 of	EKG 5A 11 of	COMMENTS
UCKET SIZE	8 cubic meter	4 Cubic meter	46 Cubic meter	5 Cubic meters	Used ropes from draglines are used on the shovels where possible.
	10.464 cubic yd.	5.232 cubic yd	6.017 Cubic yards	6.540 cubic yards	
ATERIAL WEIGHT	SAME AS FOR DRAGLINES				
TKOUT MAX	785 KN	393 KN	490 KN	490 KN	
	176,625 lbf	88,425 lbf	110,250 lbf	110,250 lbf	
OWD MAX	363 KN	265 KN	198 KN	198 KN	
	81,675 lbf	59,625 lbf	44,550 lbf	44,550 lbf	
IMUM SHEAVE SIZ	DIA. = 280 mm to 300 mm BUCKET SUPPORT (BAIL) SHEEVES				
	12 inch DIAMETER				
ST ROPES	- MOVING PARTS				
IAMETERS	45.5 mm (1.791 inch)	45.5 mm (1.791 inch)	39 mm (1.535 inch)	39 mm (1.535 inch)	
	1.75 inch (44.5 mm)	1.75 inch (44.5 mm)	1.5 inch (38.1 mm)	1.5 inch (38.1 mm)	
ENGTH	130 meters	112 meters	58 meters	58 meters	
	427 feet	368 feet	191 feet	191 feet	
DD ROPES	- MOVING PARTS				
IAMETERS	45.5 mm (1.791 inch)	45.5 mm (1.791 inch)	NONE	NONE	
	1.75 inch (44.5 mm)	1.75 inch (44.5 mm)	/	/	
ENGTH	82 meters	96 meters			
	269 feet	315 feet			
SUPPORT ROPES	- STATIC LOAD				
IAMETERS	45.5 mm (1.791 inch)	45.5 mm (1.791 inch)	30 mm (1.181 inch)	30 mm (1.181 inch)	
	1.75 inch (44.5 mm)	1.75 inch (44.5 mm)	1.25 inch (31.75 mm)	1.25 inch (31.75 mm)	
ENGTH	104 meters	150 meters	125 m	125 m	
	341 feet	492 feet	410 feet	410 feet	
OT TRIP ROPE	MOVING PARTS				
IAMETERS	13.5 mm (0.532 inch)	13.5 mm (0.532 inch)	11.5 mm (0.453 inch)	11.5 mm (0.453 inch)	
	0.5 inch (12.7 mm)	0.5 inch (12.7 mm)	0.5 inch (12.7 mm)	0.5 inch (12.7 mm)	
ENGTH	13 meters	22 meters	10.5 meters	10.5 meters	
	43 feet	72 feet	34.5 feet	34.5 feet	
PURPOSE HOIST	MOVING PARTS				
IAMETER	10.5 mm 3/8 inch	10.5 mm 3/8 inch	/	/	
ENGTH	80 meters ALL AT	80 meters ALL AT			

IOC

Date: 11/20/92

To: Phil McCandless - UE & C
From: Bruce P. DeMarcus - MK

In our initial progress report of 11/16/92, we identified the drag and hoist ropes, motors and assorted other items for which procurement and shipment should proceed expeditiously. We also recognised that the quantities listed and total weights as recorded would far exceed any amount that could be air freighted, or if air freighted would require many flights and be costly. The wire ropes were therefore reduced to the most critical size needed The wire rope lengths for individual dragline and shovels, plus the number of specific lengths were identified By identifying the specific size and lengths, spools capable of being air freighted were developed. This submittal is the bare minimum shipment of wire rope, conveyors, batteries and motors for repairing most draglines and shovels. For example, these items if acquired and delivered quickly would get the two largest draglines at Baga Nuur operational. Baga Nuur which produces 70 per cent of the country's coal has four draglines broken down out of a fleet of six The large hoist generator to be procured in Russia (order has been placed earlier by the Mongolians, only payment needs to be made for shipment, see P O of 11/16/92 for the manufacturer) is all that is required to get a third and the largest dragline (ESH 20/90) in operation Batteries with electrolite are needed for haul trucks and bulldozers which are parked. Ventilation bags are needed to continue shear panel development at the Nalaikh underground mine and for completion of the Sharyn Gol drainage tunnel. The conveyor belt request combined with glue and zipper locks are only to allow immediate patching and splicing of existing belts

If you have any questions please advise.

Attachment A identifies these supplies in detail

cc: Fred Schaeffer

Attachment A

Date 20 November 1992

Top Priority List

1 Ventilation Bags
minimum 300 meters for Nalaikh and Sharyn Gol

2 Wire Ropes
a 39 mm
i 10/70 Dragline 2 of 344 meters each
ii 13/50 Dragline 2 of 122 meters each
iii 5A Shovels 4 of 60 meters each
— Total 1,172 meters @5 4 kg/m weight
Total weight 6,330 kg or 7 tons

b 52 mm
i. 10/70 Dragline 2 of 202 meters each
ii 13/50 Dragline 1 of 164 meters
Total 568 meters @9 7 kg/m weight
Total weight 5,510 kg or 6 tons

3 Conveyor Belt
a 1400 mm - 200 meters
b 1600 mm - 200 meters
c Belt Glue (TipTop) - 50 kg
d Zipper Splices 12 for each belt size

4 Batteries 24 volt
Haul Truck Batteries Model 6CT-182 or Caterpillar
200 of w/electrolite

5 Excavator Teeth
Model no 2-160338 - 40 of

6 Generator - Hoist (new)
20/90 Dragline ГПЭ -2500-750 - У х Л3 1 of
2500 Kw, 750 amps, 1200 Volts

7 Bearings
Baga Nuur ESH 10/70 Generator ГПЭ 385
3636 - 6 of
3690 - 16 of
42616 - 10 of
42627 - 10 of
41416 - 6 of
32330 - 10 of
Baga Nuur ESH 20/90 Generator ГПЭ 2500
32244 - 6 of

7 Bearings (Cont)

- Sharyn	Gol	
- 180605	-	100 of
1607	-	100 of
307	-	200 of
60312	-	16 of
- 1608	-	16 of

8 Engine Parts

	Detail no	Description	Qty	Unit price
1	240П-1004008-Д	Ком гильз поршней	264	361 76
2	240-1000107 В6	Вал коленчатый	8	3,651 20
3	236-1000106 Б4	Ком колец	264	17 27
4	240-1000104 Б2	Вкладыши	20	152 54
5	240-1000104 Р2	Вкладыши	12	
6	240-1000104 Р1	Вкладыши	12	
7	240-1003213 А3	Прокладка	240	22 00
8	240Н-1011014	Насос	8	101.24
9	240-1017038	Элемент	1000	15 95
10	238Н-1109080	Элемент	200	
11	240Н-1118010 Б	Турбокомпрессор	8	877 50
12	240Н-1118011 Б	Турбокомпрессор	8	877.50
13	240Н-1002012 И	Блок цилиндров	2	3 916 25
14	240-1003213	Прокладка	200	13 00
15.	901611110008-02	Насос	3	2 538 90
16.	26161112110	Распыл.форсунки	120	22 75
17	236-1002024 А	Кольцо	240	
18	236-1002040	Кольцо	120	

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PROGRESS REPORT #2

Emergency Heat and Power Project No. 1-
11/22/92

I. General & Summary

In our continuing assessment of the Mongolian coal industry, we inspected the Sheeve Ovoo and Nalaikh operations on 11/20 & 11/21. Several observations and conclusions were made

Other than two basically new 5 cubic meter electric shovels the Sheeve Ovoo operation is essentially operating with reject equipment (trucks and bulldozers) - from Baga Nuur and Sharyn Gol. There is no crushing or loadout facility at Sheeve Ovoo. The maintenance shop is very small and unheated. Trains are loaded with run-of-mine material (less 1 meter) by 1.5 cubic meter electric shovels and a 3-4 cubic meter electric/hydraulic front shovel. Despite these difficulties Sheeve Ovoo is still expected to produce 400,000 tonnes in 1992, which is significantly more than Nalaikh's 250-300,000 tonnes but less than Sharyn Gol's plus 1,000,000 tonnes. Sheeve Ovoo cannot make an impact in coal supply for Mongolia without additional equipment Adding the additional equipment necessary will take months. However with the 1.15 to 1 ratio (overburden to coal) far more coal per dollar of investment will be produced here than at any other property we have seen to date in Mongolia There does remain the question of the coal quality. The coal appears to be less than the design specifications of the power plants in Ulan Bator.

The situation at Nalaikh is certainly unusual. This operation is and underground mine which is over 70 years old. It is a gassy mine with currently 3 open fires. The Nalikh mine is a small and costly contributor, one would question the merit of its continued operation. Yet for the following reasons Mongolian's feel it is necessary to continue operations

- Socioeconomic
- Local sale of house coal
- Highest quality coal mined in Mongolia and it is used for blending lower quality coals to meet boiler specifications in Ulan Bator plants
- Used as foreign trade with Russia for electricity supplied by Russians
- The current operation is profitable
- It is the only underground coal operation in Mongolia and only one of two underground operations in the entire country (the other is a hard rock

feldspar mine), therefore if closed underground mining expertise would be lost

- If closed start-up cost in the future will be prohibitive

Upon investigation, we have determined that the investment to maintain operations at this mine is relatively small in comparison to the total. This would give the Mongolians the time to assess the associated problems of closing this mine. Therefore, we concur with the present purchase order other than the quantity of ventilation bags (5,500 meters) requested. Over half this order is for future development of the mine. This future development would open up coal reserves which could last 40 years at the current production rate.

II. Sheeve Ovoo

The Sheeve Ovoo mine is one of the most significant coal deposits we have observed in the world. It's resource base consists of over 6 billion tonnes of coal at a ratio of 1.3 cubic meters of overburden to 1 tonne of coal. This is in comparison to the 8 to 1 ratio at Sharyn Gol and 3 to 1 ratio at Baga Nuur. Another attribute is that there is very little drilling and shooting required. The need for explosives for winter frost is very small. This avoids a major supply problem for Mongolia. A majority of the overburden material can be moved with draglines at approximately 1/3 the cost of truck, shovel and train material moved at Sharyn Gol. Quality is the only prohibiting factor at Sheeve Ovoo. Apparently the quality is not sufficient to exclusively supply the plants of central Mongolia (i.e. Ulan Bator) yet our observation is that this maybe a short term phenomenon since operations have begun on the outcrop. Coal quality is historically poorer at the outcrop than the deposits average coal quality.

The mine has been using reject equipment provided by Sharyn Gol and Baga Nuur for which new Terex and Komatsu equipment was purchased This would appear to be very misguided. If this investment were made at Sheeve Ovoo, coal production in Mongolia this winter would not have been a problem (other than possibly the quality requirements). We suspect that socioeconomic considerations prevail here again versus the logic of market enterprise

Although no materials, supplies, or equipment has been identified for supporting Sheeve Ovoo, it is a major contributor to the coal needs of Mongolia (approximately 400,000 tonnes in 1992 versus Nalaikh

at 250-300,000 tonnes and Sharyn Gol at plus - 1- million). An additional problem with Sheeve Ovoo is lack of a crushing facility. Without a crushing plant the material is loaded directly from the mine (run-of-mine) and thus has some particles in excess of 1 meter in size. Such material when delivered to the power plant's pulverizers which are designed for 2 inch minus material [redacted] significantly curtails pulverizing capacity.

ball mills and/or

When the mine management was approached concerning their immediate request for emergency assistance, their requirements were relatively insignificant. Spare parts for trucks and additional dewatering pump capacity were identified. Of these requests, none fit the criteria of emergency AID funding for the short term. Serious consideration for not only supplying these requests but major capital investments in equipment and plant (approximately $10 million) should be considered prior to the winter of 1992-93.

In evaluating this operation another serious dilemma surfaced that was not associated with the mine but with the rail transport system. There was in excess of 10,000 tonnes of coal ready to be loaded but a lack of rail cars to load. It was evident that this will become a more significant problem in the near future. Since nearly 300,000 tonnes of coal will be available within 4 weeks, which could be a major contribution in relieving the shortage, but it will have little influence if it can not be transported to the power plants.

In conclusion, Sheeve Ovoo does not offer much relief to the current emergency situation however it does offer a possible long term solution to Mongolia's coal dilemma (winter of 1993-94 if steps are taken to introduce new equipment capital and a crushing unit during 1993) The question of Sheeve Ovoo coal quality and its applicability to current power plant specifications should be resolved We expect to address this question in the near future and to report the findings in our next progress report. Therefore no material and supplies are recommended for Sheeve Ovoo during this emergency period

III Nalaikh

Nalaikh offers a very interesting situation. On the surface, one would immediately draw the conclusion that the mine should be shut down. It is over 70 years old,

has a gas problem with historically recorded gas explosions and several deaths. It is currently flooding beyond control and the reported costs are 8 times those of the surface mines in the country. However upon closer analisys there is some merit to continuing this operation in the short term. Although we do not agree totally with the rationale of the management of this operation, we offer their opinions as to why this mine should stay open in order of priority from their perception, to give you an insight into Mongolian logic:

Social-Economic & Political - The mine currently has 200 employees laid off out of 900 employees. This is due to the mine being flooded and no ventilation bags for continued operations. Within three weeks another 200 people will be laid off for the same reason. If this continues, the town of Nalaikh (26,000 people) will be effected since it relies on the mine for its survival.

- Nalaikh is the only remaining underground- coal mine in Mongolia. Only one other underground hard rock operation exists (a feldspar mine). Therefore if this mine closes down the country will loose its underground mining expertise.
- If the mine were to shut down now and it was decided later to re-open it 80-100 years from now, it would be extremely costly
- The next item of support, which should have been first, was economic It was reported that the mine was making a profit and why would one shut - down a profitable operation. This obviously deserved an expanded explanation. We were informed that the mining cost was 575 tugrugs of which 5 tugrugs was amortization (depreciation) of the plant and the remainder was operating cost Upon reviewing the operating cost we found it very misleading. A majority of materials and supplies (i.e. fuel, explosives, wire rope, bearings, motors etc) are purchased from Russia. Russia requires hard currency or dollars, which are paid by the Mongolian government but then repurchased by the mines with tugrugs at the official exchange rate of forty tugrugs to one dollar. This occurs despite the street market rate which is currently 320 tugrugs to one dollar. Thus artificially masking the true cost of the operations. On the revenue side of the equation, sales can be broken down into three categories:
  - Local sales of 100,000 tonnes @ 600 tugrugs /tonne
  - Power plant sales of 100,000 tonnes - @ 460 tugrugs/ tonne
  - International sales to Russia of 100,000 tonnes for 940 tugrugs/tonne

This revenue equates to 200 mm tugrugs - with an unrealistic cost of 175.5 mm tugrugs for a profit of 27.5 mm tugrugs (688,000 dollars @ 40:1 exchange rate or 138,000 dollars at a more realistic exchange - rate of 200:1). It is very apparent that if the true value of materials and supplies were recognized this would not be a profitable operation

. The final item used to merit the continuation of this operation is its involvement in foreign trade Its importance to Mongolia is difficult to quantify and obviously beyond the scope of our efforts Yet we feel it is important to report that 100,000 tonnes of this coal is sold to Russia in trade for electricity. The influence of such - arrangement is not within our scope

Having now assessed the Nalaikh situation beyond the material and supplies request and recognizing the integral and complex peripherial association this mine has with various other circumstances, we would concur with the current emergency request - being made. Other than the extensive ventilation bag order We have found that the request for 6,000 meters of ventilation bag includes 3,500 meters of bag to be utilized to develop the mine beyond 2 years of production that can be achieved without it. This additional ventilation bag would allow the mine to develop reserves and which would last for 40 years at the current production rate. We do not consider this an emergency under the present situation.

Next on our itinerary will be to visit a new coal deposit near the Siberian border. We will determine if it can have any immediate or near term influence on the present situation. We will report on this potential upon our return (11/25/92).

If you have any questions or directives please advise We will be in touch daily over the phone as communications will allow

cc. Fred Schaeffer

PROGRESS REPORT No 3
EMERGENCY HEAT AND POWER PROJECT No 1
11/26/92

I General & Summary

On 11/24 & 11/25 Messrs B P DeMarcus and A F Helbig visited the Erdenet Copper Mine with the intention of reviewing exploration and production statistics as pertained to the Ulan Ovoo Coal Mine, being developed by Erdenet The Ulan Ovoo Coal Mine is located on the Zelter River near the Siberian border in the Selenge Province This coal deposit had been reported to be very extensive and of sufficient quality to replace Sharyngol coal The Erdenet Copper operation retains the rights to this deposit It is their intention to develope this deposit for their own needs as well as local use Erdenet is a major consumer of coal in Mongolia just to heat their facility they utilize 500 000 tonne/year or over 8% of the countries total coal consumption Replacing the demand ofsuch a consumer would certainly improve the coal supply in Mongolia

There are only 60 exploration holes drilled so far and a very significant coal deposit is likely to be defined Estimates for the size of the deposit are currently 40 million tonnes Recent drilling has identified a second seam 10 meters below the first seam This second seam is reported to be 80 meters thick These tonnes are not recognized in the current 40 million tonne proven reserves calculations We did not see the drill hole logs supporting such a report but if correct this could be another world class coal deposit

The quality appears to be simular to the Sharyngol coal Two major obstacles exist for the development of this mine, they are transportation and ground water If the coal were to be transported to the nearest Mongolian railroad 120 km away two rivers must be crossed These are the Zelter River and the Selenge River The Zelter River must be crossed twice, while the Selenge River must be crossed only once The Selenge River is the largest river in Mongolia and currently only a small vehicle bridge exists to cross this river Since we could not ford the Zelter River we were unable to see the property The second problem with this deposit will be ground water The seams outcrop in the flood plain only 600 meters from the river with the ground water 2 meters below the natural surface Hydrological studies and continuing geological evaluations are being performed at this time

The Ulan Ovoo coal deposit definitely does not offer any relief from the immediate emergency situation however for the future planning of the development of the Mongolian coal industry it certainly will deserve consideration

II Ulan Ovoo

The Ulan Ovoo coal deposit is located 8 kilometers south of the Russian border north of the Zelter River in the Selenge Province This deposit was discovered in the 1970's Only 60 exploration holes have been drilled to date These holes have proven a reserve of over 40 million tonnes with a stripping ratio of 2 57 1 The coal seam averages about 54 meters thick with 6 partings totaling approximately 5 meters Recent deep hole exploration has identified a second seam 10 meters under the first seam This second seam has a reported thickness of over 80 meters This seam has not been included in the reserve or ratio calculations This deposit has the potential for several 100's of millions of tonnes of coal or more The reported coal quality is as follows

sulfur	0 25%
ash	10%
Kilo cal/kg	4600 - 5800 (8 280 - 10 440 BTU)

moisture	20 % ?
volitiles	35%

This coal could definitely be a replacement coal for Sharyngol coal The material would have to be drilled and shot (question this after seeing other Mongolian operations) particularly in the winter months

Two problems will arise in the ultimate development of this deposit

1) Transortation difficulties will be rather significant in order to tie into the nearest Mongolian rail system located approximately 30 kilometers north of Dahran and 120 Kilometers west of the Ulan Ovoo deposit A total distance to Dahran of 150 kilometers Additionally this route would require three river crossings Two of the Zelter River and one on the Selenge River (largest river in Mongolia which currently has has only a small vehicle bridge in the vicinity) Upon our visit the day of 11/25/92 the Zelter River was not fordable An alternative to this route would be to go into Siberia and tie into the Trans - Siberian Railway or approximately 40 Kilometers of new rail with no bridges This route into Dahran would be approximately 220 Kilometers by rail

2) The ground water difficulties are expected to be very significant The first seam outcrops 600 meters from the river in the flood plain and dips under the river The ground water level in the area of the outcrop is only 2 meters below the natural surface Hydrology tests are currently being conducted

A third and lesser problem will be electrical distribution At this time an 8 KVA power line exists within 8 kilometers of the deposit This power line will have to be upgraded to approximately 25 - 35 KVA line capacity and extended to the deposit

III Conclusion

The Ulan Ovoo coal deposit does not offer an opportunity to ease the emergency demands for the winter of 1992 - 1993 It however may make a significant contribution to future coal requirements

Date: 11/28/92

To. Phil McCandless
From· Bruce DeMarcus

Subject Meeting Notes & Various Issues of Importance

Over the last two days (11/27 & 11/28), we have had several meetings with "Nuurs", U E &C and Mr Tumurbaatar (Deputy Minister of Fuel and Energy This memo is to document and notify you of these proceedings plus to once again clarify and correct misinformation previously supplied In addition we have been questioned about some decisions with which we are unfamiliar and ask for your insight

* On Attachment II of Progress Report dated 11/16/92, titled "Answers to U E &C Questions" - On Question 1 we identified the items which did not require procurement and which were still required At this time we were not thoroughly versed on the logistical problem with AID funding concerning items previously ordered but not payed for With this knowledge we would like to now expand on our response to your questions

- As identified on your fax and as we have corrected for the proper machine Item 66 (shaft gear for 15/90) Item 67 (safety valve for 15/90) Item 68 (rack gear for 5A shovel) are all items which have already arrived in Mongolia The Mongolians recognize and hope new contracts can be rewritten for these components and payment made through AID Funding

- Item 69 (high voltage controller for 15/90) and Item 70 (1250 Hp motor) have arrived in Mongolia and payment has already been made by the Mongolians

- Item 71 (bearing for the 15/90) has not been ordered or delivered or has payment been made for this bearing by the Mongolians This is a very critical bearing its detail description is #32244

* On U E &C documents of 10/13/92 - Titled "Procurement Priorities (2nd Rev)" - We draw your attention to Item 3-6 - Excavator Parts EKG-5A 10011 5112 8-1

- On investigation we find that the Excavator Parts listed for EKG-5A is really a complete new EKG 5-A shovel for $650,000 dollars We feel that a much better alternative would have been to purchase a Caterpiller 992 Front End Loader for an approximate cost of $850 000 dollars The Caterpillar 992 Front End Loader would have a 11 5 cubic meter bucket (at a minimum in this material) versus the 5 cubic meter shovel being ordered The Caterpiller 992 is one of the few pieces of major U S equipment that could be introduced into the Mongolian Coal Industry during this emergency effort Also another alternative is a new EKG 5-A shovel available from the Ministry of Geology and Mineral Resources This machine is in Mongolia at Tumertinn Ovoo Zinc Mine This zinc mine's development has been postponed and the shovel is available immediately for less than $300,000 dollars

- Hydraulic Front Shovels 10011 and 5112 are small 1 cubic meter Russian units utilized in small mines for local coal consumption in the provinces These remote Mongolian mines

are virtually shut down with out these parts Through "Nuurs" we have been notified that earlier orders for parts on these machines have been cancelled Since prior orders have been placed by the Mongolians this may again be one of those issues of re-negotiating contracts or possibly the reason for cancellation

- Parts for Excavator 8-1 have been shipped from Russia and are currently being recieved The Mongolians are again looking for AID Funding to cover the cost of these items

* In MK's investigation of the mines by visually inspecting the equipment we identified circle rail bearings (house rollers) and accompaning shafts as being a critical item for the 15/90 dragline If these parts are not acquired, the second largest dragline in Mongolia should not be operated If it does it will only be a short period (days) before the failures will shut it down forweeks and many thousands of dollars in repairs We understand from "Nuurs" representatives in Moscow that these critical components were cancelled It is difficult for us to understand how this could be cancelled so quickly when we doubt U E &C in Boston U S A has yet to recieve our order We speculate that Moscow got our order via phone calls from "Nuurs" of Mongolia before U E &C - USA heard of our request and therefore it was rejected We ask for your clarification on this issue

* The coal drill refered to in the U E &C Priority List of 10/13/92 has been a continuing topic of interest This drill is a small auger unit without a compressor which is very useful in this enviroment However we have recently discovered that the specifications of the drill we have given U E &C (11/23/93) is no longer manufactured in Russia The Russians have offered another larger type drill which is available a Model # CbP-160 We question if the drill could not be supplied from the USA We will give our MK purchasing people the specifications and see what can be obtained in the USA If there is or isn't your people will be notified by 12/4/92

* We have reviewed the request for locomotive parts and rebuilds as well as several engineering studies recommending the discontinuation of the railroad system We would be the first to agree that the rail system must be discountinued However this action will take time to engineer and implement In the interm the current system must be utilized Therefore we have identified a minimal acquisition list of parts for locomotives and railcars (ie locomotives are parked because they have no batteries) These we have identified and ordered We have concurred with the originally identified U E &C order However today we were informed(11/27/92) that only two locomotive rebuilds were approved versus the original four This decision was made at least two weeks ago and presumed that it was done with the concurance of the Ministry In our discussion with Mr Tumurbaatar (Deputy Minister of Fuel and Energy) we found that he was unaware of the change We realize that there are several factors in determining priorities for purchase during this emergency period yet an important item such as this deserves a specific answer as to why it was changed

* The Naliakh underground coal mine has been discussed in previous correspondence and in phone conversations with the management of U E &C in Boston One of the more complex issues was the extensive installation of a continuous forewarning gas detection monitoring system In engineering the wiring requirements and estimating the cost of such

a system it was determined that the funds could be better invested in small individual pocket or belt secured units One dozen such devices fitted with a warning light and audible alarm would be sufficient Therefore the original order for the remote gas detection sensing system can be cancelled and a new order written for the small individual units This has been reviewed with the Ministry through Mr Tumurbaatar and is acceptable

* In our correspondence to you dated 11/20/92 and Attachment A, we want to draw your attention to Item 6 Generator - Hoist (new) During our discussions with Mr Phil Cabral he questioned the high purchase price of such a unit therefore we reinvestigated the situation We found that the generator which had been recently rewound before was inoperatable because of an unlocatable fault in the windings If the mine electrical engineers could get the proper instruments they could possibly find and repair the fault The proper instruments could be in Mongolia but were not on the mine site Under the circumstance we concur with Mr Cabral that purchase at this time is questionable Particularly if the electrical fault is found and readily repaired We will keep you posted on the developments

* Attachment A No 7 of our correspondence to you of 11/20/92 referred to numerous bearings that were required Upon further investigation we have concluded that none of these bearings are required at this time other than the ones identified for the ESH 20/90 dragline at Baga Nuur This is a generator bearing rMw 2500 with description no 32244 and is identified in your master listing as item 71 only 2 bearings are now critical versus the 6 earlier requested As you will recall we corrected this item saying it was for the 15/90 dragline versus the 20/90 dragline originally designated yet we now say the 20/90 dragline We willresolve this confusion shortly

If you have any questions or directives please advise

abd/afh

cc Fred Schaeffer

2 December 1992

To: Phil McCandless

From. Bruce P. DeMarcus

Subject **Current Developments and Issues**

In this memo, we offer the events of the past week for your review and acknowledgement

On November 27, we were notified by "Nuurs" that they had received notice that a shipment containing wire ropes and conveyor belt would be arriving in Ulan Baatar on Saturday, November 28 On the 28th, the ministry of Fuel and Energy personnel were at the airport and prepared to receive such a shipment. Unfortunately it did not arrive

On November 30th, we had another meeting with "Nuurs" They had had lengthy discussions with their representatives in Moscow. "Nuurs" was in total confusion as to the information that they received from their Moscow representative and a letter that their ministry had received from Mr. Nance of AID.

1) The memo from AID indicated that 52mm wire rope and 1600mm conveyor belt would arrive by plane from Russia on the 28th of November. "Nuurs" had been informed that this 52mm wire rope would not be manufactured in Russia until the 25th of December. Then it would be air freighted to Ulan Baatar. The 1600mm conveyor belt would not be ready for rail transport until the 25th of December as well(rail transport is expected to take 2-3 weeks into Mongolia).

2) The second item of confusion was the notification that the balance of the conveyor belt would be delivered in Ulan Baatar by rail on December 12th "Nuurs" could not comprehend how this could happen if the highest priority belt (1600mm) would not arrive until in January sometime

3) Crusher parts for Baga Nuur were also to arrive on the December 12th delivery The "Nuurs" information was that these parts had not been ordered due to unsuccessful negotiations on price

4) Excavator spare parts for draglines ESH 20/90, 15/90, 10/70, and 13/50, were defined and designated as arriving Ulan Baatar by rail from Russia on December 17th The question "Nuurs" had was that they had heard from their Moscow representative that some of the dragline parts had been canceled,as follows

* Shaft gear for the ESH 15/90, item 66 on UE&C master list.

* Safety valve for the ESH 15/90, item 67 on UE&C master list
* Rack gear for ESK 5A shovel, item 68 on UE&C master list.
* High voltage controller for ESH 15/90, item 69 on UE&C master list
* A 1250 hp motor, item 70
* Dragline bearings for the ESH 20/90, item 71 on UE&C master list.
* House Rollers and shafts for ESH 15/90, items MK had added and noted as being critical

5) Also designated as arriving on December 17th were Excavator parts for the following EKG 5A, EO 10011 and EO 5112 But no mention of parts for the 81 shovel. Nuurs' Moscow representative furnished the following information.

* The request for EKG 5A was not for parts but for a completely new shovel.
* EO-10011, EO-5112 and 81 shovel parts had all been canceled completely.

Besides this information with respect to the letter from AID of November 27th, "Nuurs" offered the following concerns and questions(some of these are repeated from our memo to you of 11/28/92)

The small drill that had been requested from Russia is no longer available The Russians offered an alternate drill, a CbP - 160 Can or will this unit alternate be purchased?

. Why have only two locomotives been approved versus the four agreed to originally?

If the reason for canceling the parts is that they have already been ordered, then Nuurs questions how this rational is applied? Since other items in the same situation have been re-ordered under new contracts.

On December 30th, Messers McCandless (UE&C) and DeMarcus (MK) met with Mr. Nance on December 30th and briefed him on the information we had received from Nuurs Also we had expressed Nuurs' concerns to him Based on this information he contacted the ambassador and briefed him Additionally, in our presence he drafted a cable to Washington questioning the misinformation he had received He once again identified the most critical items to be shipped in a partial quantity (39mm and 52mm dragline hoist and drag wire ropes) as soon as possible on the next air flight. We informed Mr Nance that we would be talking to your office in Boston that evening to reconcile the various and contradicting information

The following evening, December 1st, we were able to make contact with your office and talk to Mr Phil Cabral and staff. They were very helpful in addressing all our questions Basically they concurred with the information we had received from Nuurs. The following responses parallels the items listed earlier

A-1) The 52mm wire rope would not be available from Russia until the end of December Recognizing this late delivery, UE&C had started to find alternate suppliers in the U.S to supply an immediate air shipment.

The 1600mm conveyor belt would not be available until the 2nd or 3rd week in December and would come by rail A U.S supplier could not fill the order for 12 weeks, so the Russian supply will be the most expeditious.

A-2) The balance of the conveyor belt order will also be available for rail shipment during the 2nd or 3rd week of December. It is anticipated that any Russian rail shipment will take 2 to 3 weeks

A-3) Negotiations on crusher parts had been unsuccessful and discontinued. There is only one Russian supplier and they upped the price from the previous quote $26,000 and would discuss nothing else. Mr. Cabral asked if we could determine if there existed any old debt or some other extraordinary reason for such a response We have investigated the situation and find no outstanding debt due to this manufacturer We confirmed that this is the only manufacturer in Russia and suspect that they are taking advantage of the situation. Unfortunately these parts are not made in the U S. to fit the Russian crusher Mr Cabral's second question was as to how critical these parts are This is still being investigated We are getting varying responses to this question and will have to return to the mine and inspect for ourselves.

A-4) Some excavator parts have been canceled Nuurs is correct in their knowledge except for item 71 (bearings) The following reasoning was given for canceling each item

Items 66, 67, and 68 had all previously been ordered by the Mongolians and they have also

already been delivered and received.

Items 69 and 70 have also arrived in Mongolia and have already been paid for by the Mongolians.

Item 71 (Nuurs information was in error) These bearings are for the 20/90 Two of which have been ordered and will be paid for by AID funding

House rollers and shafts were requested by the Mongolians in Moscow This was the first the UE&C people had heard of these items and had no information or support for such a request Thus they were canceled Mr Cabral indicated that he had just received our request for such items and he would see if such a purchase could be accommodated.

A-5) UE&C recognizes that the EKG 5A is a brand new shovel and an order has been placed for its purchase. We informed Mr. Cabral that we have found a new 5A shovel in Mongolia It is located less than 100 miles from where it is currently needed and the purchase price is less than $300,000 dollars Purchasing this shovel would save $350,000 dollars (purchase price of new Russian shovel is $650,000). Mr Cabral will look into cancellation options and charges to determine if it can be accomplished

Parts for EO 10011 and EO 5112 small hydraulic shovels had been canceled since these items had previously been ordered by the Mongolians We stress the critical importance of these parts. They are for numerous small coal mines throughout Mongolia in very remote areas These machines are broken down and small villages are beginning to freeze up as a result. We recognize that the main importance is the Ulan Baatar area and that we must draw the line somewhere, but these are critical items. We wanted to make sure every one appreciates what this request represented

Parts for the 81 shovel were cancelled since the parts were ordered by the Mongolians and because they were currently receiving these parts in Mongolia

With respect to the locomotive rebuild situation, we were informed that two locomotive rebuilds out of the original four were cancelled for two reasons It will take 3 months to refurbish one locomotive, therefore to complete 2 will take until May of 1993 and thus beyond the emergency crisis of this winter The second reason is that the rebuilds are quite costly and funds are running low.

We discussed the drill situation with your staff in Boston. They asked that we provide specifications of the alternate Russian drill, which we will provide shortly.

Although we did not specifically discuss with UE&C Boston the question Nuurs had concerning when the ruling that previously ordered parts were to be canceled or not canceled. We did understand through our conversations that the funds are nearly exhausted and tough decisions on cancellations have had to been made. Hopefully with the Mongolian alternative 5A Shovel (approx $350,000 savings) and with alternative gas detection system for Nalıakh (approx $100,000 savings) some of these canceled items can be obtained.

Today, December 2nd, we asked Nuurs and the Ministry to review with us the items that have been canceled Also to prioritize and defend to us why they must be obtained. We will report our findings to you as quickly as possible.

The final issue was a request to determine if tire size 2100-33 was an error or would a 2100-35 act as a replacement The answer is that the description number is incomplete The total description number for this tire is 2100-33-32PR (International - Russian rating). This tire cannnot be interchanged with a 2100-35-36PR. Looking at the wheel hub and rim specifications, we do not have adequate demensions or drawings to identify a replacement rim to fit the 2100-35-36PR tire To change out all the rims would be very expensive We have found the Russian supplier for these tires

Bobruisk Tire Plant
Bobruisk, Belarusia 213824
Minsk Road
TLX 252647
TEL 350-68
Att Mr Alexsecv Tel: 350-68

We would like to add that if weight becomes critical other items are more important than tires when it comes to air freight from the U.S Items in IOC to you of 11/20/92 and copper wire for rewinding electric motors mentioned in Attachment 1 of Progress Report dated 11/16/92 are in greater demand.

If you have any questions or directives please advise

AFH-A

cc: Fred Schaeffer

COAL MINE COAL QUALITY STATISTICS
12/4/92

COAL MINE	ASH %	KCAL/KG	MOISTURE %	SULFUR %	VOLITLE %	ANNUAL PROD. 1000'S TN
SHARYN GOL	22	3900-4100	18	0.6	45	1400
BAGA NUUR	20	3200-3500	33	0.5	45	4000
SHEEVE OVOO	12	2800-3200	35	0.9	45	500
ULAN OVOO	10	4800-5600	?	0.25	35	--
NALAIKH	20	4500-5500	15	0.7	45	300
TALVIN TOLGOI	20	5300-6000	8.5	0.5	32.5	170
ALUNCHULUUN	9	2400	46	0.8	45	520

POWER PLANT COAL DEMAND STATISTICS
12/4/92

POWER PLANT	ASH %	KCAL/KG	MOISTURE %	SULFUR %	VOLITLE %	ANNUAL DEMAND 1000'S TN
ULAN BAATAR #2	20	4500	15	0.7	45	170
ULAN BATAAR #3	22	3900	18	0.6	45	948
ULAN BATAAR #4	20	3550	32	0.5	45	2100

IOC

4 December 1992

To: Phil McCandless, UE&C
From: Bruce P. DeMarcus, MK

As we have discussed previously, we have itemized and prioritized the items which we understand have been canceled Included is a brief description of the current status All descriptions, part numbers and suppliers have been submitted in previous correspondence

Priority	Description/Status
1-1)	Item 66, Shaft gear for the ESH 15/90 - This item has arrived in Mongolia, but no payment has been made
1-2)	Item 67, Safety valve for the ESH 15/90 - Same status as above.
1-3)	Item 68, Rack gear for the EKG 5A - Same status as above
2-1)	House Rollers and Shafts for ESH 15/90 - No order or delivery has been made. Request has been canceled since adequate description and support from MK has only recently been received
2-2)	Crusher parts for Sharyn Gol These parts are in critical demand as they have been rewelded so many times that the metal has fatigued. Orders have been made by the Mongolians and some parts have been received but no payment has been made.
2-3)	EO-10011 & EO-5112 small excavator parts These parts have been ordered by the Mongolians. None have arrived and no payment has been made
3-1)	EKG-8i Shovel spare parts The parts were ordered by the Mongolians Some parts have arrived
3-2)	Locomotive Rebuilds, 2 of the original 4 rebuilds have been canceled

In discussions with Nuurs, it was difficult to understand why the first 3 items (1-1,1-2,& 1-3) were listed so high in the priority list when they have already been received The answer is logical in that the fourth item (No. 2-1) must be purchased from the same manufacturer and if payment is not made on the delivered parts there will be no chance of receiving item 2-1

In discussions with Mr Nance of AID, it was well understood that AID would not fund items the Mongolians have already taken possession of With this guideline, it would appear that 6 items

(1-1,1-2,1-3,2-1,2-2,& 3-1) will not be secured by AID. This would only leave items 2-3 & 3-2 in question However confirmation of this understanding should be made by UE&C people

On another issue, we offer that if the first flight is full and prioritizing of items to make weight restrictions becomes necessary, the tires can be minimized and only 800 meters of ventilation bag is necessary immediately.

Also bearing description no 32244 is definitely for the ESH 20/90 dragline.

The opportunity for replacing the EKG 5A shovel for one in Mongolia is no longer an issue It was a transaction which was already in progress and therefore does not effect the need for an additional shovel

We have received specifications for the alternate drill, Model CbP-160, they are as follows

Hole Diameter	160mm
Type	Auger
Drill depth	24 meters
Angle drilling capability	30 degrees
Power	380v - 50 hertz
Feed thrust	80 Kilo Newtons
Air consumption	3 5 cubic meters/min.
Installed power	184 kW
Ground pressure	80 kPa
Model No	CbP - 160A-24

*Note the larger machine has a compressor A detailed specification sheet will be sent in the next mail pouch

MNE12_4

cc Fred Schaeffer

Date:12/6/1992

To: Phil McCandless - UE&C
From: Bruce P. DeMarcus - MK

Subject: Training Sessions and Recent Developments

On the dates of 11/2 and 11/3, Messrs. DeMarcus and Helbig gave training seminars to the administration management of the Ministry for Fuel & Energy. In addition to these individuals; some managerial, maintenance, engineering and procurement personnel from the coal mines and "Nuurs" company also attended, approximately 20 to 30 people were at each session. Although similar sessions will be held at the mines, it was critical that the senior people in the Ministry be educated first and that they were knowledgeable concerning the subject matter prior to its being presented to their mine personnel.

The sessions included the following topics:

a.) Inappropriate operational practices observed at the mines and the necessary corrective actions.

b.) The importance of establishing a preventative maintenance program.

c.) The benefits and achievements gained from good operational and maintenance programs.

d.) Mine planning and equipment replacements based on cost and economic criteria versus strict engineering and the government planned system.

e.) Basic market and competition forces (which would shut down some mines or force changes in mine planning in the mines we saw).

f.) Inventory and procurement procedures.

g.) Effective equipment utilization.

h.) Monitoring and accounting systems.

An extensive session was dedicated to drilling and blasting. Beginning with a basic explanation of how rock breakage occurs in blast hole use of explosives. Then how to combine blast patterns with delay blasting techniques to create more effective blasts. New developments in blasting delay technologies and their use with explosives were discussed. This presentation also covered problems with the explosives the mines currently use and the cause of unsatisfactory performance of ANFO as used by some of the coal

mines during the winter of 1991.

In conclusion, the seminars were quiet, productive and the best way to reach the largest number of people. The seminars resulted in several smaller spin-off meetings where people wanted specific questions answered.

Finally there is one new item to report concerning the acquisition of parts and materials. The crusher parts which were earlier identified and subsequently canceled, have been secured through a barter arrangement by the Mongolians. They have made an arrangement to trade building bricks for the crusher parts. Therefore they can be excluded from any further consideration.

afh/MNE12_6

cc: Fred Schaeffer

Date: 12/12/1992

To: Phil McCandless - UE&C
From: Bruce P. DeMarcus

Subject: Sharyn Gol Operations & Training Effort

On December 10th and 11th, Messrs. Helbig and DeMarcus focused their attention on operational practices as observed at the Sharyn Gol Mine This included our presence at preshift supervisor meetings and in subsequent meetings where instructions were given to the craft personnel Shift changes for both graveyard and day shifts were observed (only 2 - 12 hour shifts) The intent was to determine organizational and communicational effectiveness Additionally, we reviewed the imminent material and supply needs to confirm our latest information. Production as well as drilling and blasting procedures were inspected. Two, three hour seminars were presented. The first one was for production and engineering personnel on basic blasting concepts. These include the mechanics of rock breakage, surface blast design, use of blasting delays, utilization of proper detonating cord and new blasting technology. The second seminar was on cost management, maintenance, plus inventory and procurement procedures This seminar was attended by production, maintenance, engineering, administrative and accounting personnel. A review of the Sharyn Gol current cost accounting system was made This was made in conjunction with an analysis of last years monthly mine production, monthly rail deliveries, montn end mine stockpile inventories and in-pit inventories. The period covered was October 1991 thru April 1992 compared to actuals for October and November 1992 plus projections for December 1992 and early months of 1993 At the conclusion of the visit, the General Director brought in all of his deputy directors for a close out meeting At this meeting, we were requested to present our observations and recommendations both good and bad. The following provides our findings and conclusions.

1) At 7 30 AM, before the beginning of dayshift until 8.00 AM; there is a supervisors meeting This meeting is chaired by the Deputy General Manager and appeared to be well organized and thorough Reports from the previous dayshift and graveyard shift production and maintenance activities were reviewed, analyzed and new assignments made From this meeting, the supervisors meet with the craft personnel who start dayshift at 8:00 AM. The discussions with the craft employees lasted until 9:00 AM After these meetings ended, the craft employees had to walk (some rode horses) to their assigned work areas. Walking to these work could take up to an additional 40 minutes. From the start of dayshift, approximately 1 hour

and 30 minutes was lost. Then at 4·30 PM, another meeting is held with the supervisors to prepare for the graveyard shift which starts at 8 00 PM. The supervisors reported the status of the production and maintenance achieved on dayshift and decisions were made for the conduct of the graveyard shift and what was to be accomplished. These instructions were then passed on to craft masters(lead men) for implementation. On graveyard shift there are no staff supervisors Shift change for graveyard shift was much smoother and efficient. This was as a result of the absence of formal meetings and instruction presentations.

2) Mine management identified several material and supply items but none were additional or new to previous listings. We did inspect the heating plant which has been of considerable concern. In tne heating plant only one boiler out of four is operational. This plant supplies heat both to the mine structures and to the employee housing plus the town of Sharyn Gol. This plant is literally held together on a shoe string. There are so many leaks that in some places inside the heating plant it resembles a ice house. It is hard to imagine how this system will continue througn the winter without major interruptions to service

3) Field inspections of production, maintenance, drilling and blasting procedures were conducted. Even though the roads are frozen, they have deteriorated since our last visit. Their equipment, particularly road graders and dozers are not large enough to handle the frozen roads effectively. No graders were working at all. Road graders should be in continuous operation during mining operations Their assignments include sweeping roads of spillage, clearing ice off of the road surfaces and making continual road repairs The consequence of a lack of road maintenance is seen in the resultant truck repairs required For example, radiators on the new Terex 40 ton haul trucks have broken several times; tires continuously are losing air due to small leaks around the rims. The Chinese tires supplied on the Terex Haul Trucks are forming sidewall bulges or bubbles which are a result of either rough roads, high speeds, poor tire construction or a combination of all these factors. The lack of utility and support equipment is viewed as one of the major problems seen at this and other Mongolian coal mines. Another obvious example of this was witnessed in the maintenance shop where the mechanics were dismounting large tires from their rims. Not having the proper equipment, they were utilizing a haul truck to break the tire bead. This is done by raising the truck bed hence lowering the tail section of the truck bed onto the rim of the tire to be broken down. To accomplish this the

tire was stacked on top of other tire to raise its elevation. In the 30 minutes we observed this effort, the procedure being attempted was not successful, nor were the other 15 people observing of any help.

Discipline was lacking in maintaining proper drill pattern geometry. Prior to blasting, while tying in of the blast holes with detonating cord, the knots tied were sloppy and loose. Additionally long tails of excess detonating cord were left where the down line and trunk lines were tied This practice can lead to numerous cutoffs and misfires Directly following the close out session where we gave management our observations, one of which was that they were employing a less than effective drill pattern in relation to the structural geology of the deposit in blasting waste rock; we accompanied the blast engineer to the site of a blast being currently prepared. The engineer directed the blast crew to tie the blast holes for half the shot in the manner suggested during the blasting training seminar, and to tie the remaining half in their traditional manner. After the blast, the rock movement, energy trough created and fragmentation of the blasted rock was observed. It was obvious that the newly tried technique was more beneficial than the traditional method.

4) After the presentation on cost accounting, maintenance procedures, purchasing and inventory control; we were allowed to inspect the chart of accounts and accounting procedures currently being employed. On several occasions we have been asked what is the value or cost of coal and have been thus far unable to determine it or respond. However the following exercise is as close an approximation as we have been able to devise. When reviewing these figures the following must be kept in mind

(i) Actual recognized inflation in prices for in-country items has increased over 200% this year. These figures represent the cost for a three month period (Aug.,Sept., and Oct. 1992). These are as current as possible to minimize the influence of inflation.

(ii) Purchased foreign (Russian) materials and supplies are bought with hard currency or bartering Bartering agreements between the Mongolian government and the Russians use value in dollars as the basis. The mine however acquires parts and supplies at the official exchange rate of 40 tugriks to the dollar This under values the true worth of the parts and supplies charged to the mine. Such items have been recalculated at the so called parallel exchange rate of 320 tugriks

to the dollar to more realistically represent value.

	Description	Mongolian Recorded Cost Unit Cost	Percent	Corrected Cost Appropriate Exchange Rate Unit Cost	Percent
1.*	Explosives	56.76	12.00%	454.01	20.0%
2.*	Materials(RR ties,Rails teeth, wire ropes, elect. cables)	28.38	6.00%	227.04	10.0%
3.*	Fuel & Lubricants	82.78	17.50%	662.20	29.2%
4.	Electricity	20.40	4 30%	20.40	1.0%
5.	Total Salary(Adm,Mgt,Eng Craft)	67.17	14.20%	67.17	3.0%
6.	Depreciation of Equip.	99.33	21.00%	99.33	4.4%
7	Social Security	9.22	1.95%	9.22	0.4%
8.	Administrative Expense	6.62	1.40%	6.62	0.3%
9.	Outside Repair	1.89	0.40%	1.84	0 1%
10.*	Sinking Fund New Equip.	10.88	2.30%	87.03	3.8%
11.*	Tire Amortization	5 91	1.25%	437.00	19.3%
12.*	Remaining Parts & Supply	15.61	3.30%	124.87	5.5%
13.	Water	0.43	0.09%	0.43	<0.1%
14	Safety	1.04	0.22%	1.04	<0.1%
15	Security	0.33	0.07%	0.33	<0.1%
16.	Domestic Transportation	6.15	1.30%	6.15	0.3%
17.	Telephone, Paper & Mail	0.33	0.07%	0.33	<0.1%
18.	Miscellaneous	15 61	3.30%	15.61	0.1%
19.	Heating Plant	17.97	3.80%	17.97	0.1%
20	Misc. Amortization	0.24	0.05%	0.24	<0.1%
21	Profit	26.49	5 60%	26.49	1.2%
	Total Tugriks	473.54	100.00%	2265 37	99 2%
	Total $ @ 320:1	$1.48		$7.08	

*Denotes those items which are inflated for the true value of purchasing hard currency items.

Although this is an approximation of true cost, it does not represent the lack of investment in parts that should have been purchased. The equipment which is running will not last long. Since preventive maintenance and repairs have not been performed. The costs represented here do not reflect a continuing operation and therefore are significantly understated (easily up to 50%).

Although not obvious, the biggest correction (increase in cost) in the cost is not appreciation for the work needed to be performed versus what was accomplished. Since less than 1/2 the overburden was removed during this period compared to what should have been removed to maintain future operations. Therefore the costs recorded are 1/2 of the true cost to sustain this mine in the

future.

5) To determine the condition of the Sharyn Gol Mine this year in comparison to last year, we asked to review the records of production and coal inventory for the current period in comparison to this time one year ago The following was recorded in 1,000's of tonnes.

	Delivered tonnes	Produced tonnes	S/pile Inventory	In-Pit Inventory
Oct 91	104.0	96.1	44 0	140.0
Nov.91	150.1	132.1	26 0	280.0
Dec.91	160.1	153.0	19.0	150 0
Jan.92	151.1	153.1	21.0	200.0
Feb 92	166.4	175.4	30.0	210.0
Mar.92	142 0	145.0	23.0	100.0
Apr.92	106.7	108.7	35.0	70 0
Oct.92	85.4	110.4	30.0	100.0
Nov.92	142.5	162.5	50 0	150.0
Dec.92*	160.0	160,0	50.0	200.0
Jan.93*	150.0	150.0	50.0	200 0

* Denotes Forecast

It would appear that Sharyn Gol will, as it did last year, make a considerable contribution during the winter months. Its planned annual production is 1.4 million tonnes or 115,000 tonnes per month, currently it is prepared to deliver 150,000 to 160,000 tonnes per month during this winter period After reviewing the mine plan and inspecting the pit we are convinced that this is achievable and more if necessary. However this production will result in lower production and a much higher cost for coal in the year to come.

6) At the conclusion of our inspection and tour of the mine, we were allowed to address the senior management of the mine and present them with our findings and observations. These included the following

a. Shift change wasted 15% of the productive time of the employees.
b. Road conditions contribute to higher cost and lower availability of the haul truck fleet.
c. Blasting procedures can be improved with proper utilization of blast patterns and proper tie in procedures.
d To many people wander about idle, when shops are cluttered, disorganized, generally dirty and poorly maintained Regardless of a lack of available parts, personnel should be put to work in organizing and housekeeping. Once

management shows pride in the operations the employees will gain a better attitude. With what little the Mongolians have to work with, this is one area where positive principles and expectations can be initiated

e. Meetings for supervisors are through and well organized, however meeting times are excessive and as a result productive time suffers.

This concluded our second visit and assessment of the Sharyn Gol Mine. We will perform the same evaluation and presentations at the Baga Nuur Mine within the next few days. If you have any questions or directives please advise.

afh/MNE_1212

cc: Fred Schaeffer

Dated: 12/15/1992

To: Phil McCandless - UE&C
From: Bruce P. DeMarcus - MK

Subject: Critical Mining Items Not Recognized In First Flight Schedule

Per your request we have reviewed the listing of items to be supplied in the first shipment and have the following comments We have taken into consideration that this request will require a quick response in order to make the first air shipment and that space on the airplane will be limited Additionally we have considered American supply availability

1) Quantity and volume of each item would be helpful in determining distribution

2) All 6,000 meters of ventilation bag is not necessary at this time, 1,000 meters is more than sufficient for the next 2 - 3 months See correspondence dated 11/20/92

3) No mention of zipper splices or glue for splicing conveyors See correspondence of 11/20/92.

4) We can not determine what electrical cables will be supplied by the description Again, the total amount need not be delivered all at once The following is the minimum quantity for each type. See correspondence of 11/16/92

High Voltage (6000v) Kr3 3x35+1x10	750 meters
3 wire - 35mm copper, 1 ground - 10mm copper	
High Voltage (6000v) Kr3 3x50+1x16	1250 meters
3 wire - 50mm copper; 1 ground - 16mm copper	
High Voltage (6000v) Kr3 3x70+1x25	750 meters
3 wire - 70mm copper; 1 ground - 25mm copper	
Low Voltage (1000v) KMrCH 3x35 - 1x16	750 meters
3 wire - 35mm copper; 1 ground - 16mm copper	

5) Quality & Type of batteries can not be determined. The following is a minimum quantity See correspondence of 11/16/92, 11/20/92, & 11/28/92.

24 volt, 182 Amp/hr, 18 Amp, Description 6ct-182 or Caterpillar Equivalent
Maximum dimensions 143mm (H), 282mm (W), 522mm (L)
100 of

24 volt, 132 Amp/hr, 13 Amp, Description 6ct-132 or Caterpillar Equivalent.
Maximum dimensions 244mm (H), 211mm (W), 514mm (L)
50 of

64 volt, 450 Amp/hr, Description 32TH-450 or equivalent Dimensions 375mm (H), 354mm (W), 738mm (L) There are 8 batteries to a set - 16 batteries needed or 2 sets

*Note Sufficient electrolite must be supplied in sufficient quantities for all batteries supplied.

6) A listing of items not identified on schedule which are very critical and need to be put on the first shipment if at all possible are

a) 39mm Wire Rope - See correspondence 11/16/92, 11/17/92, and 11/20/92

b) Batteries (see batteries listed above)

c) Copper wire for rewinding electric motors:
See correspondence 11/16/92

Sizes	Qty in Kg
0.20mm	30 kg
0.25mm	30 kg
0 28mm	30 kg
0.31mm	30 kg
0 35mm	50 kg
0.40mm	50 kg
0.71mm	150 kg
0.55mm	100 kg
0.63mm	150 kg
0.75mm	300 kg
0.80mm	300 kg
0.85mm	300 kg
0.90mm	300 kg
1.05mm	600 kg
1.08mm	600 kg
1.18mm	450 kg
1.20mm	750 kg
1.12mm	600 kg
1.25mm	600 kg
1.27mm	300 kg
1 36mm	450 kg
1.40mm	600 kg
1.56mm	750 kg
1.60mm	900 kg

d) House roller and shafts for the ESH 15/90 dragline at Baga Nuur, Russian supplied. See correspondence of 11/16/92 & 11/28/92

Description No Roller 1040-04-01-1 102 needed
Description No Shaft 1030-04-03-1 102 needed

e) Hard Facing Welding Rods 2.5 tons
380 Amp AC-DC welders, 3 to 5mm rod
See correspondence 11/16/92

f) Brushes for Electric Motors
Description 3r-14 Size 25mm x 32mm x 40mm 150 of
Description 3r-14 Size 25mm x 32mm x 50mm 800 of
See correspondence 11/16/92`

If you have any questions or directives please advise.

afh/MNE_1215

cc Eric Peterson - AID
Fred Schaeffer - MK

MORRISON KNUDSEN CORPORATION

MINING GROUP
MORRISON KNUDSEN PLAZA
PO BOX 73/BOISE IDAHO U S A 83729
PHONE (208) 386 5000/TELEX 368439

Prepared for.

UNITED ENGINEERS & CONSTRUCTORS

In Accordance With·

"MK CONTINUING SERVICES"
For
Technical Assistance of Mongolian Emergency Heat and Power Project No 1

Contract No 7419 002 49-2

TECHNICAL REPORTS

- ***Coal Mine Procurement for 1993/1994 Heating Season***
- ***Operations and Maintenance (O & M) Training***
- ***Maintenance Order Entry and Tracking System***
- ***Shivee Ovoo Management Overview***
- ***Blasting Training Sessions and Evaluation***

March 1993

MORRISON KNUDSEN ® CORPORATION

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MORRISON KNUDSEN CORPORATION

MORRISON KNUDSEN PLAZA
PO BOX 73/BOISE IDAHO U S A 83729
PHONE (208) 386 5000/TELEX 368439

April 22, 1993

Mr Gerald Paradysz
Project Coordinator
United Engineers and Constructors
Ulaanbaatar, Mongolia

Subject **Submittal of Contractual Deliverables Contract 7419.002 49-2 "MK Continuing Services" for Technical Assistance for Mongolian Emergency Heat and Power Project No 1**

Dear Mr Paradysz

Morrison Knudsen is pleased to submit the following documentation and reports in compliance with our contractual responsibility You will find enclosed the following material

Section 1	Procurement for 1993/1994 Heating Season
Section 2	Operations and Maintenance (O & M) Training Report
Section 3	Maintenance,Order, Entry, and Tracking System Analysis
Section 4	Shivee Ovoo - Management Overview
Section 5	Blasting Training Sessions and Evaluations
Annexes	Miscellaneous Correspondence During this Phase

Other than attendance at the Valued Engineering sessions, submittal and your subsequent approval of these documents, should complete and fulfill our assignment Although working in Mongolia has been trying, the working relationship with you and other UE&C representatives has been excellent Hopefully we have made a positive contribution in Mongolia and look forward to the next opportunity to serve you

Sincerely yours,

Bruce P. DeMarcus

Bruce P DeMarcus
Project Director

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SECTION 1
PROCUREMENT FOR 1993/1994 HEATING SEASON

1 1 GENERAL

The objective of this effort was to identify the equipment and parts needs for the Mongolian coal industry for the 1993/94 heating season beginning October 1993 through April 1994

Based on lengthy discussion with the Nuurs Company, the purchasing agent for the Ministry of Fuel and Energy for the coal mines, Ministry executives and field investigations, we have identified over 800 individual items These items have been categorized in numerous ways for your review The following identifies how each of the following spreadsheets is organized

1) Individually by mine (Baga Nuur, Sharyn Gol, Shivee Ovoo, Aduunchuluun and local mines), on a priority basis, without consideration of source

2) Individually by mine, on a priority basis, but segregated by source

3) An aggregate listing of all mines together on a priority basis without consideration of source

4) An aggregate listing of all mines together on a priority basis but segregated by source

It is fair to say we have not arbitrarily accepted the recommendations of the Ministry but have presented the items which, in our judgment, would be of greater benefit and value to the Mongolian coal industry We are prepared to discuss and defend our position on these items, yet recognize there can be valid arguments supporting differing positions

The valued engineering session should be quite instrumental in resolving such differences to the mutual satisfaction of the participants

We have found it disappointing that with our best attempts, we are unable to purchase or acquire many replacement parts for Russian or Eastern Block manufactured equipment This is readily recognized in our spreadsheets where U S sourcing is not defined One could go to extravagant efforts to attempt to reproduce identical or similar replacements which would require detailed analysis and engineering of the part to be replaced and specialized machines and retooling to produce Such exercise not only appears unreasonable, but the associated cost versus the Russian source would be unacceptable Even in those areas such as explosives, dragline buckets, wire rope, etc where alternatives are available, the transportation cost makes the acquisition questionable However, wherever we have been able to define alternative American suppliers, we have identified them and the associated cost

It is our recommendation, based on this investigation, that investments be made in new American-made equipment so that not only western technology be incorporated, but the after market would be acquired from American manufacturers whether USAID continues their funding or not

1 2 MATERIALS AND PARTS PROCUREMENT - PRIORITY BASIS

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1 3 MATERIALS AND PARTS PROCUREMENT - SOURCE BASIS

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1 4 MATERIALS AND PARTS PROCUREMENT - AGGREGATE - PRIORITY BASIS

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1 5 MATERIALS AND PARTS PROUREMENT - AGGREGATE - SOURCE BASIS

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MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	164	ALUM WIRE	OVERHEAD FIELD LINE		TONNE	7 5	BA	4 912	$36 844		USA	1 Sep 93	
1	8	ANFO TR	ANFO MIX TRUCK		EA	1	BA	$135 125	$135 125		USA	1 Sep 93	
1	162	BATTERIES	32 CT 450 AMP/HR 24 V	8 BAT /SET	EA	32	BA	414	$13 248		USA	1 Sep 94	
1	5	BULLDOZER	CAT D 10 BULLDOZER		EA	1	BA	$638 900	$638 900		USA	1 Sep 93	
1	21	COAL CRUS	STAMLER FEEDER BREAKER		EA	1	BA	$400 000	$400 000		USA	1 Jan 94	3 MO SHIPPING TINE
1	29	DRAG W PTS	13/50 15/90 /20/90		LOT		BA	$187 000	$187 000		USA	1 Sep 93	
1	30	DRAG W PTS	10/70		LOT		BA	$30 000	$30 000		USA	1 Sep 93	
1	22	DRAG BUCK	20/90 DRAG BUCKET/COMPLETE		EA	1	BA	$220 000	$220 000		USA	1 Sep 93	
1	23	DRAG BUCK	15/90 DRAG BUCKET/COMPLETE		EA	1	BA	$180 000	$180 000		USA	1 Sep 93	
1	24	DRAG BUCK	13/50 DRAG BUCKET/COMPLETE		EA	1	BA	$180 000	$180 000		USA	1 Sep 93	
1	25	DRAG BUCK	10/70 DRAG BUCKET/COMP		EA	1	BA	$113 000	$113 000		USA	1 Sep 93	
1	39	EXPLOSIVES	75lb CAST PRIMERS		EA	130 000	BA	$1 75	$227 500		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	41	EXPLOSIVES	PRIMADETS #12/30FT		EA	100 000	BA	$2 00	$200 000		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	42	EXPLOSIVES	PRIMADETS #12/12FT		EA	30 000	BA	$1 75	$52 500		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	44	EXPLOSIVES	MSGS SURFACE DELAYS		EA	13 000	BA	$2 60	$33 800		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	46	EXPLOSIVES	25 GRAIN DETONATING CORD		KM	450	BA	$280 00	$126 000		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	10	FUEL TRUCK	FUEL & LUBE TRUCK		EA	1	BA	$90 275	$90 275		USA	1 Sep 93	
1	2	GRADER	CAT 16G MOTORGRADER		EA	1	BA	$385 000	$385 000		USA	1 Sep 93	
1	32	SHOV BUCK	WEAR PARTS		LOT		BA	$23 000	$23 000		USA	1 Sep 93	
1	27	SHOVEL B	EKG 4 6 SHOVEL BUCKET		EA	1	BA	$79 000	$79 000		USA	1 Sep 93	
1	13	TIRE TRUCK	TIRE HANDLING TRUCK		EA	1	BA	$79 925	$79 925		USA	1 Sep 93	
1	90	WELDING RD	ZETA HARD FACING ROD 5/32		lbs	10 000	BA	$0 55	$5 480		USA	1 Sep 93	
1	54	WIRE ROPE	64 mm(2 5) 16 8 Kg/M 15 TONNE		FT	2 851	BA	$8 05	$22 951		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	55	WIRE ROPE	57mm(2 25) 13 6 Kg/M 35 TONNE		FT	8 244	BA	$5 97	$49 217		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	56	WIRE ROPE	52 mm(2) 10 7 Kg/M 25 TONNE		FT	7 458	BA	$4 60	$34 307		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	60	WIRE ROPE	39mm (1 5) 4 2 Kg/M 25 TONNE		FT	11 040	BA	$2 31	$25 502		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	1	ELEC RR	ARC SHOE PLATES	3E 14D	EA	10	BA				URK	1 Sep 93	
1	2	ELEC RR	ARC SHOE PLATES	3E 14 1D	EA	10	BA				URK	1 Sep 93	
1	3	ELEC RR	AUTO SWITCHES	KPD 131	EA	2	BA				URK	1 Sep 93	
1	4	ELEC RR	AIR COMPRESSOR	KB 1V	EA	4	BA				URK	1 Sep 93	
1	5	ELEC RR	CONT TROLLEY LEFT	TB-13D	EA	4	BA				URK	1 Sep 93	
1	6	ELEC RR	CONT TROLLEY RIGHT	TB-12D	EA	4	BA				URK	1 Sep 93	
1	7	ELEC RR	AUTO CON COUPLING	CA 3M	EA	20	BA				URK	1 Sep 93	
1	8	ELEC RR	PACKING SHAFT MOTOR		SET	6	BA				URK	1 Sep 93	
1	9	ELEC RR	AIR VALVE		EA	10	BA				URK	1 Sep 93	
1	10	ELEC RR	AIR VALVE		EA	20	BA				URK	1 Sep 93	
1	11	ELEC RR	SWITCH START&STOP		EA	5	BA				URK	1 Sep 93	
1	12	ELEC RR	SWITCH BLK W/MAG		EA	20	BA				URK	1 Sep 93	
1	13	ELEC RR	CONDENSORS		EA	2	BA				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	14	ELEC RR	GROUNDING ROD		EA	6	BA				URK	1 Sep 93	
1	15	ELEC RR	TRIRISTER ELEC		EA	30	BA				URK	1 Sep 93	
1	16	ELEC RR	DIRISTER ELEC		EA	200	BA				URK	1 Sep 93	
1	17	ELEC RR	HOUSING FOR AUTO COUP		EA	5	BA				URK	1 Sep 93	
1	18	ELEC RR	TOTAL COST US DOLLARS				BA		$130 000		URK	1 Sep 93	
1	50	EXPLOSIVES	AN BLASTING PRILL		TONNE	1 600	BA	$190 00	$304 000		SWD	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	53	EXPLOSIVES	ENULSION		KG	200 000	BA	$0 66	$132 000		SWD	1 Sep 93	
1	1	DUMPCAR	SIDE PANELS	634 01 000-0 cb	EA	8	BA				POL	1 Sep 93	
1	2	DUMPCAR	FRONT PANEL	634 04 000 3	EA	8	BA				POL	1 Sep 93	
1	3	DUMPCAR	PANEL LOCKS LEFT	634 01 010 2	EA	8	BA				POL	1 Sep 93	
1	4	DUMPCAR	PANEL LOCKS RIGHT	634 01 020 2	EA	8	BA				POL	1 Sep 93	
1	5	DUMPCAR	PANEL SUPPORTS	634 01 150 cb	EA	4	BA				POL	1 Sep 93	
1	6	DUMPCAR	SINGLE ACTION CYLINDER	640 45 010 cb	EA	6 4	BA				POL	1 Sep 93	
1	7	DUMPCAR	PISTON COLLARS	45 129	EA	200	BA				POL	1 Sep 93	
1	8	DUMPCAR	DOUBLE ACTION CYL	640 45 010 1	EA	8	BA				POL	1 Sep 93	
1	9	DUMPCAR	DOUBLE ACTION PISTON	640 45 105 2	EA	4	BA				POL	1 Sep 93	
1	10	DUMPCAR	DISTRIBUTION VALVES	372 000-1 9	EA	20	BA				POL	1 Sep 93	
1	11	DUMPCAR	ROD EQUALIZER	522 00-003 0	EA	2	BA				POL	1 Sep 93	
1	12	DUMPCAR	BOGGEY CONNECTOR	522 00 010 1	EA	2	BA				POL	1 Sep 93	
1	13	DUMPCAR	SQ AXLE CAP ENDS	74 10 116	EA	4	BA				POL	1 Sep 93	
1	14	DUMPCAR	OUTSIDE SPRING	522 38 001 0	EA	16	BA				POL	1 Sep 93	
1	15	DUMPCAR	INSIDE SPRING	522 38 002 0	EA	16	BA				POL	1 Sep 93	
1	16	DUMPCAR	SET SH ABSORBERS	522 38 016 0	EA	4	BA				POL	1 Sep 93	
1	17	DUMPCAR	FRAME	4686-6061 40-016	EA	20	BA				POL	1 Sep 93	
1	18	DUMPCAR	SMALL BRAKE LOCKS	46-03 015	EA	20	BA				POL	1 Sep 93	
1	19	DUMPCAR	PUSH RDS BRAKE PDS	61 40 133	EA	8	BA				POL	1 Sep 93	
1	20	DUMPCAR	FRAME ENDS RIGHT	61 40 110	EA	3 2	BA				POL	1 Sep 93	
1	21	DUMPCAR	FRAME ENDS LEFT	61 40 120	EA	3 2	BA				POL	1 Sep 93	
1	22	DUMPCAR	BRK PADS COMP POLY	TY 38 114 79 72	EA	600	BA				POL	1 Sep 93	
1	23	DUMPCAR	WHEEL PAIRS	61 10 046	EA	4	BA				POL	1 Sep 93	
1	24	DUMPCAR	WHEEL PACKING COVER	TY 519 07	EA	4	BA				POL	1 Sep 93	
1	25	DUMPCAR	BOGGEY CONNECTORS	522 00 020-1	EA	2	BA				POL	1 Sep 93	
1	26	DUMPCAR	DISTRIBUTOR VALVE		EA	16	BA				POL	1 Sep 93	
1	27	DUMPCAR	AUTOMATIC COUPLING		EA	12	BA				POL	1 Sep 93	
1	28	DUMPCAR	AUTO COUPLING HEAD	106 00 00	EA	4	BA				POL	1 Sep 93	
1	29	DUMPCAR	COUPLING LOCK	106 01 002	EA	8	BA				POL	1 Sep 93	
1	30	DUMPCAR	LOCK HOLDER	106 01 003 0	EA	4	BA				POL	1 Sep 93	
1	31	DUMPCAR	COUPLING TRIPPER	106 01 006 0	EA	8	BA				POL	1 Sep 93	
1	32	DUMPCAR	COUPLING HINGE PINS	106 00-012 0	EA	12	BA				POL	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	33	DUMPCAR	COUPLING SHOCK ABS	106-00-001	EA	8	BA				POL	1 Sep 93	
1	34	DUMPCAR	COUPLING SHOCK SLIDE	106-02 00-2	EA	4	BA				POL	1 Sep 93	
1	35	DUMPCAR	COUPLING SH AB LK	106-00-002 2	EA	16	BA				POL	1 Sep 93	
1	36	DUMPCAR	DOOR ACTLATOR ARMS	634 46 010	EA	16	BA				POL	1 Sep 93	
1	37	DUMPCAR	DOOR ACTUATOR ARMS	634 46-020-2	EA	16	BA				POL	1 Sep 93	
1	38	DUMPCAR	DOOR ACTUATOR ARMS	634 46-030	EA	8	BA				POL	1 Sep 93	
1	39	DUMPCAR	END VALVE		EA	20	BA				POL	1 Sep 93	
1	40	DUMPCAR	AIR SPEED REDUCERS		EA	16	BA				POL	1 Sep 93	
1	41	DUMPCAR	RING PACKING	38 72	EA	40	BA				POL	1 Sep 93	
1	42	DUMPCAR	AIR DISTRIBUTOR	482 000	EA	0	BA				POL	1 Sep 93	
1	43	DUMPCAR	PISTON COLLAR	270 397	EA	4	BA				POL	1 Sep 93	
1	44	DUMPCAR	PISTON SPRING	270 397	EA	8	BA				POL	1 Sep 93	
1	45	DUMPCAR	HOUSING ACC AIR	DR 483 00	EA	12	BA				POL	1 Sep 93	
1	46	DUMPCAR	BRAKE CYL PARTS	VR 483 000	EA	12	BA				POL	1 Sep 93	
1	47	DUMPCAR	PIPES	VR 483 000	EA	12	BA				POL	1 Sep 93	
1	48	DUMPCAR	REGULATOR ARM	522 10 050 1	EA	12	BA				POL	1 Sep 93	
1	49	DUMPCAR	CAR CONNECTOR HOSE		EA	60	BA				POL	1 Sep 93	
1	50	DUMPCAR	TOTAL COST US DOLLARS				BA		$200 000		POL	1 Sep 93	
1	1	COAL LOAD	PUMP STATION	CMJ V3A00 OCY 2	EA	1	BA				CIS	1 Sep 93	
1	2	COAL LOAD	PULLEY HOIST	3460 03 03600/3430 11 2	EA	4	BA				CIS	1 Sep 93	
1	3	COAL LOAD	PULLEY IDLER	3460 03 03600/3430 11 0	EA	20	BA				CIS	1 Sep 93	
1	4	COAL LOAD	BELTS		EA	20	BA				CIS	1 Sep 93	
1	5	COAL LOAD	FRONT PLATE	3460 00 005 02	EA	1	BA				CIS	1 Sep 93	
1	6	COAL LOAD	VIBRATOR SCREEN	7204 001	EA	2	BA				CIS	1 Sep 93	
1	7	COAL LOAD	SCREEN SPRINGS	1R0 72	EA	6	BA				CIS	1 Sep 93	
1	8	COAL LOAD	REDUCTION GEAR BOX	MY25 AM 01 03 160	EA	1	BA				CIS	1 Sep 93	
1	9	COAL LOAD	ROLLARS	200001 01 00 04	EA	1000	BA				CIS	1 Sep 93	
1	10	COAL LOAD	ROLLARS	200022 01 00 04	EA	1000	BA				CIS	1 Sep 93	
1	11	COAL LOAD	ROLLARS	1E4 952 306	EA	100	BA				CIS	1 Sep 93	
1	12	COAL LOAD	ROLLARS	1E4 992 11CB	EA	60	BA				CIS	1 Sep 93	
1	13	COAL LOAD	ROLLARS	1E4 954 3CB	EA	30	BA				CIS	1 Sep 93	
1	14	COAL LOAD	REDUCTION GEAR BOX	KS1 300	EA	1	BA				CIS	1 Sep 93	
1	15	COAL LOAD	CONVEYOR BELTS	B 1000	M	400	BA				CIS	1 Sep 93	
1	16	COAL LOAD	CONVEYOR BELTS	B 1400	M	300	BA				CIS	1 Sep 93	
1	17	COAL LOAD	CONVEYOR BELTS	B 1200	M	400	BA				CIS	1 Sep 93	
1	18	COAL LOAD	CONVEYOR DR MOTORS	4A3556Y3 160	EA	1	BA				CIS	1 Sep 93	
1	19	COAL LOAD	CONVEYOR DR MOTORS	4AM200M6Y3 22	EA	2	BA				CIS	1 Sep 93	
1	20	COAL LOAD	CONVEYOR DR MOTORS	AO102 12 6-6-4 24/37	EA	1	BA				CIS	1 Sep 93	
1	21	COAL LOAD	CONVEYOR DR MOTORS	AO102 12 B 3 4 24/35	EA	1	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	22	COAL LOAD	CRUSHER SPRING	5460 00 004 60	EA	4	BA				CIS	1 Sep 93	
1	23	COAL LOAD	CRUSHER COLLAR	8752 79	EA	4	BA				CIS	1 Sep 93	
1	24	COAL LOAD	CRUSHER COLLAR	8752 79	EA	4	BA				CIS	1 Sep 93	
1	25	COAL LOAD	CRUSHER SHIM	3450-01 011	EA	2	BA				CIS	1 Sep 93	
1	26	COAL LOAD	CRUSHER BEARING	GOST 5721 75	EA	2	BA				CIS	1 Sep 93	
1	27	COAL LOAD	TOTAL COST US DOLLARS				BA		$315 000		CIS	1 Sep 93	
1	1	DRILL PARTS	TRACK PADS	31 001 008 34	SET	30	BA				CIS	1 Sep 93	
1	2	DRILL PARTS	TRACK RAILS	31 001 008 000	EA	1	BA				CIS	1 Sep 93	
1	3	DRILL PARTS	LEVELING JACKS	B59 14 240	EA	3 5	BA				CIS	1 Sep 93	
1	4	DRILL PARTS	SPROCKET	31C 152 012 06	EA	2	BA				CIS	1 Sep 93	
1	5	DRILL PARTS	SPROCKET	B59 14 052	EA	2	BA				CIS	1 Sep 93	
1	6	DRILL PARTS	SHOCK ABSORBER	B122 22 11 015	EA	5	BA				CIS	1 Sep 93	
1	7	DRILL PARTS	SHOCK ABSORBER	B122 22 00 155	EA	3	BA				CIS	1 Sep 93	
1	8	DRILL PARTS	COMPRESSOR SUPP	B122 0017 000	EA	0 5	BA				CIS	1 Sep 93	
1	9	DRILL PARTS	CARTRIDGE	10 10 080	EA	2	BA				CIS	1 Sep 93	
1	10	DRILL PARTS	DRILL STEEL	722 22 11 00	EA	2	BA				CIS	1 Sep 93	
1	11	DRILL PARTS	BUSHING	31 001 008 037	EA	30	BA				CIS	1 Sep 93	
1	12	DRILL PARTS	BUSHING	31 001 008 102	EA	30	BA				CIS	1 Sep 93	
1	13	DRILL PARTS	HYD DISTRIBUTOR	R102 A4 A222 50	EA	5	BA				CIS	1 Sep 93	
1	14	DRILL PARTS	HYD PUMP	61 12 22	EA	3	BA				CIS	1 Sep 93	
1	15	DRILL PARTS	3 SPEED MOTOR		EA	2 5	BA				CIS	1 Sep 93	
1	16	DRILL PARTS	PULL DOWN CABLE	3X50+1X16	M	300	BA				CIS	1 Sep 93	
1	17	DRILL PARTS	HYD PUMP	N 403E TY2 653260 70	EA	2 5	BA				CIS	1 Sep 93	
1	18	DRILL PARTS	HYD PUMP	BG 12 22 MI TY2 05	EA	5	BA				CIS	1 Sep 93	
1	19	DRILL PARTS	TOTAL COST US DOLLARS				BA		$150 000		CIS	1 Sep 93	
1	37	ELEC EQUIP	SYNC MOTOR	CDE 2 15 34 642	EA	1	BA				CIS	1 Jan 94	
1	1	HEAT PLT	CHAIN	9 08 000	M	125	BA				CIS	1 Sep 93	
1	2	HEAT PLT	HOLDER	T9 05 002	EA	100	BA				CIS	1 Sep 93	
1	3	HEAT PLT	HOLDER	T9 05 001	EA	100	BA				CIS	1 Sep 93	
1	4	HEAT PLT	HOLDER	6 30 2	EA	500	BA				CIS	1 Sep 93	
1	5	HEAT PLT	ROLLER	6 30 25	EA	300	BA				CIS	1 Sep 93	
1	6	HEAT PLT	FRONT PACKING	T197 01 001	EA	5	BA				CIS	1 Sep 93	
1	7	HEAT PLT	MIDDLE PACKING	T197 01 002	EA	5	BA				CIS	1 Sep 93	
1	8	HEAT PLT	END LEFT PACKING	T82 01 001	EA	5	BA				CIS	1 Sep 93	
1	9	HEAT PLT	RIGHT PACKING	T82 01 002	EA	5	BA				CIS	1 Sep 93	
1	10	HEAT PLT	MIDDLE PACKING	T82 01 003	EA	5	BA				CIS	1 Sep 93	
1	13	HEAT PLT	CONNECTING LINK	T82 00 018	EA	300	BA				CIS	1 Sep 93	
1	14	HEAT PLT	SHAFT	6 30 9	EA	300	BA				CIS	1 Sep 93	
1	15	HEAT PLT	WASHER	T82 03 005	EA	0 1	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	16	HEAT PLT	WASHER	12 10906-66	EA	0 1	BA				CIS	1 Sep 93	
1	17	HEAT PLT	WASHER	16-10906 66	EA	0 1	BA				CIS	1 Sep 93	
1	18	HEAT PLT	WASHER	20 11371 66	EA	0 1	BA				CIS	1 Sep 93	
1	19	HEAT PLT	COTTER PIN	5X25 397 66	EA	0 1	BA				CIS	1 Sep 93	
1	20	HEAT PLT	COTTER PIN	5X28 397 66	EA	0 25	BA				CIS	1 Sep 93	
1	21	HEAT PLT	COTTER PIN	9X50 2319 70	EA	0 25	BA				CIS	1 Sep 93	
1	22	HEAT PLT	CHAIN	9X27 2319 70	M	100	BA				CIS	1 Sep 93	
1	23	HEAT PLT	FT SHFT W/ HALF COUP	T82 03 000	EA	0 5	BA				CIS	1 Sep 93	
1	24	HEAT PLT	END SHAFT	T82 07 000	EA	0 5	BA				CIS	1 Sep 93	
1	25	HEAT PLT	SOCKSHING PAN	DN 17	EA	1	BA				CIS	1 Sep 93	
1	26	HEAT PLT	STEAM BOILER PARTS	1 08 06	SET	100	BA				CIS	1 Sep 93	
1	27	HEAT PLT	STEAM BOILER PARTS	1 08 05	EA	600	BA				CIS	1 Sep 93	
1	28	HEAT PLT	STEAM BOILER PARTS	3P 800	EA	2	BA				CIS	1 Sep 93	
1	29	HEAT PLT	BOILER CONVEC SEC	KVTC 20 150	EA	1	BA				CIS	1 Sep 93	
1	30	HEAT PLT	TOTAL COST US DOLLARS				BA		$300 000		CIS	1 Sep 93	
1	1	RAIL MAT	RAIL TYPE P 50	7174 75	TONNE	450	BA				CIS	1 Sep 93	
1	2	RAIL MAT	RAIL TYPE P 65	7174-75	TONNE	300	BA				CIS	1 Sep 93	
1	3	RAIL MAT	BEDING PLATE P 50	12135 75	TONNE	36	BA				CIS	1 Sep 93	
1	4	RAIL MAT	BEDING PLATE P 65	12135 75	TONNE	36	BA				CIS	1 Sep 93	
1	5	RAIL MAT	CONN PLATE P 50	4133 54	TONNE	36	BA				CIS	1 Sep 93	
1	6	RAIL MAT	CONN PLATE P 65	4133 54	TONNE	36	BA				CIS	1 Sep 93	
1	7	RAIL MAT	RR SPAKE P 50		TONNE	36	BA				CIS	1 Sep 93	
1	8	RAIL MAT	RAIL PLANGE P 50	2953 51	TONNE	9	BA				CIS	1 Sep 93	
1	9	RAIL MAT	RAIL PLANGE P 65	2953 51	TONNE	9	BA				CIS	1 Sep 93	
1	10	RAIL MAT	BOLTS&NUTS P 50	11530 76	TONNE	9	BA				CIS	1 Sep 93	
1	11	RAIL MAT	BOLTS & NUTS P 65	11530 76	TONNE	4 5	BA				CIS	1 Sep 93	
1	12	RAIL MAT	LOCK WASHER P 50	19115 73	TONNE	3 6	BA				CIS	1 Sep 93	
1	13	RAIL MAT	TRACK SWITCH P50 RT		SET	3	BA				CIS	1 Sep 93	
1	14	RAIL MAT	TRACK SWITCH P65 LEFT		SET	3	BA				CIS	1 Sep 93	
1	15	RAIL MAT	Y RAIL P50 DIRECT LEFT		EA	1 5	BA				CIS	1 Sep 93	
1	16	RAIL MAT	Y RAIL P50-DIRECT RIGHT		EA	1 5	BA				CIS	1 Sep 93	
1	17	RAIL MAT	YRAIL P50-BENDED RIGHT		EA	1 5	BA				CIS	1 Sep 93	
1	18	RAIL MAT	RAIL INSOLATOR P50		SET	180	BA				CIS	1 Sep 93	
1	19	RAIL MAT	RAIL INSOLATOR P65		SET	165	BA				CIS	1 Sep 93	
1	20	RAIL MAT	CRESOTA SLEEPER		TONNE	3	BA				CIS	1 Sep 93	
1	21	RAIL MAT	TOTAL COST US DOLLARS				BA		$105 000		CIS	1 Sep 93	
1	1	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	BA				CIS	1 Sep 93	
1	1	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	BA				CIS	1 Jan 94	
1	2	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	2	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	BA				CIS	1 Jan 94	
1	3	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	BA				CIS	1 Sep 93	
1	3	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	BA				CIS	1 Jan 94	
1	4	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	BA				CIS	1 Sep 93	
1	4	RR COMM	SIGNAL CABLE	GOST6436 75	KM	2	BA				CIS	1 Jan 94	
1	5	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	BA				CIS	1 Sep 93	
1	5	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	BA				CIS	1 Jan 94	
1	6	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	BA				CIS	1 Sep 93	
1	6	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	BA				CIS	1 Jan 94	
1	7	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1 5	BA				CIS	1 Sep 93	
1	7	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1 5	BA				CIS	1 Jan 94	
1	8	RR COMM	ROAD TRANSFORMER	NFT A	EA	15	BA				CIS	1 Sep 93	
1	8	RR COMM	ROAD TRANSFORMER	NFT A	EA	15	BA				CIS	1 Jan 94	
1	9	RR COMM	ROAD TRANSPORMER	NOVC 5A	EA	15	BA				CIS	1 Sep 93	
1	9	RR COMM	ROAD TRANSPORMER	NOVC 5A	EA	15	BA				CIS	1 Jan 94	
1	10	RR COMM	SIGNAL TRANSFORMER	ST 6	EA	25	BA				CIS	1 Sep 93	
1	10	RR COMM	SIGNAL TRANSFORMER	ST 6	EA	25	BA				CIS	1 Jan 94	
1	11	RR COMM	SWITCH RELAY	2162 00 V	EA	25	BA				CIS	1 Sep 93	
1	11	RR COMM	SWITCH RELAY	2162 00 V	EA	25	BA				CIS	1 Jan 94	
1	12	RR COMM	RECTIFIER	86 00 00V	EA	25	BA				CIS	1 Sep 93	
1	12	RR COMM	RECTIFIER	86 00 00V	EA	25	BA				CIS	1 Jan 94	
1	13	RR COMM	RESISTOR	7165	EA	25	BA				CIS	1 Sep 93	
1	13	RR COMM	RESISTOR	7165	EA	25	BA				CIS	1 Jan 94	
1	14	RR COMM	SWITCHING GEAR BOX		EA	5	BA				CIS	1 Sep 93	
1	14	RR COMM	SWITCHING GEAR BOX		EA	5	BA				CIS	1 Jan 94	
1	15	RR COMM	LAMPS FOR LINZ		EA	250	BA				CIS	1 Sep 93	
1	15	RR COMM	LAMPS FOR LINZ		EA	250	BA				CIS	1 Jan 94	
1	16	RR COMM	FRAMEWORK	19402 00 00	EA	5	BA				CIS	1 Sep 93	
1	16	RR COMM	FRAMEWORK	19402 00-00	EA	5	BA				CIS	1 Jan 94	
1	17	RR COMM	BONDING WIRE	21 00 00	EA	25	BA				CIS	1 Sep 93	
1	17	RR COMM	BONDING WIRE	21 00 00	EA	25	BA				CIS	1 Jan 94	
1	18	RR COMM	CONTROL WIRE		EA	50	BA				CIS	1 Sep 93	
1	18	RR COMM	CONTROL WIRE		EA	50	BA				CIS	1 Jan 94	
1	19	RR COMM	LAMPS FOR TERM BD		EA	500	BA				CIS	1 Sep 93	
1	19	RR COMM	LAMPS FOR TERM BD		EA	500	BA				CIS	1 Jan 94	
1	20	RR COMM	SWITCHING RELAY SET	144690000A	EA	5	BA				CIS	1 Sep 93	
1	20	RR COMM	SWITCHING RELAY SET	144690000A	EA	5	BA				CIS	1 Jan 94	
1	21	RR COMM	INST FOR ELEC MEAS		EA	5	BA				CIS	1 Sep 93	
1	21	RR COMM	INST FOR ELEC MEAS		EA	5	BA				CIS	1 Jan 94	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	22	RR COMM	RR LINZ LTS RED	26116-00-00	EA	25	BA				CIS	1 Sep 93	
1	22	RR COMM	RR LINZ LTS RED	26116-00 00	EA	25	BA				CIS	1 Jan 94	
1	23	RR COMM	RR LINZ LTS GREEN	26116-00-00	EA	25	BA				CIS	1 Sep 93	
1	23	RR COMM	RR LINZ LTS GREEN	26116 00-00	EA	25	BA				CIS	1 Jan 94	
1	24	RR COMM	RR LINZ LTS WHITE	26116 00 00	EA	20	BA				CIS	1 Sep 93	
1	24	RR COMM	RR LINZ LTS WHITE	26116 00-00	EA	20	BA				CIS	1 Jan 94	
1	25	RR COMM	ELECTROMOTOR		EA	10	BA				CIS	1 Sep 93	
1	25	RR COMM	ELECTROMOTOR		EA	10	BA				CIS	1 Jan 94	
1	26	RR COMM	SWITCHING ARM		EA	15	BA				CIS	1 Sep 93	
1	26	RR COMM	SWITCHING ARM		EA	15	BA				CIS	1 Jan 94	
1	27	RR COMM	TOTAL COST US DOLLARS				BA		$4 000		CIS	1 Sep 93	
1	27	RR COMM	TOTAL COST US DOLLARS				BA		$4 000		CIS	1 Jan 94	
2	152	BATTERIES	6 CT 132 AMP/HR 12V		EA	50	BA	169 6	$8 480		USA	1 Sep 93	
2	157	BATTERIES	6 CT 182 AMP/HR 12V		EA	50	BA	204 06	$10 203		USA	1 Jan 94	
2	82	BELT SUPP	SPLICING KITS 1600 mm		EA	10	BA	$564 98	$5 650		USA	1 Jan 94	
2	83	BELT SUPP	SPLICING KITS 1400 mm		EA	10	BA	$461 10	$4 611		USA	1 Jan 94	
2	84	BELT SUPP	SPLICING KITS 1200 mm		EA	10	BA	$368 88	$3 689		USA	1 Jan 94	
2	86	BELT SUPP	SPLICING KITS 1000 mm		EA	10	BA	$322 24	$3 222		USA	1 Jan 94	
2	88	BELT SUPP	SPLICING KITS 800 mm		EA	10	BA	$276 66	$2 767		USA	1 Jan 94	
2	17	FEL	CAT992C FRONT END LOADER		EA	1	BA	$977 672	$977 672		USA	1 Sep 93	
2	151	TRUCK TIRE	18x33x32 PLY EH		EA	120	BA	1706	$204 720		USA	1 Jan 94	
2	58	WIRE ROPE	45 5mm(1 75) 8 2 Kg/M 10 TONNE		FT	3 888	BA	$2 91	$11 314		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	64	WIRE ROPE	30mm (1 25) 4 0 Kg/M 3TONNE		FT	1 907	BA	$1 73	$3 299		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	68	WIRE ROPE	30mm (5/8) 9 Kg/M 1 5 TONNE		FT	4 563	BA	$0 55	$2 510		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	70	WIRE ROPE	13 5mm(9/16) 2 5 TONNE		FT	9 340	BA	$0 50	$4 670		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	72	WIRE ROPE	9 11 mm(7/16) 2 TONNE		FT	12 958	BA	$0 40	$5 183		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	1	ELE MOTOR	20/90 DRAGLINE	AO2 72 4Y2 30 KVT	EA	2	BA				CIS	1 Jan 94	
2	2	ELE MOTOR	20/90 DRAGLINE	AO2 72 4Y2 22 KVT	EA	2	BA				CIS	1 Jan 94	
2	3	ELE MOTOR	20/90 DRAGLINE	MPE 1000-630 YXLE	EA	2	BA				CIS	1 Jan 94	
2	4	ELE MOTOR	20/90 DRAGLINE	HOISE GENERATOR	EA	5	BA				CIS	1 Jan 94	
2	5	ELE MOTOR	10/70-13/50 DRAGLINE	GENERATOR	EA	3	BA				CIS	1 Jan 94	
2	6	ELE MOTOR	10/70-13/50 DRAGLINE	SYNC MOTOR	EA	10	BA				CIS	1 Sep 93	
2	7	ELE MOTOR	10/70-13/50 DRAGLINE	EXCITER MOTOR	EA	8	BA				CIS	1 Jan 94	
2	8	ELE MOTOR	10/70-13/50 DRAGLINE	EXCITER MOTOR	EA	4	BA				CIS	1 Jan 94	
2	9	ELE MOTOR	10/70-13/50 DRAGLINE	GENERATOR	EA	2	BA				CIS	1 Jan 94	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	15	ELE MOTOR	MISC ELEC MOTORS	BAO 61 4 13KVT	EA	1	BA				CIS	1 Jan 94	
2	16	ELE MOTOR	MISC ELEC MOTORS	BAO 62 4 17KVT	EA	1	BA				CIS	1 Jan 94	
2	17	ELE MOTOR	MISC ELEC MOTORS	BAO 71 4 22KVT	EA	1	BA				CIS	1 Jan 94	
2	18	ELE MOTOR	MISC ELEC MOTORS	BAO 72 4 30KVT	EA	1	BA				CIS	1 Jan 94	
2	19	ELE MOTOR	MISC ELEC MOTORS	BAO 82 4 55KVT	EA	1	BA				CIS	1 Jan 94	
2	20	ELE MOTOR	MISC ELEC MOTORS	BAO 180M4 30KVT	EA	2	BA				CIS	1 Jan 94	
2	21	ELE MOTOR	MISC ELEC MOTORS	BAO 62 6 13KVT	EA	1	BA				CIS	1 Jan 94	
2	22	ELE MOTOR	MISC ELEC MOTORS	BAO 72 6 22KVT	EA	2	BA				CIS	1 Jan 94	
2	31	ELE MOTOR	ELEC MOTORS	MTKE 4AC18054	EA	1	BA				CIS	1 Jan 94	
2	32	ELE MOTOR	ELEC MOTORS	MTKE 4A10024YE	EA	1	BA				CIS	1 Jan 94	
2	33	ELE MOTOR	ELEC MOTORS	MTKE 4A71A2YE	EA	1	BA				CIS	1 Jan 94	
2	38	ELEC EQUIP	SINGLE SHAFT EL MO	DE 816Y2	EA	2	BA				CIS	1 Jan 94	
2	39	ELEC EQUIP	HORIZ MOTOR	DEB 12	EA	2	BA				CIS	1 Jan 94	
2	44	ELEC EQUIP	GEN 30KW 115V 261 A	MIXED BOOSTER	EA	2	BA				CIS	1 Sep 93	
2	1	YM2 PARTS	CYLINDER	240H 1004008 D	EA	132	BA				CIS	1 Sep 93	
2	2	YM2 PARTS	CRANK SHAFT	240 1000107 B6	EA	4	BA				CIS	1 Sep 93	
2	3	YM2 PARTS	RINGS	236 1000106 B4	EA	132	BA				CIS	1 Sep 93	
2	4	YM2 PARTS	PACKING	240 1000104 B2	EA	10	BA				CIS	1 Sep 93	
2	5	YM2 PARTS	PACKING	240 1000104 P2	EA	5	BA				CIS	1 Sep 93	
2	6	YM2 PARTS	PACKING	240 1000104 P1	EA	5	BA				CIS	1 Sep 93	
2	7	YM2 PARTS	SEAL	240 1003213 A3	EA	100	BA				CIS	1 Sep 93	
2	8	YM2 PARTS	PUMP	240 1011014	EA	3	BA				CIS	1 Sep 93	
2	9	YM2 PARTS	ELEMENT	240 1017038	EA	500	BA				CIS	1 Sep 93	
2	10	YM2 PARTS	ELEMENT	238H 1109080	EA	50	BA				CIS	1 Sep 93	
2	11	YM2 PARTS	TURBOCOMPRESSOR	240H 1118010 B	EA	4	BA				CIS	1 Sep 93	
2	12	YM2 PARTS	TURBOCOMPRESSOR	240H 1118011B	EA	4	BA				CIS	1 Sep 93	
2	13	YM2 PARTS	BLOCK CYLINDER	240H 1002012H	EA	1	BA				CIS	1 Sep 93	
2	14	YM2 PARTS	PUMP	9016111008 02	EA	1	BA				CIS	1 Sep 93	
2	15	YM2 PARTS	SPRAY INJECTOR	26161112110	EA	60	BA				CIS	1 Sep 93	
2	16	YM2 PARTS	RING	236-1002024A	EA	100	BA				CIS	1 Sep 93	
2	17	YM2 PARTS	RING	236 1002040	EA	50	BA				CIS	1 Sep 93	
2	18	YM2 PARTS	ELEMENT FILTER	240T 1017040 A3	EA	100	BA				CIS	1 Sep 93	
2	19	YM2 PARTS	ELEMENT	201T 1105540	EA	100	BA				CIS	1 Sep 93	
2	20	YM2 PARTS	RINGS	236 1004002 A3	EA	48	BA				CIS	1 Sep 93	
2	21	YM2 PARTS	PACKING SEALS	240-1008098	EA	5	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	22	YM2 PARTS	PACKING SEALS	240T 1009040 A2	EA	5	BA				CIS	1 Sep 93	
2	23	YM2 PARTS	FUEL PUMP	1111008 20	EA	1	BA				CIS	1 Sep 93	
2	24	YM2 PARTS	ELEMENT	201 1117038-A2	EA	250	BA				CIS	1 Sep 93	
2	25	YM2 PARTS	PUMP	240-1307010-A	EA	2 5	BA				CIS	1 Sep 93	
2	26	YM2 PARTS	GENERATOR	45 7371 0209	EA	1 5	BA				CIS	1 Sep 93	
2	27	YM2 PARTS	STARTER	45 7375 1471	EA	1 5	BA				CIS	1 Sep 93	
2	28	YM2 PARTS	TOTAL COST US DOLLARS				BA		$12 500		CIS	1 Sep 93	
2	1	BELAZ	ENGINE	240N 1000187	SET	4	BA				Bel	1 Jan 94	
2	2	BELAZ	CYLINDER LINER SETS	240N 1004006D	SET	144	BA				Bel	1 Jan 94	
2	3	BELAZ	PACKINC	240 1003213	EA	300	BA				Bel	1 Jan 94	
2	4	BELAZ	RING SETS	236 100106 B3	EA	200	BA				Bel	1 Jan 94	
2	5	BELAZ	CLUTCH SHIMS	240 1000104	EA	16	BA				Bel	1 Jan 94	
2	6	BELAZ	SHIMS	240 1000104 BR	EA	10	BA				Bel	1 Jan 94	
2	7	BELAZ	PACKING	240-1009040A2	EA	30	BA				Bel	1 Jan 94	
2	8	BELAZ	FILTER	240 1017040A2	EA	2000	BA				Bel	1 Jan 94	
2	9	BELAZ	FILTER	201 1105538	EA	1500	BA				Bel	1 Jan 94	
2	10	BELAZ	INJECTOR	236-1112110B2	EA	240	BA				Bel	1 Jan 94	
2	11	BELAZ	TURBOCHARGER	240N 118010B	EA	10	BA				Bel	1 Jan 94	
2	12	BELAZ	TURBOCHARGER	240N 1118011B	EA	10	BA				Bel	1 Jan 94	
2	13	BELAZ	FILTER	201 1117040 A	EA	1000	BA				Bel	1 Jan 94	
2	14	BELAZ	FILTER	238 1109080	EA	500	BA				Bel	1 Jan 94	
2	15	BELAZ	FILTER COVER	240-1002264	EA	5	BA				Bel	1 Jan 94	
2	16	BELAZ	PACKING	240 1002314	EA	20	BA				Bel	1 Jan 94	
2	17	BELAZ	HARMONIC BALANCER	240-1002310	EA	5	BA				Bel	1 Jan 94	
2	18	BELAZ	CRANK SHAFT	240 1005008G4	EA	5	BA				Bel	1 Jan 94	
2	19	BELAZ	PUSH RODS	236-1007180	EA	24	BA				Bel	1 Jan 94	
2	20	BELAZ	PACKING	240-1008098	EA	30	BA				Bel	1 Jan 94	
2	21	BELAZ	PUMP	240-1011014 B	EA	5	BA				Bel	1 Jan 94	
2	22	BELAZ	PIPE HOSE	240-1104308-G	EA	24	BA				Bel	1 Jan 94	
2	23	BELAZ	PIPE	240-1104300-B	EA	13	BA				Bel	1 Jan 94	
2	24	BELAZ	PIPE	240-1104390A	EA	6	BA				Bel	1 Jan 94	
2	25	BELAZ	PIPE	240 1104346A	EA	8	BA				Bel	1 Jan 94	
2	26	BELAZ	PUMP	240-1106210	EA	5	BA				Bel	1 Jan 94	
2	27	BELAZ	PISTON PLUNGER	60 1111074	EA	24	BA				Bel	1 Jan 94	
2	28	BELAZ	VALVE	33 1111102	EA	38	BA				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	29	BELAZ	INJECTORS	262 111201	EA	24	BA				Bel	1 Jan-94	
2	30	BELAZ	ROTORS	240N 1118080B	EA	20	BA				Bel	1 Jan 94	
2	31	BELAZ	COVER	240N 1118280B	EA	30	BA				Bel	1 Jan 94	
2	32	BELAZ	RING	240N 1118240	EA	40	BA				Bel	1 Jan 94	
2	33	BELAZ	PUMP	240N 1307010A	EA	3	BA				Bel	1 Jan 94	
2	34	BELAZ	SET	240-1307029	EA	20	BA				Bel	1 Jan 94	
2	35	BELAZ	STARTER	25 3708	EA	5	BA				Bel	1 Jan 94	
2	36	BELAZ	GENERATOR	G263	EA	5	BA				Bel	1 Jan 94	
2	37	BELAZ	REGULATOR RELAY	RR 363 3702000	EA	5	BA				Bel	1 Jan 94	
2	38	BELAZ	COMPRESSOR	540 3509015	EA	10	BA				Bel	1 Jan 94	
2	39	BELAZ	WASHER	540A 3509130	EA	5	BA				Bel	1 Jan 94	
2	40	BELAZ	SHIMS	130 3509092	EA	5	BA				Bel	1 Jan 94	
2	41	BELAZ	PISTON	130 350909160	EA	10	BA				Bel	1 Jan 94	
2	42	BELAZ	RING	130 3509164	EA	20	BA				Bel	1 Jan 94	
2	43	BELAZ	RING	130 350 9166	EA	20	BA				Bel	1 Jan-94	
2	44	BELAZ	RING	130 3509167	EA	20	BA				Bel	1 Jan 94	
2	45	BELAZ	FILTER	740 1109560	EA	100	BA				Bel	1 Jan 94	
2	46	BELAZ	ROLLER	540 1308110 01	EA	5	BA				Bel	1 Jan 94	
2	47	BELAZ	ROLLER	540 1308111 01	EA	5	BA				Bel	1 Jan 94	
2	48	BELAZ	BELT	P21X14X1950	EA	100	BA				Bel	1 Jan 94	
2	49	BELAZ	BELT	P21X14X1735	EA	100	BA				Bel	1 Jan 94	
2	50	BELAZ	HYDRAULIC BOOSTER	548A 1700004 10	EA	4	BA				Bel	1 Jan 94	
2	51	BELAZ	FRICTION PLATES BRAKE	540-1701330 01	EA	12	BA				Bel	1 Jan 94	
2	52	BELAZ	DISC	540-1701352 11	EA	120	BA				Bel	1 Jan 94	
2	53	BELAZ	DISC	540-1701344	EA	140	BA				Bel	1 Jan 94	
2	54	BELAZ	BRAKE DRUM	540-1701312 10	EA	12	BA				Bel	1 Jan 94	
2	55	BELAZ	PACKING RING	540-1701326B	EA	50	BA				Bel	1 Jan 94	
2	56	BELAZ	ELECTRIC MAGNETO	RC330-1705000	EA	20	BA				Bel	1 Jan 94	
2	57	BELAZ	RADIATOR	548A 1301010	EA	5	BA				Bel	1 Jan 94	
2	58	BELAZ	DRIVE SHAFT	548A 2201010-02	EA	5	BA				Bel	1 Jan 94	
2	59	BELAZ	DRIVE SHAFT	548A 2208010	EA	5	BA				Bel	1 Jan 94	
2	60	BELAZ	TRANSMISSION GEAR	548P 2402010-10	EA	2	BA				Bel	1 Jan 94	
2	61	BELAZ	CYLINDER	548 2917020-11	EA	6	BA				Bel	1 Jan 94	
2	62	BELAZ	COLLAR	540 2917062	EA	200	BA				Bel	1 Jan 94	
2	63	BELAZ	CYLINDER	540-2917080 01	EA	100	BA				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	64	BELAZ	RINGS	540-2917064	EA	400	BA				Bel	1 Jan 94	
2	65	BELAZ	SHIFTING FORK	7540-2919412	EA	3	BA				Bel	1 Jan 94	
2	66	BELAZ	LEVER	548 3001031	EA	5	BA				Bel	1 Jan 94	
2	67	BELAZ	PULLEY	540 3003052 02	EA	3	BA				Bel	1 Jan 94	
2	68	BELAZ	HYDRALIC BOOSTER	525 3405010-06	EA	5	BA				Bel	1 Jan 94	
2	69	BELAZ	RINGS	016 020-25 2 2	EA	50	BA				Bel	1 Jan 94	
2	70	BELAZ	RINGS	080 090 58 2 2	EA	20	BA				Bel	1 Jan 94	
2	71	BELAZ	PISTON	130 3509160-02	EA	40	BA				Bel	1 Jan 94	
2	72	BELAZ	RINGS	130 3509167	EA	40	BA				Bel	1 Jan 94	
2	73	BELAZ	SPRAYER DEFLECTORS	FG 140 371200	EA	100	BA				Bel	1 Jan 94	
2	74	BELAZ	LAMPS	A2M 55 50	EA	300	BA				Bel	1 Jan 94	
2	75	BELAZ	LAMPS	A24 5	EA	300	BA				Bel	1 Jan 94	
2	76	BELAZ	LAMPS	A24 21 2	EA	200	BA				Bel	1 Jan 94	
2	77	BELAZ	LAMPS	A24 60 40	EA	100	BA				Bel	1 Jan 94	
2	78	BELAZ	SPRAYERS DEFLECTORS	FP 130-3716200 B	EA	50	BA				Bel	1 Jan 94	
2	79	BELAZ	LOCK	VK 856 3708000	EA	10	BA				Bel	1 Jan 94	
2	80	BELAZ	TOTAL COST US DOLLLARS				BA		$565 000		Bel	1 Jan 94	
3	74	CONV BELT	1000 mm 5 PLY FABRIC		M	800	BA	$106 89	$85 512		USA	1 Jan 94	
3	76	CONV BELT	1200 mm 6 PLY FABRIC		M	1 000	BA	$147 53	$147 530		USA	1 Jan 94	
3	78	CONV BELT	1400 mm 6 PLY FABRIC		M	1 430	BA	$181 07	$258 930		USA	1 Jan 94	
3	79	CONV BELT	1600 mm 4 PLY FABRIC		M	1 875	BA	$157 71	$295 706		USA	1 Jan 94	
3	80	CONV BELT	800 mm 6 PLY FABRIC		M	500	BA	$107 99	$53 995		USA	1 Jan 94	
3	147	TRUCK TIRE	12x20x16 PLY/W TUBES		EA	20	BA	341 4	$6 828		USA	1 Sep 93	
3	1	KRAZ	ENGINE	238M 1000186	EA	0 6	BA				URK	1 Sep 93	
3	2	KRAZ	SHIM	238 1000102 B2R1	EA	3 2	BA				URK	1 Sep 93	
3	3	KRAZ	SHIM	238 1000102 B2	EA	3 2	BA				URK	1 Sep 93	
3	4	KRAZ	SHIM	23831000104 V2	EA	3 2	BA				URK	1 Sep 93	
3	5	KRAZ	CLIPS	256-1001005 A1	EA	5	BA				URK	1 Sep 93	
3	6	KRAZ	ENG RING SETS	236 1000106-B2	EA	20	BA				URK	1 Sep 93	
3	7	KRAZ	ENG MOUNTS	236-1001008 01	EA	3	BA				URK	1 Sep 93	
3	8	KRAZ	SHAFT	2383 1000107 V2	EA	0 8	BA				URK	1 Sep 93	
3	9	KRAZ	BLOCK	238-1002012 B2	EA	0 4	BA				URK	1 Sep 93	
3	10	KRAZ	RING	236 100202 A	EA	5	BA				URK	1 Sep 93	
3	11	KRAZ	RING	236-1002040	EA	4	BA				URK	1 Sep 93	
3	12	KRAZ	OIL INS	236-1002272	EA	1	BA				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	13	KRAZ	PIPE	238-1003290-V	EA	1	BA				URK	1 Sep 93	
3	14	KRAZ	PIPE	238-1003291 V	EA	1	BA				URK	1 Sep 93	
3	15	KRAZ	CYL WIPER COLLAR	236-1002314 B	EA	4	BA				URK	1 Sep 93	
3	16	KRAZ	HEAD C76G	238 1003013 D	EA	1	BA				URK	1 Sep 93	
3	17	KRAZ	RING	237 1003114 V	EA	1	BA				URK	1 Sep 93	
3	18	KRAZ	PACKING	238 1003210-V2	EA	10	BA				URK	1 Sep 93	
3	19	KRAZ	PACKING	238 1003270	EA	10	BA				URK	1 Sep 93	
3	20	KRAZ	LINER CYLINDER	236-1004008	EA	16	BA				URK	1 Sep 93	
3	21	KRAZ	ROCKER ARM	236-1004045 V2	EA	4	BA				URK	1 Sep 93	
3	22	KRAZ	RING	400-1004030-80	EA	4	BA				URK	1 Sep 93	
3	23	KRAZ	SEAL	201 1005034 B3	EA	4	BA				URK	1 Sep 93	
3	24	KRAZ	GEAR	236-1005030 A	EA	4	BA				URK	1 Sep 93	
3	25	KRAZ	COLLAR	236 1005160 A2	EA	10	BA				URK	1 Sep 93	
3	26	KRAZ	SHAFT	238 1006015 G2	EA	0 2	BA				URK	1 Sep 93	
3	27	KRAZ	SPACERS	236 1006026-AR	EA	6	BA				URK	1 Sep 93	
3	28	KRAZ	SPACERS	236-1006037 AR	EA	4 8	BA				URK	1 Sep 93	
3	29	KRAZ	VALVE	236 1007010-V	EA	5	BA				URK	1 Sep 93	
3	30	KRAZ	VALVE	236 1007015 V4	EA	5	BA				URK	1 Sep 93	
3	31	KRAZ	ROD PUSH	236 1007176-A	EA	4 2	BA				URK	1 Sep 93	
3	32	KRAZ	PACKING	236-1008050	EA	5	BA				URK	1 Sep 93	
3	33	KRAZ	PACKING	238T 1009040	EA	5	BA				URK	1 Sep 93	
3	34	KRAZ	PUMP	236 1011014 V3	EA	1	BA				URK	1 Sep 93	
3	35	KRAZ	RADIATOR	157 1013010 A	EA	1	BA				URK	1 Sep 93	
3	36	KRAZ	EXHAUST PIPE	256B 1013408 B	EA	1 6	BA				URK	1 Sep 93	
3	37	KRAZ	ELEMENT FILTER	201T 1105540	EA	60	BA				URK	1 Sep 93	
3	38	KRAZ	PUMP	240-1106210	EA	1	BA				URK	1 Sep 93	
3	39	KRAZ	PUMP	236T1106288 A2	EA	1	BA				URK	1 Sep 93	
3	40	KRAZ	COLLAR	236-102940	EA	10	BA				URK	1 Sep 93	
3	41	KRAZ	1/2 HUB COUPLING	236-1029268 B	EA	0 5	BA				URK	1 Sep 93	
3	42	KRAZ	PIPE	236-1104308-V	EA	2	BA				URK	1 Sep 93	
3	43	KRAZ	PUMP	8006-1111005	EA	0 6	BA				URK	1 Sep 93	
3	44	KRAZ	PLUNGER RODS	60-1111074 01	EA	15	BA				URK	1 Sep 93	
3	45	KRAZ	INJECTOR	2606-1112010-02	EA	28	BA				URK	1 Sep 93	
3	46	KRAZ	SPRAYER	26 111211	EA	28	BA				URK	1 Sep 93	
3	47	KRAZ	FILTER	201T 1117038	EA	20	BA				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	48	KRAZ	COUPLING	09000 1121010 000	EA	0 2	BA				URK	1 Sep 93	
3	49	KRAZ	MUFFLER	256-1201010	EA	1	BA				URK	1 Sep 93	
3	50	KRAZ	PACKING	256B-1203002	EA	10	BA				URK	1 Sep 93	
3	51	KRAZ	SLEEVE	256 B1 1203096	EA	2 5	BA				URK	1 Sep 93	
3	52	KRAZ	PACKING	256B 1203039	EA	4	BA				URK	1 Sep 93	
3	53	KRAZ	RADIATOR	256B-1301008 10	EA	2	BA				URK	1 Sep 93	
3	54	KRAZ	ENG MOUNTS	256 1302025	EA	1	BA				URK	1 Sep 93	
3	55	KRAZ	ENG/ MOUNTS	256 1302139	EA	1	BA				URK	1 Sep 93	
3	56	KRAZ	RODS	214B 1303010	EA	3	BA				URK	1 Sep 93	
3	57	KRAZ	RODS	255 1303012	EA	2	BA				URK	1 Sep 93	
3	58	KRAZ	EXHAUST PIPE	256 1303016	EA	0 6	BA				URK	1 Sep 93	
3	59	KRAZ	PUMP	236 1307010 A3	EA	2 5	BA				URK	1 Sep 93	
3	60	KRAZ	SET	236-1307029 A	EA	5	BA				URK	1 Sep 93	
3	61	KRAZ	COLLAR	236 1307090	EA	8	BA				URK	1 Sep 93	
3	62	KRAZ	BELTS	25 6411 1404	EA	20	BA				URK	1 Sep 93	
3	63	KRAZ	BELTS	6421 1403	EA	20	BA				URK	1 Sep 93	
3	64	KRAZ	MOTOR	236-1308011 G2	EA	0 6	BA				URK	1 Sep 93	
3	65	KRAZ	DISCS	238 1601690 G	EA	1	BA				URK	1 Sep 93	
3	66	KRAZ	DISCS	238 1601094	EA	1	BA				URK	1 Sep 93	
3	67	KRAZ	DISCS	238 1601130 B	EA	1	BA				URK	1 Sep 93	
3	68	KRAZ	DISCS	238 1601131	EA	1 5	BA				URK	1 Sep 93	
3	69	KRAZ	BRAKE FRICTION PLATE	236 1601138 A3	EA	5	BA				URK	1 Sep 93	
3	70	KRAZ	COUPLING	236 1601180 B2	EA	1	BA				URK	1 Sep 93	
3	71	KRAZ	GEAR BOX	236NT 1700003	EA	0 8	BA				URK	1 Sep 93	
3	72	KRAZ	BOX	257 18000020-V2	EA	0 2	BA				URK	1 Sep 93	
3	73	KRAZ	BOX	256 1800020-V2	EA	0 2	BA				URK	1 Sep 93	
3	74	KRAZ	HEAD CROSS	131 2201025 A	EA	2	BA				URK	1 Sep 93	
3	75	KRAZ	SHAFT	527 2202010-16	EA	0 8	BA				URK	1 Sep 93	
3	76	KRAZ	DRIVE SHAFT	210G 2202045 04	EA	0 8	BA				URK	1 Sep 93	
3	77	KRAZ	SHAFT	210G 2204010-16	EA	0 8	BA				URK	1 Sep 93	
3	78	KRAZ	SUPPORT	210-2204080 B2	EA	1	BA				URK	1 Sep 93	
3	79	KRAZ	REAR DRIVE AXLE	255P 2400015 02	EA	1	BA				URK	1 Sep 93	
3	80	KRAZ	SET OF GEARS	256B-2402020	EA	0 2	BA				URK	1 Sep 93	
3	81	KRAZ	DIFFERENTIAL SEAL	210-2402052 A1	EA	6	BA				URK	1 Sep 93	
3	82	KRAZ	DIFFERENTIAL	200 2403010 A2	EA	0 4	BA				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	83	KRAZ	FLANGE	200-2403072 B1	EA	0 4	BA				URK	1 Sep 93	
3	84	KRAZ	AXLE	2550-2500015 02	EA	0 2	BA				URK	1 Sep 93	
3	85	KRAZ	SHOCK ABSORBER	256B1 2902012	EA	2	BA				URK	1 Sep 93	
3	86	KRAZ	1ST PLATE	255B-2902074 01	EA	2	BA				URK	1 Sep 93	
3	87	KRAZ	2ND PLATE	255B 2902076-01	EA	2	BA				URK	1 Sep 93	
3	88	KRAZ	SHOCK SPRINGS	500-2905006	EA	5	BA				URK	1 Sep 93	
3	89	KRAZ	SHOCK ABSORBER	256B 2912012 11	EA	2 6	BA				URK	1 Sep 93	
3	90	KRAZ	CONN BRACKETS	219 2912408	EA	6	BA				URK	1 Sep 93	
3	91	KRAZ	EQUALIZER	256B 2918005	EA	3	BA				URK	1 Sep 93	
3	92	KRAZ	SHAFT	256B 2918054	EA	0 4	BA				URK	1 Sep 93	
3	93	KRAZ	ROD	214 2919011 02	EA	5	BA				URK	1 Sep 93	
3	94	KRAZ	ROD	210 2919012 03	EA	5	BA				URK	1 Sep 93	
3	95	KRAZ	BUSHING	200 3001016	EA	4	BA				URK	1 Sep 93	
3	96	KRAZ	SEAL	200 3103035	EA	1 4	BA				URK	1 Sep 93	
3	97	KRAZ	SEAL	210-3104036	EA	1 4	BA				URK	1 Sep 93	
3	98	KRAZ	COTTER PINS	200 3104050 A	EA	50	BA				URK	1 Sep 93	
3	99	KRAZ	COTTER PINS	200 3104050 A	EA	50	BA				URK	1 Sep 93	
3	100	KRAZ	RELAYS	500-3401005 D	EA	0 5	BA				URK	1 Sep 93	
3	101	KRAZ	HYD BOOSTER BRAKES	256B 3405010-14	EA	1	BA				URK	1 Sep 93	
3	102	KRAZ	DISTRIBUTOR	255B-3405016	EA	1	BA				URK	1 Sep 93	
3	103	KRAZ	PUMP	256B 3407199	EA	1	BA				URK	1 Sep 93	
3	104	KRAZ	FRIC PLATES SHOE	200 3501105	EA	30	BA				URK	1 Sep 93	
3	105	KRAZ	LEVER	210-3501136 A2	EA	0 8	BA				URK	1 Sep 93	
3	106	KRAZ	FRIC PLATES SHOES	200 3502105 A	EA	30	BA				URK	1 Sep 93	
3	107	KRAZ	COMPRESSOR	130 3509009 11	EA	0 8	BA				URK	1 Sep 93	
3	108	KRAZ	GENERATOR	4573711587	EA	2	BA				URK	1 Sep 93	
3	109	KRAZ	REGULATOR	1112 3702	EA	2	BA				URK	1 Sep 93	
3	110	KRAZ	SWITCH	VK318T 3704000	EA	1	BA				URK	1 Sep 93	
3	111	KRAZ	ELECTRO BRUSHES	2501 370805	EA	26	BA				URK	1 Sep 93	
3	112	KRAZ	SWITCH	P305 3709000	EA	1 5	BA				URK	1 Sep 93	
3	113	KRAZ	SWITCH	P39 371000-T	EA	1 5	BA				URK	1 Sep 93	
3	114	KRAZ	STARTER	45 7375 1471	EA	2 5	BA				URK	1 Sep 93	
3	115	KRAZ	RELAY	RC103 3708000	EA	1	BA				URK	1 Sep 93	
3	116	KRAZ	LAMPS	A 24 60 40	EA	40	BA				URK	1 Sep 93	
3	117	KRAZ	FILTERS	FG122 3711200 V	EA	3	BA				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	118	KRAZ	LAMPS	A24 324	EA	40	BA				URK	1 Sep 93	
3	119	KRAZ	LAMPS	A 24 2	EA	40	BA				URK	1 Sep 93	
3	120	KRAZ	LAMPS	A 24 5	EA	40	BA				URK	1 Sep 93	
3	121	KRAZ	LAMPS	A 24 21 2	EA	40	BA				URK	1 Sep 93	
3	122	KRAZ	SPEEDOMETER	CP135 3802010	EA	1	BA				URK	1 Sep 93	
3	123	KRAZ	RELAY	RC401 3726010	EA	1	BA				URK	1 Sep 93	
3	124	KRAZ	RECIEVER	YK143 3807010 G4	EA	0 4	BA				URK	1 Sep 93	
3	125	KRAZ	SENSOR	BM146 3806600D	EA	0 4	BA				URK	1 Sep 93	
3	126	KRAZ	AMP METER	AP110 3811010	EA	0 8	BA				URK	1 Sep 93	
3	127	KRAZ	PRESSURE GAUGE	MD103 3816010	EA	0 4	BA				URK	1 Sep 93	
3	128	KRAZ	SENSOR	TM100 3808000 G	EA	1	BA				URK	1 Sep 93	
3	129	KRAZ	MIRRORS	256 8201012	EA	3	BA				URK	1 Sep 93	
3	130	KRAZ	EQUALIZER	220V 8702010A	EA	0 2	BA				URK	1 Sep 93	
3	131	KRAZ	TOTAL COST US DOLLARS				BA		$11 000		URK	1 Sep 93	
3	1	T130 DOZER	PACKING	2301103160 CBN 1	EA	3	BA				CIS	1 Sep 93	
3	2	T130 DOZER	THIMBLE ?	01466 2	EA	10	BA				CIS	1 Sep 93	
3	3	T130 DOZER	RINGS	51 03 115 CP	EA	10	BA				CIS	1 Sep 93	
3	4	T130 DOZER	CRANKSHAFT	16 03 126 CP	EA	0 6	BA				CIS	1 Sep 93	
3	5	T130 DOZER	CYLINDER	51 03 23	EA	10	BA				CIS	1 Sep 93	
3	6	T130 DOZER	HYDRALIC SEAL	700 40 2889	EA	4 8	BA				CIS	1 Sep 93	
3	7	T130 DOZER	FILTER	F A41 20 000 01 CP	EA	10	BA				CIS	1 Sep 93	
3	8	T130 DOZER	FILTER	A41 10 000 02 CP	EA	10	BA				CIS	1 Sep 93	
3	9	T130 DOZER	RING	40843	EA	10	BA				CIS	1 Sep 93	
3	10	T130 DOZER	PACKING	40269	EA	3	BA				CIS	1 Sep 93	
3	11	T130 DOZER	GEAR PINION	74116	EA	0 3	BA				CIS	1 Sep 93	
3	12	T130 DOZER	REDUCTION GEAR	17 76 8 CP	EA	0 1	BA				CIS	1 Sep 93	
3	13	T130 DOZER	FUEL INJECTORS	17 69 107 1 CP	EA	10	BA				CIS	1 Sep 93	
3	14	T130 DOZER	SPRAYER	14 69 117 1 CP	EA	10	BA				CIS	1 Sep 93	
3	15	T130 DOZER	PUMP	51 67 11 CP	EA	0 3	BA				CIS	1 Sep 93	
3	16	T130 DOZER	COMPRESSOR PIPING	92 000 06	EA	1	BA				CIS	1 Sep 93	
3	17	T130 DOZER	AIR INLET	N036 85 770	EA	0 9	BA				CIS	1 Sep 93	
3	18	T130 DOZER	WATER PUMP	16 8-140-CP	EA	1	BA				CIS	1 Sep 93	
3	19	T130 DOZER	OIL PUMP	29 09 124 CP	EA	1	BA				CIS	1 Sep 93	
3	20	T130 DOZER	HYDRALIC PUMP	NS 100A 3 P	EA	0 6	BA				CIS	1 Sep 93	
3	21	T130 DOZER	PUMP	NS 32 Y WP	EA	0 2	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	22	T130 DOZER	GEAR BOX	24 12 1 CP	EA	0 2	BA				CIS	1 Sep 93	
3	23	T130 DOZER	FILTER	A23 30 000 01	EA	5	BA				CIS	1 Sep 93	
3	24	T130 DOZER	PACKING SEALS	700-40 2049	EA	3	BA				CIS	1 Sep 93	
3	25	T130 DOZER	CARBURATOR	113 1107011	EA	1 2	BA				CIS	1 Sep 93	
3	26	T130 DOZER	SUPPORT BRACKET	51 07 102 CP	EA	0 4	BA				CIS	1 Sep 93	
3	27	T130 DOZER	ENGINE HEAD	07146-1 CP	EA	0 6	BA				CIS	1 Sep 93	
3	28	T130 DOZER	FUEL SYS CENTRIFUGE	95000	EA	0 5	BA				CIS	1 Sep 93	
3	29	T130 DOZER	FAN BLADES	51 08 113 CP	EA	0 4	BA				CIS	1 Sep 93	
3	30	T130 DOZER	RADIATOR	130Y 13 010 1	EA	1	BA				CIS	1 Sep 93	
3	31	T130 DOZER	BRAKE DISC	738 4 CP	EA	1 5	BA				CIS	1 Sep 93	
3	32	T130 DOZER	MAGNET SOLENOID	M149 A3	EA	1 4	BA				CIS	1 Sep 93	
3	33	T130 DOZER	STARTER	ST 230M	EA	1 4	BA				CIS	1 Sep 93	
3	34	T130 DOZER	GENERATOR	70 3701	EA	0 5	BA				CIS	1 Sep 93	
3	35	T130 DOZER	RELAY STARTER	RR 0362B1	EA	1 5	BA				CIS	1 Sep 93	
3	36	T130 DOZER	DISTRIBUTOR	R 150 A3T001	EA	0 3	BA				CIS	1 Sep 93	
3	37	T130 DOZER	DRIVE SHAFT	50 14 113	EA	0 2	BA				CIS	1 Sep 93	
3	38	T130 DOZER	CYLINDER POWER	18 26 270 CP	EA	0 5	BA				CIS	1 Sep 93	
3	39	T130 DOZER	CYLINDER	DP 26 C 06 140	EA	0 2	BA				CIS	1 Sep 93	
3	40	T130 DOZER	ELEMENT FILTER	EF 01 00 CP	EA	14	BA				CIS	1 Sep 93	
3	41	T130 DOZER	PUMP BRAKE	14 71 3 CP	EA	0 3	BA				CIS	1 Sep 93	
3	42	T130 DOZER	MECH	17 74 8 CP	EA	0 2	BA				CIS	1 Sep 93	
3	43	T130 DOZER	SUPPORT	17 74 284	EA	0 4	BA				CIS	1 Sep 93	
3	44	T130 DOZER	SHAFT	16 74 10 CP	EA	0 3	BA				CIS	1 Sep 93	
3	45	T130 DOZER	GEAR	17 01 22	EA	0 3	BA				CIS	1 Sep 93	
3	46	T130 DOZER	FRICTION CLUTCH PADS	24 16 101 CP	EA	0 6	BA				CIS	1 Sep 93	
3	47	T130 DOZER	SERVICE MECH	21 17 4 CP	EA	0 5	BA				CIS	1 Sep 93	
3	48	T130 DOZER	FAN BELT	18360-01 CP	EA	1 2	BA				CIS	1 Sep 93	
3	49	T130 DOZER	PULLEY WHEEL	24 21 146 CP	EA	0 4	BA				CIS	1 Sep 93	
3	50	T130 DOZER	DRIVE PULLEY	24 21 169 CP	EA	1 6	BA				CIS	1 Sep 93	
3	51	T130 DOZER	DOUBLE PULLEY	24 21 170 CP	EA	1 6	BA				CIS	1 Sep 93	
3	52	T130 DOZER	FILTER	A 410000 2	EA	1	BA				CIS	1 Sep 93	
3	53	T130 DOZER	IDLER PULLEY	24 21 171 CP	EA	1 6	BA				CIS	1 Sep 93	
3	54	T130 DOZER	FILTER	A 410000-A CP	EA	6	BA				CIS	1 Sep 93	
3	55	T130 DOZER	MIDDLE CUTTING EDGE	D3-110AXP 02 001 0	EA	0 3	BA				CIS	1 Sep 93	
3	56	T130 DOZER	END CUTTING EDGE RT	D661 02001 02	EA	0 3	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	57	T130 DOZER	END CUTTING EDGE LEFT	D661 02 002 02	EA	0 3	BA				CIS	1 Sep 93	
3	58	T130 DOZER	TRACK ASSEMBLY	24 22 1	SET	0 3	BA				CIS	1 Sep 93	
3	59	T130 DOZER	DEFLECTOR RK GUARD	2204	EA	20	BA				CIS	1 Sep 93	
3	60	T130 DOZER	DEFLECTOR RK GUARD	2205	EA	20	BA				CIS	1 Sep 93	
3	61	T130 DOZER	PACKING TRACKS ADJ	40201	EA	8	BA				CIS	1 Sep 93	
3	62	T130 DOZER	RING	40210	EA	2	BA				CIS	1 Sep 93	
3	63	T130 DOZER	CYLINDER PACKING	40944 CP	EA	5	BA				CIS	1 Sep 93	
3	64	T130 DOZER	CYLINDER	14 02 101 CP	EA	5	BA				CIS	1 Sep 93	
3	65	T130 DOZER	HEAD CYLINDER	16 02 106 CP	EA	2	BA				CIS	1 Sep 93	
3	66	T130 DOZER	VALVE	14 02 32	EA	1	BA				CIS	1 Sep 93	
3	67	T130 DOZER	VALVE	14 02 33 V	EA	1	BA				CIS	1 Sep 93	
3	68	T130 DOZER	PIPE	10663 1	EA	1	BA				CIS	1 Sep 93	
3	69	T130 DOZER	PIPE	10664 1	EA	1	BA				CIS	1 Sep 93	
3	70	T130 DOZER	GEARBOX	50 12 12 CP	EA	0 2	BA				CIS	1 Sep 93	
3	71	T130 DOZER	COUPLING	18 14 133 CP	EA	0 3	BA				CIS	1 Sep 93	
3	72	T130 DOZER	DISC	18 14 135 CP	EA	0 4	BA				CIS	1 Sep 93	
3	73	T130 DOZER	COUPLING	18 14 78	EA	0 3	BA				CIS	1 Sep 93	
3	74	T130 DOZER	COLLAR	3 48X28 6	EA	0 4	BA				CIS	1 Sep 93	
3	75	T130 DOZER	RING	N1 35X28 2	EA	0 6	BA				CIS	1 Sep 93	
3	76	T130 DOZER	DISC	24 16 103 CP	EA	1	BA				CIS	1 Sep 93	
3	77	T130 DOZER	PUMP	51 67 10 CP	EA	0 2	BA				CIS	1 Sep 93	
3	78	T130 DOZER	PISTON PUMP	16 67 102 CP	EA	3 6	BA				CIS	1 Sep 93	
3	79	T130 DOZER	PUMP PISTON	16-67 108 CP	EA	3 6	BA				CIS	1 Sep 93	
3	80	T130 DOZER	DISC	738 4 CP	EA	1	BA				CIS	1 Sep 93	
3	81	T130 DOZER	COUPLING	72118 CP	EA	0 5	BA				CIS	1 Sep 93	
3	82	T130 DOZER	RING	111 30 123 00	EA	2	BA				CIS	1 Sep 93	
3	83	T130 DOZER	ROTOR	92 55	EA	0 2	BA				CIS	1 Sep 93	
3	84	T130 DOZER	RADIATOR	21 09 1	EA	0 2	BA				CIS	1 Sep 93	
3	85	T130 DOZER	PUMP	51 67 11 CP	EA	0 2	BA				CIS	1 Sep 93	
3	86	T130 DOZER	TOTAL COST US DOLLARS				BA		$18 000		CIS	1 Sep 93	
3	1	T250 DOZER	ENGINE	B 31M 748 01 4 cb	EA	2	BA				CIS	1 Sep 93	
3	2	T250 DOZER	HOUSING	748-05 120 CP	EA	20	BA				CIS	1 Sep 93	
3	3	T250 DOZER	HOUSING	748 05 271 CP	EA	20	BA				CIS	1 Sep 93	
3	4	T250 DOZER	REFLECTOR LIGHTS	748 07 182 CP	EA	1	BA				CIS	1 Sep 93	
3	5	T250 DOZER	REFLECTOR LIGHTS	748 07 212 CP	EA	1	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	6	T250 DOZER	REGULATOR	P5M	EA	10	BA				CIS	1 Sep 93	
3	7	T250 DOZER	LIGHT SET	FG 122B	EA	20	BA				CIS	1 Sep 93	
3	8	T250 DOZER	LAMP	A 24 75X60	EA	1000	BA				CIS	1 Sep 93	
3	9	T250 DOZER	PLANETARY MECH	748 16-141 cb	EA	1	BA				CIS	1 Sep 93	
3	10	T250 DOZER	RINGS	748 16 86	EA	4	BA				CIS	1 Sep 93	
3	11	T250 DOZER	RINGS	748 58 2059	EA	4	BA				CIS	1 Sep 93	
3	12	T250 DOZER	SHIMS	748 18 226-232	EA	160	BA				CIS	1 Sep 93	
3	13	T250 DOZER	CLIPS	3629	EA	10000	BA				CIS	1 Sep 93	
3	14	T250 DOZER	GEAR BOX	748 19	EA	2	BA				CIS	1 Sep 93	
3	15	T250 DOZER	SHIFTING FORK	748 19 1	EA	30	BA				CIS	1 Sep 93	
3	16	T250 DOZER	IDLER	748 21 112 CP	EA	48	BA				CIS	1 Sep 93	
3	17	T250 DOZER	IDLER	748 21 130 CP	EA	48	BA				CIS	1 Sep 93	
3	18	T250 DOZER	SETS TRACK	748 22 101 CP	SET	4	BA				CIS	1 Sep 93	
3	19	T250 DOZER	GROUSERS	748 22 132 CP	EA	20	BA				CIS	1 Sep 93	
3	20	T250 DOZER	TRACK BOLTS	700 28 232	EA	1000	BA				CIS	1 Sep 93	
3	21	T250 DOZER	TRACK BUSHINGS	748 22 3	EA	100	BA				CIS	1 Sep 93	
3	22	T250 DOZER	TRACK LINKS	748 22 1	EA	40	BA				CIS	1 Sep 93	
3	23	T250 DOZER	TRACK LINKS	748 22 2	EA	40	BA				CIS	1 Sep 93	
3	24	T250 DOZER	TRACK PINS	748 22 6	EA	100	BA				CIS	1 Sep 93	
3	25	T250 DOZER	CONE 7	748 22 71	EA	200	BA				CIS	1 Sep 93	
3	26	T250 DOZER	WASHERS	748-22 50	EA	1000	BA				CIS	1 Sep 93	
3	27	T250 DOZER	BLOWER	748 27 208 CP	EA	2	BA				CIS	1 Sep 93	
3	28	T250 DOZER	PACKING	748 31 11	EA	10	BA				CIS	1 Sep 93	
3	29	T250 DOZER	PACKING	748 31 138	EA	10	BA				CIS	1 Sep 93	
3	30	T250 DOZER	COUPLING	748 13 75	EA	2	BA				CIS	1 Sep 93	
3	31	T250 DOZER	AXLE	748 50 206	EA	2	BA				CIS	1 Sep 93	
3	32	T250 DOZER	COUPLING	748 50-171 CP	EA	2	BA				CIS	1 Sep 93	
3	33	T250 DOZER	DISC	748 50-302 CP	EA	4	BA				CIS	1 Sep 93	
3	34	T250 DOZER	DISC	748 50-152 CP	EA	4	BA				CIS	1 Sep 93	
3	35	T250 DOZER	PUMP	748 50-232 cb	EA	5	BA				CIS	1 Sep 93	
3	36	T250 DOZER	CONTACTOR	TKC 611D0D	EA	8	BA				CIS	1 Sep 93	
3	37	T250 DOZER	CONTROLLER	KB30G 748 82 371	EA	2	BA				CIS	1 Sep 93	
3	38	T250 DOZER	ELECT BRUSH	UG 2A 2/12 5X40X60	EA	300	BA				CIS	1 Sep 93	
3	39	T250 DOZER	ELECT BRUSH	UG 2A /16X32X40/	EA	500	BA				CIS	1 Sep 93	
3	40	T250 DOZER	INITIATOR	DK 913A	EA	2	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	41	T250 DOZER	HYDRO PUMP	748-99 230 cb	EA	2	BA				CIS	1 Sep 93	
3	42	T250 DOZER	WASHER	748 99 993	EA	20	BA				CIS	1 Sep 93	
3	43	T250 DOZER	RINGS	748-99 446	EA	20	BA				CIS	1 Sep 93	
3	44	T250 DOZER	DISTRIBUTOR	748-99 465 cb	EA	2	BA				CIS	1 Sep 93	
3	45	T250 DOZER	POWER CYLINDER	748 99 10 cb	EA	6	BA				CIS	1 Sep 93	
3	46	T250 DOZER	SHOCK ABSORBER	402 50 7	EA	24	BA				CIS	1 Sep 93	
3	47	T250 DOZER	PACKING	3303 08 1	EA	4	BA				CIS	1 Sep 93	
3	48	T250 DOZER	RING	303 10-2	EA	72	BA				CIS	1 Sep 93	
3	49	T250 DOZER	PIPE	303 18 1A	EA	72	BA				CIS	1 Sep 93	
3	50	T250 DOZER	GENERATOR	CBV 30940-3	EA	4	BA				CIS	1 Sep 93	
3	51	T250 DOZER	BUSHING	3308 233 2	EA	2	BA				CIS	1 Sep 93	
3	52	T250 DOZER	PUMP	CB 3311 00 4	EA	1	BA				CIS	1 Sep 93	
3	53	T250 DOZER	SHAFT	CB411 22 16	EA	2	BA				CIS	1 Sep 93	
3	54	T250 DOZER	PUMP	CB412 00 5	EA	2	BA				CIS	1 Sep 93	
3	55	T250 DOZER	TOTAL COST US DOLLARS				BA		$45 000		CIS	1 Sep 93	

TOTAL COST US DOLLARS $7 960 564

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	165	ALUM WIRE	OVERHEAD FIELD LINE		TONNE	7 5	SG	4912	$35 844		USA	1 Sep 93	
1	7	ANFO TR	ANFO MIX TRUCK		EA	1	SG	$135 125	$135 125		USA	1 Sep 93	
1	158	BATTERIES	6 CT 182 AMP/HR 12V		EA	50	SG	204 06	$10 203		USA	1 Jan 94	
1	163	BATTERIES	32 CT 450 AMP/HR 24 V		EA	32	SG	414	$13 248		USA	1 Jan 94	
1	4	BULLDOZER	CAT D 10 BULLDOZER		EA	1	SG	$638 900	$638 900		USA	1 Sep 93	
1	31	DRAG W PTS	10/70		LOT		SG	$30 000	$30 000		USA	1 Sep 93	
1	26	DRAG BUCK	10/70 DRAG BUCKET/COMP		EA	1	SG	$113 000	$113 000		USA	1 Sep 93	
1	38	EXPLOSIVES	75lb CAST PRIMERS		EA	30 000	SG	$1 75	$52 500		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	43	EXPLOSIVES	PRIMADETS #12/12FT		EA	12 000	SG	$1 75	$21 000		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	45	EXPLOSIVES	MSGS SURFACE DELAYS		EA	7 000	SG	$2 60	$18 200		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	47	EXPLOSIVES	26 GRAIN DETONATING CORD		KM	200	SG	$280 00	$56 000		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	48	EXPLOSIVES	EZ DET 25 350/18m Length		EA	15 000	SG	$4 38	$65 700		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	49	EXPLOSIVES	EZ TRUNK LINES 17MS/9M LENGTH		EA	900	SG	$2 95	$2 655		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	16	FEL	CAT992C FRONT END LOADER		EA	1	SG	$977 672	$977 672		USA	1 Sep 93	
1	9	FUEL TRUCK	FUEL & LUBE TRUCK		EA	1	SG	$90 275	$90 275		USA	1 Sep 93	
1	113	GEN BRUSH	ER4 25x32x40		EA	500	SG	2 92	$1 460		USA	1 Sep 93	
1	114	GEN BRUSH	ER4 2/12 5x32x40		EA	1000	SG				USA	1 Sep 93	
1	115	GEN BRUSH	ER4 16x25x32		EA	200	SG	5 88	$1 176		USA	1 Sep 93	
1	116	GEN BRUSH	ER4 25x50x64		EA	300	SG	3 97	$1 191		USA	1 Sep 93	
1	117	GEN BRUSH	ER4 25x32x40		EA	200	SG	4 11	$822		USA	1 Sep 93	
1	118	GEN BRUSH	ER4 16x32x40		EA	200	SG				USA	1 Sep 93	
1	119	GEN BRUSH	ER4 25x32x64		EA	1000	SG				USA	1 Sep 93	
1	120	GEN BRUSH	ER4 16x25x40		EA	100	SG				USA	1 Sep 93	
1	121	GEN BRUSH	ER4 30x25x40		EA	100	SG				USA	1 Sep 93	
1	122	GEN BRUSH	ER4 8x10x25		EA	200	SG				USA	1 Sep 93	
1	123	GEN BRUSH	ER4 2/12 55x32x40		EA	300	SG	2 92	$876		USA	1 Sep 93	
1	124	GEN BRUSH	ER74 25x32x51		EA	1000	SG	2 92	$2 920		USA	1 Sep 93	
1	125	GEN BRUSH	ER74 2/12 55x32x64		EA	200	SG				USA	1 Sep 93	
1	126	GEN BRUSH	ER74 2/12 5x44x40		EA	200	SG				USA	1 Sep 93	
1	127	GEN BRUSH	ER74 2/20x32x40		EA	100	SG				USA	1 Sep 93	
1	128	GEN BRUSH	ER74 2/25x30x64		EA	100	SG				USA	1 Sep 93	
1	129	GEN BRUSH	ER14 16x32x40		EA	400	SG	4 11	$1 644		USA	1 Sep 93	
1	130	GEN BRUSH	ER14 25x50x64		EA	1500	SG	5 88	$8 820		USA	1 Sep 93	
1	131	GEN BRUSH	ER14 2/12 5x16x25		EA	200	SG				USA	1 Sep 93	
1	132	GEN BRUSH	ER14 2/12 5x32x40		EA	2000	SG				USA	1 Sep 93	
1	133	GEN BRUSH	ER14 20x32x32		EA	200	SG				USA	1 Sep 93	
1	134	GEN BRUSH	ER14 25x50x60		EA	200	SG	5 88	$1 176		USA	1 Sep 93	
1	135	GEN BRUSH	ER74 20x52x40		EA	100	SG				USA	1 Sep 93	
1	136	GEN BRUSH	ER74 25x30x64		EA	100	SG				USA	1 Sep 93	
1	137	GEN BRUSH	ER74 12 5x32x65		EA	200	SG				USA	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	138	GEN BRUSH	ER2A 2/12 5x40x60		EA	100	SG				USA	1 Sep 93	
1	139	GEN BRUSH	ER2A 5x9x17 5		EA	100	SG				USA	1 Sep 93	
1	140	GEN BRUSH	ER2A 8x10x25		EA	100	SG				USA	1 Sep 93	
1	141	GEN BRUSH	ER2A 16x32x40		EA	400	SG	4 11	$1 644		USA	1 Sep 93	
1	142	GEN BRUSH	ER2A 16x40x60		EA	100	SG				USA	1 Sep 93	
1	143	GEN BRUSH	ER61 2/10x40x52		EA	400	SG				USA	1 Sep 93	
1	144	GEN BRUSH	ER61 2/8x32x50		EA	400	SG				USA	1 Sep 93	
1	145	GEN BRUSH	ER61 2/8x32x52		EA	100	SG				USA	1 Sep 93	
1	146	GEN BRUSH	ER61 2/12 5x40x52		EA	100	SG				USA	1 Sep 93	
1	1	GRADER	CAT 16G MOTORGRADER		EA	1	SG	$385 000	$385 000		USA	1 Sep 93	
1	35	INSTRU	ELECT TEST INSTRUMENTS				SG	$3 000	$3 000		USA	1 Sep 93	
1	92	REWIND CU	4 ARMOURED POLY THERMALEZE		lbs	220	SG	$2 82	$620		USA	1 Sep 93	
1	93	REWIND CU	45 ARMOURED POLY THERMALEZE		lbs	440	SG	$2 75	$1 211		USA	1 Sep 93	
1	94	REWIND CU	47 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 75	$5 505		USA	1 Sep 93	
1	95	REWIND CU	55 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 63	$5 265		USA	1 Sep 93	
1	96	REWIND CU	6 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 53	$5 065		USA	1 Sep 93	
1	97	REWIND CU	63 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 52	$5 045		USA	1 Sep 93	
1	98	REWIND CU	67 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 40	$4 805		USA	1 Sep 93	
1	99	REWIND CU	7 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 40	$4 805		USA	1 Sep 93	
1	100	REWIND CU	8 ARMOURED POLY THERMALEZE		lbs	440	SG	$2 33	$1 027		USA	1 Sep 93	
1	101	REWIND CU	83 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 33	$4 669		USA	1 Sep 93	
1	102	REWIND CU	95 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 26	$4 529		USA	1 Sep 93	
1	103	REWIND CU	1 0 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 26	$4 529		USA	1 Sep 93	
1	104	REWIND CU	1 12 ARMOURED POLY THERMALEZE		lbs	2 860	SG	$2 17	$6 209		USA	1 Sep 93	
1	105	REWIND CU	1 18 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 17	$4 342		USA	1 Sep 93	
1	106	REWIND CU	1 20 ARMOURED POLY THERMALEZE		lbs	2 200	SG	$2 17	$4 776		USA	1 Sep 93	
1	107	REWIND CU	1 30 ARMOURED POLY THERMALEZE		lbs	2 200	SG	$2 12	$4 666		USA	1 Sep 93	
1	108	REWIND CU	1 32 ARMOURED POLY THERMALEZE		lbs	2 200	SG	$2 12	$4 666		USA	1 Sep 93	
1	109	REWIND CU	1 40 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 12	$4 241		USA	1 Sep 93	
1	110	REWIND CU	1 45 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 12	$4 241		USA	1 Sep 93	
1	111	REWIND CU	1 47 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 12	$4 241		USA	1 Sep 93	
1	112	REWIND CU	1 60 ARMOURED POLY THERMALESE		lbs	2 000	SG	$2 07	$4 146		USA	1 Sep 93	
1	33	SHOV BUCK	WEAR PARTS		LOT		SG	$22 000	$22 000		USA	1 Sep 93	
1	28	SHOVEL B	EKG 4 6 SHOVEL BUCKET		EA	1	SG	$79 000	$79 000		USA	1 Sep 93	
1	12	TIRE TRUCK	TIRE HANDLING TRUCK		EA	1	SG	$79 925	$79 925		USA	1 Sep 93	
1	19	TRUCK	2 TON FLATBED FOR PERSONNEL TRANS		EA	1	SG	$40 250	$40 250		USA	1 Sep 93	
1	91	WELDING RD	6011 GEN PURPOSE ROD 5/32		lbs	10 000	SG	$0 57	$5 710		USA	1 Sep 93	
1	57	WIRE ROPE	52 mm(2) 10 7 Kg/M 15 TONNE		FT	4 475	SG	$4 60	$20 585		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	61	WIRE ROPE	39mm (1 5) 4 2 Kg/M 15 TONNE		FT	6 625	SG	$2 31	$15 304		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	51	EXPLOSIVES	AN BLASTING PRILL		TONNE	1 000	SG	$190 00	$190 000		SWD	SPLIT	50% 1 SEPT 93 50% 1 JAN 94

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	52	EXPLOSIVES	5 x30 (20KG) BAGGED EMULSION		KG	500 000	SG	$0 66	$330 000		SWD	1 Sep 93	
1	1	DUMPCAR	SIDE PANELS	634 01 000-0 cb	EA	12	SG				POL	1 Sep 93	
1	2	DUMPCAR	FRONT PANEL	634 04 000 3	EA	12	SG				POL	1 Sep 93	
1	3	DUMPCAR	PANEL LOCKS LEFT	634 01 010 2	EA	12	SG				POL	1 Sep 93	
1	4	DUMPCAR	PANEL LOCKS RIGHT	634 01 020-2	EA	12	SG				POL	1 Sep 93	
1	5	DUMPCAR	PANEL SUPPORTS	634 01 150 cb	EA	6	SG				POL	1 Sep 93	
1	6	DUMPCAR	SINGLE ACTION CYLINDER	640 45 010 cb	EA	9 6	SG				POL	1 Sep 93	
1	7	DUMPCAR	PISTON COLLARS	45 129	EA	300	SG				POL	1 Sep 93	
1	8	DUMPCAR	DOUBLE ACTION CYL	640 45 010 1	EA	12	SG				POL	1 Sep 93	
1	9	DUMPCAR	DOUBLE ACTION PISTON	640 45 105 2	EA	6	SG				POL	1 Sep 93	
1	10	DUMPCAR	DISTRIBUTION VALVES	372 000-1 9	EA	30	SG				POL	1 Sep 93	
1	11	DUMPCAR	ROD EQUALIZER	522 00 003 0	EA	3	SG				POL	1 Sep 93	
1	12	DUMPCAR	BOGGEY CONNECTOR	522 00 010 1	EA	3	SG				POL	1 Sep 93	
1	13	DUMPCAR	SQ AXLE CAP ENDS	74 10 116	EA	6	SG				POL	1 Sep 93	
1	14	DUMPCAR	OUTSIDE SPRING	522 38 001 0	EA	24	SG				POL	1 Sep 93	
1	15	DUMPCAR	INSIDE SPRING	522 38 002 0	EA	24	SG				POL	1 Sep 93	
1	16	DUMPCAR	SET SH ABSORBERS	522 38 016-0	EA	6	SG				POL	1 Sep 93	
1	17	DUMPCAR	FRAME	4686 6061 40 016	EA	30	SG				POL	1 Sep 93	
1	18	DUMPCAR	SMALL BRAKE LOCKS	46-03 015	EA	30	SG				POL	1 Sep 93	
1	19	DUMPCAR	PUSH RDS BRAKE PDS	61 40 133	EA	12	SG				POL	1 Sep 93	
1	20	DUMPCAR	FRAME ENDS RIGHT	61 40 110	EA	4 8	SG				POL	1 Sep 93	
1	21	DUMPCAR	FRAME ENDS LEFT	61 40 120	EA	4 8	SG				POL	1 Sep 93	
1	22	DUMPCAR	BRK PADS COMP POLY	TY 38 114 79 72	EA	900	SG				POL	1 Sep 93	
1	23	DUMPCAR	WHEEL PAIRS	61 10 046	EA	6	SG				POL	1 Sep 93	
1	24	DUMPCAR	WHEEL PACKING COVER	TY 519 07	EA	6	SG				POL	1 Sep 93	
1	25	DUMPCAR	BOGGEY CONNECTORS	522 00 020-1	EA	3	SG				POL	1 Sep 93	
1	26	DUMPCAR	DISTRIBUTOR VALVE		EA	24	SG				POL	1 Sep 93	
1	27	DUMPCAR	AUTOMATIC COUPLING		EA	18	SG				POL	1 Sep 93	
1	28	DUMPCAR	AUTO COUPLING HEAD	106 00 00	EA	6	SG				POL	1 Sep 93	
1	29	DUMPCAR	COUPLING LOCK	106 01 002	EA	12	SG				POL	1 Sep 93	
1	30	DUMPCAR	LOCK HOLDER	106 01 003-0	EA	6	SG				POL	1 Sep 93	
1	31	DUMPCAR	COUPLING TRIPPER	106 01 006 0	EA	12	SG				POL	1 Sep 93	
1	32	DUMPCAR	COUPLING HINGE PINS	106 00 012 0	EA	18	SG				POL	1 Sep 93	
1	33	DUMPCAR	COUPLING SHOCK ABS	106 00 001	EA	12	SG				POL	1 Sep 93	
1	34	DUMPCAR	COUPLING SHOCK SLIDE	106 02 00-2	EA	6	SG				POL	1 Sep 93	
1	35	DUMPCAR	COUPLING SH AB LK	106 00 002 2	EA	24	SG				POL	1 Sep 93	
1	36	DUMPCAR	DOOR ACTLATOR ARMS	634 46 010	EA	24	SG				POL	1 Sep 93	
1	37	DUMPCAR	DOOR ACTUATOR ARMS	634 46 020-2	EA	24	SG				POL	1 Sep 93	
1	38	DUMPCAR	DOOR ACTUATOR ARMS	634 46 030	EA	12	SG				POL	1 Sep 93	
1	39	DUMPCAR	END VALVE		EA	30	SG				POL	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	40	DUMPCAR	AIR SPEED REDUCERS		EA	24	SG				POL	1 Sep 93	
1	41	DUMPCAR	RING PACKING	38 72	EA	60	SG				POL	1 Sep 93	
1	42	DUMPCAR	AIR DISTRIBUTOR	482 000	EA	0	SG				POL	1 Sep 93	
1	43	DUMPCAR	PISTON COLLAR	270 397	EA	6	SG				POL	1 Sep 93	
1	44	DUMPCAR	PISTON SPRING	270 397	EA	12	SG				POL	1 Sep 93	
1	45	DUMPCAR	HOUSING ACC AIR	DR 483 00	EA	18	SG				POL	1 Sep 93	
1	46	DUMPCAR	BRAKE CYL PARTS	VR 483-000	EA	18	SG				POL	1 Sep 93	
1	47	DUMPCAR	PIPES	VR 483 000	EA	18	SG				POL	1 Sep 93	
1	48	DUMPCAR	REGULATOR ARM	522 10 050 1	EA	18	SG				POL	1 Sep 93	
1	49	DUMPCAR	CAR CONNECTOR HOSE		EA	90	SG				POL	1 Sep 93	
1	50	DUMPCAR	TOTAL COST US DOLLARS				SG		$300 000		POL	1 Sep 93	
1	1	COAL LOAD	BUSHING	3400 00 005 02	EA	4	SG				CIS	1 Sep 93	
1	2	COAL LOAD	FRONT PLATE	3430 04 200 7	EA	8	SG				CIS	1 Sep 93	
1	3	COAL LOAD	DISC	3430 11 200 00	EA	8	SG				CIS	1 Sep 93	
1	4	COAL LOAD	DISC	3430 11 007 00	EA	8	SG				CIS	1 Sep 93	
1	5	COAL LOAD	DRIVE UNIT LEFT SIDE	7415 53 050 00	EA	1	SG				CIS	1 Sep 93	
1	6	COAL LOAD	VIBRATOR LEFT	GUCL 72 00	EA	1	SG				CIS	1 Sep 93	
1	7	COAL LOAD	VIBRATOR RIGHT	GUCL 72 00	EA	1	SG				CIS	1 Sep 93	
1	8	COAL LOAD	TOTAL COST US DOLLARS				SG		$35 000		CIS	1 Sep 93	
1	1	D TRAIN	DISTRIBUTER	D50 17 101 cb 1	EA	500	SG				CIS	1 Sep 93	
1	2	D TRAIN	PUMP ELEMENT	D50 27 104 cb	EA	50	SG				CIS	1 Sep 93	
1	3	D TRAIN	SEAL	D50 27 204 cb 2	EA	100	SG				CIS	1 Sep 93	
1	4	D TRAIN	DIRECTIONAL VALVE	D50 27 209 cb 1	EA	10	SG				CIS	1 Sep 93	
1	5	D TRAIN	OIL PUMP	D50 12 3 01	EA	30	SG				CIS	1 Sep 93	
1	6	D TRAIN	WATER PUMP	D50 11 01	EA	30	SG				CIS	1 Sep 93	
1	7	D TRAIN	SHOCK	D50 10 111	EA	40	SG				CIS	1 Sep 93	
1	8	D TRAIN	SEAL	D50 34 114 01	EA	50	SG				CIS	1 Sep 93	
1	9	D TRAIN	REGULATOR	D50 27 200cb	EA	10	SG				CIS	1 Sep 93	
1	10	D TRAIN	OUTLET VALVE	KT6 06 001 cb 2	EA	50	SG				CIS	1 Sep 93	
1	11	D TRAIN	INLET VALVE	KT6-06 001 cb 2	EA	50	SG				CIS	1 Sep 93	
1	12	D TRAIN	SPRING VALVE	KT6 06-033 2	EA	2000	SG				CIS	1 Sep 93	
1	13	D TRAIN	INLET FILTER	KT6 06 021	EA	500	SG				CIS	1 Sep 93	
1	14	D TRAIN	DRIVE HUB	T33 55 6 cb	EA	100	SG				CIS	1 Sep 93	
1	15	D TRAIN	BELT	b 2240	EA	100	SG				CIS	1 Sep 93	
1	16	D TRAIN	BELT	b 1250	EA	100	SG				CIS	1 Sep 93	
1	17	D TRAIN	SHOCK ABSORBER SP	3 35 30 101	EA	40	SG				CIS	1 Sep 93	
1	18	D TRAIN	PRESS ELEC GAUGE		EA	15	SG				CIS	1 Sep 93	
1	19	D TRAIN	SWITCHES	TB1 2	EA	50	SG				CIS	1 Sep 93	
1	20	D TRAIN	SWITCHES	TB1 1	EA	50	SG				CIS	1 Sep 93	
1	21	D TRAIN	SWITCHES	TB1 4	EA	50	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	22	D TRAIN	COUPLES RAIL	GEM 70 85 000	EA	10	SG				CIS	1 Sep 93	
1	23	D TRAIN	BRAKE SHOES	GEM 2 4211	EA	1000	SG				CIS	1 Sep 93	
1	24	D TRAIN	AUTO COUPLINGS	CA 3	EA	40	SG				CIS	1 Sep 93	
1	25	D TRAIN	BATTERY	32TN 450	SET	6	SG				CIS	1 Sep 93	
1	26	D TRAIN	LAMP	PX50X50	EA	200	SG				CIS	1 Sep 93	
1	27	D TRAIN	LAMP	24 25	EA	100	SG				CIS	1 Sep 93	
1	28	D TRAIN	TOTAL COST US DOLLARS				SG				CIS	1 Sep 93	
1	1	HEAT PLT	CHAIN	9 08 000	M	125	SG				CIS	1 Sep 93	
1	2	HEAT PLT	HOLDER	T9 05 002	EA	100	SG				CIS	1 Sep 93	
1	3	HEAT PLT	HOLDER	T9 05 001	EA	100	SG				CIS	1 Sep 93	
1	4	HEAT PLT	HOLDER	6 30 2	EA	500	SG				CIS	1 Sep 93	
1	5	HEAT PLT	ROLLER	6 30 25	EA	300	SG				CIS	1 Sep 93	
1	6	HEAT PLT	FRONT PACKING	T197 01 001	EA	5	SG				CIS	1 Sep 93	
1	7	HEAT PLT	MIDDLE PACKING	T197 01 002	EA	5	SG				CIS	1 Sep 93	
1	8	HEAT PLT	END LEFT PACKING	T82 01 001	EA	5	SG				CIS	1 Sep 93	
1	9	HEAT PLT	RIGHT PACKING	T82 01 002	EA	5	SG				CIS	1 Sep 93	
1	10	HEAT PLT	MIDDLE PACKING	T82 01 003	EA	5	SG				CIS	1 Sep 93	
1	13	HEAT PLT	CONNECTING LINK	T82 00 018	EA	300	SG				CIS	1 Sep 93	
1	14	HEAT PLT	SHAFT	6 30 9	EA	300	SG				CIS	1 Sep 93	
1	15	HEAT PLT	WASHER	T82 03 005	EA	0 1	SG				CIS	1 Sep 93	
1	16	HEAT PLT	WASHER	12 10906 66	EA	0 1	SG				CIS	1 Sep 93	
1	17	HEAT PLT	WASHER	16 10906 66	EA	0 1	SG				CIS	1 Sep 93	
1	18	HEAT PLT	WASHER	20 11371 66	EA	0 1	SG				CIS	1 Sep 93	
1	19	HEAT PLT	COTTER PIN	5X25 397 66	EA	0 1	SG				CIS	1 Sep 93	
1	20	HEAT PLT	COTTER PIN	5X28 397 66	EA	0 25	SG				CIS	1 Sep 93	
1	21	HEAT PLT	COTTER PIN	9X50 2319 70	EA	0 25	SG				CIS	1 Sep 93	
1	22	HEAT PLT	CHAIN	9X27 2319 70	M	100	SG				CIS	1 Sep 93	
1	23	HEAT PLT	FT SHFT W/ HALF COUP	T82 03 000	EA	0 5	SG				CIS	1 Sep 93	
1	24	HEAT PLT	END SHAFT	T82 07 000	EA	0 5	SG				CIS	1 Sep 93	
1	25	HEAT PLT	SOCKSHING PAN	DN 17	EA	1	SG				CIS	1 Sep 93	
1	26	HEAT PLT	STEAM BOILER PARTS	1 08 06	SET	100	SG				CIS	1 Sep 93	
1	27	HEAT PLT	STEAM BOILER PARTS	1 08 05	EA	600	SG				CIS	1 Sep 93	
1	28	HEAT PLT	STEAM BOILER PARTS	3P 800	EA	2	SG				CIS	1 Sep 93	
1	29	HEAT PLT	BOILER CONVEC SEC	KVTC 20 150	EA	1	SG				CIS	1 Sep 93	
1	30	HEAT PLT	TOTAL COST US DOLLARS				SG		$300 000		CIS	1 Sep 93	
1	1	RAIL MAT	RAIL TYPE P 50	7174 75	TONNE	1050	SG				CIS	1 Sep 93	
1	2	RAIL MAT	RAIL TYPE P 65	7174 75	TONNE	700	SG				CIS	1 Sep 93	
1	3	RAIL MAT	BEDING PLATE P 50	12135 75	TONNE	84	SG				CIS	1 Sep 93	
1	4	RAIL MAT	BEDING PLATE P 65	12135 75	TONNE	84	SG				CIS	1 Sep 93	
1	5	RAIL MAT	CONN PLATE P 50	4133 54	TONNE	84	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	6	RAIL MAT	CONN PLATE P 65	4133 54	TONNE	84	SG				CIS	1 Sep 93	
1	7	RAIL MAT	RR SPAKE P 50		TONNE	84	SG				CIS	1 Sep 93	
1	8	RAIL MAT	RAIL PLANGE P 50	2953 51	TONNE	21	SG				CIS	1 Sep 93	
1	9	RAIL MAT	RAIL PLANGE P 65	2953-51	TONNE	21	SG				CIS	1 Sep 93	
1	10	RAIL MAT	BOLTS&NUTS P 50	11530-76	TONNE	21	SG				CIS	1 Sep 93	
1	11	RAIL MAT	BOLTS & NUTS P 65	11530 76	TONNE	10 5	SG				CIS	1 Sep 93	
1	12	RAIL MAT	LOCK WASHER P 50	19115 73	TONNE	8 4	SG				CIS	1 Sep 93	
1	13	RAIL MAT	TRACK SWITCH P50 RT		SET	7	SG				CIS	1 Sep 93	
1	14	RAIL MAT	TRACK SWITCH P65 LEFT		SET	7	SG				CIS	1 Sep 93	
1	15	RAIL MAT	Y RAIL P50 DIRECT LEFT		EA	3 5	SG				CIS	1 Sep 93	
1	16	RAIL MAT	Y RAIL P50 DIRECT RIGHT		EA	3 5	SG				CIS	1 Sep 93	
1	17	RAIL MAT	YRAIL P50 BENDED RIGHT		EA	3 5	SG				CIS	1 Sep 93	
1	18	RAIL MAT	RAIL INSOLATOR P50		SET	420	SG				CIS	1 Sep 93	
1	19	RAIL MAT	RAIL INSOLATOR P65		SET	385	SG				CIS	1 Sep 93	
1	20	RAIL MAT	CRESOTA SLEEPER		TONNE	7	SG				CIS	1 Sep 93	
1	21	RAIL MAT	TOTAL COST US DOLLARS				SG		$245 000		CIS	1 Sep 93	
1	1	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	SG				CIS	1 Sep 93	
1	2	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	SG				CIS	1 Sep 93	
1	3	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	SG				CIS	1 Sep 93	
1	4	RR COMM	SIGNAL CABLE	GOST6436 75	KM	2	SG				CIS	1 Sep 93	
1	5	RR COMM	SIGNAL CABLE	GOST6436 75	KM	2	SG				CIS	1 Sep 93	
1	6	RR COMM	SIGNAL CABLE	GOST6436 75	KM	2	SG				CIS	1 Sep 93	
1	7	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1 5	SG				CIS	1 Sep 93	
1	8	RR COMM	ROAD TRANSFORMER	NFT A	EA	15	SG				CIS	1 Sep 93	
1	9	RR COMM	ROAD TRANSPORMER	NOVC 5A	EA	15	SG				CIS	1 Sep 93	
1	10	RR COMM	SIGNAL TRANSFORMER	ST 6	EA	25	SG				CIS	1 Sep 93	
1	11	RR COMM	SWITCH RELAY	2162 00-V	EA	25	SG				CIS	1 Sep 93	
1	12	RR COMM	RECTIFIER	86 00 00V	EA	25	SG				CIS	1 Sep 93	
1	13	RR COMM	RESISTOR	7165	EA	25	SG				CIS	1 Sep 93	
1	14	RR COMM	SWITCHING GEAR BOX		EA	5	SG				CIS	1 Sep 93	
1	15	RR COMM	LAMPS FOR LINZ		EA	250	SG				CIS	1 Sep 93	
1	16	RR COMM	FRAMEWORK	19402 00 00	EA	5	SG				CIS	1 Sep 93	
1	17	RR COMM	BONDING WIRE	21 00 00	EA	25	SG				CIS	1 Sep 93	
1	18	RR COMM	CONTROL WIRE		EA	50	SG				CIS	1 Sep 93	
1	19	RR COMM	LAMPS FOR TERM BD		EA	500	SG				CIS	1 Sep 93	
1	20	RR COMM	SWITCHING RELAY SET	144690000A	EA	5	SG				CIS	1 Sep 93	
1	21	RR COMM	INST FOR ELEC MEAS		EA	5	SG				CIS	1 Sep 93	
1	22	RR COMM	RR LINZ LTS RED	26116-00-00	EA	25	SG				CIS	1 Sep 93	
1	23	RR COMM	RR LINZ LTS GREEN	26116-00 00	EA	25	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	24	RR COMM	RR LINZ LTS WHITE	26116-00-00	EA	20	SG				CIS	1 Sep 93	
1	25	RR COMM	ELECTROMOTOR		EA	10	SG				CIS	1 Sep 93	
1	26	RR COMM	SWITCHING ARM		EA	15	SG				CIS	1 Sep 93	
1	27	RR COMM	TOTAL COST US DOLLARS				SG		$6 000		CIS	1 Sep 93	
1	1	WATER P	PUMP CENTRIFUGE	SNC 180 65	EA	0 6	SG				CIS	1 Sep 93	
1	2	WATER P	PUMP CENTRIFUGE	D 1250 65	EA	0 6	SG				CIS	1 Sep 93	
1	3	WATER P	PUMP CENTRIFUGE	D 200-95	EA	0 6	SG				CIS	1 Sep 93	
1	4	WATER P	PUMP CENTRIFUGE	NSC 3	EA	1 2	SG				CIS	1 Sep 93	
1	5	WATER P	IMPELLOR		EA	1 8	SG				CIS	1 Sep 93	
1	6	WATER P	IMPELLOR	5KE 224 176A	EA	12	SG				CIS	1 Sep 93	
1	7	WATER P	SHAFT	8KE 200 525 01A	EA	3	SG				CIS	1 Sep 93	
1	8	WATER P	SHAFT	EB 205 320	EA	3	SG				CIS	1 Sep 93	
1	9	WATER P	SHAFT	EB-205 320	EA	3	SG				CIS	1 Sep 93	
1	10	WATER P	COLLAR	1 35 58 2 GOCT 8752 70	EA	6	SG				CIS	1 Sep 93	
1	11	WATER P	SPARING	8KE 211 023	EA	3 6	SG				CIS	1 Sep 93	
1	12	WATER P	BEARING	5KS 253 013	EA	3 6	SG				CIS	1 Sep 93	
1	13	WATER P	IMPELLOR	5KE 224 014	EA	3 6	SG				CIS	1 Sep 93	
1	14	WATER P	SPARING	8KS 210 095	EA	3 6	SG				CIS	1 Sep 93	
1	15	WATER P	COUPLING	8KS 255 000	EA	1 8	SG				CIS	1 Sep 93	
1	16	WATER P	PUMP	VKC 1/16	EA	1 2	SG				CIS	1 Sep 93	
1	17	WATER P	PUMP PART	0G 81/18	EA	0 6	SG				CIS	1 Sep 93	
1	18	WATER P	PUMP CENTRIFUGE	D 320 50	EA	0 6	SG				CIS	1 Sep 93	
1	19	WATER P	PUMP CENTRIFUGE	D 1250 65	EA	1 2	SG				CIS	1 Sep 93	
1	20	WATER P	PUMP PART	GNOM 10-10	EA	2 4	SG				CIS	1 Sep 93	
1	21	WATER P	PUMP PART	NSC 3	EA	0 6	SG				CIS	1 Sep 93	
1	22	WATER P	PUMP PART	FG 144/46	EA	1 2	SG				CIS	1 Sep 93	
1	23	WATER P	PUMP CENTRIFUGE	SHCGA 38 220	EA	1 2	SG				CIS	1-Sep 93	
1	24	WATER P	PUMP CENTRIFUGE	K 20-30	EA	4 8	SG				CIS	1 Sep 93	
1	25	WATER P	PUMP CENTRIFUGE	K 45/55	EA	2 4	SG				CIS	1 Sep 93	
1	26	WATER P	PUMP CENTRIFUGE	SNC 400 105	EA	0 6	SG				CIS	1 Sep 93	
1	27	WATER P	PUMP CENTRIFUGE	SNC 240 300	EA	0 6	SG				CIS	1 Sep 93	
1	28	WATER P	PUMP PART	ESB 6 16-75	EA	0 6	SG				CIS	1 Sep 93	
1	29	WATER P	PUMP PART	ESB 8-40-165	EA	1 2	SG				CIS	1 Sep 93	
1	30	WATER P	PUMP PART	ESB 10-120-60	EA	1 2	SG				CIS	1 Sep 93	
1	31	WATER P	PUMP PART	ESB 10-120 60	EA	3	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	32	WATER P	TOTAL COST US DOLLARS				SG		$150 000		CIS	1 Sep 93	
2	153	BATTERIES	6 CT 132 AMP/HR 12V		EA	50	SG	169 6	$8 480		USA	1 Sep 93	
2	85	BELT SUPP	SPLICING KITS 1200 mm		EA	10	SG	$368 88	$3 689		USA	1 Jan 94	
2	87	BELT SUPP	SPLICING KITS 1000 mm		EA	10	SG	$322 24	$3 222		USA	1 Jan 94	
2	89	BELT SUPP	SPLICING KITS 800 mm		EA	10	SG	$276 66	$2 767		USA	1 Jan 94	
2	75	CONV BELT	1000 mm 5 PLY FABRIC		M	800	SG	$106 89	$85 512		USA	1 Jan 94	
2	77	CONV BELT	1200 mm 6 PLY FABRIC		M	670	SG	$147 53	$98 845		USA	1 Jan 94	
2	81	CONV BELT	800 mm 6 PLY FABRIC		M	500	SG	$107 99	$53 995		USA	1 Jan 94	
2	36	DRILLS	160mm				SG	$300 000	$300 000		USA	1 Jan 94	
2	59	WIRE ROPE	45 5mm(1 75) 8 2 Kg/M 15 TONNE		FT	5 832	SG	$2 91	$16 971		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	65	WIRE ROPE	30mm (1 25) 4 0 Kg/M 2 TONNE		FT	1 271	SG	$1 73	$2 199		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	69	WIRE ROPE	30mm (5/8) 9 Kg/M 1 5 TONNE		FT	4 593	SG	$0 55	$2 526		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	71	WIRE ROPE	13 5mm(9/16) 2 5 TONNE		FT	9 340	SG	$0 50	$4 670		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	73	WIRE ROPE	9 11 mm(7/16) 2 TONNE		FT	12 598	SG	$0 40	$5 039		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	1	DRILL PARTS	TRACK PADS	31 001 008 34	SET	30	SG				CIS	1 Sep 93	
2	2	DRILL PARTS	TRACK RAILS	31 001 008 000	EA	1	SG				CIS	1 Sep 93	
2	3	DRILL PARTS	LEVELING JACKS	B59 14 240	EA	3 5	SG				CIS	1 Sep 93	
2	4	DRILL PARTS	SPROCKET	31C 152 012 06	EA	2	SG				CIS	1 Sep 93	
2	5	DRILL PARTS	SPROCKET	B59 14 052	EA	2	SG				CIS	1 Sep 93	
2	6	DRILL PARTS	SHOCK ABSORBER	B122 22 11 015	EA	5	SG				CIS	1 Sep 93	
2	7	DRILL PARTS	SHOCK ABSORBER	B122 22 00 155	EA	3	SG				CIS	1 Sep 93	
2	8	DRILL PARTS	COMPRESSOR SUPP	B122 0017 000	EA	0 5	SG				CIS	1 Sep 93	
2	9	DRILL PARTS	CARTRIDGE	10 10 080	EA	2	SG				CIS	1 Sep 93	
2	10	DRILL PARTS	DRILL STEEL	722 22 11 00	EA	2	SG				CIS	1 Sep 93	
2	11	DRILL PARTS	BUSHING	31 001 008 037	EA	30	SG				CIS	1 Sep 93	
2	12	DRILL PARTS	BUSHING	31 001 008 102	EA	30	SG				CIS	1 Sep 93	
2	13	DRILL PARTS	HYD DISTRIBUTOR	R102 A4 A222 50	EA	5	SG				CIS	1 Sep 93	
2	14	DRILL PARTS	HYD PUMP	61 12 22	EA	3	SG				CIS	1 Sep 93	
2	15	DRILL PARTS	3-SPEED MOTOR		EA	2 5	SG				CIS	1 Sep 93	
2	16	DRILL PARTS	PULL DOWN CABLE	3X50+1X16	M	300	SG				CIS	1 Sep 93	
2	17	DRILL PARTS	HYD PUMP	N 403E TY2 653260-70	EA	2 5	SG				CIS	1 Sep 93	
2	18	DRILL PARTS	HYD PUMP	BG 12 22 MI TY2 05	EA	5	SG				CIS	1 Sep 93	
2	19	DRILL PARTS	TOTAL COST US DOLLARS				SG		$150 000		CIS	1 Sep 93	
2	10	ELE MOTOR	EKG 8i & 4U SHOVEL	HOIST MOTOR	EA	10	SG				CIS	1 Jan 94	
2	11	ELE MOTOR	EKG 8i & 4U SHOVEL	VEN FAN MOTOR	EA	8	SG				CIS	1 Jan 94	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	12	ELE MOTOR	EKG 8i & 4U SHOVEL	SW OIL PUMP MOT	EA	4	SG				CIS	1 Jan 94	
2	13	ELE MOTOR	EKG 8i & 4U SHOVEL	FAN M FOR GEN	EA	4	SG				CIS	1 Jan 94	
2	14	ELE MOTOR	EKG 8i & 4U SHOVEL	AIR COMP ELEC MO	EA	2	SG				CIS	1 Jan 94	
2	23	ELE MOTOR	MISC ELEC MOTORS	BAO 81 6 30KVT	EA	1	SG				CIS	1 Jan 94	
2	24	ELE MOTOR	MISC ELEC MOTORS	BAO 82 6 40KVT	EA	1	SG				CIS	1 Jan 94	
2	25	ELE MOTOR	MISC ELEC MOTORS	BAP 160M6 15KVT	EA	1	SG				CIS	1 Jan 94	
2	26	ELE MOTOR	MISC ELEC MOTORS	BAO 81 8Y2 22KVT	EA	1	SG				CIS	1 Jan 94	
2	27	ELE MOTOR	MISC ELEC MOTORS	WOUND MOTOR	EA	1	SG				CIS	1 Jan 94	
2	28	ELE MOTOR	MISC ELEC MOTORS	HOIST	EA	1	SG				CIS	1 Jan 94	
2	29	ELE MOTOR	MISC ELEC MOTORS	A/C ELECT MOTOR	EA	5	SG				CIS	1 Jan 94	
2	30	ELE MOTOR	MISC ELEC MOTORS	A/C ELECT MOTOR	EA	1	SG				CIS	1 Jan 94	
2	34	ELE MOTOR	ELEC MOTORS	MTKE 4A33556YE	EA	1	SG				CIS	1 Jan 94	
2	35	ELE MOTOR	ELEC MOTORS	MTKE 4AM200M6YE	EA	2	SG				CIS	1 Jan 94	
2	36	ELE MOTOR	ELEC MOTORS	MTKE AO2 12/8/6/4	EA	1	SG				CIS	1 Jan 94	
2	40	ELEC EQUIP	TWO SHAFT MOTOR	DPE 52 60	EA	3	SG				CIS	1 Jan 94	
2	41	ELEC EQUIP	DC GENERATOR	VP 250M94	EA	1	SG				CIS	1 Jan 94	
2	42	ELEC EQUIP	HI VOLT/VACUM BREK	2KVE 6 630	EA	1	SG				CIS	1 Jan 94	
2	43	ELEC EQUIP	RING TYPE CURR REC	TK3 12 492	EA	2	SG				CIS	1 Jan 94	
2	45	ELEC EQUIP	GEN 30KW 115V 261 A	INDEP BOOSTER	EA	1	SG				CIS	1 Sep 93	
2	1	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	SG				CIS	1 Jan 94	
2	2	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	SG				CIS	1 Jan 94	
2	3	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	SG				CIS	1 Jan 94	
2	4	RR COMM	SIGNAL CABLE	GOST6436 75	KM	2	SG				CIS	1 Jan 94	
2	5	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	SG				CIS	1 Jan 94	
2	6	RR COMM	SIGNAL CABLE	GOST6436 75	KM	2	SG				CIS	1 Jan 94	
2	7	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1 5	SG				CIS	1 Jan 94	
2	8	RR COMM	ROAD TRANSFORMER	NFT A	EA	15	SG				CIS	1 Jan 94	
2	9	RR COMM	ROAD TRANSPORMER	NOVC 5A	EA	15	SG				CIS	1 Jan 94	
2	10	RR COMM	SIGNAL TRANSFORMER	ST 6	EA	25	SG				CIS	1 Jan 94	
2	11	RR COMM	SWITCH RELAY	2162 00 V	EA	25	SG				CIS	1 Jan 94	
2	12	RR COMM	RECTIFIER	86-00 00V	EA	25	SG				CIS	1 Jan 94	
2	13	RR COMM	RESISTOR	7165	EA	25	SG				CIS	1 Jan 94	
2	14	RR COMM	SWITCHING GEAR BOX		EA	5	SG				CIS	1 Jan 94	
2	15	RR COMM	LAMPS FOR LINZ		EA	250	SG				CIS	1 Jan 94	
2	16	RR COMM	FRAMEWORK	19402 00 00	EA	5	SG				CIS	1 Jan 94	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	17	RR COMM	BONDING WIRE	21 00-00	EA	25	SG				CIS	1 Jan 94	
2	18	RR COMM	CONTROL WIRE		EA	50	SG				CIS	1 Jan 94	
2	19	RR COMM	LAMPS FOR TERM BD		EA	500	SG				CIS	1 Jan 94	
2	20	RR COMM	SWITCHING RELAY SET	144690000A	EA	5	SG				CIS	1 Jan 94	
2	21	RR COMM	INST FOR ELEC MEAS		EA	5	SG				CIS	1 Jan 94	
2	22	RR COMM	RR LINZ LTS RED	26116 00-00	EA	25	SG				CIS	1 Jan 94	
2	23	RR COMM	RR LINZ LTS GREEN	26116 00-00	EA	25	SG				CIS	1 Jan 94	
2	24	RR COMM	RR LINZ LTS WHITE	26116-00 00	EA	20	SG				CIS	1 Jan 94	
2	25	RR COMM	ELECTROMOTOR		EA	10	SG				CIS	1 Jan 94	
2	26	RR COMM	SWITCHING ARM		EA	15	SG				CIS	1 Jan 94	
2	27	RR COMM	TOTAL COST US DOLLARS				SG		$6 000		CIS	1 Jan 94	
2	1	BELAZ	ENGINE	YM3 240N1000411B	SET	2	SG				Bel	1 Jan 94	
2	2	BELAZ	TRANSMISSION	GMP 548T 1700004	SET	3	SG				Bel	1 Jan 94	
2	3	BELAZ	CABIN	548T 5000012 50	SET	3	SG				Bel	1 Jan 94	
2	4	BELAZ	LAMPS	A 24 5 1	EA	1000	SG				Bel	1 Jan 94	
2	5	BELAZ	LAMPS	A 24 55X50	EA	500	SG				Bel	1 Jan 94	
2	6	BELAZ	LAMPS	A 24 60X40	EA	200	SG				Bel	1 Jan 94	
2	7	BELAZ	BELT	1950/00368/	EA	60	SG				Bel	1 Jan 94	
2	8	BELAZ	PUMP	NS 50Y 3 T	EA	30	SG				Bel	1 Jan 94	
2	9	BELAZ	PUMP	NS 50Y 2 1	EA	30	SG				Bel	1 Jan 94	
2	10	BELAZ	SHIMMS	240-1000104B2	EA	15	SG				Bel	1 Jan 94	
2	11	BELAZ	SHIMMS	240 1000104B2R1	EA	15	SG				Bel	1 Jan 94	
2	12	BELAZ	SHIMMS	240 100010452R2	EA	10	SG				Bel	1 Jan 94	
2	13	BELAZ	RING SET	236-10000106 B4	EA	240	SG				Bel	1 Jan 94	
2	14	BELAZ	CRANK SHAFT	240-1000107B6	EA	10	SG				Bel	1 Jan 94	
2	15	BELAZ	PACKING	240-1002265	EA	40	SG				Bel	1 Jan 94	
2	16	BELAZ	CRANKCASE (OIL PAN)	240-1002310	EA	4	SG				Bel	1 Jan 94	
2	17	BELAZ	PACKING	240-1003240A3	EA	60	SG				Bel	1 Jan 94	
2	18	BELAZ	PACKING	240-1003213	EA	200	SG				Bel	1 Jan 94	
2	19	BELAZ	PACKING	240-1003270 B	EA	120	SG				Bel	1 Jan 94	
2	20	BELAZ	SET	240N 1004008 B	EA	120	SG				Bel	1 Jan 94	
2	21	BELAZ	LINER	240N 1004008	EA	60	SG				Bel	1 Jan 94	
2	22	BELAZ	COLLAR	236-1005160 A2	EA	30	SG				Bel	1 Jan 94	
2	23	BELAZ	RING	240-1005576	EA	80	SG				Bel	1 Jan 94	
2	24	BELAZ	RING	240-1005582B	EA	80	SG				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	25	BELAZ	PACKING	240N 1008027	EA	100	SG				Bel	1 Jan 94	
2	26	BELAZ	PACKING	240T 1009040	EA	80	SG				Bel	1 Jan 94	
2	27	BELAZ	PUMP	240-1011014B	EA	15	SG				Bel	1 Jan 94	
2	28	BELAZ	ELEMENT	201T 1017038A	EA	1000	SG				Bel	1 Jan 94	
2	29	BELAZ	OIL CLEANER	236 1029240	EA	6	SG				Bel	1 Jan 94	
2	30	BELAZ	COLLAR	236-1029240	EA	20	SG				Bel	1 Jan 94	
2	31	BELAZ	SHAFT	240 1029336	EA	10	SG				Bel	1 Jan 94	
2	32	BELAZ	ELEMENT	201 1105538	EA	1000	SG				Bel	1 Jan 94	
2	33	BELAZ	ELEMENT	238N 1109080	EA	200	SG				Bel	1 Jan 94	
2	34	BELAZ	PUMP	9016 11110082	EA	4	SG				Bel	1 Jan 94	
2	35	BELAZ	PLUNGER	PARA 60 1111073	EA	60	SG				Bel	1 Jan 94	
2	36	BELAZ	SPRAYER	261 1112110	EA	120	SG				Bel	1 Jan 94	
2	37	BELAZ	ELEMENT	201 1117038 A2	EA	1000	SG				Bel	1 Jan 94	
2	38	BELAZ	TURBOCOMPRESSOR	240N 1118010B	EA	10	SG				Bel	1 Jan 94	
2	39	BELAZ	TURBOCOMPRESSOR	240N 1118011B	EA	10	SG				Bel	1 Jan 94	
2	40	BELAZ	RING	240N 1118106	EA	120	SG				Bel	1 Jan 94	
2	41	BELAZ	FLANGE	240N 1118272	EA	20	SG				Bel	1 Jan 94	
2	42	BELAZ	COVER	240N 1118280-B	EA	20	SG				Bel	1 Jan 94	
2	43	BELAZ	BELT	1735/256421 1413	EA	60	SG				Bel	1 Jan 94	
2	44	BELAZ	RADIATOR	548A 1301010	EA	10	SG				Bel	1 Jan 94	
2	45	BELAZ	PIPE	240-1303100 V2	EA	6	SG				Bel	1 Jan 94	
2	46	BELAZ	PIPE	240-1303101 V2	EA	6	SG				Bel	1 Jan 94	
2	47	BELAZ	GEARS	7523 1731002	EA	4	SG				Bel	1 Jan 94	
2	48	BELAZ	AXLE	540-1731030 20	EA	10	SG				Bel	1 Jan 94	
2	49	BELAZ	AXLE	548A 1731101 01	EA	6	SG				Bel	1 Jan 94	
2	50	BELAZ	CROSSET	540 2201025 02	EA	20	SG				Bel	1 Jan 94	
2	51	BELAZ	SHAFT	548T 2208010	EA	4	SG				Bel	1 Jan 94	
2	52	BELAZ	SHAFT	7523 2201010	EA	6	SG				Bel	1 Jan 94	
2	53	BELAZ	SHAFT	540T 2208117	EA	40	SG				Bel	1 Jan 94	
2	54	BELAZ	TRANSMISSION	548-2402010 11	EA	2	SG				Bel	1 Jan 94	
2	55	BELAZ	BUMPER	7523-2803010	EA	4	SG				Bel	1 Jan 94	
2	56	BELAZ	CYLINDER	540-2917056-31	EA	20	SG				Bel	1 Jan 94	
2	57	BELAZ	CYLINDER	548-2917020-11	EA	6	SG				Bel	1 Jan 94	
2	58	BELAZ	SHIFTING FORK	540-2919412 23	EA	6	SG				Bel	1 Jan 94	
2	59	BELAZ	PIN	540M 2919426	EA	10	SG				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	60	BELAZ	ROD	540-2919429 30	EA	6	SG				Bel	1 Jan 94	
2	61	BELAZ	SEAL	540-2919440-B1	EA	60	SG				Bel	1 Jan 94	
2	62	BELAZ	RING	7540-2919442	EA	40	SG				Bel	1 Jan 94	
2	63	BELAZ	ROD	7548 2919016-01	EA	10	SG				Bel	1 Jan 94	
2	64	BELAZ	SPACERS	548 3001016	EA	30	SG				Bel	1 Jan 94	
2	65	BELAZ	SPACERS	548 3001017	EA	30	SG				Bel	1 Jan 94	
2	66	BELAZ	SPACERS	548 3001026	EA	30	SG				Bel	1 Jan 94	
2	67	BELAZ	PULLEY	540 3003052	EA	6	SG				Bel	1 Jan 94	
2	68	BELAZ	BOOSTER	525 3405010 06	EA	6	SG				Bel	1 Jan 94	
2	69	BELAZ	SET	7522 3405155	EA	10	SG				Bel	1 Jan 94	
2	70	BELAZ	PACKING	548 3501105	EA	240	SG				Bel	1 Jan 94	
2	71	BELAZ	PIPE	540T 3506060-01	EA	20	SG				Bel	1 Jan 94	
2	72	BELAZ	BRAKE PLATE	549A 3507015	EA	60	SG				Bel	1 Jan 94	
2	73	BELAZ	COMPRESSOR	540T 3509015	EA	10	SG				Bel	1 Jan 94	
2	74	BELAZ	RING	130 35L 167	EA	40	SG				Bel	1 Jan 94	
2	75	BELAZ	REGULATOR	11 3512010	EA	8	SG				Bel	1 Jan 94	
2	76	BELAZ	COLLAR	540 3519137 B	EA	40	SG				Bel	1 Jan 94	
2	77	BELAZ	CYLINDER	540M 3519310	EA	10	SG				Bel	1 Jan 94	
2	78	BELAZ	BRUSHHOLDER	G263A 3701010	EA	20	SG				Bel	1 Jan 94	
2	79	BELAZ	LOCK	856 3708000	EA	20	SG				Bel	1 Jan 94	
2	80	BELAZ	RELE STARTER	RC103 37078000	EA	10	SG				Bel	1 Jan 94	
2	81	BELAZ	STARTER	45 7375 1451	EA	6	SG				Bel	1 Jan 94	
2	82	BELAZ	VOLTAGE REGULATOR	21 3702	EA	20	SG				Bel	1 Jan 94	
2	83	BELAZ	SOLENOID	CT103 3708120-150	EA	20	SG				Bel	1 Jan 94	
2	84	BELAZ	ROTOR	25 3708200	EA	10	SG				Bel	1 Jan 94	
2	85	BELAZ	EQUALIZER BAR	25 3708320	EA	12	SG				Bel	1 Jan 94	
2	86	BELAZ	SWITCH	P602 3709210	EA	10	SG				Bel	1 Jan 94	
2	87	BELAZ	LIGHT SET	122 3711010 BV	EA	30	SG				Bel	1 Jan 94	
2	88	BELAZ	LIGHT SET	6 3711000KT	EA	30	SG				Bel	1 Jan 94	
2	89	BELAZ	FILTER ELEMENT	140 37112000-01	EA	30	SG				Bel	1 Jan 94	
2	90	BELAZ	INST LIGHTS	130-3712010 B	EA	20	SG				Bel	1 Jan 94	
2	91	BELAZ	INST LIGHTS	130-3716010 V	EA	15	SG				Bel	1 Jan 94	
2	92	BELAZ	INST LIGHTS	130-3716010 G	EA	15	SG				Bel	1 Jan 94	
2	93	BELAZ	REFLECTOR	FN 130-3716210	EA	20	SG				Bel	1 Jan 94	
2	94	BELAZ	REFLECTOR	FN 130-3716210B	EA	20	SG				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	95	BELAZ	SIGNAL	C40-3721000	EA	12	SG				Bel	1 Jan 94	
2	96	BELAZ	ENGINE DIP STICKS	YP101 3726000-V1T	EA	30	SG				Bel	1 Jan 94	
2	97	BELAZ	SWITCH	P145 3726000T	EA	20	SG				Bel	1 Jan 94	
2	98	BELAZ	RELAY	RC 951A 3726010 70	EA	12	SG				Bel	1 Jan 94	
2	99	BELAZ	SENSOR	MM355 3829010	EA	20	SG				Bel	1 Jan 94	
2	100	BELAZ	HYDRALICK JACK	11107 39103010	EA	10	SG				Bel	1 Jan 94	
2	101	BELAZ	GLASS	540-5206010-10	EA	20	SG				Bel	1 Jan 94	
2	102	BELAZ	WINDOW HANDLES	81 6104013 B	EA	10	SG				Bel	1 Jan 94	
2	103	BELAZ	MIRROR	5040 8201015 01	EA	30	SG				Bel	1 Jan 94	
2	104	BELAZ	HOOD	7523 8402012	EA	6	SG				Bel	1 Jan 94	
2	105	BELAZ	HOOD	548A 8402411	EA	4	SG				Bel	1 Jan 94	
2	106	BELAZ	FENDERS	548A 840 3010	EA	4	SG				Bel	1 Jan 94	
2	107	BELAZ	GENERATOR	G263A 457371 1487	EA	6	SG				Bel	1 Jan 94	
2	108	BELAZ	STARTER	G263A	EA	10	SG				Bel	1 Jan 94	
2	109	BELAZ	ELECTROMOTOR	MN 1	EA	10	SG				Bel	1 Jan 94	
2	110	BELAZ	LAMPA	A24 1	EA	1000	SG				Bel	1 Jan 94	
2	111	BELAZ	LAMPA	A24 21 5	EA	1000	SG				Bel	1 Jan 94	
3	148	TRUCK TIRE	12x20x16 PLY/W TUBES		EA	20	SG	341 4	$6 828		USA	1 Sep 93	
3	1	KRAZ	ENGINE	238M 1000186	EA	0 6	SG				URK	1 Sep 93	
3	2	KRAZ	SHIM	238-1000102 B2R1	EA	3 2	SG				URK	1 Sep 93	
3	3	KRAZ	SHIM	238 1000102 B2	EA	3 2	SG				URK	1 Sep 93	
3	4	KRAZ	SHIM	23831000104 V2	EA	3 2	SG				URK	1 Sep 93	
3	5	KRAZ	CLIPS	256-1001005 A1	EA	5	SG				URK	1 Sep 93	
3	6	KRAZ	ENG RING SETS	236-1000106 B2	EA	20	SG				URK	1 Sep 93	
3	7	KRAZ	ENG MOUNTS	236-1001008 01	EA	3	SG				URK	1 Sep 93	
3	8	KRAZ	SHAFT	2383 1000107 V2	EA	0 8	SG				URK	1 Sep 93	
3	9	KRAZ	BLOCK	238-1002012 B2	EA	0 4	SG				URK	1 Sep 93	
3	10	KRAZ	RING	236-100202 A	EA	5	SG				URK	1 Sep 93	
3	11	KRAZ	RING	236 1002040	EA	4	SG				URK	1 Sep 93	
3	12	KRAZ	OIL INS	236-1002272	EA	1	SG				URK	1 Sep 93	
3	13	KRAZ	PIPE	238 1003290-V	EA	1	SG				URK	1 Sep 93	
3	14	KRAZ	PIPE	238 1003291 V	EA	1	SG				URK	1 Sep 93	
3	15	KRAZ	CYL WIPER COLLAR	236-1002314 B	EA	4	SG				URK	1 Sep 93	
3	16	KRAZ	HEAD C76G	238-1003013 D	EA	1	SG				URK	1 Sep 93	
3	17	KRAZ	RING	237 1003114 V	EA	1	SG				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	18	KRAZ	PACKING	238-1003210-V2	EA	10	SG				URK	1 Sep 93	
3	19	KRAZ	PACKING	238-1003270	EA	10	SG				URK	1 Sep 93	
3	20	KRAZ	LINER CYLINDER	236-1004008	EA	16	SG				URK	1 Sep 93	
3	21	KRAZ	ROCKER ARM	236 1004045 V2	EA	4	SG				URK	1 Sep 93	
3	22	KRAZ	RING	400-1004030-80	EA	4	SG				URK	1 Sep 93	
3	23	KRAZ	SEAL	201 1005034 B3	EA	4	SG				URK	1 Sep 93	
3	24	KRAZ	GEAR	236-1005030 A	EA	4	SG				URK	1 Sep 93	
3	25	KRAZ	COLLAR	236 1005160 A2	EA	10	SG				URK	1 Sep 93	
3	26	KRAZ	SHAFT	238 1006015 G2	EA	0 2	SG				URK	1 Sep 93	
3	27	KRAZ	SPACERS	236-1006026 AR	EA	6	SG				URK	1 Sep 93	
3	28	KRAZ	SPACERS	236 1006037 AR	EA	4 8	SG				URK	1 Sep 93	
3	29	KRAZ	VALVE	236 1007010 V	EA	5	SG				URK	1 Sep 93	
3	30	KRAZ	VALVE	236 1007015 V4	EA	5	SG				URK	1 Sep 93	
3	31	KRAZ	ROD PUSH	236-1007176 A	EA	4 2	SG				URK	1 Sep 93	
3	32	KRAZ	PACKING	236-1008050	EA	5	SG				URK	1 Sep 93	
3	33	KRAZ	PACKING	238T 1009040	EA	5	SG				URK	1 Sep 93	
3	34	KRAZ	PUMP	236 1011014 V3	EA	1	SG				URK	1 Sep 93	
3	35	KRAZ	RADIATOR	157 1013010 A	EA	1	SG				URK	1 Sep 93	
3	36	KRAZ	EXHAUST PIPE	256B-1013408 B	EA	1 6	SG				URK	1 Sep 93	
3	37	KRAZ	ELEMENT FILTER	201T 1105540	EA	60	SG				URK	1 Sep 93	
3	38	KRAZ	PUMP	240 1106210	EA	1	SG				URK	1 Sep 93	
3	39	KRAZ	PUMP	236T1106288 A2	EA	1	SG				URK	1 Sep 93	
3	40	KRAZ	COLLAR	236 102940	EA	10	SG				URK	1 Sep 93	
3	41	KRAZ	1/2 HUB COUPLING	236-1029268-B	EA	0 5	SG				URK	1 Sep 93	
3	42	KRAZ	PIPE	236 1104308 V	EA	2	SG				URK	1 Sep 93	
3	43	KRAZ	PUMP	8006-1111005	EA	0 6	SG				URK	1 Sep 93	
3	44	KRAZ	PLUNGER RODS	60-1111074 01	EA	15	SG				URK	1 Sep 93	
3	45	KRAZ	INJECTOR	2606-1112010-02	EA	28	SG				URK	1 Sep 93	
3	46	KRAZ	SPRAYER	26 111211	EA	28	SG				URK	1 Sep 93	
3	47	KRAZ	FILTER	201T 1117038	EA	20	SG				URK	1 Sep 93	
3	48	KRAZ	COUPLING	09000 1121010 000	EA	0 2	SG				URK	1 Sep 93	
3	49	KRAZ	MUFFLER	256-1201010	EA	1	SG				URK	1 Sep 93	
3	50	KRAZ	PACKING	256B-1203002	EA	10	SG				URK	1 Sep 93	
3	51	KRAZ	SLEEVE	256 B1 1203096	EA	2 5	SG				URK	1 Sep 93	
3	52	KRAZ	PACKING	256B-1203039	EA	4	SG				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	53	KRAZ	RADIATOR	256B 1301008-10	EA	2	SG				URK	1 Sep 93	
3	54	KRAZ	ENG MOUNTS	256-1302025	EA	1	SG				URK	1 Sep 93	
3	55	KRAZ	ENG/ MOUNTS	256-1302139	EA	1	SG				URK	1 Sep 93	
3	56	KRAZ	RODS	214B-1303010	EA	3	SG				URK	1 Sep 93	
3	57	KRAZ	RODS	255 1303012	EA	2	SG				URK	1 Sep 93	
3	58	KRAZ	EXHAUST PIPE	256-1303016	EA	0 6	SG				URK	1 Sep 93	
3	59	KRAZ	PUMP	236 1307010-A3	EA	2 5	SG				URK	1 Sep 93	
3	60	KRAZ	SET	236-1307029 A	EA	5	SG				URK	1 Sep 93	
3	61	KRAZ	COLLAR	236-1307090	EA	8	SG				URK	1 Sep 93	
3	62	KRAZ	BELTS	25 6411 1404	EA	20	SG				URK	1 Sep 93	
3	63	KRAZ	BELTS	6421 1403	EA	20	SG				URK	1 Sep 93	
3	64	KRAZ	MOTOR	236 1308011 G2	EA	0 6	SG				URK	1 Sep 93	
3	65	KRAZ	DISCS	238 1601690 G	EA	1	SG				URK	1 Sep 93	
3	66	KRAZ	DISCS	238 1601094	EA	1	SG				URK	1 Sep 93	
3	67	KRAZ	DISCS	238 1601130-B	EA	1	SG				URK	1 Sep 93	
3	68	KRAZ	DISCS	238 1601131	EA	1 5	SG				URK	1 Sep 93	
3	69	KRAZ	BRAKE FRICTION PLATE	236 1601138 A3	EA	5	SG				URK	1 Sep 93	
3	70	KRAZ	COUPLING	236 1601180 B2	EA	1	SG				URK	1 Sep 93	
3	71	KRAZ	GEAR BOX	236NT 1700003	EA	0 8	SG				URK	1 Sep 93	
3	72	KRAZ	BOX	257 18000020 V2	EA	0 2	SG				URK	1 Sep 93	
3	73	KRAZ	BOX	256 1800020 V2	EA	0 2	SG				URK	1 Sep 93	
3	74	KRAZ	HEAD CROSS	131 2201025 A	EA	2	SG				URK	1 Sep 93	
3	75	KRAZ	SHAFT	527 2202010 16	EA	0 8	SG				URK	1 Sep 93	
3	76	KRAZ	DRIVE SHAFT	210G 2202045 04	EA	0 8	SG				URK	1 Sep 93	
3	77	KRAZ	SHAFT	210G 2204010-16	EA	0 8	SG				URK	1 Sep 93	
3	78	KRAZ	SUPPORT	210-2204080 B2	EA	1	SG				URK	1 Sep 93	
3	79	KRAZ	REAR DRIVE AXLE	255P 2400015 02	EA	1	SG				URK	1 Sep 93	
3	80	KRAZ	SET OF GEARS	256B 2402020	EA	0 2	SG				URK	1 Sep 93	
3	81	KRAZ	DIFFERENTIAL SEAL	210-2402052 A1	EA	6	SG				URK	1 Sep 93	
3	82	KRAZ	DIFFERENTIAL	200 2403010 A2	EA	0 4	SG				URK	1 Sep 93	
3	83	KRAZ	FLANGE	200 2403072 B1	EA	0 4	SG				URK	1 Sep 93	
3	84	KRAZ	AXLE	2550-2500015 02	EA	0 2	SG				URK	1 Sep 93	
3	85	KRAZ	SHOCK ABSORBER	256B1 2902012	EA	2	SG				URK	1 Sep 93	
3	86	KRAZ	1ST PLATE	255B 2902074 01	EA	2	SG				URK	1 Sep 93	
3	87	KRAZ	2ND PLATE	255B 2902076-01	EA	2	SG				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	88	KRAZ	SHOCK SPRINGS	500-2905006	EA	5	SG				URK	1 Sep 93	
3	89	KRAZ	SHOCK ABSORBER	256B-2912012 11	EA	2 6	SG				URK	1 Sep 93	
3	90	KRAZ	CONN BRACKETS	219 2912408	EA	6	SG				URK	1 Sep 93	
3	91	KRAZ	EQUALIZER	256B 2918005	EA	3	SG				URK	1 Sep 93	
3	92	KRAZ	SHAFT	256B 2918054	EA	0 4	SG				URK	1 Sep 93	
3	93	KRAZ	ROD	214 2919011 02	EA	5	SG				URK	1 Sep 93	
3	94	KRAZ	ROD	210 2919012 03	EA	5	SG				URK	1 Sep 93	
3	95	KRAZ	BUSHING	200 3001016	EA	4	SG				URK	1 Sep 93	
3	96	KRAZ	SEAL	200 3103035	EA	1 4	SG				URK	1 Sep 93	
3	97	KRAZ	SEAL	210 3104036	EA	1 4	SG				URK	1 Sep 93	
3	98	KRAZ	COTTER PINS	200 3104050 A	EA	50	SG				URK	1 Sep 93	
3	99	KRAZ	COTTER PINS	200 3104050 A	EA	50	SG				URK	1 Sep 93	
3	100	KRAZ	RELAYS	500 3401005 D	EA	0 5	SG				URK	1 Sep 93	
3	101	KRAZ	HYD BOOSTER BRAKES	256B 3405010 14	EA	1	SG				URK	1 Sep 93	
3	102	KRAZ	DISTRIBUTOR	255B 3405016	EA	1	SG				URK	1 Sep 93	
3	103	KRAZ	PUMP	256B 3407199	EA	1	SG				URK	1 Sep 93	
3	104	KRAZ	FRIC PLATES SHOE	200 3501105	EA	30	SG				URK	1 Sep 93	
3	105	KRAZ	LEVER	210 3501136-A2	EA	0 8	SG				URK	1 Sep 93	
3	106	KRAZ	FRIC PLATES SHOES	200 3502105 A	EA	30	SG				URK	1 Sep 93	
3	107	KRAZ	COMPRESSOR	130 3509009 11	EA	0 8	SG				URK	1 Sep 93	
3	108	KRAZ	GENERATOR	4573711587	EA	2	SG				URK	1 Sep 93	
3	109	KRAZ	REGULATOR	1112 3702	EA	2	SG				URK	1 Sep 93	
3	110	KRAZ	SWITCH	VK318T 3704000	EA	1	SG				URK	1 Sep 93	
3	111	KRAZ	ELECTRO BRUSHES	2501 370805	EA	26	SG				URK	1 Sep 93	
3	112	KRAZ	SWITCH	P305 3709000	EA	1 5	SG				URK	1 Sep 93	
3	113	KRAZ	SWITCH	P39 371000 T	EA	1 5	SG				URK	1 Sep 93	
3	114	KRAZ	STARTER	45 7375 1471	EA	2 5	SG				URK	1 Sep 93	
3	115	KRAZ	RELAY	RC103 3708000	EA	1	SG				URK	1 Sep 93	
3	116	KRAZ	LAMPS	A 24 60-40	EA	40	SG				URK	1 Sep 93	
3	117	KRAZ	FILTERS	FG122 3711200-V	EA	3	SG				URK	1 Sep 93	
3	118	KRAZ	LAMPS	A24 324	EA	40	SG				URK	1 Sep 93	
3	119	KRAZ	LAMPS	A 24 2	EA	40	SG				URK	1 Sep 93	
3	120	KRAZ	LAMPS	A 24 5	EA	40	SG				URK	1 Sep 93	
3	121	KRAZ	LAMPS	A 24 21 2	EA	40	SG				URK	1 Sep 93	
3	122	KRAZ	SPEEDOMETER	CP135 3802010	EA	1	SG				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	123	KRAZ	RELAY	RC401 3726010	EA	1	SG				URK	1 Sep 93	
3	124	KRAZ	RECIEVER	YK143 3807010-G4	EA	0 4	SG				URK	1 Sep 93	
3	125	KRAZ	SENSOR	BM146 3806600D	EA	0 4	SG				URK	1 Sep 93	
3	126	KRAZ	AMP METER	AP110-3811010	EA	0 8	SG				URK	1 Sep 93	
3	127	KRAZ	PRESSURE GAUGE	MD103 3816010	EA	0 4	SG				URK	1 Sep 93	
3	128	KRAZ	SENSOR	TM100 3808000-G	EA	1	SG				URK	1 Sep 93	
3	129	KRAZ	MIRRORS	256 8201012	EA	3	SG				URK	1 Sep 93	
3	130	KRAZ	EQUALIZER	220V 8702010A	EA	0 2	SG				URK	1 Sep 93	
3	131	KRAZ	TOTAL COST US DOLLARS				SG		$11 000		URK	1 Sep 93	
3	1	T130 DOZER	PACKING	2301103160 CBN 1	EA	5	SG				CIS	1 Sep 93	
3	2	T130 DOZER	THIMBLE r	01466 2	EA	15	SG				CIS	1 Sep 93	
3	3	T130 DOZER	RINGS	51 03 115 CP	EA	15	SG				CIS	1 Sep 93	
3	4	T130 DOZER	CRANKSHAFT	16 03 126 CP	EA	1	SG				CIS	1 Sep 93	
3	5	T130 DOZER	CYLINDER	51 03 23	EA	15	SG				CIS	1 Sep 93	
3	6	T130 DOZER	HYDRALIC SEAL	700 40 2889	EA	7	SG				CIS	1 Sep 93	
3	7	T130 DOZER	FILTER	F A41 20 000 01 CP	EA	15	SG				CIS	1 Sep 93	
3	8	T130 DOZER	FILTER	A41 10 000 02 CP	EA	15	SG				CIS	1 Sep 93	
3	9	T130 DOZER	RING	40843	EA	15	SG				CIS	1 Sep 93	
3	10	T130 DOZER	PACKING	40269	EA	5	SG				CIS	1 Sep 93	
3	11	T130 DOZER	GEAR PINION	74116	EA	0	SG				CIS	1 Sep 93	
3	12	T130 DOZER	REDUCTION GEAR	17 76-8 CP	EA	0	SG				CIS	1 Sep 93	
3	13	T130 DOZER	FUEL INJECTORS	17 69 107 1 CP	EA	15	SG				CIS	1 Sep 93	
3	14	T130 DOZER	SPRAYER	14 69 117 1 CP	EA	15	SG				CIS	1 Sep 93	
3	15	T130 DOZER	PUMP	51 67 11 CP	EA	0	SG				CIS	1 Sep 93	
3	16	T130 DOZER	COMPRESSOR PIPING	92 000 06	EA	2	SG				CIS	1 Sep 93	
3	17	T130 DOZER	AIR INLET	N036-85 770	EA	1	SG				CIS	1 Sep 93	
3	18	T130 DOZER	WATER PUMP	16-8 140 CP	EA	2	SG				CIS	1 Sep 93	
3	19	T130 DOZER	OIL PUMP	29 09 124 CP	EA	2	SG				CIS	1 Sep 93	
3	20	T130 DOZER	HYDRALIC PUMP	NS 100A 3-P	EA	1	SG				CIS	1 Sep 93	
3	21	T130 DOZER	PUMP	NS 32 Y WP	EA	0	SG				CIS	1 Sep 93	
3	22	T130 DOZER	GEAR BOX	24 12 1 CP	EA	0	SG				CIS	1 Sep 93	
3	23	T130 DOZER	FILTER	A23 30 000 01	EA	8	SG				CIS	1 Sep 93	
3	24	T130 DOZER	PACKING SEALS	700-40-2049	EA	5	SG				CIS	1 Sep 93	
3	25	T130 DOZER	CARBURATOR	113 1107011	EA	2	SG				CIS	1 Sep 93	
3	26	T130 DOZER	SUPPORT BRACKET	51 07 102 CP	EA	1	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	27	T130 DOZER	ENGINE HEAD	07146 1 CP	EA	1	SG				CIS	1 Sep 93	
3	28	T130 DOZER	FUEL SYS CENTRIFUGE	95000	EA	1	SG				CIS	1 Sep 93	
3	29	T130 DOZER	FAN BLADES	51 08 113 CP	EA	1	SG				CIS	1 Sep 93	
3	30	T130 DOZER	RADIATOR	130Y 13 010-1	EA	2	SG				CIS	1 Sep 93	
3	31	T130 DOZER	BRAKE DISC	738 4 CP	EA	2	SG				CIS	1 Sep 93	
3	32	T130 DOZER	MAGNET SOLENOID	M149 A3	EA	2	SG				CIS	1 Sep 93	
3	33	T130 DOZER	STARTER	ST 230M	EA	2	SG				CIS	1 Sep 93	
3	34	T130 DOZER	GENERATOR	70 3701	EA	1	SG				CIS	1 Sep 93	
3	35	T130 DOZER	RELAY STARTER	RR 0362B1	EA	2	SG				CIS	1 Sep 93	
3	36	T130 DOZER	DISTRIBUTOR	R 150-A3T001	EA	0	SG				CIS	1 Sep 93	
3	37	T130 DOZER	DRIVE SHAFT	50-14 113	EA	0	SG				CIS	1 Sep 93	
3	38	T130 DOZER	CYLINDER POWER	18 26 270 CP	EA	1	SG				CIS	1 Sep 93	
3	39	T130 DOZER	CYLINDER	DP 26 C 06 140	EA	0	SG				CIS	1 Sep 93	
3	40	T130 DOZER	ELEMENT FILTER	EF 01 00 CP	EA	21	SG				CIS	1 Sep 93	
3	41	T130 DOZER	PUMP BRAKE	14 71 3 CP	EA	0	SG				CIS	1 Sep 93	
3	42	T130 DOZER	MECH	17 74 8 CP	EA	0	SG				CIS	1 Sep 93	
3	43	T130 DOZER	SUPPORT	17 74 284	EA	1	SG				CIS	1 Sep 93	
3	44	T130 DOZER	SHAFT	16-74 10 CP	EA	0	SG				CIS	1 Sep 93	
3	45	T130 DOZER	GEAR	17 01 22	EA	0	SG				CIS	1 Sep 93	
3	46	T130 DOZER	FRICTION CLUTCH PADS	24 16-101 CP	EA	1	SG				CIS	1 Sep 93	
3	47	T130 DOZER	SERVICE MECH	21 17 4 CP	EA	1	SG				CIS	1 Sep 93	
3	48	T130 DOZER	FAN BELT	18360 01 CP	EA	2	SG				CIS	1 Sep 93	
3	49	T130 DOZER	PULLEY WHEEL	24 21 146 CP	EA	1	SG				CIS	1 Sep 93	
3	50	T130 DOZER	DRIVE PULLEY	24 21 169 CP	EA	2	SG				CIS	1 Sep 93	
3	51	T130 DOZER	DOUBLE PULLEY	24 21 170 CP	EA	2	SG				CIS	1 Sep 93	
3	52	T130 DOZER	FILTER	A 410000 2	EA	2	SG				CIS	1 Sep 93	
3	53	T130 DOZER	IDLER PULLEY	24 21 171 CP	EA	2	SG				CIS	1 Sep 93	
3	54	T130 DOZER	FILTER	A 410000 A CP	EA	9	SG				CIS	1 Sep 93	
3	55	T130 DOZER	MIDDLE CUTTING EDGE	D3 110AXP 02 001 0	EA	0	SG				CIS	1 Sep 93	
3	56	T130 DOZER	END CUTTING EDGE RT	D661 02001 02	EA	0	SG				CIS	1 Sep 93	
3	57	T130 DOZER	END CUTTING EDGE LEFT	D661 02 002 02	EA	0	SG				CIS	1 Sep 93	
3	58	T130 DOZER	TRACK ASSEMBLY	24 22 1	SET	0	SG				CIS	1 Sep 93	
3	59	T130 DOZER	DEFLECTOR RK GUARD	2204	EA	30	SG				CIS	1 Sep 93	
3	60	T130 DOZER	DEFLECTOR RK GUARD	2205	EA	30	SG				CIS	1 Sep 93	
3	61	T130 DOZER	PACKING TRACKS ADJ	40201	EA	12	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	62	T130 DOZER	RING	40210	EA	3	SG				CIS	1 Sep 93	
3	63	T130 DOZER	CYLINDER PACKING	40944 CP	EA	8	SG				CIS	1 Sep 93	
3	64	T130 DOZER	CYLINDER	14 02 101 CP	EA	8	SG				CIS	1 Sep 93	
3	65	T130 DOZER	HEAD CYLINDER	16-02 106 CP	EA	3	SG				CIS	1 Sep 93	
3	66	T130 DOZER	VALVE	14 02 32	EA	2	SG				CIS	1 Sep 93	
3	67	T130 DOZER	VALVE	14 02 33 V	EA	2	SG				CIS	1 Sep 93	
3	68	T130 DOZER	PIPE	10663 1	EA	2	SG				CIS	1 Sep 93	
3	69	T130 DOZER	PIPE	10664 1	EA	2	SG				CIS	1 Sep 93	
3	70	T130 DOZER	GEARBOX	50 12 12 CP	EA	0	SG				CIS	1 Sep 93	
3	71	T130 DOZER	COUPLING	18-14 133 CP	EA	0	SG				CIS	1 Sep 93	
3	72	T130 DOZER	DISC	18 14 135 CP	EA	1	SG				CIS	1 Sep 93	
3	73	T130 DOZER	COUPLING	18 14 78	EA	0	SG				CIS	1 Sep 93	
3	74	T130 DOZER	COLLAR	3 48X28 6	EA	1	SG				CIS	1 Sep 93	
3	75	T130 DOZER	RING	N1 35X28 2	EA	1	SG				CIS	1 Sep 93	
3	76	T130 DOZER	DISC	24 16 103 CP	EA	2	SG				CIS	1 Sep 93	
3	77	T130 DOZER	PUMP	51 67 10 CP	EA	0	SG				CIS	1 Sep 93	
3	78	T130 DOZER	PISTON PUMP	16 67 102 CP	EA	5	SG				CIS	1 Sep 93	
3	79	T130 DOZER	PUMP PISTON	16 67 108 CP	EA	5	SG				CIS	1 Sep 93	
3	80	T130 DOZER	DISC	738 4 CP	EA	2	SG				CIS	1 Sep 93	
3	81	T130 DOZER	COUPLING	72118 CP	EA	1	SG				CIS	1 Sep 93	
3	82	T130 DOZER	RING	111 30 123 00	EA	3	SG				CIS	1 Sep 93	
3	83	T130 DOZER	ROTOR	92 55	EA	0	SG				CIS	1 Sep 93	
3	84	T130 DOZER	RADIATOR	21 09 1	EA	0	SG				CIS	1 Sep 93	
3	85	T130 DOZER	PUMP	51 67 11 CP	EA	0	SG				CIS	1 Sep 93	
3	86	T130 DOZER	TOTAL COST US DOLLARS				SG		$27 000		CIS	1 Sep 93	
3	1	T250 DOZER	LINK	748 22 132 CP	EA	20	SG				CIS	1 Sep 93	
3	2	T250 DOZER	LINK	748 22 133 CP	EA	20	SG				CIS	1 Sep 93	
3	3	T250 DOZER	LINK	748 22 134 CP	EA	20	SG				CIS	1 Sep 93	
3	4	T250 DOZER	END PIN	748 22 6	EA	200	SG				CIS	1 Sep 93	
3	5	T250 DOZER	HEAD LAMP SET	748 10-318 CP	EA	18	SG				CIS	1 Sep 93	
3	6	T250 DOZER	PACKING	748 18 234	EA	40	SG				CIS	1 Sep 93	
3	7	T250 DOZER	PACKING	748 18 229	EA	40	SG				CIS	1 Sep 93	
3	8	T250 DOZER	PACKING	748-18 229	EA	40	SG				CIS	1 Sep 93	
3	9	T250 DOZER	CROWN ?	748 19 1	EA	8	SG				CIS	1 Sep 93	
3	10	T250 DOZER	COUPLING	748 19 5	EA	4	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	11	T250 DOZER	GENERATOR	GNA 222 748 82 349 CP	EA	2	SG				CIS	1 Sep 93	
3	12	T250 DOZER	OIL PUMP	748-60-276-CP	EA	10	SG				CIS	1 Sep 93	
3	13	T250 DOZER	BRUSH	UG2A KG3 16X32X40	EA	72	SG				CIS	1 Sep 93	
3	14	T250 DOZER	BRUSH	UG2A K12 8 2X12 5X40X5	EA	36	SG				CIS	1 Sep 93	
3	15	T250 DOZER	DISTRIBUTOR	748 99 465 CP	EA	1	SG				CIS	1 Sep 93	
3	16	T250 DOZER	HYDROPUMP	933 02 06	EA	1	SG				CIS	1 Sep 93	
3	17	T250 DOZER	TOTAL COST US DOLLARS				SG		$45 000		CIS	1 Sep 93	
3	1	YM2 PARTS	CYLINDER	240H 1004008 D	EA	132	SG				CIS	1 Sep 93	
3	2	YM2 PARTS	CRANK SHAFT	240 1000107 B6	EA	4	SG				CIS	1 Sep 93	
3	3	YM2 PARTS	RINGS	236 1000106 B4	EA	132	SG				CIS	1 Sep 93	
3	4	YM2 PARTS	PACKING	240 1000104 B2	EA	10	SG				CIS	1 Sep 93	
3	5	YM2 PARTS	PACKING	240 1000104 P2	EA	5	SG				CIS	1 Sep 93	
3	6	YM2 PARTS	PACKING	240 1000104 P1	EA	5	SG				CIS	1 Sep 93	
3	7	YM2 PARTS	SEAL	240 1003213 A3	EA	100	SG				CIS	1 Sep 93	
3	8	YM2 PARTS	PUMP	240 1011014	EA	3	SG				CIS	1 Sep 93	
3	9	YM2 PARTS	ELEMENT	240 1017038	EA	500	SG				CIS	1 Sep 93	
3	10	YM2 PARTS	ELEMENT	238H 1109080	EA	50	SG				CIS	1 Sep 93	
3	11	YM2 PARTS	TURBOCOMPRESSOR	240H 1118010 B	EA	4	SG				CIS	1 Sep 93	
3	12	YM2 PARTS	TURBOCOMPRESSOR	240H 1118011B	EA	4	SG				CIS	1 Sep 93	
3	13	YM2 PARTS	BLOCK CYLINDER	240H 1002012H	EA	1	SG				CIS	1 Sep 93	
3	14	YM2 PARTS	PUMP	9016111008-02	EA	1	SG				CIS	1 Sep 93	
3	15	YM2 PARTS	SPRAY INJECTOR	26161112110	EA	60	SG				CIS	1 Sep 93	
3	16	YM2 PARTS	RING	236 1002024A	EA	100	SG				CIS	1 Sep 93	
3	17	YM2 PARTS	RING	236 1002040	EA	50	SG				CIS	1 Sep 93	
3	18	YM2 PARTS	ELEMENT FILTER	240T 1017040 A3	EA	100	SG				CIS	1 Sep 93	
3	19	YM2 PARTS	ELEMENT	201T 1105540	EA	100	SG				CIS	1 Sep 93	
3	20	YM2 PARTS	RINGS	236-1004002 A3	EA	48	SG				CIS	1 Sep 93	
3	21	YM2 PARTS	PACKING SEALS	240-1008098	EA	5	SG				CIS	1 Sep 93	
3	22	YM2 PARTS	PACKING SEALS	240T 1009040 A2	EA	5	SG				CIS	1 Sep 93	
3	23	YM2 PARTS	FUEL PUMP	1111008 20	EA	1	SG				CIS	1 Sep 93	
3	24	YM2 PARTS	ELEMENT	201 1117038 A2	EA	250	SG				CIS	1 Sep 93	
3	25	YM2 PARTS	PUMP	240-1307010-A	EA	2 5	SG				CIS	1 Sep 93	
3	26	YM2 PARTS	GENERATOR	45 7371 0209	EA	1 5	SG				CIS	1 Sep 93	
3	27	YM2 PARTS	STARTER	45 7375 1471	EA	1 5	SG				CIS	1 Sep 93	
3	28	YM2 PARTS	TOTAL COST US DOLLARS				SG		$12 500		CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS

TOTAL COST - US DOLLARS $5 423 671

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	6	BULLDOZER	CAT D 10 BULLDOZER		EA	1	SO	$638 900	$638 900		USA	1 Sep 93	
1	37	DRILLS	160mm				SO	$300 000	$300 000		USA	1 Jan 94	
1	18	FEL	CAT992C FRONT END LOADER		EA	1	SO	$977 672	$977 672		USA	1 Sep 93	
1	11	FUEL TRUCK	FUEL & LUBE TRUCK		EA	1	SO	$90 275	$90 275		USA	1 Sep 93	
1	3	GRADER	CAT 16G MOTORGRADER		EA	1	SO	$385 000	$385 000		USA	1 Sep 93	
1	15	HAUL TRUCK	85 90 TON AHUL TRUCKS		EA	10	SO	$672 750	$6 727 500		USA	1 Sep 93	
1	14	TIRE TRUCK	TIRE HANDLING TRUCK		EA	1	SO	$79 925	$79 925		USA	1 Sep 93	
1	20	TRUCK	3 TON FLATBED FOR PERSONNEL TRANS		EA	1	SO	$40 250	$40 250		USA	1 Sep 93	
1	149	TRUCK TIRE	12x20x16 PLY/W TUBES		EA	20	SO	341 4	$6 828		USA	1 Sep 93	
1	62	WIRE ROPE	39mm (1 5) 4 2 Kg/M 10 TONNE		FT	4 417	SO	$2 31	$10 203		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	66	WIRE ROPE	30mm (1 25) 4 0 Kg/M 5 TONNE		FT	318	SO	$1 73	$550		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	1	WATER P	PUMP CENTRIFUGE	SNC 180 65	EA	0 4	SO				CIS	1 Sep 93	
1	2	WATER P	PUMP CENTRIFUGE	D 1250 65	EA	0 4	SO				CIS	1 Sep 93	
1	3	WATER P	PUMP CENTRIFUGE	D 200 95	EA	0 4	SO				CIS	1 Sep 93	
1	4	WATER P	PUMP CENTRIFUGE	NSC 3	EA	0 8	SO				CIS	1 Sep 93	
1	5	WATER P	IMPELLOR		EA	1 2	SO				CIS	1 Sep 93	
1	6	WATER P	IMPELLOR	5KE 224 176A	EA	8	SO				CIS	1 Sep 93	
1	7	WATER P	SHAFT	8KE 200 525 01A	EA	2	SO				CIS	1 Sep 93	
1	8	WATER P	SHAFT	EB 205 320	EA	2	SO				CIS	1 Sep 93	
1	9	WATER P	SHAFT	EB 205 320	EA	2	SO				CIS	1 Sep 93	
1	10	WATER P	COLLAR	1 35 58 2 GOCT 8752 70	EA	4	SO				CIS	1 Sep 93	
1	11	WATER P	SPARING	8KE 211 023	EA	2 4	SO				CIS	1 Sep 93	
1	12	WATER P	BEARING	5KS 253 013	EA	2 4	SO				CIS	1 Sep 93	
1	13	WATER P	IMPELLOR	5KE 224 014	EA	2 4	SO				CIS	1 Sep 93	
1	14	WATER P	SPARING	8KS 210 095	EA	2 4	SO				CIS	1 Sep 93	
1	15	WATER P	COUPLING	8KS 255 000	EA	1 2	SO				CIS	1 Sep 93	
1	16	WATER P	PUMP	VKC 1/16	EA	0 8	SO				CIS	1 Sep 93	
1	17	WATER P	PUMP PART	0G 81/18	EA	0 4	SO				CIS	1 Sep 93	
1	18	WATER P	PUMP CENTRIFUGE	D 320 50	EA	0 4	SO				CIS	1 Sep 93	
1	19	WATER P	PUMP CENTRIFUGE	D 1250 65	EA	0 8	SO				CIS	1 Sep 93	
1	20	WATER P	PUMP PART	GNOM 10 10	EA	1 6	SO				CIS	1 Sep 93	
1	21	WATER P	PUMP PART	NSC 3	EA	0 4	SO				CIS	1 Sep 93	
1	22	WATER P	PUMP PART	FG 144/46	EA	0 8	SO				CIS	1 Sep 93	
1	23	WATER P	PUMP CENTRIFUGE	SHCGA 38-220	EA	0 8	SO				CIS	1 Sep 93	
1	24	WATER P	PUMP CENTRIFUGE	K 20 30	EA	3 2	SO				CIS	1 Sep 93	
1	25	WATER P	PUMP CENTRIFUGE	K 45/55	EA	1 6	SO				CIS	1 Sep 93	
1	26	WATER P	PUMP CENTRIFUGE	SNC 400-105	EA	0 4	SO				CIS	1 Sep 93	
1	27	WATER P	PUMP CENTRIFUGE	SNC 240-300	EA	0 4	SO				CIS	1 Sep 93	
1	28	WATER P	PUMP PART	ESB 6 16-75	EA	0 4	SO				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	29	WATER P	PUMP PART	ESB 8 40-165	EA	0 8	SO				CIS	1 Sep 93	
1	30	WATER P	PUMP PART	ESB 10-120 60	EA	0 8	SO				CIS	1 Sep 93	
1	31	WATER P	PUMP PART	ESB-10-120-60	EA	2	SO				CIS	1 Sep 93	
1	32	WATER P	TOTAL COST US DOLLARS				SO		$100 000		CIS	1 Sep 93	
2	154	BATTERIES	6 CT 132 AMP/HR 12V		EA	20	SO	169 6	$3 392		USA	1 Sep 93	
2	159	BATTERIES	6 CT 182 AMP/HR 12V		EA	20	SO	204 06	$4 081		USA	1 Jan 94	
2	1	SM ENG PTS	ENGINE	D160	SET	0 75	SO				CIS	1 Sep 93	
2	2	SM ENG PTS	COTTER PINS	1434	EA	12	SO				CIS	1 Sep 93	
2	3	SM ENG PTS	COTTER PINS	2971	EA	12	SO				CIS	1 Sep 93	
2	4	SM ENG PTS	BLOCK ENGINE	51 01 2 cb	EA	0 75	SO				CIS	1 Sep 93	
2	5	SM ENG PTS	PACKING	40201	EA	2 5	SO				CIS	1 Sep 93	
2	6	SM ENG PTS	RINGS	40210	EA	25	SO				CIS	1 Sep 93	
2	7	SM ENG PTS	PACKING SETS UPPER	A 230113160 cbn1	SET	5	SO				CIS	1 Sep 93	
2	8	SM ENG PTS	PACKINGSETS LOWER	A230110311	SET	5	SO				CIS	1 Sep 93	
2	9	SM ENG PTS	PACKING SETS	A23 0110312 AN2	SET	5	SO				CIS	1 Sep 93	
2	10	SM ENG PTS	PACKING	14 02 101 cb	EA	5	SO				CIS	1 Sep 93	
2	11	SM ENG PTS	ENGINE REBUILD KIT	1 02 10 cp	SET	1	SO				CIS	1 Sep 93	
2	12	SM ENG PTS	GUSHING	03325	EA	2 5	SO				CIS	1 Sep 93	
2	13	SM ENG PTS	PACKING UPPER	023 02 10002 AN1	SET	5	SO				CIS	1 Sep 93	
2	14	SM ENG PTS	PACKING LOWER	A23 0 10004 DN1	ET	5	SO				CIS	1 Sep 93	
2	15	SM ENG PTS	RING SETS	A27 00 011	SET	7 5	SO				CIS	1 Sep 93	
2	16	SM ENG PTS	RING SETS	027 00 024	SET	7 5	SO				CIS	1 Sep 93	
2	17	SM ENG PTS	RING SETS	A27 00 043	SET	7 5	SO				CIS	1 Sep 93	
2	18	SM ENG PTS	PISTON RING SETS	03694 1 cp	SET	1	SO				CIS	1 Sep 93	
2	19	SM ENG PTS	GENERATOR BELT	5X9X1090	EA	5	SO				CIS	1 Sep 93	
2	20	SM ENG PTS	FAN BELTS	16X11X1650	EA	5	SO				CIS	1 Sep 93	
2	21	SM ENG PTS	WATER PUMP	16 08 140 cp	EA	2 5	SO				CIS	1 Sep 93	
2	22	SM ENG PTS	OIL PUMP	29 09 124 cp	EA	2	SO				CIS	1 Sep 93	
2	23	SM ENG PTS	CYLINDER LINER	01466	EA	3	SO				CIS	1 Sep 93	
2	24	SM ENG PTS	RING SETS	51 03 115 cp	EA	25	SO				CIS	1 Sep 93	
2	25	SM ENG PTS	CRANKSHAFT	16 03 1120 cp	EA	1	SO				CIS	1 Sep 93	
2	26	SM ENG PTS	PISTON	51 03 103	SET	2 5	SO				CIS	1 Sep 93	
2	27	SM ENG PTS	PACKING	700-40-2886	EA	5	SO				CIS	1 Sep 93	
2	28	SM ENG PTS	FILTER	A41 20 000-1 cp	EA	10	SO				CIS	1 Sep 93	
2	29	SM ENG PTS	FILTER	A41 10 000 02	EA	10	SO				CIS	1 Sep 93	
2	30	SM ENG PTS	RING	40843	EA	25	SO				CIS	1 Sep 93	
2	31	SM ENG PTS	PACKING	40269	EA	2 5	SO				CIS	1 Sep 93	
2	32	SM ENG PTS	SPRAYER	14 69 107 1 cp	EA	25	SO				CIS	1 Sep 93	
2	33	SM ENG PTS	INJECTOR FITTINGS	14 69 117 1 cp	EA	25	SO				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	34	SM ENG PTS	CYLINDER HEAD	29 02 30 cp	EA	0 75	SO				CIS	1 Sep 93	
2	35	SM ENG PTS	STARTER	1723 cp	EA	0 75	SO				CIS	1 Sep 93	
2	36	SM ENG PTS	RADIATOR	1304130101 cp	EA	2 5	SO				CIS	1 Sep 93	
2	37	SM ENG PTS	MAGNETO	M 149A	EA	2 5	SO				CIS	1 Sep 93	
2	38	SM ENG PTS	CARBURATOR	113 110 70-11	EA	2 5	SO				CIS	1 Sep 93	
2	39	SM ENG PTS	GENERATOR	69 063701	EA	2	SO				CIS	1 Sep 93	
2	40	SM ENG PTS	STARTER	CT 230E	EA	2	SO				CIS	1 Sep 93	
2	41	SM ENG PTS	TRUBO COMPRESSOR	111 30 001 10	EA	1 5	SO				CIS	1 Sep 93	
2	42	SM ENG PTS	FUEL SYSTEM UPPER	16 67 1 cp	EA	1 5	SO				CIS	1 Sep 93	
2	43	SM ENG PTS	TOTAL COST US DOLLARS				SO		$30 000		CIS	1 Sep 93	
3	1	T250 DOZER	CUTTING EDGES	D3 132 T 0200T	EA	4	SO				CIS	1 Sep 93	
3	2	T250 DOZER	CUTTING EDGES	D3 132 1 02002	EA	4	SO				CIS	1 Sep 93	
3	3	T250 DOZER	CUTTING EDGES	D3 59XL 0T00030	EA	2	SO				CIS	1 Sep 93	
3	4	T250 DOZER	CUTTING EDGES	D3 TT8 TO OOT	EA	2	SO				CIS	1 Sep 93	
3	5	T250 DOZER	TOTAL COST US DOLLARS				SO		$45 000		CIS	1 Sep 93	

TOTAL COST US DOLLARS $9 439 577

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORIT NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	155	BATTERIES	6 CT 132 AMP/HR 12V		EA	60	AD	169 6	$10 176		USA	1 Sep 93	
1	160	BATTERIES	6 CT 182 AMP/HR 12V		EA	60	AD	204 06	$12 244		USA	1 Jan 94	
1	2	T250 DOZER	TRACK ASSEMBLEY	748 27 TOT CP	SET	2	AD				CIS	1 Sep 93	
2	63	WIRE ROPE	39mm (1 5) 4 2 Kg/M 10 TONNE		FT	4 417	AD	$2 31	$10 203		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	1	T250 DOZER	HOSE	700 40 3505	EA	2	AD				CIS	1 Sep 93	
2	3	T250 DOZER	PINS TRACK	748 22 6	EA	10	AD				CIS	1 Sep 93	
2	4	T250 DOZER	REGULATOR RELAY		EA	2	AD				CIS	1 Sep 93	
2	5	T250 DOZER	ELEMENT	CB 3329 00 6G	EA	48	AD				CIS	1 Sep 93	
2	6	T250 DOZER	PUMP	933 02 06	EA	1	AD				CIS	1 Sep 93	
2	7	T250 DOZER	FILTER HOUSING	748 05 T20 CP	EA	2	AD				CIS	1 Sep 93	
2	8	T250 DOZER	FILTER HOUSING	748 65 272 CP	EA	2	AD				CIS	1 Sep 93	
2	9	T250 DOZER	ELEMENT	54 57 020A	EA	10	AD				CIS	1 Sep 93	
2	10	T250 DOZER	PUMP	BNK 12	EA	2	AD				CIS	1 Sep 93	
2	11	T250 DOZER	TOTAL COST US DOLLARS				AD		$45 000		CIS	1 Sep 93	

TOTAL COST US DOLLARS $77 623

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	156	BATTERIES	6 CT 132 AMP/HR 12V		EA	20	OT	169 6	$3 392		USA	1 Sep 93	
1	161	BATTERIES	6 CT 182 AMP/HR 12V		EA	20	OT	204 06	$4 081		USA	1 Jan 94	
1	150	TRUCK TIRE	12x20x16 PLY/W TUBES		EA	140	OT	341 4	$47 796		USA	1 Sep 93	
1	67	WIRE ROPE	30mm (1 25) 4 0 Kg/M 5 TONNE		FT	318	OT	$1 73	$550		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	40	EXPLOSIVES	AMMONIT 20mm CARRIDGES		TONNE	20	OT	$650 00	$13 000		CIS	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	1	SM ENG PTS	ENGINE	D160	SET	2 25	OT				CIS	1 Sep 93	
1	2	SM ENG PTS	COTTER PINS	1434	EA	36	OT				CIS	1 Sep 93	
1	3	SM ENG PTS	COTTER PINS	2971	EA	36	OT				CIS	1 Sep 93	
1	4	SM ENG PTS	BLOCK ENGINE	51 01 2 cb	EA	2 25	OT				CIS	1 Sep 93	
1	5	SM ENG PTS	PACKING	40201	EA	7 5	OT				CIS	1 Sep 93	
1	6	SM ENG PTS	RINGS	40210	EA	75	OT				CIS	1 Sep 93	
1	7	SM ENG PTS	PACKING SETS UPPER	A 230113160 cbn1	SET	15	OT				CIS	1 Sep 93	
1	8	SM ENG PTS	PACKINGSETS LOWER	A230110311	SET	15	OT				CIS	1 Sep 93	
1	9	SM ENG PTS	PACKING SETS	A23 0110312 AN2	SET	15	OT				CIS	1 Sep 93	
1	10	SM ENG PTS	PACKING	14 02 101 cb	EA	15	OT				CIS	1 Sep 93	
1	11	SM ENG PTS	ENGINE REBUILD KIT	1 02 10 cp	SET	3	OT				CIS	1 Sep 93	
1	12	SM ENG PTS	GUSHING	03325	EA	7 5	OT				CIS	1 Sep 93	
1	13	SM ENG PTS	PACKING UPPER	023 02 10002 AN1	SET	15	OT				CIS	1 Sep 93	
1	14	SM ENG PTS	PACKING LOWER	A23 0 10004 DN1	ET	15	OT				CIS	1 Sep 93	
1	15	SM ENG PTS	RING SETS	A27 00 011	SET	22 5	OT				CIS	1 Sep 93	
1	16	SM ENG PTS	RING SETS	027 00 024	SET	22 5	OT				CIS	1 Sep 93	
1	17	SM ENG PTS	RING SETS	A27 00 043	SET	22 5	OT				CIS	1 Sep 93	
1	18	SM ENG PTS	PISTON RING SETS	03694 1 cp	SET	3	OT				CIS	1 Sep 93	
1	19	SM ENG PTS	GENERATOR BELT	5X9X1090	EA	15	OT				CIS	1 Sep 93	
1	20	SM ENG PTS	FAN BELTS	16X11X1650	EA	15	OT				CIS	1 Sep 93	
1	21	SM ENG PTS	WATER PUMP	16 08 140 cp	EA	7 5	OT				CIS	1 Sep 93	
1	22	SM ENG PTS	OIL PUMP	29 09 124 cp	EA	6	OT				CIS	1 Sep 93	
1	23	SM ENG PTS	CYLINDER LINER	01466	EA	9	OT				CIS	1 Sep 93	
1	24	SM ENG PTS	RING SETS	51 03 115 cp	EA	75	OT				CIS	1 Sep 93	
1	25	SM ENG PTS	CRANKSHAFT	16-03 1120 cp	EA	3	OT				CIS	1 Sep 93	
1	26	SM ENG PTS	PISTON	51 03 103	SET	7 5	OT				CIS	1-Sep 93	
1	27	SM ENG PTS	PACKING	700-40-2886	EA	15	OT				CIS	1 Sep 93	
1	28	SM ENG PTS	FILTER	A41 20 000 1 cp	EA	30	OT				CIS	1 Sep 93	
1	29	SM ENG PTS	FILTER	A41 10 000-02	EA	30	OT				CIS	1 Sep 93	
1	30	SM ENG PTS	RING	40843	EA	75	OT				CIS	1 Sep 93	
1	31	SM ENG PTS	PACKING	40269	EA	7 5	OT				CIS	1 Sep 93	
1	32	SM ENG PTS	SPRAYER	14 69 107 1 cp	EA	75	OT				CIS	1 Sep 93	
1	33	SM ENG PTS	INJECTOR FITTINGS	14 69 117 1 cp	EA	75	OT				CIS	1 Sep 93	
1	34	SM ENG PTS	CYLINDER HEAD	29 02 30 cp	EA	2 25	OT				CIS	1 Sep 93	
1	35	SM ENG PTS	STARTER	1723 cp	EA	2 25	OT				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	36	SM ENG PTS	RADIATOR	1304130101 cp	EA	7 5	OT				CIS	1 Sep 93	
1	37	SM ENG PTS	MAGNETO	M 149A	EA	7 5	OT				CIS	1 Sep 93	
1	38	SM ENG PTS	CARBURATOR	113 110-70-11	EA	7 5	OT				CIS	1 Sep 93	
1	39	SM ENG PTS	GENERATOR	69 063701	EA	6	OT				CIS	1 Sep 93	
1	40	SM ENG PTS	STARTER	CT 230E	EA	6	OT				CIS	1 Sep 93	
1	41	SM ENG PTS	TRUBO COMPRESSOR	111 30 001 10	EA	4 5	OT				CIS	1 Sep 93	
1	42	SM ENG PTS	FUEL SYSTEM UPPER	16 67 1 cp	EA	4 5	OT				CIS	1 Sep 93	
1	43	SM ENG PTS	TOTAL COST US DOLLARS				OT		$90 000		CIS	1 Sep 93	
2	1	KRAZ	ENGINE	238M 1000186	EA	4 8	OT				URK	1 Sep 93	
2	2	KRAZ	SHIM	238 1000102 B2R1	EA	25 6	OT				URK	1 Sep 93	
2	3	KRAZ	SHIM	238 1000102 B2	EA	25 6	OT				URK	1 Sep 93	
2	4	KRAZ	SHIM	23831000104 V2	EA	25 6	OT				URK	1 Sep 93	
2	5	KRAZ	CLIPS	256 1001005 A1	EA	40	OT				URK	1 Sep 93	
2	6	KRAZ	ENG RING SETS	236 1000106 B2	EA	160	OT				URK	1 Sep 93	
2	7	KRAZ	ENG MOUNTS	236 1001008 01	EA	24	OT				URK	1 Sep 93	
2	8	KRAZ	SHAFT	2383 1000107 V2	EA	6 4	OT				URK	1 Sep 93	
2	9	KRAZ	BLOCK	238 1002012 B2	EA	3 2	OT				URK	1 Sep 93	
2	10	KRAZ	RING	236 100202 A	EA	40	OT				URK	1 Sep 93	
2	11	KRAZ	RING	236 1002040	EA	32	OT				URK	1 Sep 93	
2	12	KRAZ	OIL INS	236 1002272	EA	8	OT				URK	1 Sep 93	
2	13	KRAZ	PIPE	238 1003290-V	EA	8	OT				URK	1 Sep 93	
2	14	KRAZ	PIPE	238 1003291 V	EA	8	OT				URK	1 Sep 93	
2	15	KRAZ	CYL WIPER COLLAR	236 1002314 B	EA	32	OT				URK	1 Sep 93	
2	16	KRAZ	HEAD C76G	238 1003013 D	EA	8	OT				URK	1 Sep 93	
2	17	KRAZ	RING	237 1003114 V	EA	8	OT				URK	1 Sep 93	
2	18	KRAZ	PACKING	238 1003210 V2	EA	80	OT				URK	1 Sep 93	
2	19	KRAZ	PACKING	238 1003270	EA	80	OT				URK	1 Sep 93	
2	20	KRAZ	LINER CYLINDER	236 1004008	EA	128	OT				URK	1 Sep 93	
2	21	KRAZ	ROCKER ARM	236-1004045 V2	EA	32	OT				URK	1 Sep 93	
2	22	KRAZ	RING	400-1004030-80	EA	32	OT				URK	1 Sep 93	
2	23	KRAZ	SEAL	201 1005034 B3	EA	32	OT				URK	1 Sep 93	
2	24	KRAZ	GEAR	236 1005030-A	EA	32	OT				URK	1 Sep 93	
2	25	KRAZ	COLLAR	236 1005160-A2	EA	80	OT				URK	1 Sep 93	
2	26	KRAZ	SHAFT	238 1006015 G2	EA	1 6	OT				URK	1 Sep 93	
2	27	KRAZ	SPACERS	236 1006026 AR	EA	48	OT				URK	1 Sep 93	
2	28	KRAZ	SPACERS	236-1006037 AR	EA	38 4	OT				URK	1 Sep 93	
2	29	KRAZ	VALVE	236 1007010-V	EA	40	OT				URK	1 Sep 93	
2	30	KRAZ	VALVE	236-1007015 V4	EA	40	OT				URK	1 Sep 93	
2	31	KRAZ	ROD PUSH	236 1007176 A	EA	33 6	OT				URK	1 Sep 93	
2	32	KRAZ	PACKING	236 1008050	EA	40	OT				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	33	KRAZ	PACKING	238T 1009040	EA	40	OT				URK	1 Sep 93	
2	34	KRAZ	PUMP	236 1011014 V3	EA	8	OT				URK	1 Sep 93	
2	35	KRAZ	RADIATOR	157 1013010 A	EA	8	OT				URK	1 Sep 93	
2	36	KRAZ	EXHAUST PIPE	256B 1013408 B	EA	12 8	OT				URK	1 Sep 93	
2	37	KRAZ	ELEMENT FILTER	201T 1105540	EA	480	OT				URK	1 Sep 93	
2	38	KRAZ	PUMP	240 1106210	EA	8	OT				URK	1 Sep 93	
2	39	KRAZ	PUMP	236T1106288 A2	EA	8	OT				URK	1 Sep 93	
2	40	KRAZ	COLLAR	236 102940	EA	80	OT				URK	1 Sep 93	
2	41	KRAZ	1/2 HUB COUPLING	236 1029268 B	EA	4	OT				URK	1 Sep 93	
2	42	KRAZ	PIPE	236 1104308 V	EA	16	OT				URK	1 Sep 93	
2	43	KRAZ	PUMP	8006 1111005	EA	4 8	OT				URK	1 Sep 93	
2	44	KRAZ	PLUNGER RODS	60 1111074 01	EA	120	OT				URK	1 Sep 93	
2	45	KRAZ	INJECTOR	2606-1112010 02	EA	224	OT				URK	1 Sep 93	
2	46	KRAZ	SPRAYER	26 111211	EA	224	OT				URK	1 Sep 93	
2	47	KRAZ	FILTER	201T 1117038	EA	160	OT				URK	1 Sep 93	
2	48	KRAZ	COUPLING	09000 1121010 000	EA	1 6	OT				URK	1 Sep 93	
2	49	KRAZ	MUFFLER	256 1201010	EA	8	OT				URK	1 Sep 93	
2	50	KRAZ	PACKING	256B 1203002	EA	80	OT				URK	1 Sep 93	
2	51	KRAZ	SLEEVE	256 B1 1203096	EA	20	OT				URK	1 Sep 93	
2	52	KRAZ	PACKING	256B 1203039	EA	32	OT				URK	1 Sep 93	
2	53	KRAZ	RADIATOR	256B 1301008 10	EA	16	OT				URK	1 Sep 93	
2	54	KRAZ	ENG MOUNTS	256-1302025	EA	8	OT				URK	1 Sep 93	
2	55	KRAZ	ENG/ MOUNTS	256 1302139	EA	8	OT				URK	1 Sep 93	
2	56	KRAZ	RODS	214B 1303010	EA	24	OT				URK	1 Sep 93	
2	57	KRAZ	RODS	255 1303012	EA	16	OT				URK	1 Sep 93	
2	58	KRAZ	EXHAUST PIPE	256 1303016	EA	4 8	OT				URK	1 Sep 93	
2	59	KRAZ	PUMP	236 1307010-A3	EA	20	OT				URK	1 Sep 93	
2	60	KRAZ	SET	236 1307029 A	EA	40	OT				URK	1 Sep 93	
2	61	KRAZ	COLLAR	236 1307090	EA	64	OT				URK	1 Sep 93	
2	62	KRAZ	BELTS	25 6411 1404	EA	160	OT				URK	1 Sep 93	
2	63	KRAZ	BELTS	6421 1403	EA	160	OT				URK	1 Sep 93	
2	64	KRAZ	MOTOR	236 1308011 G2	EA	4 8	OT				URK	1 Sep 93	
2	65	KRAZ	DISCS	238-1601690-G	EA	8	OT				URK	1 Sep 93	
2	66	KRAZ	DISCS	238-1601094	EA	8	OT				URK	1 Sep 93	
2	67	KRAZ	DISCS	238 1601130 B	EA	8	OT				URK	1 Sep 93	
2	68	KRAZ	DISCS	238 1601131	EA	12	OT				URK	1 Sep 93	
2	69	KRAZ	BRAKE FRICTION PLATE	236-1601138 A3	EA	40	OT				URK	1 Sep 93	
2	70	KRAZ	COUPLING	236 1601180-B2	EA	8	OT				URK	1 Sep 93	
2	71	KRAZ	GEAR BOX	236NT 1700003	EA	6 4	OT				URK	1 Sep 93	
2	72	KRAZ	BOX	257 18000020 V2	EA	1 6	OT				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	73	KRAZ	BOX	256 1800020 V2	EA	1 6	OT				URK	1 Sep 93	
2	74	KRAZ	HEAD CROSS	131 2201025 A	EA	16	OT				URK	1 Sep 93	
2	75	KRAZ	SHAFT	527 2202010-16	EA	6 4	OT				URK	1 Sep 93	
2	76	KRAZ	DRIVE SHAFT	210G 2202045 04	EA	6 4	OT				URK	1 Sep 93	
2	77	KRAZ	SHAFT	210G 2204010 16	EA	6 4	OT				URK	1 Sep 93	
2	78	KRAZ	SUPPORT	210 2204080 B2	EA	8	OT				URK	1 Sep 93	
2	79	KRAZ	REAR DRIVE AXLE	255P 2400015 02	EA	8	OT				URK	1 Sep 93	
2	80	KRAZ	SET OF GEARS	256B 2402020	EA	1 6	OT				URK	1 Sep 93	
2	81	KRAZ	DIFFERENTIAL SEAL	210 2402052 A1	EA	48	OT				URK	1 Sep 93	
2	82	KRAZ	DIFFERENTIAL	200 2403010-A2	EA	3 2	OT				URK	1 Sep 93	
2	83	KRAZ	FLANGE	200 2403072 B1	EA	3 2	OT				URK	1 Sep 93	
2	84	KRAZ	AXLE	2550 2500015 02	EA	1 6	OT				URK	1 Sep-93	
2	85	KRAZ	SHOCK ABSORBER	256B1 2902012	EA	16	OT				URK	1 Sep 93	
2	86	KRAZ	1ST PLATE	255B 2902074 01	EA	16	OT				URK	1 Sep 93	
2	87	KRAZ	2ND PLATE	255B 2902076 01	EA	16	OT				URK	1 Sep 93	
2	88	KRAZ	SHOCK SPRINGS	500 2905006	EA	40	OT				URK	1 Sep 93	
2	89	KRAZ	SHOCK ABSORBER	256B 2912012 11	EA	20 8	OT				URK	1 Sep 93	
2	90	KRAZ	CONN BRACKETS	219 2912408	EA	48	OT				URK	1 Sep 93	
2	91	KRAZ	EQUALIZER	256B 2918005	EA	24	OT				URK	1 Sep 93	
2	92	KRAZ	SHAFT	256B 2918054	EA	3 2	OT				URK	1 Sep 93	
2	93	KRAZ	ROD	214 2919011 02	EA	40	OT				URK	1 Sep 93	
2	94	KRAZ	ROD	210 2919012 03	EA	40	OT				URK	1 Sep 93	
2	95	KRAZ	BUSHING	200 3001016	EA	32	OT				URK	1 Sep 93	
2	96	KRAZ	SEAL	200 3103035	EA	11 2	OT				URK	1 Sep 93	
2	97	KRAZ	SEAL	210 3104036	EA	11 2	OT				URK	1 Sep 93	
2	98	KRAZ	COTTER PINS	200 3104050 A	EA	400	OT				URK	1 Sep 93	
2	99	KRAZ	COTTER PINS	200 3104050 A	EA	400	OT				URK	1 Sep 93	
2	100	KRAZ	RELAYS	500 3401005 D	EA	4	OT				URK	1 Sep 93	
2	101	KRAZ	HYD BOOSTER BRAKES	256B 3405010 14	EA	8	OT				URK	1 Sep 93	
2	102	KRAZ	DISTRIBUTOR	255B-3405016	EA	8	OT				URK	1 Sep 93	
2	103	KRAZ	PUMP	256B 3407199	EA	8	OT				URK	1 Sep 93	
2	104	KRAZ	FRIC PLATES SHOE	200 3501105	EA	240	OT				URK	1 Sep 93	
2	105	KRAZ	LEVER	210 3501136-A2	EA	6 4	OT				URK	1 Sep 93	
2	106	KRAZ	FRIC PLATES SHOES	200 3502105 A	EA	240	OT				URK	1 Sep 93	
2	107	KRAZ	COMPRESSOR	130-3509009 11	EA	6 4	OT				URK	1 Sep 93	
2	108	KRAZ	GENERATOR	4573711587	EA	16	OT				URK	1 Sep 93	
2	109	KRAZ	REGULATOR	1112 3702	EA	16	OT				URK	1 Sep 93	
2	110	KRAZ	SWITCH	VK318T 3704000	EA	8	OT				URK	1 Sep 93	
2	111	KRAZ	ELECTRO BRUSHES	2501 370805	EA	208	OT				URK	1 Sep 93	
2	112	KRAZ	SWITCH	P305 3709000	EA	12	OT				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	113	KRAZ	SWITCH	P39 371000 T	EA	12	OT				URK	1 Sep 93	
2	114	KRAZ	STARTER	45 7375 1471	EA	20	OT				URK	1 Sep 93	
2	115	KRAZ	RELAY	RC103 3708000	EA	8	OT				URK	1 Sep 93	
2	116	KRAZ	LAMPS	A 24 60-40	EA	320	OT				URK	1 Sep 93	
2	117	KRAZ	FILTERS	FG122 3711200-V	EA	24	OT				URK	1 Sep 93	
2	118	KRAZ	LAMPS	A24 324	EA	320	OT				URK	1 Sep 93	
2	119	KRAZ	LAMPS	A 24 2	EA	320	OT				URK	1 Sep 93	
2	120	KRAZ	LAMPS	A 24 5	EA	320	OT				URK	1 Sep 93	
2	121	KRAZ	LAMPS	A 24 21 2	EA	320	OT				URK	1 Sep 93	
2	122	KRAZ	SPEEDOMETER	CP135 3802010	EA	8	OT				URK	1 Sep 93	
2	123	KRAZ	RELAY	RC401 3726010	EA	8	OT				URK	1 Sep 93	
2	124	KRAZ	RECIEVER	YK143 3807010-G4	EA	3 2	OT				URK	1 Sep 93	
2	125	KRAZ	SENSOR	BM146 3806600D	EA	3 2	OT				URK	1 Sep 93	
2	126	KRAZ	AMP METER	AP110 3811010	EA	6 4	OT				URK	1 Sep 93	
2	127	KRAZ	PRESSURE GAUGE	MD103 3816010	EA	3 2	OT				URK	1 Sep 93	
2	128	KRAZ	SENSOR	TM100 3808000 G	EA	8	OT				URK	1 Sep 93	
2	129	KRAZ	MIRRORS	256-8201012	EA	24	OT				URK	1 Sep 93	
2	130	KRAZ	EQUALIZER	220V 8702010A	EA	1 6	OT				URK	1 Sep 93	
2	131	KRAZ	TOTAL COST US DOLLARS				OT		$88 000		URK	1 Sep 93	
3	1	T130 DOZER	PACKING	2301103160 CBN 1	EA	23	OT				CIS	1 Sep 93	
3	2	T130 DOZER	THIMBLE ?	01466-2	EA	75	OT				CIS	1 Sep 93	
3	3	T130 DOZER	RINGS	51 03 115 CP	EA	75	OT				CIS	1 Sep 93	
3	4	T130 DOZER	CRANKSHAFT	16 03 126 CP	EA	5	OT				CIS	1 Sep 93	
3	5	T130 DOZER	CYLINDER	51 03 23	EA	75	OT				CIS	1 Sep 93	
3	6	T130 DOZER	HYDRALIC SEAL	700 40 2889	EA	36	OT				CIS	1 Sep 93	
3	7	T130 DOZER	FILTER	F A41 20 000 01 CP	EA	75	OT				CIS	1 Sep 93	
3	8	T130 DOZER	FILTER	A41 10 000 02 CP	EA	75	OT				CIS	1 Sep 93	
3	9	T130 DOZER	RING	40843	EA	75	OT				CIS	1 Sep 93	
3	10	T130 DOZER	PACKING	40269	EA	23	OT				CIS	1 Sep 93	
3	11	T130 DOZER	GEAR PINION	74116	EA	2	OT				CIS	1 Sep 93	
3	12	T130 DOZER	REDUCTION GEAR	17 76 8 CP	EA	1	OT				CIS	1 Sep 93	
3	13	T130 DOZER	FUEL INJECTORS	17 69 107 1 CP	EA	75	OT				CIS	1 Sep 93	
3	14	T130 DOZER	SPRAYER	14 69 117 1 CP	EA	75	OT				CIS	1 Sep 93	
3	15	T130 DOZER	PUMP	51 67 11 CP	EA	2	OT				CIS	1 Sep 93	
3	16	T130 DOZER	COMPRESSOR PIPING	92 000-06	EA	8	OT				CIS	1 Sep 93	
3	17	T130 DOZER	AIR INLET	N036 85 770	EA	7	OT				CIS	1 Sep 93	
3	18	T130 DOZER	WATER PUMP	16-8 140-CP	EA	8	OT				CIS	1 Sep 93	
3	19	T130 DOZER	OIL PUMP	29 09 124 CP	EA	8	OT				CIS	1 Sep 93	
3	20	T130 DOZER	HYDRALIC PUMP	NS 100A 3 P	EA	5	OT				CIS	1 Sep 93	
3	21	T130 DOZER	PUMP	NS 32 Y WP	EA	2	OT				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	22	T130 DOZER	GEAR BOX	24-12 1 CP	EA	2	OT				CIS	1 Sep 93	
3	23	T130 DOZER	FILTER	A23 30 000 01	EA	38	OT				CIS	1 Sep 93	
3	24	T130 DOZER	PACKING SEALS	700 40-2049	EA	23	OT				CIS	1 Sep 93	
3	25	T130 DOZER	CARBURATOR	113 1107011	EA	9	OT				CIS	1 Sep 93	
3	26	T130 DOZER	SUPPORT BRACKET	51 07 102 CP	EA	3	OT				CIS	1 Sep 93	
3	27	T130 DOZER	ENGINE HEAD	07146 1 CP	EA	5	OT				CIS	1 Sep 93	
3	28	T130 DOZER	FUEL SYS CENTRIFUGE	95000	EA	4	OT				CIS	1 Sep 93	
3	29	T130 DOZER	FAN BLADES	51 08 113 CP	EA	3	OT				CIS	1 Sep 93	
3	30	T130 DOZER	RADIATOR	130Y 13 010 1	EA	8	OT				CIS	1 Sep 93	
3	31	T130 DOZER	BRAKE DISC	738 4 CP	EA	11	OT				CIS	1 Sep 93	
3	32	T130 DOZER	MAGNET SOLENOID	M149 A3	EA	11	OT				CIS	1 Sep 93	
3	33	T130 DOZER	STARTER	ST 230M	EA	11	OT				CIS	1 Sep 93	
3	34	T130 DOZER	GENERATOR	70-3701	EA	4	OT				CIS	1 Sep 93	
3	35	T130 DOZER	RELAY STARTER	RR 0362B1	EA	11	OT				CIS	1 Sep 93	
3	36	T130 DOZER	DISTRIBUTOR	R 150 A3T001	EA	2	OT				CIS	1 Sep 93	
3	37	T130 DOZER	DRIVE SHAFT	50 14 113	EA	2	OT				CIS	1 Sep 93	
3	38	T130 DOZER	CYLINDER POWER	18 26 270 CP	EA	4	OT				CIS	1 Sep 93	
3	39	T130 DOZER	CYLINDER	DP 26 C 06 140	EA	2	OT				CIS	1 Sep 93	
3	40	T130 DOZER	ELEMENT FILTER	EF 01 00 CP	EA	105	OT				CIS	1 Sep 93	
3	41	T130 DOZER	PUMP BRAKE	14 71 3 CP	EA	2	OT				CIS	1 Sep 93	
3	42	T130 DOZER	MECH	17 74 8 CP	EA	2	OT				CIS	1 Sep 93	
3	43	T130 DOZER	SUPPORT	17 74 284	EA	3	OT				CIS	1 Sep 93	
3	44	T130 DOZER	SHAFT	16-74 10 CP	EA	2	OT				CIS	1 Sep 93	
3	45	T130 DOZER	GEAR	17 01 22	EA	2	OT				CIS	1 Sep 93	
3	46	T130 DOZER	FRICTION CLUTCH PADS	24 16 101 CP	EA	5	OT				CIS	1 Sep 93	
3	47	T130 DOZER	SERVICE MECH	21 17 4 CP	EA	4	OT				CIS	1 Sep 93	
3	48	T130 DOZER	FAN BELT	18360 01 CP	EA	9	OT				CIS	1 Sep 93	
3	49	T130 DOZER	PULLEY WHEEL	24 21 146 CP	EA	3	OT				CIS	1 Sep-93	
3	50	T130 DOZER	DRIVE PULLEY	24 21 169 CP	EA	12	OT				CIS	1 Sep 93	
3	51	T130 DOZER	DOUBLE PULLEY	24 21 170 CP	EA	12	OT				CIS	1 Sep 93	
3	52	T130 DOZER	FILTER	A 410000-2	EA	8	OT				CIS	1 Sep 93	
3	53	T130 DOZER	IDLER PULLEY	24 21 171 CP	EA	12	OT				CIS	1 Sep 93	
3	54	T130 DOZER	FILTER	A 410000-A CP	EA	45	OT				CIS	1 Sep 93	
3	55	T130 DOZER	MIDDLE CUTTING EDGE	D3 110AXP 02 001 0	EA	2	OT				CIS	1 Sep 93	
3	56	T130 DOZER	END CUTTING EDGE RT	D661 02001 02	EA	2	OT				CIS	1 Sep 93	
3	57	T130 DOZER	END CUTTING EDGE LEFT	D661 02 002 02	EA	2	OT				CIS	1 Sep 93	
3	58	T130 DOZER	TRACK ASSEMBLY	24 22 1	SET	2	OT				CIS	1 Sep 93	
3	59	T130 DOZER	DEFLECTOR RK GUARD	2204	EA	150	OT				CIS	1 Sep 93	
3	60	T130 DOZER	DEFLECTOR RK GUARD	2205	EA	150	OT				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	61	T130 DOZER	PACKING TRACKS ADJ	40201	EA	60	OT				CIS	1 Sep 93	
3	62	T130 DOZER	RING	40210	EA	15	OT				CIS	1 Sep 93	
3	63	T130 DOZER	CYLINDER PACKING	40944 CP	EA	38	OT				CIS	1 Sep 93	
3	64	T130 DOZER	CYLINDER	14 02 101 CP	EA	38	OT				CIS	1 Sep 93	
3	65	T130 DOZER	HEAD CYLINDER	16-02 106 CP	EA	15	OT				CIS	1 Sep 93	
3	66	T130 DOZER	VALVE	14 02 32	EA	8	OT				CIS	1 Sep 93	
3	67	T130 DOZER	VALVE	14 02 33 V	EA	8	OT				CIS	1 Sep 93	
3	68	T130 DOZER	PIPE	10663 1	EA	8	OT				CIS	1 Sep 93	
3	69	T130 DOZER	PIPE	10664 1	EA	8	OT				CIS	1 Sep 93	
3	70	T130 DOZER	GEARBOX	50-12 12 CP	EA	2	OT				CIS	1 Sep 93	
3	71	T130 DOZER	COUPLING	18 14 133 CP	EA	2	OT				CIS	1 Sep 93	
3	72	T130 DOZER	DISC	18 14 135 CP	EA	3	OT				CIS	1 Sep 93	
3	73	T130 DOZER	COUPLING	18 14 78	EA	2	OT				CIS	1 Sep 93	
3	74	T130 DOZER	COLLAR	3-48X28 6	EA	3	OT				CIS	1 Sep 93	
3	75	T130 DOZER	RING	N1 35X28 2	EA	5	OT				CIS	1 Sep 93	
3	76	T130 DOZER	DISC	24 16 103 CP	EA	8	OT				CIS	1 Sep 93	
3	77	T130 DOZER	PUMP	51 67 10 CP	EA	2	OT				CIS	1 Sep 93	
3	78	T130 DOZER	PISTON PUMP	16 67 102 CP	EA	27	OT				CIS	1 Sep 93	
3	79	T130 DOZER	PUMP PISTON	16 67 108 CP	EA	27	OT				CIS	1 Sep 93	
3	80	T130 DOZER	DISC	738 4 CP	EA	8	OT				CIS	1 Sep 93	
3	81	T130 DOZER	COUPLING	72118 CP	EA	4	OT				CIS	1 Sep 93	
3	82	T130 DOZER	RING	111 30 123 00	EA	15	OT				CIS	1 Sep 93	
3	83	T130 DOZER	ROTOR	92 55	EA	2	OT				CIS	1 Sep 93	
3	84	T130 DOZER	RADIATOR	21 09 1	EA	2	OT				CIS	1 Sep 93	
3	85	T130 DOZER	PUMP	51 67 11 CP	EA	2	OT				CIS	1 Sep 93	
3	86	T130 DOZER	TOTAL COST US DOLLARS				OT		$135 000		CIS	1 Sep 93	

TOTAL COST US DOLLARS $381 819

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	164	ALUM WIRE	OVERHEAD FIELD LINE		TONNE	7 5	BA	4 912	$36 844		USA	1 Sep 93	
1	8	ANFO TR	ANFO MIX TRUCK		EA	1	BA	$135 125	$135 125		USA	1 Sep 93	
1	162	BATTERIES	32 CT 450 AMP/HR 24 V	8 BAT /SET	EA	32	BA	414	$13 248		USA	1 Sep 94	
1	5	BULLDOZER	CAT D 10 BULLDOZER		EA	1	BA	$638 900	$638 900		USA	1 Sep 93	
1	21	COAL CRUS	STAMLER FEEDER BREAKER		EA	1	BA	$400 000	$400 000		USA	1 Jan 94	3 MO SHIPPING TINE
1	29	DRAG W PTS	13/50 15/90 /20/90		LOT		BA	$187 000	$187 000		USA	1 Sep 93	
1	30	DRAG W PTS	10/70		LOT		BA	$30 000	$30 000		USA	1 Sep 93	
1	22	DRAG BUCK	20/90 DRAG BUCKET/COMPLETE		EA	1	BA	$220 000	$220 000		USA	1 Sep 93	
1	23	DRAG BUCK	15/90 DRAG BUCKET/COMPLETE		EA	1	BA	$180 000	$180 000		USA	1 Sep 93	
1	24	DRAG BUCK	13/50 DRAG BUCKET/COMPLETE		EA	1	BA	$180 000	$180 000		USA	1 Sep 93	
1	25	DRAG BUCK	10/70 DRAG BUCKET/COMP		EA	1	BA	$113 000	$113 000		USA	1 Sep 93	
1	39	EXPLOSIVES	75lb CAST PRIMERS		EA	130 000	BA	$1 75	$227 500		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	41	EXPLOSIVES	PRIMADETS #12/30FT		EA	100 000	BA	$2 00	$200 000		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	42	EXPLOSIVES	PRIMADETS #12/12FT		EA	30 000	BA	$1 75	$52 500		USA	SPLIT	50% 1 SEPT 93 50% 1-JAN 94
1	44	EXPLOSIVES	MSGS SURFACE DELAYS		EA	13 000	BA	$2 60	$33 800		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	46	EXPLOSIVES	25 GRAIN DETONATING CORD		KM	450	BA	$280 00	$126 000		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	10	FUEL TRUCK	FUEL & LUBE TRUCK		EA	1	BA	$90 275	$90 275		USA	1 Sep 93	
1	2	GRADER	CAT 16G MOTORGRADER		EA	1	BA	$385 000	$385 000		USA	1 Sep 93	
1	32	SHOV BUCK	WEAR PARTS		LOT		BA	$23 000	$23 000		USA	1 Sep 93	
1	27	SHOVEL B	EKG 4 6 SHOVEL BUCKET		EA	1	BA	$79 000	$79 000		USA	1 Sep 93	
1	13	TIRE TRUCK	TIRE HANDLING TRUCK		EA	1	BA	$79 925	$79 925		USA	1 Sep 93	
1	90	WELDING RD	ZETA HARD FACING ROD 5/32		lbs	10 000	BA	$0 55	$5 480		USA	1 Sep 93	
1	54	WIRE ROPE	64 mm(2 5) 16 8 Kg/M 15 TONNE		FT	2 851	BA	$8 05	$22 951		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	55	WIRE ROPE	57mm(2 25) 13 6 Kg/M 35 TONNE		FT	8 244	BA	$5 97	$49 217		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	56	WIRE ROPE	52 mm(2) 10 7 Kg/M 25 TONNE		FT	7 458	BA	$4 60	$34 307		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	60	WIRE ROPE	39mm (1 5) 4 2 Kg/M 25 TONNE		FT	11 040	BA	$2 31	$25 502		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	152	BATTERIES	6 CT 132 AMP/HR 12V		EA	50	BA	169 6	$8 480		USA	1 Sep 93	
2	157	BATTERIES	6 CT 182 AMP/HR 12V		EA	50	BA	204 06	$10 203		USA	1 Jan 94	
2	82	BELT SUPP	SPLICING KITS 1600 mm		EA	10	BA	$564 98	$5 650		USA	1 Jan 94	
2	83	BELT SUPP	SPLICING KITS 1400 mm		EA	10	BA	$461 10	$4 611		USA	1 Jan 94	
2	84	BELT SUPP	SPLICING KITS 1200 mm		EA	10	BA	$368 88	$3 689		USA	1 Jan 94	
2	86	BELT SUPP	SPLICING KITS 1000 mm		EA	10	BA	$322 24	$3 222		USA	1 Jan 94	
2	88	BELT SUPP	SPLICING KITS 800 mm		EA	10	BA	$276 66	$2 767		USA	1 Jan 94	
2	17	FEL	CAT992C FRONT END LOADER		EA	1	BA	$977 672	$977 672		USA	1 Sep 93	
2	151	TRUCK TIRE	18x33x32 PLY EH		EA	120	BA	1706	$204 720		USA	1 Jan 94	
2	58	WIRE ROPE	45 5mm(1 75) 8 2 Kg/M 10 TONNE		FT	3 888	BA	$2 91	$11 314		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	64	WIRE ROPE	30mm (1 25) 4 0 Kg/M - 3TONNE		FT	1 907	BA	$1 73	$3 299		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	68	WIRE ROPE	30mm (5/8) 9 Kg/M 1 5 TONNE		FT	4 563	BA	$0 55	$2 510		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	70	WIRE ROPE	13 5mm(9/16) 2 5 TONNE		FT	9 340	BA	$0 50	$4 670		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	72	WIRE ROPE	9 11 mm(7/16) 2 TONNE		FT	12 958	BA	$0 40	$5 183		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
3	74	CONV BELT	1000 mm 5 PLY FABRIC		M	800	BA	$106 89	$85 512		USA	1 Jan 94	
3	76	CONV BELT	1200 mm 6 PLY FABRIC		M	1 000	BA	$147 53	$147 530		USA	1 Jan 94	
3	78	CONV BELT	1400 mm 6 PLY FABRIC		M	1 430	BA	$181 07	$258 930		USA	1 Jan 94	
3	79	CONV BELT	1600 mm 4 PLY FABRIC		M	1 875	BA	$157 71	$295 706		USA	1 Jan 94	
3	80	CONV BELT	800 mm 6 PLY FABRIC		M	500	BA	$107 99	$53 995		USA	1 Jan 94	
3	147	TRUCK TIRE	12x20x16 PLY/W TUBES		EA	20	BA	341 4	$6 828		USA	1 Sep 93	
1	1	ELEC RR	ARC SHOE PLATES	3E 14D	EA	10	BA				URK	1 Sep 93	
1	2	ELEC RR	ARC SHOE PLATES	3E 14-1D	EA	10	BA				URK	1 Sep 93	
1	3	ELEC RR	AUTO SWITCHES	KPD 131	EA	2	BA				URK	1 Sep 93	
1	4	ELEC RR	AIR COMPRESSOR	KB 1V	EA	4	BA				URK	1 Sep 93	
1	5	ELEC RR	CONT TROLLEY LEFT	TB 13D	EA	4	BA				URK	1 Sep 93	
1	6	ELEC RR	CONT TROLLEY RIGHT	TB 12D	EA	4	BA				URK	1 Sep 93	
1	7	ELEC RR	AUTO CON COUPLING	CA 3M	EA	20	BA				URK	1 Sep 93	
1	8	ELEC RR	PACKING SHAFT MOTOR		SET	6	BA				URK	1 Sep 93	
1	9	ELEC RR	AIR VALVE		EA	10	BA				URK	1 Sep 93	
1	10	ELEC RR	AIR VALVE		EA	20	BA				URK	1 Sep 93	
1	11	ELEC RR	SWITCH START&STOP		EA	5	BA				URK	1 Sep 93	
1	12	ELEC RR	SWITCH BLK W/MAG		EA	20	BA				URK	1 Sep 93	
1	13	ELEC RR	CONDENSORS		EA	2	BA				URK	1 Sep 93	
1	14	ELEC RR	GROUNDING ROD		EA	6	BA				URK	1 Sep 93	
1	15	ELEC RR	TRIRISTER ELEC		EA	30	BA				URK	1 Sep 93	
1	16	ELEC RR	DIRISTER ELEC		EA	200	BA				URK	1 Sep 93	
1	17	ELEC RR	HOUSING FOR AUTO COUP		EA	5	BA				URK	1 Sep 93	
1	18	ELEC RR	TOTAL COST US DOLLARS				BA		$130 000		URK	1 Sep 93	
3	1	KRAZ	ENGINE	238M 1000186	EA	0 6	BA				URK	1 Sep 93	
3	2	KRAZ	SHIM	238 1000102 B2R1	EA	3 2	BA				URK	1 Sep 93	
3	3	KRAZ	SHIM	238-1000102 B2	EA	3 2	BA				URK	1 Sep 93	
3	4	KRAZ	SHIM	23831000104 V2	EA	3 2	BA				URK	1 Sep 93	
3	5	KRAZ	CLIPS	256-1001005 A1	EA	5	BA				URK	1 Sep 93	
3	6	KRAZ	ENG RING SETS	236-1000106 B2	EA	20	BA				URK	1 Sep 93	
3	7	KRAZ	ENG MOUNTS	236-1001008 01	EA	3	BA				URK	1 Sep 93	
3	8	KRAZ	SHAFT	2383 1000107 V2	EA	0 8	BA				URK	1 Sep 93	
3	9	KRAZ	BLOCK	238 1002012 B2	EA	0 4	BA				URK	1 Sep 93	
3	10	KRAZ	RING	236-100202 A	EA	5	BA				URK	1 Sep 93	
3	11	KRAZ	RING	236-1002040	EA	4	BA				URK	1 Sep 93	
3	12	KRAZ	OIL INS	236-1002272	EA	1	BA				URK	1 Sep 93	
3	13	KRAZ	PIPE	238-1003290-V	EA	1	BA				URK	1 Sep 93	
3	14	KRAZ	PIPE	238-1003291 V	EA	1	BA				URK	1 Sep 93	

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MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	15	KRAZ	CYL WIPER COLLAR	236-1002314 B	EA	4	BA				URK	1 Sep 93	
3	16	KRAZ	HEAD C76G	238-1003013-D	EA	1	BA				URK	1 Sep-93	
3	17	KRAZ	RING	237 1003114 V	EA	1	BA				URK	1 Sep 93	
3	18	KRAZ	PACKING	238-1003210-V2	EA	10	BA				URK	1 Sep 93	
3	19	KRAZ	PACKING	238 1003270	EA	10	BA				URK	1 Sep 93	
3	20	KRAZ	LINER CYLINDER	236-1004008	EA	16	BA				URK	1 Sep 93	
3	21	KRAZ	ROCKER ARM	236-1004045 V2	EA	4	BA				URK	1 Sep 93	
3	22	KRAZ	RING	400-1004030 80	EA	4	BA				URK	1 Sep 93	
3	23	KRAZ	SEAL	201 1005034 B3	EA	4	BA				URK	1 Sep 93	
3	24	KRAZ	GEAR	236 1005030-A	EA	4	BA				URK	1 Sep 93	
3	25	KRAZ	COLLAR	236 1005160 A2	EA	10	BA				URK	1 Sep 93	
3	26	KRAZ	SHAFT	238-1006015 G2	EA	0 2	BA				URK	1 Sep 93	
3	27	KRAZ	SPACERS	236 1006026-AR	EA	6	BA				URK	1 Sep 93	
3	28	KRAZ	SPACERS	236 1006037 AR	EA	4 8	BA				URK	1 Sep 93	
3	29	KRAZ	VALVE	236 1007010-V	EA	5	BA				URK	1 Sep 93	
3	30	KRAZ	VALVE	236-1007015 V4	EA	5	BA				URK	1 Sep 93	
3	31	KRAZ	ROD PUSH	236 1007176 A	EA	4 2	BA				URK	1 Sep 93	
3	32	KRAZ	PACKING	236 1008050	EA	5	BA				URK	1 Sep 93	
3	33	KRAZ	PACKING	238T 1009040	EA	5	BA				URK	1 Sep 93	
3	34	KRAZ	PUMP	236-1011014 V3	EA	1	BA				URK	1 Sep 93	
3	35	KRAZ	RADIATOR	157 1013010 A	EA	1	BA				URK	1 Sep 93	
3	36	KRAZ	EXHAUST PIPE	256B 1013408 B	EA	1 6	BA				URK	1 Sep 93	
3	37	KRAZ	ELEMENT FILTER	201T 1105540	EA	60	BA				URK	1 Sep 93	
3	38	KRAZ	PUMP	240 1106210	EA	1	BA				URK	1 Sep 93	
3	39	KRAZ	PUMP	236T1106288 A2	EA	1	BA				URK	1 Sep 93	
3	40	KRAZ	COLLAR	236 102940	EA	10	BA				URK	1 Sep 93	
3	41	KRAZ	1/2 HUB COUPLING	236 1029268 B	EA	0 5	BA				URK	1 Sep 93	
3	42	KRAZ	PIPE	236 1104308 V	EA	2	BA				URK	1 Sep 93	
3	43	KRAZ	PUMP	8006-1111005	EA	0 6	BA				URK	1 Sep 93	
3	44	KRAZ	PLUNGER RODS	60-1111074 01	EA	15	BA				URK	1 Sep 93	
3	45	KRAZ	INJECTOR	2606-1112010 02	EA	28	BA				URK	1 Sep 93	
3	46	KRAZ	SPRAYER	26 111211	EA	28	BA				URK	1 Sep 93	
3	47	KRAZ	FILTER	201T 1117038	EA	20	BA				URK	1 Sep 93	
3	48	KRAZ	COUPLING	09000 1121010 000	EA	0 2	BA				URK	1 Sep 93	
3	49	KRAZ	MUFFLER	256-1201010	EA	1	BA				URK	1 Sep 93	
3	50	KRAZ	PACKING	256B-1203002	EA	10	BA				URK	1 Sep 93	
3	51	KRAZ	SLEEVE	256-B1 1203096	EA	2 5	BA				URK	1 Sep 93	
3	52	KRAZ	PACKING	256B 1203039	EA	4	BA				URK	1 Sep 93	
3	53	KRAZ	RADIATOR	256B 1301008-10	EA	2	BA				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	54	KRAZ	ENG MOUNTS	256-1302025	EA	1	BA				URK	1 Sep 93	
3	55	KRAZ	ENG/ MOUNTS	256-1302139	EA	1	BA				URK	1 Sep 93	
3	56	KRAZ	RODS	214B 1303010	EA	3	BA				URK	1 Sep 93	
3	57	KRAZ	RODS	255 1303012	EA	2	BA				URK	1 Sep 93	
3	58	KRAZ	EXHAUST PIPE	256-1303016	EA	0 6	BA				URK	1 Sep 93	
3	59	KRAZ	PUMP	236-1307010-A3	EA	2 5	BA				URK	1 Sep 93	
3	60	KRAZ	SET	236-1307029 A	EA	5	BA				URK	1 Sep 93	
3	61	KRAZ	COLLAR	236-1307090	EA	8	BA				URK	1 Sep 93	
3	62	KRAZ	BELTS	25 6411 1404	EA	20	BA				URK	1 Sep 93	
3	63	KRAZ	BELTS	6421 1403	EA	20	BA				URK	1 Sep 93	
3	64	KRAZ	MOTOR	236 1308011 G2	EA	0 6	BA				URK	1 Sep 93	
3	65	KRAZ	DISCS	238 1601690 G	EA	1	BA				URK	1 Sep 93	
3	66	KRAZ	DISCS	238 1601094	EA	1	BA				URK	1 Sep 93	
3	67	KRAZ	DISCS	238 1601130-B	EA	1	BA				URK	1 Sep 93	
3	68	KRAZ	DISCS	238 1601131	EA	1 5	BA				URK	1 Sep 93	
3	69	KRAZ	BRAKE FRICTION PLATE	236-1601138 A3	EA	5	BA				URK	1 Sep 93	
3	70	KRAZ	COUPLING	236-1601180 B2	EA	1	BA				URK	1 Sep 93	
3	71	KRAZ	GEAR BOX	236NT 1700003	EA	0 8	BA				URK	1 Sep 93	
3	72	KRAZ	BOX	257 18000020 V2	EA	0 2	BA				URK	1 Sep 93	
3	73	KRAZ	BOX	256-1800020 V2	EA	0 2	BA				URK	1 Sep 93	
3	74	KRAZ	HEAD CROSS	131 2201025 A	EA	2	BA				URK	1 Sep 93	
3	75	KRAZ	SHAFT	527 2202010-16	EA	0 8	BA				URK	1 Sep 93	
3	76	KRAZ	DRIVE SHAFT	210G 2202045 04	EA	0 8	BA				URK	1 Sep 93	
3	77	KRAZ	SHAFT	210G 2204010-16	EA	0 8	BA				URK	1 Sep 93	
3	78	KRAZ	SUPPORT	210 2204080 B2	EA	1	BA				URK	1 Sep 93	
3	79	KRAZ	REAR DRIVE AXLE	255P 2400015 02	EA	1	BA				URK	1 Sep 93	
3	80	KRAZ	SET OF GEARS	256B-2402020	EA	0 2	BA				URK	1 Sep 93	
3	81	KRAZ	DIFFERENTIAL SEAL	210-2402052 A1	EA	6	BA				URK	1 Sep 93	
3	82	KRAZ	DIFFERENTIAL	200 2403010 A2	EA	0 4	BA				URK	1 Sep 93	
3	83	KRAZ	FLANGE	200-2403072 B1	EA	0 4	BA				URK	1 Sep 93	
3	84	KRAZ	AXLE	2550-2500015 02	EA	0 2	BA				URK	1 Sep 93	
3	85	KRAZ	SHOCK ABSORBER	256B1 2902012	EA	2	BA				URK	1 Sep 93	
3	86	KRAZ	1ST PLATE	255B 2902074 01	EA	2	BA				URK	1 Sep 93	
3	87	KRAZ	2ND PLATE	255B 2902076 01	EA	2	BA				URK	1 Sep 93	
3	88	KRAZ	SHOCK SPRINGS	500-2905006	EA	5	BA				URK	1 Sep 93	
3	89	KRAZ	SHOCK ABSORBER	256B-2912012 11	EA	2 6	BA				URK	1 Sep 93	
3	90	KRAZ	CONN BRACKETS	219 2912408	EA	6	BA				URK	1 Sep 93	
3	91	KRAZ	EQUALIZER	256B-2918005	EA	3	BA				URK	1 Sep 93	
3	92	KRAZ	SHAFT	256B-2918054	EA	0 4	BA				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	93	KRAZ	ROD	214 2919011 02	EA	5	BA				URK	1 Sep 93	
3	94	KRAZ	ROD	210-2919012 03	EA	5	BA				URK	1 Sep 93	
3	95	KRAZ	BUSHING	200-3001016	EA	4	BA				URK	1 Sep 93	
3	96	KRAZ	SEAL	200 3103035	EA	1 4	BA				URK	1 Sep 93	
3	97	KRAZ	SEAL	210-3104036	EA	1 4	BA				URK	1 Sep 93	
3	98	KRAZ	COTTER PINS	200 3104050-A	EA	50	BA				URK	1 Sep 93	
3	99	KRAZ	COTTER PINS	200 3104050-A	EA	50	BA				URK	1 Sep 93	
3	100	KRAZ	RELAYS	500-3401005 D	EA	0 5	BA				URK	1 Sep 93	
3	101	KRAZ	HYD BOOSTER BRAKES	256B-3405010-14	EA	1	BA				URK	1 Sep 93	
3	102	KRAZ	DISTRIBUTOR	255B-3405016	EA	1	BA				URK	1 Sep 93	
3	103	KRAZ	PUMP	256B-3407199	EA	1	BA				URK	1 Sep 93	
3	104	KRAZ	FRIC PLATES SHOE	200-3501105	EA	30	BA				URK	1 Sep 93	
3	105	KRAZ	LEVER	210 3501136 A2	EA	0 8	BA				URK	1 Sep 93	
3	106	KRAZ	FRIC PLATES SHOES	200 3502105 A	EA	30	BA				URK	1 Sep 93	
3	107	KRAZ	COMPRESSOR	130 3509009 11	EA	0 8	BA				URK	1 Sep 93	
3	108	KRAZ	GENERATOR	4573711587	EA	2	BA				URK	1 Sep 93	
3	109	KRAZ	REGULATOR	1112 3702	EA	2	BA				URK	1 Sep 93	
3	110	KRAZ	SWITCH	VK318T 3704000	EA	1	BA				URK	1 Sep 93	
3	111	KRAZ	ELECTRO BRUSHES	2501 370805	EA	26	BA				URK	1 Sep 93	
3	112	KRAZ	SWITCH	P305 3709000	EA	1 5	BA				URK	1 Sep 93	
3	113	KRAZ	SWITCH	P39 371000-T	EA	1 5	BA				URK	1 Sep 93	
3	114	KRAZ	STARTER	45 7375 1471	EA	2 5	BA				URK	1 Sep 93	
3	115	KRAZ	RELAY	RC103 3708000	EA	1	BA				URK	1 Sep 93	
3	116	KRAZ	LAMPS	A 24 60-40	EA	40	BA				URK	1 Sep 93	
3	117	KRAZ	FILTERS	FG122 3711200-V	EA	3	BA				URK	1 Sep 93	
3	118	KRAZ	LAMPS	A24 324	EA	40	BA				URK	1 Sep 93	
3	119	KRAZ	LAMPS	A 24 2	EA	40	BA				URK	1 Sep 93	
3	120	KRAZ	LAMPS	A 24 5	EA	40	BA				URK	1 Sep 93	
3	121	KRAZ	LAMPS	A 24 21 2	EA	40	BA				URK	1 Sep 93	
3	122	KRAZ	SPEEDOMETER	CP135 3802010	EA	1	BA				URK	1 Sep 93	
3	123	KRAZ	RELAY	RC401 3726010	EA	1	BA				URK	1 Sep 93	
3	124	KRAZ	RECIEVER	YK143 3807010-G4	EA	0 4	BA				URK	1 Sep 93	
3	125	KRAZ	SENSOR	BM146-3806600D	EA	0 4	BA				URK	1 Sep 93	
3	126	KRAZ	AMP METER	AP110-3811010	EA	0 8	BA				URK	1 Sep 93	
3	127	KRAZ	PRESSURE GAUGE	MD103-3816010	EA	0 4	BA				URK	1 Sep 93	
3	128	KRAZ	SENSOR	TM100-3808000-G	EA	1	BA				URK	1 Sep 93	
3	129	KRAZ	MIRRORS	256-8201012	EA	3	BA				URK	1 Sep 93	
3	130	KRAZ	EQUALIZER	220V 8702010A	EA	0 2	BA				URK	1 Sep 93	
3	131	KRAZ	TOTAL COST US DOLLARS				BA		$11 000		URK	1 Sep 93	

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MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	50	EXPLOSIVES	AN BLASTING PRILL		TONNE	1 600	BA	$190 00	$304 000		SWD	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	53	EXPLOSIVES	ENULSION		KG	200 000	BA	$0 66	$132 000		SWD	1 Sep 93	
1	1	DUMPCAR	SIDE PANELS	634 01 000-0 cb	EA	8	BA				POL	1 Sep 93	
1	2	DUMPCAR	FRONT PANEL	634 04 000 3	EA	8	BA				POL	1 Sep 93	
1	3	DUMPCAR	PANEL LOCKS LEFT	634-01 010-2	EA	8	BA				POL	1 Sep 93	
1	4	DUMPCAR	PANEL LOCKS RIGHT	634 01 020 2	EA	8	BA				POL	1 Sep 93	
1	5	DUMPCAR	PANEL SUPPORTS	634 01 150 cb	EA	4	BA				POL	1 Sep 93	
1	6	DUMPCAR	SINGLE ACTION CYLINDER	640-45 010 cb	EA	6 4	BA				POL	1 Sep 93	
1	7	DUMPCAR	PISTON COLLARS	45 129	EA	200	BA				POL	1 Sep 93	
1	8	DUMPCAR	DOUBLE ACTION CYL	640 45 010 1	EA	8	BA				POL	1 Sep 93	
1	9	DUMPCAR	DOUBLE ACTION PISTON	640 45 105 2	EA	4	BA				POL	1 Sep 93	
1	10	DUMPCAR	DISTRIBUTION VALVES	372 000 1 9	EA	20	BA				POL	1 Sep 93	
1	11	DUMPCAR	ROD EQUALIZER	522 00-003 0	EA	2	BA				POL	1 Sep 93	
1	12	DUMPCAR	BOGGEY CONNECTOR	522 00 010 1	EA	2	BA				POL	1 Sep 93	
1	13	DUMPCAR	SQ AXLE CAP ENDS	74 10 116	EA	4	BA				POL	1 Sep 93	
1	14	DUMPCAR	OUTSIDE SPRING	522 38 001 0	EA	16	BA				POL	1 Sep 93	
1	15	DUMPCAR	INSIDE SPRING	522 38 002 0	EA	16	BA				POL	1 Sep 93	
1	16	DUMPCAR	SET SH ABSORBERS	522 38 016 0	EA	4	BA				POL	1 Sep 93	
1	17	DUMPCAR	FRAME	4686 6061 40 016	EA	20	BA				POL	1 Sep 93	
1	18	DUMPCAR	SMALL BRAKE LOCKS	46 03 015	EA	20	BA				POL	1 Sep 93	
1	19	DUMPCAR	PUSH RDS BRAKE PDS	61 40 133	EA	8	BA				POL	1 Sep 93	
1	20	DUMPCAR	FRAME ENDS RIGHT	61 40 110	EA	3 2	BA				POL	1 Sep 93	
1	21	DUMPCAR	FRAME ENDS LEFT	61 40 120	EA	3 2	BA				POL	1 Sep 93	
1	22	DUMPCAR	BRK PADS COMP POLY	TY 38-114 79 72	EA	600	BA				POL	1 Sep 93	
1	23	DUMPCAR	WHEEL PAIRS	61 10 046	EA	4	BA				POL	1 Sep 93	
1	24	DUMPCAR	WHEEL PACKING COVER	TY 519 07	EA	4	BA				POL	1 Sep 93	
1	25	DUMPCAR	BOGGEY CONNECTORS	522 00-020 1	EA	2	BA				POL	1 Sep 93	
1	26	DUMPCAR	DISTRIBUTOR VALVE		EA	16	BA				POL	1 Sep 93	
1	27	DUMPCAR	AUTOMATIC COUPLING		EA	12	BA				POL	1 Sep 93	
1	28	DUMPCAR	AUTO COUPLING HEAD	106 00 00	EA	4	BA				POL	1 Sep 93	
1	29	DUMPCAR	COUPLING LOCK	106 01 002	EA	8	BA				POL	1 Sep 93	
1	30	DUMPCAR	LOCK HOLDER	106 01 003 0	EA	4	BA				POL	1 Sep 93	
1	31	DUMPCAR	COUPLING TRIPPER	106 01 006-0	EA	8	BA				POL	1 Sep 93	
1	32	DUMPCAR	COUPLING HINGE PINS	106 00-012 0	EA	12	BA				POL	1 Sep 93	
1	33	DUMPCAR	COUPLING SHOCK ABS	106-00-001	EA	8	BA				POL	1 Sep 93	
1	34	DUMPCAR	COUPLING SHOCK SLIDE	106 02 00-2	EA	4	BA				POL	1 Sep 93	
1	35	DUMPCAR	COUPLING SH AB LK	106 00-002 2	EA	16	BA				POL	1 Sep 93	
1	36	DUMPCAR	DOOR ACTLATOR ARMS	634 46-010	EA	16	BA				POL	1 Sep 93	
1	37	DUMPCAR	DOOR ACTUATOR ARMS	634 46-020-2	EA	16	BA				POL	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	38	DUMPCAR	DOOR ACTUATOR ARMS	634 46-030	EA	8	BA				POL	1 Sep 93	
1	39	DUMPCAR	END VALVE		EA	20	BA				POL	1 Sep 93	
1	40	DUMPCAR	AIR SPEED REDUCERS		EA	16	BA				POL	1 Sep 93	
1	41	DUMPCAR	RING PACKING	38-72	EA	40	BA				POL	1 Sep 93	
1	42	DUMPCAR	AIR DISTRIBUTOR	482 000	EA	0	BA				POL	1 Sep 93	
1	43	DUMPCAR	PISTON COLLAR	270 397	EA	4	BA				POL	1 Sep 93	
1	44	DUMPCAR	PISTON SPRING	270 397	EA	8	BA				POL	1 Sep 93	
1	45	DUMPCAR	HOUSING ACC AIR	DR 483 00	EA	12	BA				POL	1 Sep 93	
1	46	DUMPCAR	BRAKE CYL PARTS	VR 483 000	EA	12	BA				POL	1 Sep 93	
1	47	DUMPCAR	PIPES	VR 483 000	EA	12	BA				POL	1 Sep 93	
1	48	DUMPCAR	REGULATOR ARM	522 10 050-1	EA	12	BA				POL	1 Sep 93	
1	49	DUMPCAR	CAR CONNECTOR HOSE		EA	60	BA				POL	1 Sep 93	
1	50	DUMPCAR	TOTAL COST US DOLLARS				BA		$200 000		POL	1 Sep 93	
1	1	COAL LOAD	PUMP STATION	CMJ V3A00 OCY 2	EA	1	BA				CIS	1 Sep 93	
1	2	COAL LOAD	PULLEY HOIST	3460 03 03600/3430 11 2	EA	4	BA				CIS	1 Sep 93	
1	3	COAL LOAD	PULLEY IDLER	3460 03 03600/3430 11 0	EA	20	BA				CIS	1 Sep 93	
1	4	COAL LOAD	BELTS		EA	20	BA				CIS	1 Sep 93	
1	5	COAL LOAD	FRONT PLATE	3460 00 005 02	EA	1	BA				CIS	1 Sep 93	
1	6	COAL LOAD	VIBRATOR SCREEN	7204 001	EA	2	BA				CIS	1 Sep 93	
1	7	COAL LOAD	SCREEN SPRINGS	1R0 72	EA	6	BA				CIS	1 Sep 93	
1	8	COAL LOAD	REDUCTION GEAR BOX	MY25 AM 01 03 160	EA	1	BA				CIS	1 Sep 93	
1	9	COAL LOAD	ROLLARS	200001 01 00 04	EA	1000	BA				CIS	1 Sep 93	
1	10	COAL LOAD	ROLLARS	200022 01 00 04	EA	1000	BA				CIS	1 Sep 93	
1	11	COAL LOAD	ROLLARS	1E4 952 306	EA	100	BA				CIS	1 Sep 93	
1	12	COAL LOAD	ROLLARS	1E4 992 11CB	EA	60	BA				CIS	1 Sep 93	
1	13	COAL LOAD	ROLLARS	1E4 954 3CB	EA	30	BA				CIS	1 Sep 93	
1	14	COAL LOAD	REDUCTION GEAR BOX	KS1 300	EA	1	BA				CIS	1 Sep 93	
1	15	COAL LOAD	CONVEYOR BELTS	B-1000	M	400	BA				CIS	1 Sep 93	
1	16	COAL LOAD	CONVEYOR BELTS	B 1400	M	300	BA				CIS	1 Sep 93	
1	17	COAL LOAD	CONVEYOR BELTS	B-1200	M	400	BA				CIS	1 Sep 93	
1	18	COAL LOAD	CONVEYOR DR MOTORS	4A3556Y3 160	EA	1	BA				CIS	1 Sep 93	
1	19	COAL LOAD	CONVEYOR DR MOTORS	4AM200M6Y3 22	EA	2	BA				CIS	1 Sep 93	
1	20	COAL LOAD	CONVEYOR DR MOTORS	AO102 12 6-6-4 24/37	EA	1	BA				CIS	1 Sep 93	
1	21	COAL LOAD	CONVEYOR DR MOTORS	AO102 12 B-3 4 24/35	EA	1	BA				CIS	1 Sep 93	
1	22	COAL LOAD	CRUSHER SPRING	5460 00 004 60	EA	4	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	23	COAL LOAD	CRUSHER COLLAR	8752 79	EA	4	BA				CIS	1 Sep 93	
1	24	COAL LOAD	CRUSHER COLLAR	8752 79	EA	4	BA				CIS	1 Sep 93	
1	25	COAL LOAD	CRUSHER SHIM	3450-01 011	EA	2	BA				CIS	1 Sep 93	
1	26	COAL LOAD	CRUSHER BEARING	GOST 5721 75	EA	2	BA				CIS	1 Sep 93	
1	27	COAL LOAD	TOTAL COST US DOLLARS				BA		$315 000		CIS	1 Sep 93	
1	1	DRILL PARTS	TRACK PADS	31 001 008 34	SET	30	BA				CIS	1 Sep 93	
1	2	DRILL PARTS	TRACK RAILS	31 001 008 000	EA	1	BA				CIS	1 Sep 93	
1	3	DRILL PARTS	LEVELING JACKS	B59 14 240	EA	3 5	BA				CIS	1 Sep 93	
1	4	DRILL PARTS	SPROCKET	31C 152 012 06	EA	2	BA				CIS	1 Sep 93	
1	5	DRILL PARTS	SPROCKET	B59 14 052	EA	2	BA				CIS	1 Sep 93	
1	6	DRILL PARTS	SHOCK ABSORBER	B122 22 11 015	EA	5	BA				CIS	1 Sep 93	
1	7	DRILL PARTS	SHOCK ABSORBER	B122 22 00 155	EA	3	BA				CIS	1 Sep 93	
1	8	DRILL PARTS	COMPRESSOR SUPP	B122 0017 000	EA	0 5	BA				CIS	1 Sep 93	
1	9	DRILL PARTS	CARTRIDGE	10 10 080	EA	2	BA				CIS	1 Sep 93	
1	10	DRILL PARTS	DRILL STEEL	722 22 11 00	EA	2	BA				CIS	1 Sep 93	
1	11	DRILL PARTS	BUSHING	31 001 008 037	EA	30	BA				CIS	1 Sep 93	
1	12	DRILL PARTS	BUSHING	31 001 008 102	EA	30	BA				CIS	1 Sep 93	
1	13	DRILL PARTS	HYD DISTRIBUTOR	R102 A4 A222 50	EA	5	BA				CIS	1 Sep 93	
1	14	DRILL PARTS	HYD PUMP	61 12 22	EA	3	BA				CIS	1 Sep 93	
1	15	DRILL PARTS	3 SPEED MOTOR		EA	2 5	BA				CIS	1 Sep 93	
1	16	DRILL PARTS	PULL DOWN CABLE	3X50+1X16	M	300	BA				CIS	1 Sep 93	
1	17	DRILL PARTS	HYD PUMP	N 403E TY2 653260 70	EA	2 5	BA				CIS	1 Sep 93	
1	18	DRILL PARTS	HYD PUMP	BG 12 22 MI TY2 05	EA	5	BA				CIS	1 Sep 93	
1	19	DRILL PARTS	TOTAL COST US DOLLARS				BA		$150 000		CIS	1 Sep 93	
1	37	ELEC EQUIP	SYNC MOTOR	CDE 2 15 34 642	EA	1	BA				CIS	1 Jan 94	
1	1	HEAT PLT	CHAIN	9 08 000	M	125	BA				CIS	1 Sep 93	
1	2	HEAT PLT	HOLDER	T9 05 002	EA	100	BA				CIS	1 Sep 93	
1	3	HEAT PLT	HOLDER	T9 05 001	EA	100	BA				CIS	1 Sep 93	
1	4	HEAT PLT	HOLDER	6 30 2	EA	500	BA				CIS	1 Sep 93	
1	5	HEAT PLT	ROLLER	6 30 25	EA	300	BA				CIS	1 Sep 93	
1	6	HEAT PLT	FRONT PACKING	T197 01 001	EA	5	BA				CIS	1 Sep 93	
1	7	HEAT PLT	MIDDLE PACKING	T197 01 002	EA	5	BA				CIS	1 Sep 93	
1	8	HEAT PLT	END LEFT PACKING	T82 01 001	EA	5	BA				CIS	1 Sep 93	
1	9	HEAT PLT	RIGHT PACKING	T82 01 002	EA	5	BA				CIS	1 Sep 93	
1	10	HEAT PLT	MIDDLE PACKING	T82 01 003	EA	5	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	13	HEAT PLT	CONNECTING LINK	T82 00 018	EA	300	BA				CIS	1 Sep 93	
1	14	HEAT PLT	SHAFT	6 30 9	EA	300	BA				CIS	1 Sep 93	
1	15	HEAT PLT	WASHER	T82 03 005	EA	0 1	BA				CIS	1 Sep 93	
1	16	HEAT PLT	WASHER	12 10906-66	EA	0 1	BA				CIS	1 Sep 93	
1	17	HEAT PLT	WASHER	16-10906-66	EA	0 1	BA				CIS	1 Sep 93	
1	18	HEAT PLT	WASHER	20-11371 66	EA	0 1	BA				CIS	1 Sep 93	
1	19	HEAT PLT	COTTER PIN	5X25 397 66	EA	0 1	BA				CIS	1 Sep 93	
1	20	HEAT PLT	COTTER PIN	5X28 397 66	EA	0 25	BA				CIS	1 Sep 93	
1	21	HEAT PLT	COTTER PIN	9X50 2319 70	EA	0 25	BA				CIS	1 Sep 93	
1	22	HEAT PLT	CHAIN	9X27 2319 70	M	100	BA				CIS	1 Sep 93	
1	23	HEAT PLT	FT SHFT W/ HALF COUP	T82 03 000	EA	0 5	BA				CIS	1 Sep 93	
1	24	HEAT PLT	END SHAFT	T82 07 000	EA	0 5	BA				CIS	1 Sep 93	
1	25	HEAT PLT	SOCKSHING PAN	DN 17	EA	1	BA				CIS	1 Sep 93	
1	26	HEAT PLT	STEAM BOILER PARTS	1 08 06	SET	100	BA				CIS	1 Sep 93	
1	27	HEAT PLT	STEAM BOILER PARTS	1 08 05	EA	600	BA				CIS	1 Sep 93	
1	28	HEAT PLT	STEAM BOILER PARTS	3P 800	EA	2	BA				CIS	1 Sep 93	
1	29	HEAT PLT	BOILER CONVEC SEC	KVTC 20-150	EA	1	BA				CIS	1 Sep 93	
1	30	HEAT PLT	TOTAL COST US DOLLARS				BA		$300 000		CIS	1 Sep 93	
1	1	RAIL MAT	RAIL TYPE P 50	7174 75	TONNE	450	BA				CIS	1 Sep 93	
1	2	RAIL MAT	RAIL TYPE P 65	7174 75	TONNE	300	BA				CIS	1 Sep 93	
1	3	RAIL MAT	BEDING PLATE P 50	12135 75	TONNE	36	BA				CIS	1 Sep 93	
1	4	RAIL MAT	BEDING PLATE P 65	12135 75	TONNE	36	BA				CIS	1 Sep 93	
1	5	RAIL MAT	CONN PLATE P 50	4133 54	TONNE	36	BA				CIS	1 Sep 93	
1	6	RAIL MAT	CONN PLATE P 65	4133 54	TONNE	36	BA				CIS	1 Sep 93	
1	7	RAIL MAT	RR SPAKE P 50		TONNE	36	BA				CIS	1 Sep 93	
1	8	RAIL MAT	RAIL PLANGE P 50	2953 51	TONNE	9	BA				CIS	1 Sep 93	
1	9	RAIL MAT	RAIL PLANGE P 65	2953 51	TONNE	9	BA				CIS	1 Sep 93	
1	10	RAIL MAT	BOLTS&NUTS P 50	11530-76	TONNE	9	BA				CIS	1 Sep 93	
1	11	RAIL MAT	BOLTS & NUTS P 65	11530-76	TONNE	4 5	BA				CIS	1 Sep 93	
1	12	RAIL MAT	LOCK WASHER P 50	19115 73	TONNE	3 6	BA				CIS	1 Sep 93	
1	13	RAIL MAT	TRACK SWITCH P50-RT		SET	3	BA				CIS	1 Sep 93	
1	14	RAIL MAT	TRACK SWITCH P65 LEFT		SET	3	BA				CIS	1 Sep 93	
1	15	RAIL MAT	Y RAIL P50-DIRECT LEFT		EA	1 5	BA				CIS	1 Sep 93	
1	16	RAIL MAT	Y RAIL P50-DIRECT RIGHT		EA	1 5	BA				CIS	1 Sep 93	
1	17	RAIL MAT	YRAIL P50 BENDED RIGHT		EA	1 5	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	18	RAIL MAT	RAIL INSOLATOR P50		SET	180	BA				CIS	1 Sep 93	
1	19	RAIL MAT	RAIL INSOLATOR P65		SET	165	BA				CIS	1 Sep 93	
1	20	RAIL MAT	CRESOTA SLEEPER		TONNE	3	BA				CIS	1 Sep 93	
1	21	RAIL MAT	TOTAL COST US DOLLARS				BA		$105 000		CIS	1 Sep 93	
1	1	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	BA				CIS	1 Sep 93	
1	1	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	BA				CIS	1 Jan 94	
1	2	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	BA				CIS	1 Sep 93	
1	2	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	BA				CIS	1 Jan 94	
1	3	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	BA				CIS	1 Sep 93	
1	3	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	BA				CIS	1 Jan 94	
1	4	RR COMM	SIGNAL CABLE	GOST6436 75	KM	2	BA				CIS	1 Sep 93	
1	4	RR COMM	SIGNAL CABLE	GOST6436 75	KM	2	BA				CIS	1 Jan 94	
1	5	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	BA				CIS	1 Sep 93	
1	5	RR COMM	SIGNAL CABLE	GOST6436 75	KM	2	BA				CIS	1 Jan 94	
1	6	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	BA				CIS	1 Sep 93	
1	6	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	BA				CIS	1 Jan 94	
1	7	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1 5	BA				CIS	1 Sep 93	
1	7	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1 5	BA				CIS	1 Jan 94	
1	8	RR COMM	ROAD TRANSFORMER	NFT A	EA	15	BA				CIS	1 Sep 93	
1	8	RR COMM	ROAD TRANSFORMER	NFT A	EA	15	BA				CIS	1 Jan 94	
1	9	RR COMM	ROAD TRANSPORMER	NOVC 5A	EA	15	BA				CIS	1 Sep 93	
1	9	RR COMM	ROAD TRANSPORMER	NOVC 5A	EA	15	BA				CIS	1 Jan 94	
1	10	RR COMM	SIGNAL TRANSFORMER	ST 6	EA	25	BA				CIS	1 Sep 93	
1	10	RR COMM	SIGNAL TRANSFORMER	ST 6	EA	25	BA				CIS	1 Jan 94	
1	11	RR COMM	SWITCH RELAY	2162 00 V	EA	25	BA				CIS	1 Sep 93	
1	11	RR COMM	SWITCH RELAY	2162 00 V	EA	25	BA				CIS	1 Jan 94	
1	12	RR COMM	RECTIFIER	86-00 00V	EA	25	BA				CIS	1 Sep 93	
1	12	RR COMM	RECTIFIER	86-00-00V	EA	25	BA				CIS	1 Jan 94	
1	13	RR COMM	RESISTOR	7165	EA	25	BA				CIS	1 Sep 93	
1	13	RR COMM	RESISTOR	7165	EA	25	BA				CIS	1 Jan 94	
1	14	RR COMM	SWITCHING GEAR BOX		EA	5	BA				CIS	1-Sep 93	
1	14	RR COMM	SWITCHING GEAR BOX		EA	5	BA				CIS	1 Jan 94	
1	15	RR COMM	LAMPS FOR LINZ		EA	250	BA				CIS	1 Sep 93	
1	15	RR COMM	LAMPS FOR LINZ		EA	250	BA				CIS	1 Jan 94	
1	16	RR COMM	FRAMEWORK	19402 00-00	EA	5	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	16	RR COMM	FRAMEWORK	19402 00-00	EA	5	BA				CIS	1 Jan 94	
1	17	RR COMM	BONDING WIRE	21 00-00	EA	25	BA				CIS	1 Sep 93	
1	17	RR COMM	BONDING WIRE	21 00-00	EA	25	BA				CIS	1 Jan 94	
1	18	RR COMM	CONTROL WIRE		EA	50	BA				CIS	1 Sep 93	
1	18	RR COMM	CONTROL WIRE		EA	50	BA				CIS	1 Jan 94	
1	19	RR COMM	LAMPS FOR TERM BD		EA	500	BA				CIS	1 Sep 93	
1	19	RR COMM	LAMPS FOR TERM BD		EA	500	BA				CIS	1 Jan 94	
1	20	RR COMM	SWITCHING RELAY SET	144690000A	EA	5	BA				CIS	1 Sep 93	
1	20	RR COMM	SWITCHING RELAY SET	144690000A	EA	5	BA				CIS	1 Jan 94	
1	21	RR COMM	INST FOR ELEC MEAS		EA	5	BA				CIS	1 Sep 93	
1	21	RR COMM	INST FOR ELEC MEAS		EA	5	BA				CIS	1 Jan 94	
1	22	RR COMM	RR LINZ LTS RED	26116-00-00	EA	25	BA				CIS	1 Sep 93	
1	22	RR COMM	RR LINZ LTS RED	26116-00-00	EA	25	BA				CIS	1 Jan 94	
1	23	RR COMM	RR LINZ LTS GREEN	26116-00-00	EA	25	BA				CIS	1 Sep 93	
1	23	RR COMM	RR LINZ LTS GREEN	26116 00-00	EA	25	BA				CIS	1 Jan 94	
1	24	RR COMM	RR LINZ LTS WHITE	26116-00-00	EA	20	BA				CIS	1 Sep 93	
1	24	RR COMM	RR LINZ LTS WHITE	26116-00-00	EA	20	BA				CIS	1 Jan 94	
1	25	RR COMM	ELECTROMOTOR		EA	10	BA				CIS	1 Sep 93	
1	25	RR COMM	ELECTROMOTOR		EA	10	BA				CIS	1 Jan 94	
1	26	RR COMM	SWITCHING ARM		EA	15	BA				CIS	1 Sep 93	
1	26	RR COMM	SWITCHING ARM		EA	15	BA				CIS	1 Jan 94	
1	27	RR COMM	TOTAL COST US DOLLARS				BA		$4 000		CIS	1 Sep 93	
1	27	RR COMM	TOTAL COST US DOLLARS				BA		$4 000		CIS	1 Jan 94	
2	1	ELE MOTOR	20/90 DRAGLINE	AO2 72 4Y2 30 KVT	EA	2	BA				CIS	1 Jan 94	
2	2	ELE MOTOR	20/90 DRAGLINE	AO2 72 4Y2 22 KVT	EA	2	BA				CIS	1 Jan 94	
2	3	ELE MOTOR	20/90 DRAGLINE	MPE 1000-630 YXLE	EA	2	BA				CIS	1 Jan 94	
2	4	ELE MOTOR	20/90 DRAGLINE	HOISE GENERATOR	EA	5	BA				CIS	1 Jan 94	
2	5	ELE MOTOR	10/70 13/50 DRAGLINE	GENERATOR	EA	3	BA				CIS	1 Jan 94	
2	6	ELE MOTOR	10/70-13/50 DRAGLINE	SYNC MOTOR	EA	10	BA				CIS	1 Sep 93	
2	7	ELE MOTOR	10/70-13/50 DRAGLINE	EXCITER MOTOR	EA	8	BA				CIS	1 Jan 94	
2	8	ELE MOTOR	10/70-13/50 DRAGLINE	EXCITER MOTOR	EA	4	BA				CIS	1 Jan 94	
2	9	ELE MOTOR	10/70-13/50 DRAGLINE	GENERATOR	EA	2	BA				CIS	1 Jan 94	
2	15	ELE MOTOR	MISC ELEC MOTORS	BAO 61 4 13KVT	EA	1	BA				CIS	1 Jan 94	
2	16	ELE MOTOR	MISC ELEC MOTORS	BAO 62 4 17KVT	EA	1	BA				CIS	1 Jan 94	
2	17	ELE MOTOR	MISC ELEC MOTORS	BAO 71 4 22KVT	EA	1	BA				CIS	1 Jan 94	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	18	ELE MOTOR	MISC ELEC MOTORS	BAO 72 4 30KVT	EA	1	BA				CIS	1 Jan 94	
2	19	ELE MOTOR	MISC ELEC MOTORS	BAO 82 4 55KVT	EA	1	BA				CIS	1 Jan 94	
2	20	ELE MOTOR	MISC ELEC MOTORS	BAO 180M4 30KVT	EA	2	BA				CIS	1 Jan 94	
2	21	ELE MOTOR	MISC ELEC MOTORS	BAO 62 6 13KVT	EA	1	BA				CIS	1 Jan 94	
2	22	ELE MOTOR	MISC ELEC MOTORS	BAO 72 6 22KVT	EA	2	BA				CIS	1 Jan 94	
2	31	ELE MOTOR	ELEC MOTORS	MTKE 4AC18054	EA	1	BA				CIS	1 Jan 94	
2	32	ELE MOTOR	ELEC MOTORS	MTKE 4A10024YE	EA	1	BA				CIS	1 Jan 94	
2	33	ELE MOTOR	ELEC MOTORS	MTKE 4A71A2YE	EA	1	BA				CIS	1 Jan 94	
2	38	ELEC EQUIP	SINGLE SHAFT EL MO	DE 816Y2	EA	2	BA				CIS	1 Jan 94	
2	39	ELEC EQUIP	HORIZ MOTOR	DEB 12	EA	2	BA				CIS	1 Jan 94	
2	44	ELEC EQUIP	GEN 30KW 115V 261 A	MIXED BOOSTER	EA	2	BA				CIS	1 Sep 93	
2	1	YM2 PARTS	CYLINDER	240H 1004008 D	EA	132	BA				CIS	1 Sep 93	
2	2	YM2 PARTS	CRANK SHAFT	240 1000107 B6	EA	4	BA				CIS	1 Sep 93	
2	3	YM2 PARTS	RINGS	236 1000106 B4	EA	132	BA				CIS	1 Sep 93	
2	4	YM2 PARTS	PACKING	240 1000104 B2	EA	10	BA				CIS	1 Sep 93	
2	5	YM2 PARTS	PACKING	240-1000104 P2	EA	5	BA				CIS	1 Sep 93	
2	6	YM2 PARTS	PACKING	240 1000104 P1	EA	5	BA				CIS	1 Sep 93	
2	7	YM2 PARTS	SEAL	240-1003213 A3	EA	100	BA				CIS	1 Sep 93	
2	8	YM2 PARTS	PUMP	240 1011014	EA	3	BA				CIS	1 Sep 93	
2	9	YM2 PARTS	ELEMENT	240 1017038	EA	500	BA				CIS	1 Sep 93	
2	10	YM2 PARTS	ELEMENT	238H 1109080	EA	50	BA				CIS	1 Sep 93	
2	11	YM2 PARTS	TURBOCOMPRESSOR	240H 1118010 B	EA	4	BA				CIS	1 Sep 93	
2	12	YM2 PARTS	TURBOCOMPRESSOR	240H 1118011B	EA	4	BA				CIS	1 Sep 93	
2	13	YM2 PARTS	BLOCK CYLINDER	240H 1002012H	EA	1	BA				CIS	1 Sep 93	
2	14	YM2 PARTS	PUMP	9016111008-02	EA	1	BA				CIS	1 Sep 93	
2	15	YM2 PARTS	SPRAY INJECTOR	26161112110	EA	60	BA				CIS	1 Sep 93	
2	16	YM2 PARTS	RING	236-1002024A	EA	100	BA				CIS	1 Sep 93	
2	17	YM2 PARTS	RING	236-1002040	EA	50	BA				CIS	1 Sep 93	
2	18	YM2 PARTS	ELEMENT FILTER	240T 1017040 A3	EA	100	BA				CIS	1 Sep 93	
2	19	YM2 PARTS	ELEMENT	201T 1105540	EA	100	BA				CIS	1 Sep 93	
2	20	YM2 PARTS	RINGS	236-1004002 A3	EA	48	BA				CIS	1 Sep 93	
2	21	YM2 PARTS	PACKING SEALS	240-1008098	EA	5	BA				CIS	1 Sep 93	
2	22	YM2 PARTS	PACKING SEALS	240T 1009040 A2	EA	5	BA				CIS	1 Sep 93	
2	23	YM2 PARTS	FUEL PUMP	1111008 20	EA	1	BA				CIS	1 Sep 93	
2	24	YM2 PARTS	ELEMENT	201 1117038 A2	EA	250	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	25	YM2 PARTS	PUMP	240-1307010-A	EA	2 5	BA				CIS	1 Sep 93	
2	26	YM2 PARTS	GENERATOR	45 7371 0209	EA	1 5	BA				CIS	1 Sep-93	
2	27	YM2 PARTS	STARTER	45 7375 1471	EA	1 5	BA				CIS	1 Sep 93	
2	28	YM2 PARTS	TOTAL COST US DOLLARS				BA		$12 500		CIS	1 Sep 93	
3	1	T130 DOZER	PACKING	2301103160 CBN 1	EA	3	BA				CIS	1 Sep 93	
3	2	T130 DOZER	THIMBLE ?	01466-2	EA	10	BA				CIS	1 Sep 93	
3	3	T130 DOZER	RINGS	51 03-115 CP	EA	10	BA				CIS	1 Sep 93	
3	4	T130 DOZER	CRANKSHAFT	16 03 126 CP	EA	0 6	BA				CIS	1 Sep 93	
3	5	T130 DOZER	CYLINDER	51 03 23	EA	10	BA				CIS	1 Sep 93	
3	6	T130 DOZER	HYDRALIC SEAL	700-40-2889	EA	4 8	BA				CIS	1 Sep 93	
3	7	T130 DOZER	FILTER	F A41 20 000 01 CP	EA	10	BA				CIS	1 Sep 93	
3	8	T130 DOZER	FILTER	A41 10 000 02 CP	EA	10	BA				CIS	1 Sep 93	
3	9	T130 DOZER	RING	40843	EA	10	BA				CIS	1 Sep 93	
3	10	T130 DOZER	PACKING	40269	EA	3	BA				CIS	1 Sep 93	
3	11	T130 DOZER	GEAR PINION	74116	EA	0 3	BA				CIS	1 Sep 93	
3	12	T130 DOZER	REDUCTION GEAR	17 76 8 CP	EA	0 1	BA				CIS	1 Sep 93	
3	13	T130 DOZER	FUEL INJECTORS	17 69 107 1 CP	EA	10	BA				CIS	1 Sep 93	
3	14	T130 DOZER	SPRAYER	14 69 117 1 CP	EA	10	BA				CIS	1 Sep 93	
3	15	T130 DOZER	PUMP	51 67 11 CP	EA	0 3	BA				CIS	1 Sep 93	
3	16	T130 DOZER	COMPRESSOR PIPING	92 000 06	EA	1	BA				CIS	1 Sep 93	
3	17	T130 DOZER	AIR INLET	N036 85 770	EA	0 9	BA				CIS	1 Sep 93	
3	18	T130 DOZER	WATER PUMP	16-8 140 CP	EA	1	BA				CIS	1 Sep 93	
3	19	T130 DOZER	OIL PUMP	29 09 124 CP	EA	1	BA				CIS	1 Sep 93	
3	20	T130 DOZER	HYDRALIC PUMP	NS 100A 3 P	EA	0 6	BA				CIS	1 Sep 93	
3	21	T130 DOZER	PUMP	NS 32 Y WP	EA	0 2	BA				CIS	1 Sep 93	
3	22	T130 DOZER	GEAR BOX	24 12 1 CP	EA	0 2	BA				CIS	1 Sep 93	
3	23	T130 DOZER	FILTER	A23 30 000 01	EA	5	BA				CIS	1 Sep 93	
3	24	T130 DOZER	PACKING SEALS	700-40-2049	EA	3	BA				CIS	1 Sep 93	
3	25	T130 DOZER	CARBURATOR	113-1107011	EA	1 2	BA				CIS	1 Sep 93	
3	26	T130 DOZER	SUPPORT BRACKET	51 07 102 CP	EA	0 4	BA				CIS	1 Sep 93	
3	27	T130 DOZER	ENGINE HEAD	07146-1 CP	EA	0 6	BA				CIS	1 Sep 93	
3	28	T130 DOZER	FUEL SYS CENTRIFUGE	95000	EA	0 5	BA				CIS	1 Sep 93	
3	29	T130 DOZER	FAN BLADES	51 08-113 CP	EA	0 4	BA				CIS	1 Sep 93	
3	30	T130 DOZER	RADIATOR	130Y 13 010-1	EA	1	BA				CIS	1 Sep 93	
3	31	T130 DOZER	BRAKE DISC	738-4 CP	EA	1 5	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST#	TOTAL COST#	SEA/RR TOTAL #	SOURCE CNTRY	NEED DATE	COMMENTS
3	32	T130 DOZER	MAGNET SOLENOID	M149 A3	EA	1 4	BA				CIS	1 Sep 93	
3	33	T130 DOZER	STARTER	ST 230M	EA	1 4	BA				CIS	1 Sep 93	
3	34	T130 DOZER	GENERATOR	70 3701	EA	0 5	BA				CIS	1 Sep 93	
3	35	T130 DOZER	RELAY STARTER	RR 036281	EA	1 5	BA				CIS	1 Sep 93	
3	36	T130 DOZER	DISTRIBUTOR	R 150-A3T001	EA	0 3	BA				CIS	1 Sep 93	
3	37	T130 DOZER	DRIVE SHAFT	50 14 113	EA	0 2	BA				CIS	1 Sep 93	
3	38	T130 DOZER	CYLINDER POWER	18 26-270 CP	EA	0 5	BA				CIS	1 Sep 93	
3	39	T130 DOZER	CYLINDER	DP 26-C 06-140	EA	0 2	BA				CIS	1 Sep 93	
3	40	T130 DOZER	ELEMENT FILTER	EF 01 00 CP	EA	14	BA				CIS	1 Sep 93	
3	41	T130 DOZER	PUMP BRAKE	14 71 3 CP	EA	0 3	BA				CIS	1 Sep 93	
3	42	T130 DOZER	MECH	17 74 8 CP	EA	0 2	BA				CIS	1 Sep 93	
3	43	T130 DOZER	SUPPORT	17 74 284	EA	0 4	BA				CIS	1 Sep 93	
3	44	T130 DOZER	SHAFT	16-74 10 CP	EA	0 3	BA				CIS	1 Sep 93	
3	45	T130 DOZER	GEAR	17 01 22	EA	0 3	BA				CIS	1 Sep 93	
3	46	T130 DOZER	FRICTION CLUTCH PADS	24 16 101 CP	EA	0 6	BA				CIS	1 Sep 93	
3	47	T130 DOZER	SERVICE MECH	21 17 4 CP	EA	0 5	BA				CIS	1 Sep 93	
3	48	T130 DOZER	FAN BELT	18360 01 CP	EA	1 2	BA				CIS	1 Sep 93	
3	49	T130 DOZER	PULLEY WHEEL	24 21 146 CP	EA	0 4	BA				CIS	1 Sep 93	
3	50	T130 DOZER	DRIVE PULLEY	24 21 169 CP	EA	1 6	BA				CIS	1 Sep 93	
3	51	T130 DOZER	DOUBLE PULLEY	24 21 170 CP	EA	1 6	BA				CIS	1 Sep 93	
3	52	T130 DOZER	FILTER	A 410000-2	EA	1	BA				CIS	1 Sep 93	
3	53	T130 DOZER	IDLER PULLEY	24 21 171 CP	EA	1 6	BA				CIS	1 Sep 93	
3	54	T130 DOZER	FILTER	A 410000-A CP	EA	6	BA				CIS	1 Sep 93	
3	55	T130 DOZER	MIDDLE CUTTING EDGE	D3 110AXP 02 001 0	EA	0 3	BA				CIS	1 Sep 93	
3	56	T130 DOZER	END CUTTING EDGE RT	D661 02001 02	EA	0 3	BA				CIS	1 Sep 93	
3	57	T130 DOZER	END CUTTING EDGE LEFT	D661 02 002 02	EA	0 3	BA				CIS	1 Sep 93	
3	58	T130 DOZER	TRACK ASSEMBLY	24 22 1	SET	0 3	BA				CIS	1 Sep 93	
3	59	T130 DOZER	DEFLECTOR RK GUARD	2204	EA	20	BA				CIS	1 Sep 93	
3	60	T130 DOZER	DEFLECTOR RK GUARD	2205	EA	20	BA				CIS	1 Sep 93	
3	61	T130 DOZER	PACKING TRACKS ADJ	40201	EA	8	BA				CIS	1 Sep 93	
3	62	T130 DOZER	RING	40210	EA	2	BA				CIS	1 Sep 93	
3	63	T130 DOZER	CYLINDER PACKING	40944 CP	EA	5	BA				CIS	1 Sep 93	
3	64	T130 DOZER	CYLINDER	14 02 101 CP	EA	5	BA				CIS	1 Sep 93	
3	65	T130 DOZER	HEAD CYLINDER	16-02 106 CP	EA	2	BA				CIS	1 Sep 93	
3	66	T130 DOZER	VALVE	14 02 32	EA	1	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	67	T130 DOZER	VALVE	14 02 33 V	EA	1	BA				CIS	1 Sep 93	
3	68	T130 DOZER	PIPE	10663-1	EA	1	BA				CIS	1 Sep 93	
3	69	T130 DOZER	PIPE	10664 1	EA	1	BA				CIS	1 Sep 93	
3	70	T130 DOZER	GEARBOX	50 12 12 CP	EA	0 2	BA				CIS	1 Sep 93	
3	71	T130 DOZER	COUPLING	18-14 133 CP	EA	0 3	BA				CIS	1 Sep 93	
3	72	T130 DOZER	DISC	18 14 135 CP	EA	0 4	BA				CIS	1 Sep 93	
3	73	T130 DOZER	COUPLING	18 14 78	EA	0 3	BA				CIS	1 Sep 93	
3	74	T130 DOZER	COLLAR	3 48X28 6	EA	0 4	BA				CIS	1 Sep 93	
3	75	T130 DOZER	RING	N1 35X28 2	EA	0 6	BA				CIS	1 Sep 93	
3	76	T130 DOZER	DISC	24 16-103 CP	EA	1	BA				CIS	1 Sep 93	
3	77	T130 DOZER	PUMP	51 67 10 CP	EA	0 2	BA				CIS	1 Sep 93	
3	78	T130 DOZER	PISTON PUMP	16 67 102 CP	EA	3 6	BA				CIS	1 Sep 93	
3	79	T130 DOZER	PUMP PISTON	16 67 108 CP	EA	3 6	BA				CIS	1 Sep 93	
3	80	T130 DOZER	DISC	738 4 CP	EA	1	BA				CIS	1 Sep 93	
3	81	T130 DOZER	COUPLING	72118 CP	EA	0 5	BA				CIS	1 Sep 93	
3	82	T130 DOZER	RING	111 30 123 00	EA	2	BA				CIS	1 Sep 93	
3	83	T130 DOZER	ROTOR	92 55	EA	0 2	BA				CIS	1 Sep 93	
3	84	T130 DOZER	RADIATOR	21 09 1	EA	0 2	BA				CIS	1 Sep 93	
3	85	T130 DOZER	PUMP	51 67 11 CP	EA	0 2	BA				CIS	1 Sep 93	
3	86	T130 DOZER	TOTAL COST US DOLLARS				BA		$18 000		CIS	1 Sep 93	
3	1	T250 DOZER	ENGINE	B 31M 748 01 4 cb	EA	2	BA				CIS	1 Sep 93	
3	2	T250 DOZER	HOUSING	748 05 120 CP	EA	20	BA				CIS	1 Sep 93	
3	3	T250 DOZER	HOUSING	748 05 271 CP	EA	20	BA				CIS	1 Sep 93	
3	4	T250 DOZER	REFLECTOR LIGHTS	748 07 182 CP	EA	1	BA				CIS	1 Sep 93	
3	5	T250 DOZER	REFLECTOR LIGHTS	748 07 212 CP	EA	1	BA				CIS	1 Sep 93	
3	6	T250 DOZER	REGULATOR	P5M	EA	10	BA				CIS	1 Sep 93	
3	7	T250 DOZER	LIGHT SET	FG 122B	EA	20	BA				CIS	1 Sep 93	
3	8	T250 DOZER	LAMP	A 24 75X60	EA	1000	BA				CIS	1 Sep 93	
3	9	T250 DOZER	PLANETARY MECH	748-16-141 cb	EA	1	BA				CIS	1 Sep 93	
3	10	T250 DOZER	RINGS	748 16-86	EA	4	BA				CIS	1 Sep 93	
3	11	T250 DOZER	RINGS	748 58 2059	EA	4	BA				CIS	1 Sep 93	
3	12	T250 DOZER	SHIMS	748-18-226-232	EA	160	BA				CIS	1 Sep 93	
3	13	T250 DOZER	CLIPS	3629	EA	10000	BA				CIS	1 Sep-93	
3	14	T250 DOZER	GEAR BOX	748 19	EA	2	BA				CIS	1 Sep 93	
3	15	T250 DOZER	SHIFTING FORK	748-19 1	EA	30	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	16	T250 DOZER	IDLER	748-21 112 CP	EA	48	BA				CIS	1 Sep 93	
3	17	T250 DOZER	IDLER	748-21 130 CP	EA	48	BA				CIS	1 Sep 93	
3	18	T250 DOZER	SETS TRACK	748 22 101 CP	SET	4	BA				CIS	1 Sep 93	
3	19	T250 DOZER	GROUSERS	748-22 132 CP	EA	20	BA				CIS	1 Sep 93	
3	20	T250 DOZER	TRACK BOLTS	700-28-232	EA	1000	BA				CIS	1 Sep 93	
3	21	T250 DOZER	TRACK BUSHINGS	748 22 3	EA	100	BA				CIS	1 Sep 93	
3	22	T250 DOZER	TRACK LINKS	748-22 1	EA	40	BA				CIS	1 Sep 93	
3	23	T250 DOZER	TRACK LINKS	748 22 2	EA	40	BA				CIS	1 Sep 93	
3	24	T250 DOZER	TRACK PINS	748 22 6	EA	100	BA				CIS	1 Sep 93	
3	25	T250 DOZER	CONE ?	748 22 71	EA	200	BA				CIS	1 Sep 93	
3	26	T250 DOZER	WASHERS	748 22 50	EA	1000	BA				CIS	1 Sep 93	
3	27	T250 DOZER	BLOWER	748 27 208 CP	EA	2	BA				CIS	1 Sep 93	
3	28	T250 DOZER	PACKING	748 31 11	EA	10	BA				CIS	1 Sep 93	
3	29	T250 DOZER	PACKING	748 31 138	EA	10	BA				CIS	1 Sep 93	
3	30	T250 DOZER	COUPLING	748 13-75	EA	2	BA				CIS	1 Sep 93	
3	31	T250 DOZER	AXLE	748 50-206	EA	2	BA				CIS	1 Sep 93	
3	32	T250 DOZER	COUPLING	748 50-171 CP	EA	2	BA				CIS	1 Sep 93	
3	33	T250 DOZER	DISC	748 50-302 CP	EA	4	BA				CIS	1 Sep 93	
3	34	T250 DOZER	DISC	748 50-152 CP	EA	4	BA				CIS	1 Sep 93	
3	35	T250 DOZER	PUMP	748 50-232 cb	EA	5	BA				CIS	1 Sep 93	
3	36	T250 DOZER	CONTACTOR	TKC 611D0D	EA	8	BA				CIS	1 Sep 93	
3	37	T250 DOZER	CONTROLLER	KB30G 748-82 371	EA	2	BA				CIS	1 Sep 93	
3	38	T250 DOZER	ELECT BRUSH	UG 2A 2/12 5X40X60	EA	300	BA				CIS	1 Sep 93	
3	39	T250 DOZER	ELECT BRUSH	UG 2A /16X32X40/	EA	500	BA				CIS	1 Sep 93	
3	40	T250 DOZER	INITIATOR	DK 913A	EA	2	BA				CIS	1 Sep 93	
3	41	T250 DOZER	HYDRO PUMP	748-99 230 cb	EA	2	BA				CIS	1 Sep 93	
3	42	T250 DOZER	WASHER	748-99 993	EA	20	BA				CIS	1 Sep 93	
3	43	T250 DOZER	RINGS	748 99 446	EA	20	BA				CIS	1 Sep 93	
3	44	T250 DOZER	DISTRIBUTOR	748 99 465 cb	EA	2	BA				CIS	1 Sep 93	
3	45	T250 DOZER	POWER CYLINDER	748 99 10 cb	EA	6	BA				CIS	1 Sep 93	
3	46	T250 DOZER	SHOCK ABSORBER	402 50-7	EA	24	BA				CIS	1 Sep 93	
3	47	T250 DOZER	PACKING	3303 08 1	EA	4	BA				CIS	1 Sep 93	
3	48	T250 DOZER	RING	303-10-2	EA	72	BA				CIS	1 Sep 93	
3	49	T250 DOZER	PIPE	303 18 1A	EA	72	BA				CIS	1 Sep 93	
3	50	T250 DOZER	GENERATOR	CBV 30940-3	EA	4	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	51	T250 DOZER	BUSHING	3308-233 2	EA	2	BA				CIS	1 Sep 93	
3	52	T250 DOZER	PUMP	CB 3311 00-4	EA	1	BA				CIS	1 Sep 93	
3	53	T250 DOZER	SHAFT	CB411 22 16	EA	2	BA				CIS	1 Sep 93	
3	54	T250 DOZER	PUMP	CB412 00-5	EA	2	BA				CIS	1 Sep 93	
3	55	T250 DOZER	TOTAL COST US DOLLARS				BA		$45 000		CIS	1 Sep 93	
2	1	BELAZ	ENGINE	240N 1000187	SET	4	BA				Bel	1 Jan 94	
2	2	BELAZ	CYLINDER LINER SETS	240N 1004006D	SET	144	BA				Bel	1 Jan 94	
2	3	BELAZ	PACKING	240 1003213	EA	300	BA				Bel	1 Jan 94	
2	4	BELAZ	RING SETS	236-100106 B3	EA	200	BA				Bel	1 Jan 94	
2	5	BELAZ	CLUTCH SHIMS	240 1000104	EA	16	BA				Bel	1 Jan 94	
2	6	BELAZ	SHIMS	240 1000104 BR	EA	10	BA				Bel	1 Jan 94	
2	7	BELAZ	PACKING	240-1009040A2	EA	30	BA				Bel	1 Jan 94	
2	8	BELAZ	FILTER	240-1017040A2	EA	2000	BA				Bel	1 Jan 94	
2	9	BELAZ	FILTER	201 1105538	EA	1500	BA				Bel	1 Jan 94	
2	10	BELAZ	INJECTOR	236 111211082	EA	240	BA				Bel	1 Jan 94	
2	11	BELAZ	TURBOCHARGER	240N 118010B	EA	10	BA				Bel	1 Jan 94	
2	12	BELAZ	TURBOCHARGER	240N 1118011B	EA	10	BA				Bel	1 Jan 94	
2	13	BELAZ	FILTER	201 1117040 A	EA	1000	BA				Bel	1 Jan 94	
2	14	BELAZ	FILTER	238 1109080	EA	500	BA				Bel	1 Jan 94	
2	15	BELAZ	FILTER COVER	240 1002264	EA	5	BA				Bel	1 Jan 94	
2	16	BELAZ	PACKING	240-1002314	EA	20	BA				Bel	1 Jan 94	
2	17	BELAZ	HARMONIC BALANCER	240 1002310	EA	5	BA				Bel	1 Jan 94	
2	18	BELAZ	CRANK SHAFT	240 1005008G4	EA	5	BA				Bel	1 Jan 94	
2	19	BELAZ	PUSH RODS	236 1007180	EA	24	BA				Bel	1 Jan 94	
2	20	BELAZ	PACKING	240 1008098	EA	30	BA				Bel	1 Jan 94	
2	21	BELAZ	PUMP	240-1011014 B	EA	5	BA				Bel	1 Jan 94	
2	22	BELAZ	PIPE HOSE	240-1104308 G	EA	24	BA				Bel	1 Jan 94	
2	23	BELAZ	PIPE	240-1104300 B	EA	13	BA				Bel	1 Jan 94	
2	24	BELAZ	PIPE	240-1104390A	EA	6	BA				Bel	1 Jan 94	
2	25	BELAZ	PIPE	240-1104346A	EA	8	BA				Bel	1 Jan 94	
2	26	BELAZ	PUMP	240-1106210	EA	5	BA				Bel	1 Jan 94	
2	27	BELAZ	PISTON PLUNGER	60 1111074	EA	24	BA				Bel	1 Jan 94	
2	28	BELAZ	VALVE	33 1111102	EA	38	BA				Bel	1 Jan 94	
2	29	BELAZ	INJECTORS	262 111201	EA	24	BA				Bel	1 Jan 94	
2	30	BELAZ	ROTORS	240N 11180B0B	EA	20	BA				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	31	BELAZ	COVER	240N 1116280B	EA	30	BA				Bel	1 Jan 94	
2	32	BELAZ	RING	240N 1116240	EA	40	BA				Bel	1 Jan 94	
2	33	BELAZ	PUMP	240N 1307010A	EA	3	BA				Bel	1 Jan 94	
2	34	BELAZ	SET	240-1307029	EA	20	BA				Bel	1 Jan 94	
2	35	BELAZ	STARTER	25 3708	EA	5	BA				Bel	1 Jan 94	
2	36	BELAZ	GENERATOR	G263	EA	5	BA				Bel	1 Jan 94	
2	37	BELAZ	REGULATOR RELAY	RR 363 3702000	EA	5	BA				Bel	1 Jan 94	
2	38	BELAZ	COMPRESSOR	540 3509015	EA	10	BA				Bel	1 Jan 94	
2	39	BELAZ	WASHER	540A 3509130	EA	5	BA				Bel	1 Jan 94	
2	40	BELAZ	SHIMS	130 3509092	EA	5	BA				Bel	1 Jan 94	
2	41	BELAZ	PISTON	130 350909160	EA	10	BA				Bel	1 Jan 94	
2	42	BELAZ	RING	130 3509164	EA	20	BA				Bel	1 Jan 94	
2	43	BELAZ	RING	130 350 9166	EA	20	BA				Bel	1 Jan 94	
2	44	BELAZ	RING	130 3509167	EA	20	BA				Bel	1 Jan 94	
2	45	BELAZ	FILTER	740-1109560	EA	100	BA				Bel	1 Jan 94	
2	46	BELAZ	ROLLER	540 1308110-01	EA	5	BA				Bel	1 Jan 94	
2	47	BELAZ	ROLLER	540 1308111 01	EA	5	BA				Bel	1 Jan 94	
2	48	BELAZ	BELT	P21X14X1950	EA	100	BA				Bel	1 Jan 94	
2	49	BELAZ	BELT	P21X14X1735	EA	100	BA				Bel	1 Jan 94	
2	50	BELAZ	HYDRAULIC BOOSTER	548A 1700004 10	EA	4	BA				Bel	1 Jan 94	
2	51	BELAZ	FRICTION PLATES BRAKE	540 1701330 01	EA	12	BA				Bel	1 Jan 94	
2	52	BELAZ	DISC	540 1701352 11	EA	120	BA				Bel	1 Jan 94	
2	53	BELAZ	DISC	540 1701344	EA	140	BA				Bel	1 Jan 94	
2	54	BELAZ	BRAKE DRUM	540-1701312 10	EA	12	BA				Bel	1 Jan 94	
2	55	BELAZ	PACKING RING	540-1701326B	EA	50	BA				Bel	1 Jan 94	
2	56	BELAZ	ELECTRIC MAGNETO	RC330 1705000	EA	20	BA				Bel	1 Jan 94	
2	57	BELAZ	RADIATOR	548A 1301010	EA	5	BA				Bel	1 Jan 94	
2	58	BELAZ	DRIVE SHAFT	548A 2201010-02	EA	5	BA				Bel	1 Jan 94	
2	59	BELAZ	DRIVE SHAFT	548A 2208010	EA	5	BA				Bel	1 Jan 94	
2	60	BELAZ	TRANSMISSION GEAR	548P 2402010-10	EA	2	BA				Bel	1 Jan 94	
2	61	BELAZ	CYLINDER	548-2917020-11	EA	6	BA				Bel	1 Jan 94	
2	62	BELAZ	COLLAR	540-2917062	EA	200	BA				Bel	1 Jan 94	
2	63	BELAZ	CYLINDER	540-2917080-01	EA	100	BA				Bel	1 Jan 94	
2	64	BELAZ	RINGS	540-2917064	EA	400	BA				Bel	1 Jan 94	
2	65	BELAZ	SHIFTING FORK	7540-2919412	EA	3	BA				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	66	BELAZ	LEVER	548-3001031	EA	5	BA				Bel	1 Jan 94	
2	67	BELAZ	PULLEY	540-3003052 02	EA	3	BA				Bel	1 Jan 94	
2	68	BELAZ	HYDRALIC BOOSTER	525 3405010-06	EA	5	BA				Bel	1 Jan 94	
2	69	BELAZ	RINGS	016-020-25 2 2	EA	50	BA				Bel	1 Jan 94	
2	70	BELAZ	RINGS	080-090 58-2 2	EA	20	BA				Bel	1 Jan 94	
2	71	BELAZ	PISTON	130-3509160-02	EA	40	BA				Bel	1 Jan 94	
2	72	BELAZ	RINGS	130-3509167	EA	40	BA				Bel	1 Jan 94	
2	73	BELAZ	SPRAYER DEFLECTORS	FG 140 371200	EA	100	BA				Bel	1 Jan 94	
2	74	BELAZ	LAMPS	A2M 55 50	EA	300	BA				Bel	1 Jan 94	
2	75	BELAZ	LAMPS	A24 5	EA	300	BA				Bel	1 Jan 94	
2	76	BELAZ	LAMPS	A24 21 2	EA	200	BA				Bel	1 Jan 94	
2	77	BELAZ	LAMPS	A24 60-40	EA	100	BA				Bel	1 Jan 94	
2	78	BELAZ	SPRAYERS DEFLECTORS	FP 130-3716200 B	EA	50	BA				Bel	1 Jan 94	
2	79	BELAZ	LOCK	VK 856 3708000	EA	10	BA				Bel	1 Jan 94	
2	80	BELAZ	TOTAL COST US DOLLLARS				BA		$565 000		Bel	1 Jan 94	

TOTAL COST US DOLLARS $7 960 564

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TABLE 1 3 2

SOURCE BASIS

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	165	ALUM WIRE	OVERHEAD FIELD LINE		TONNE	7 5	SG	4912	$35 844		USA	1 Sep 93	
1	7	ANFO TR	ANFO MIX TRUCK		EA	1	SG	$135 125	$135 125		USA	1 Sep 93	
1	158	BATTERIES	6 CT 182 AMP/HR 12V		EA	50	SG	204 06	$10 203		USA	1 Jan 94	
1	163	BATTERIES	32 CT 450 AMP/HR 24 V		EA	32	SG	414	$13 248		USA	1 Jan 94	
1	4	BULLDOZER	CAT D 10 BULLDOZER		EA	1	SG	$638 900	$638 900		USA	1 Sep 93	
1	31	DRAG W PTS	10/70		LOT		SG	$30 000	$30 000		USA	1 Sep 93	
1	26	DRAG BUCK	10/70 DRAG BUCKET/COMP		EA	1	SG	$113 000	$113 000		USA	1 Sep 93	
1	38	EXPLOSIVES	75lb CAST PRIMERS		EA	30 000	SG	$1 75	$52 500		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	43	EXPLOSIVES	PRIMADETS #12/12FT		EA	12 000	SG	$1 75	$21 000		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	45	EXPLOSIVES	MSGS SURFACE DELAYS		EA	7 000	SG	$2 60	$18 200		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	47	EXPLOSIVES	26 GRAIN DETONATING CORD		KM	200	SG	$280 00	$56 000		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	48	EXPLOSIVES	EZ DET 25 350/18m Length		EA	15 000	SG	$4 38	$65 700		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	49	EXPLOSIVES	EZ TRUNK LINES 17MS/9M LENGTH		EA	900	SG	$2 95	$2 655		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	16	FEL	CAT992C FRONT END LOADER		EA	1	SG	$977 672	$977 672		USA	1 Sep 93	
1	9	FUEL TRUCK	FUEL & LUBE TRUCK		EA	1	SG	$90 275	$90 275		USA	1 Sep 93	
1	113	GEN BRUSH	ER4 25x32x40		EA	500	SG	2 92	$1 460		USA	1 Sep 93	
1	114	GEN BRUSH	ER4 2/12 5x32x40		EA	1000	SG				USA	1 Sep 93	
1	115	GEN BRUSH	ER4 16x25x32		EA	200	SG	5 88	$1 176		USA	1 Sep 93	
1	116	GEN BRUSH	ER4 25x50x64		EA	300	SG	3 97	$1 191		USA	1 Sep 93	
1	117	GEN BRUSH	ER4 25x32x40		EA	200	SG	4 11	$822		USA	1 Sep 93	
1	118	GEN BRUSH	ER4 16x32x40		EA	200	SG				USA	1 Sep 93	
1	119	GEN BRUSH	ER4 25x32x64		EA	1000	SG				USA	1 Sep 93	
1	120	GEN BRUSH	ER4 16x25x40		EA	100	SG				USA	1 Sep 93	
1	121	GEN BRUSH	ER4 30x25x40		EA	100	SG				USA	1 Sep 93	
1	122	GEN BRUSH	ER4 8x10x25		EA	200	SG				USA	1 Sep 93	
1	123	GEN BRUSH	ER4 2/12 55x32x40		EA	300	SG	2 92	$876		USA	1 Sep 93	
1	124	GEN BRUSH	ER74 25x32x51		EA	1000	SG	2 92	$2 920		USA	1 Sep 93	
1	125	GEN BRUSH	ER74 2/12 55x32x64		EA	200	SG				USA	1 Sep 93	
1	126	GEN BRUSH	ER74 2/12 5x44x40		EA	200	SG				USA	1 Sep 93	
1	127	GEN BRUSH	ER74 2/20x32x40		EA	100	SG				USA	1 Sep 93	
1	128	GEN BRUSH	ER74 2/25x30x64		EA	100	SG				USA	1 Sep 93	
1	129	GEN BRUSH	ER14 16x32x40		EA	400	SG	4 11	$1 644		USA	1 Sep 93	
1	130	GEN BRUSH	ER14 25x50x64		EA	1500	SG	5 88	$8 820		USA	1 Sep 93	
1	131	GEN BRUSH	ER14 2/12 5x16x25		EA	200	SG				USA	1 Sep 93	
1	132	GEN BRUSH	ER14 2/12 5x32x40		EA	2000	SG				USA	1 Sep 93	
1	133	GEN BRUSH	ER14 20x32x32		EA	200	SG				USA	1 Sep 93	
1	134	GEN BRUSH	ER14 25x50x60		EA	200	SG	5 88	$1 176		USA	1 Sep 93	
1	135	GEN BRUSH	ER74 20x52x40		EA	100	SG				USA	1 Sep 93	
1	136	GEN BRUSH	ER74 25x30x64		EA	100	SG				USA	1 Sep 93	
1	137	GEN BRUSH	ER74 12 5x32x65		EA	200	SG				USA	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	138	GEN BRUSH	ER2A 2/12 5x40x60		EA	100	SG				USA	1 Sep 93	
1	139	GEN BRUSH	ER2A 5x9x17 5		EA	100	SG				USA	1 Sep 93	
1	140	GEN BRUSH	ER2A 8x10x25		EA	100	SG				USA	1 Sep 93	
1	141	GEN BRUSH	ER2A 16x32x40		EA	400	SG	4 11	$1 644		USA	1 Sep 93	
1	142	GEN BRUSH	ER2A 16x40x60		EA	100	SG				USA	1 Sep 93	
1	143	GEN BRUSH	ER61 2/10x40x52		EA	400	SG				USA	1 Sep 93	
1	144	GEN BRUSH	ER61 2/8x32x50		EA	400	SG				USA	1 Sep 93	
1	145	GEN BRUSH	ER61 2/8x32x52		EA	100	SG				USA	1 Sep 93	
1	146	GEN BRUSH	ER61 2/12 5x40x52		EA	100	SG				USA	1 Sep 93	
1	1	GRADER	CAT 16G MOTORGRADER		EA	1	SG	$385 000	$385 000		USA	1 Sep 93	
1	35	INSTRU	ELECT TEST INSTRUMENTS				SG	$3 000	$3 000		USA	1 Sep 93	
1	92	REWIND CU	4 ARMOURED POLY THERMALEZE		lbs	220	SG	$2 82	$620		USA	1 Sep 93	
1	93	REWIND CU	45 ARMOURED POLY THERMALEZE		lbs	440	SG	$2 75	$1 211		USA	1 Sep 93	
1	94	REWIND CU	47 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 75	$5 505		USA	1 Sep 93	
1	95	REWIND CU	55 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 63	$5 265		USA	1 Sep 93	
1	96	REWIND CU	6 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 53	$5 065		USA	1 Sep 93	
1	97	REWIND CU	63 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 52	$5 045		USA	1 Sep 93	
1	98	REWIND CU	67 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 40	$4 805		USA	1 Sep 93	
1	99	REWIND CU	7 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 40	$4 805		USA	1 Sep 93	
1	100	REWIND CU	8 ARMOURED POLY THERMALEZE		lbs	440	SG	$2 33	$1 027		USA	1 Sep 93	
1	101	REWIND CU	83 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 33	$4 669		USA	1 Sep 93	
1	102	REWIND CU	95 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 26	$4 529		USA	1 Sep 93	
1	103	REWIND CU	1 0 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 26	$4 529		USA	1 Sep 93	
1	104	REWIND CU	1 12 ARMOURED POLY THERMALEZE		lbs	2 860	SG	$2 17	$6 209		USA	1 Sep 93	
1	105	REWIND CU	1 18 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 17	$4 342		USA	1 Sep 93	
1	106	REWIND CU	1 20 ARMOURED POLY THERMALEZE		lbs	2 200	SG	$2 17	$4 776		USA	1 Sep 93	
1	107	REWIND CU	1 30 ARMOURED POLY THERMALEZE		lbs	2 200	SG	$2 12	$4 666		USA	1 Sep 93	
1	108	REWIND CU	1 32 ARMOURED POLY THERMALEZE		lbs	2 200	SG	$2 12	$4 666		USA	1 Sep 93	
1	109	REWIND CU	1 40 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 12	$4 241		USA	1 Sep 93	
1	110	REWIND CU	1 45 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 12	$4 241		USA	1 Sep 93	
1	111	REWIND CU	1 47 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 12	$4 241		USA	1 Sep 93	
1	112	REWIND CU	1 60 ARMOURED POLY THERMALESE		lbs	2 000	SG	$2 07	$4 146		USA	1 Sep 93	
1	33	SHOV BUCK	WEAR PARTS		LOT		SG	$22 000	$22 000		USA	1 Sep 93	
1	28	SHOVEL B	EKG 4 6 SHOVEL BUCKET		EA	1	SG	$79 000	$79 000		USA	1 Sep 93	
1	12	TIRE TRUCK	TIRE HANDLING TRUCK		EA	1	SG	$79 925	$79 925		USA	1 Sep 93	
1	19	TRUCK	2 TON FLATBED FOR PERSONNEL TRANS		EA	1	SG	$40 250	$40 250		USA	1 Sep 93	
1	91	WELDING RD	6011 GEN PURPOSE ROD 5/32		lbs	10 000	SG	$0 57	$5 710		USA	1 Sep 93	
1	57	WIRE ROPE	52 mm(2) 10 7 Kg/M 15 TONNE		FT	4 475	SG	$4 60	$20 585		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	61	WIRE ROPE	39mm (1 5) 4 2 Kg/M 15 TONNE		FT	6 625	SG	$2 31	$15 304		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	153	BATTERIES	6 CT 132 AMP/HR 12V		EA	50	SG	169 6	$8 480		USA	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	85	BELT SUPP	SPLICING KITS 1200 mm		EA	10	SG	$368 88	$3 689		USA	1 Jan 94	
2	87	BELT SUPP	SPLICING KITS 1000 mm		EA	10	SG	$322 24	$3 222		USA	1 Jan 94	
2	89	BELT SUPP	SPLICING KITS 800 mm		EA	10	SG	$276 66	$2 767		USA	1 Jan 94	
2	75	CONV BELT	1000 mm 5 PLY FABRIC		M	800	SG	$106 89	$85 512		USA	1 Jan 94	
2	77	CONV BELT	1200 mm 6 PLY FABRIC		M	670	SG	$147 53	$98 845		USA	1 Jan 94	
2	81	CONV BELT	800 mm 6 PLY FABRIC		M	500	SG	$107 99	$53 995		USA	1 Jan 94	
2	36	DRILLS	160mm				SG	$300 000	$300 000		USA	1 Jan 94	
2	59	WIRE ROPE	45 5mm(1 75) 8 2 Kg/M 15 TONNE		FT	5 832	SG	$2 91	$16 971		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	65	WIRE ROPE	30mm (1 25) 4 0 Kg/M 2 TONNE		FT	1 271	SG	$1 73	$2 199		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	69	WIRE ROPE	30mm (5/8) 9 Kg/M 1 5 TONNE		FT	4 593	SG	$0 55	$2 526		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	71	WIRE ROPE	13 5mm(9/16) 2 5 TONNE		FT	9 340	SG	$0 50	$4 670		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	73	WIRE ROPE	9 11 mm(7/16) 2 TONNE		FT	12 598	SG	$0 40	$5 039		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
3	148	TRUCK TIRE	12x20x16 PLY/W TUBES		EA	20	SG	341 4	$6 828		USA	1 Sep 93	
3	1	KRAZ	ENGINE	238M 1000186	EA	0 6	SG				URK	1 Sep 93	
3	2	KRAZ	SHIM	238-1000102 B2R1	EA	3 2	SG				URK	1 Sep 93	
3	3	KRAZ	SHIM	238 1000102 B2	EA	3 2	SG				URK	1 Sep 93	
3	4	KRAZ	SHIM	23831000104 V2	EA	3 2	SG				URK	1 Sep 93	
3	5	KRAZ	CLIPS	256-1001005 A1	EA	5	SG				URK	1 Sep 93	
3	6	KRAZ	ENG RING SETS	236 1000106 B2	EA	20	SG				URK	1 Sep 93	
3	7	KRAZ	ENG MOUNTS	236 1001008 01	EA	3	SG				URK	1 Sep 93	
3	8	KRAZ	SHAFT	2383 1000107 V2	EA	0 8	SG				URK	1 Sep 93	
3	9	KRAZ	BLOCK	238 1002012 B2	EA	0 4	SG				URK	1 Sep 93	
3	10	KRAZ	RING	236-100202 A	EA	5	SG				URK	1 Sep 93	
3	11	KRAZ	RING	236-1002040	EA	4	SG				URK	1 Sep 93	
3	12	KRAZ	OIL INS	236 1002272	EA	1	SG				URK	1 Sep 93	
3	13	KRAZ	PIPE	238 1003290 V	EA	1	SG				URK	1 Sep 93	
3	14	KRAZ	PIPE	238 1003291 V	EA	1	SG				URK	1 Sep 93	
3	15	KRAZ	CYL WIPER COLLAR	236 1002314 B	EA	4	SG				URK	1 Sep 93	
3	16	KRAZ	HEAD C76G	238 1003013 D	EA	1	SG				URK	1 Sep 93	
3	17	KRAZ	RING	237 1003114 V	EA	1	SG				URK	1 Sep 93	
3	18	KRAZ	PACKING	238 1003210-V2	EA	10	SG				URK	1 Sep 93	
3	19	KRAZ	PACKING	238 1003270	EA	10	SG				URK	1 Sep 93	
3	20	KRAZ	LINER CYLINDER	236-1004008	EA	16	SG				URK	1 Sep 93	
3	21	KRAZ	ROCKER ARM	236-1004045 V2	EA	4	SG				URK	1 Sep 93	
3	22	KRAZ	RING	400-1004030-80	EA	4	SG				URK	1 Sep 93	
3	23	KRAZ	SEAL	201 1005034 B3	EA	4	SG				URK	1 Sep 93	
3	24	KRAZ	GEAR	236-1005030-A	EA	4	SG				URK	1 Sep 93	
3	25	KRAZ	COLLAR	236 1005160-A2	EA	10	SG				URK	1 Sep 93	
3	26	KRAZ	SHAFT	238-1006015 G2	EA	0 2	SG				URK	1 Sep 93	
3	27	KRAZ	SPACERS	236-1006026-AR	EA	6	SG				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	28	KRAZ	SPACERS	236-1006037 AR	EA	4 8	SG				URK	1 Sep 93	
3	29	KRAZ	VALVE	236-1007010-V	EA	5	SG				URK	1 Sep 93	
3	30	KRAZ	VALVE	236-1007015 V4	EA	5	SG				URK	1 Sep 93	
3	31	KRAZ	ROD PUSH	236-1007176-A	EA	4 2	SG				URK	1 Sep 93	
3	32	KRAZ	PACKING	236-1008050	EA	5	SG				URK	1 Sep 93	
3	33	KRAZ	PACKING	238T 1009040	EA	5	SG				URK	1 Sep 93	
3	34	KRAZ	PUMP	236-1011014 V3	EA	1	SG				URK	1 Sep 93	
3	35	KRAZ	RADIATOR	157 1013010 A	EA	1	SG				URK	1 Sep 93	
3	36	KRAZ	EXHAUST PIPE	256B 1013408 B	EA	1 6	SG				URK	1 Sep 93	
3	37	KRAZ	ELEMENT FILTER	201T 1105540	EA	60	SG				URK	1 Sep 93	
3	38	KRAZ	PUMP	240 1106210	EA	1	SG				URK	1 Sep 93	
3	39	KRAZ	PUMP	236T1106288 A2	EA	1	SG				URK	1 Sep 93	
3	40	KRAZ	COLLAR	236-102940	EA	10	SG				URK	1 Sep 93	
3	41	KRAZ	1/2 HUB COUPLING	236 1029268 B	EA	0 5	SG				URK	1 Sep 93	
3	42	KRAZ	PIPE	236-1104308 V	EA	2	SG				URK	1 Sep 93	
3	43	KRAZ	PUMP	8006-1111005	EA	0 6	SG				URK	1 Sep 93	
3	44	KRAZ	PLUNGER RODS	60-1111074 01	EA	15	SG				URK	1 Sep 93	
3	45	KRAZ	INJECTOR	2606-1112010-02	EA	28	SG				URK	1 Sep 93	
3	46	KRAZ	SPRAYER	26 111211	EA	28	SG				URK	1 Sep 93	
3	47	KRAZ	FILTER	201T 1117038	EA	20	SG				URK	1 Sep 93	
3	48	KRAZ	COUPLING	09000 1121010 000	EA	0 2	SG				URK	1 Sep 93	
3	49	KRAZ	MUFFLER	256-1201010	EA	1	SG				URK	1 Sep 93	
3	50	KRAZ	PACKING	256B 1203002	EA	10	SG				URK	1 Sep 93	
3	51	KRAZ	SLEEVE	256 B1 1203096	EA	2 5	SG				URK	1 Sep 93	
3	52	KRAZ	PACKING	256B 1203039	EA	4	SG				URK	1 Sep 93	
3	53	KRAZ	RADIATOR	256B-1301008 10	EA	2	SG				URK	1 Sep 93	
3	54	KRAZ	ENG MOUNTS	256 1302025	EA	1	SG				URK	1 Sep 93	
3	55	KRAZ	ENG/ MOUNTS	256 1302139	EA	1	SG				URK	1 Sep 93	
3	56	KRAZ	RODS	214B 1303010	EA	3	SG				URK	1 Sep 93	
3	57	KRAZ	RODS	255 1303012	EA	2	SG				URK	1 Sep 93	
3	58	KRAZ	EXHAUST PIPE	256-1303016	EA	0 6	SG				URK	1 Sep 93	
3	59	KRAZ	PUMP	236-1307010-A3	EA	2 5	SG				URK	1 Sep 93	
3	60	KRAZ	SET	236-1307029 A	EA	5	SG				URK	1 Sep 93	
3	61	KRAZ	COLLAR	236-1307090	EA	8	SG				URK	1 Sep 93	
3	62	KRAZ	BELTS	25 6411 1404	EA	20	SG				URK	1 Sep 93	
3	63	KRAZ	BELTS	6421 1403	EA	20	SG				URK	1 Sep 93	
3	64	KRAZ	MOTOR	236-1308011 G2	EA	0 6	SG				URK	1 Sep 93	
3	65	KRAZ	DISCS	238-1601690-G	EA	1	SG				URK	1 Sep 93	
3	66	KRAZ	DISCS	238-1601094	EA	1	SG				URK	1 Sep 93	
3	67	KRAZ	DISCS	238-1601130-B	EA	1	SG				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	68	KRAZ	DISCS	238 1601131	EA	1 5	SG				URK	1 Sep 93	
3	69	KRAZ	BRAKE FRICTION PLATE	236-1601138 A3	EA	5	SG				URK	1 Sep 93	
3	70	KRAZ	COUPLING	236-1601180-B2	EA	1	SG				URK	1 Sep 93	
3	71	KRAZ	GEAR BOX	236NT 1700003	EA	0 8	SG				URK	1 Sep 93	
3	72	KRAZ	BOX	257 18000020-V2	EA	0 2	SG				URK	1 Sep 93	
3	73	KRAZ	BOX	256-1800020-V2	EA	0 2	SG				URK	1 Sep 93	
3	74	KRAZ	HEAD CROSS	131 2201025 A	EA	2	SG				URK	1 Sep 93	
3	75	KRAZ	SHAFT	527 2202010 16	EA	0 8	SG				URK	1 Sep 93	
3	76	KRAZ	DRIVE SHAFT	210G 2202045 04	EA	0 8	SG				URK	1 Sep 93	
3	77	KRAZ	SHAFT	210G 2204010-16	EA	0 8	SG				URK	1 Sep 93	
3	78	KRAZ	SUPPORT	210 2204080 B2	EA	1	SG				URK	1 Sep 93	
3	79	KRAZ	REAR DRIVE AXLE	255P 2400015 02	EA	1	SG				URK	1 Sep 93	
3	80	KRAZ	SET OF GEARS	256B 2402020	EA	0 2	SG				URK	1 Sep 93	
3	81	KRAZ	DIFFERENTIAL SEAL	210 2402052 A1	EA	6	SG				URK	1 Sep 93	
3	82	KRAZ	DIFFERENTIAL	200 2403010 A2	EA	0 4	SG				URK	1 Sep 93	
3	83	KRAZ	FLANGE	200 2403072 B1	EA	0 4	SG				URK	1 Sep 93	
3	84	KRAZ	AXLE	2550 2500015 02	EA	0 2	SG				URK	1 Sep 93	
3	85	KRAZ	SHOCK ABSORBER	256B1 2902012	EA	2	SG				URK	1 Sep 93	
3	86	KRAZ	1ST PLATE	255B 2902074 01	EA	2	SG				URK	1 Sep 93	
3	87	KRAZ	2ND PLATE	255B 2902076-01	EA	2	SG				URK	1 Sep 93	
3	88	KRAZ	SHOCK SPRINGS	500 2905006	EA	5	SG				URK	1 Sep 93	
3	89	KRAZ	SHOCK ABSORBER	256B 2912012 11	EA	2 6	SG				URK	1 Sep 93	
3	90	KRAZ	CONN BRACKETS	219 2912408	EA	6	SG				URK	1 Sep 93	
3	91	KRAZ	EQUALIZER	256B 2918005	EA	3	SG				URK	1 Sep 93	
3	92	KRAZ	SHAFT	256B 2918054	EA	0 4	SG				URK	1 Sep 93	
3	93	KRAZ	ROD	214 2919011 02	EA	5	SG				URK	1 Sep 93	
3	94	KRAZ	ROD	210 2919012 03	EA	5	SG				URK	1 Sep 93	
3	95	KRAZ	BUSHING	200 3001016	EA	4	SG				URK	1 Sep 93	
3	96	KRAZ	SEAL	200 3103035	EA	1 4	SG				URK	1 Sep 93	
3	97	KRAZ	SEAL	210 3104036	EA	1 4	SG				URK	1 Sep 93	
3	98	KRAZ	COTTER PINS	200-3104050-A	EA	50	SG				URK	1-Sep 93	
3	99	KRAZ	COTTER PINS	200-3104050-A	EA	50	SG				URK	1 Sep 93	
3	100	KRAZ	RELAYS	500-3401005 D	EA	0 5	SG				URK	1 Sep 93	
3	101	KRAZ	HYD BOOSTER BRAKES	256B 3405010-14	EA	1	SG				URK	1 Sep 93	
3	102	KRAZ	DISTRIBUTOR	255B 3405016	EA	1	SG				URK	1 Sep 93	
3	103	KRAZ	PUMP	256B 3407199	EA	1	SG				URK	1 Sep 93	
3	104	KRAZ	FRIC PLATES SHOE	200-3501105	EA	30	SG				URK	1 Sep 93	
3	105	KRAZ	LEVER	210-3501136-A2	EA	0 8	SG				URK	1 Sep 93	
3	106	KRAZ	FRIC PLATES SHOES	200-3502105 A	EA	30	SG				URK	1 Sep 93	
3	107	KRAZ	COMPRESSOR	130-3509009 11	EA	0 8	SG				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	108	KRAZ	GENERATOR	4573711587	EA	2	SG				URK	1 Sep 93	
3	109	KRAZ	REGULATOR	1112 3702	EA	2	SG				URK	1 Sep 93	
3	110	KRAZ	SWITCH	VK318T 3704000	EA	1	SG				URK	1 Sep 93	
3	111	KRAZ	ELECTRO BRUSHES	2501 370805	EA	26	SG				URK	1 Sep 93	
3	112	KRAZ	SWITCH	P305 3709000	EA	1 5	SG				URK	1 Sep 93	
3	113	KRAZ	SWITCH	P39 371000-T	EA	1 5	SG				URK	1 Sep 93	
3	114	KRAZ	STARTER	45 7375 1471	EA	2 5	SG				URK	1 Sep 93	
3	115	KRAZ	RELAY	RC103 3708000	EA	1	SG				URK	1 Sep 93	
3	116	KRAZ	LAMPS	A 24-60 40	EA	40	SG				URK	1 Sep 93	
3	117	KRAZ	FILTERS	FG122 3711200-V	EA	3	SG				URK	1 Sep 93	
3	118	KRAZ	LAMPS	A24 324	EA	40	SG				URK	1 Sep 93	
3	119	KRAZ	LAMPS	A 24 2	EA	40	SG				URK	1 Sep 93	
3	120	KRAZ	LAMPS	A 24 5	EA	40	SG				URK	1 Sep 93	
3	121	KRAZ	LAMPS	A 24-21 2	EA	40	SG				URK	1 Sep 93	
3	122	KRAZ	SPEEDOMETER	CP135 3802010	EA	1	SG				URK	1 Sep 93	
3	123	KRAZ	RELAY	RC401 3726010	EA	1	SG				URK	1 Sep 93	
3	124	KRAZ	RECIEVER	YK143 3807010 G4	EA	0 4	SG				URK	1 Sep 93	
3	125	KRAZ	SENSOR	BM146-3806600D	EA	0 4	SG				URK	1 Sep 93	
3	126	KRAZ	AMP METER	AP110 3811010	EA	0 8	SG				URK	1 Sep 93	
3	127	KRAZ	PRESSURE GAUGE	MD103 3816010	EA	0 4	SG				URK	1 Sep 93	
3	128	KRAZ	SENSOR	TM100 3808000 G	EA	1	SG				URK	1 Sep 93	
3	129	KRAZ	MIRRORS	256 8201012	EA	3	SG				URK	1 Sep 93	
3	130	KRAZ	EQUALIZER	220V 8702010A	EA	0 2	SG				URK	1 Sep 93	
3	131	KRAZ	TOTAL COST US DOLLARS				SG		$11 000		URK	1 Sep 93	
1	51	EXPLOSIVES	AN BLASTING PRILL		TONNE	1 000	SG	$190 00	$190 000		SWD	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	52	EXPLOSIVES	5 x30 (20KG) BAGGED EMULSION		KG	500 000	SG	$0 66	$330 000		SWD	1 Sep 93	
1	1	DUMPCAR	SIDE PANELS	634 01 000-0 cb	EA	12	SG				POL	1 Sep 93	
1	2	DUMPCAR	FRONT PANEL	634 04 000 3	EA	12	SG				POL	1 Sep 93	
1	3	DUMPCAR	PANEL LOCKS LEFT	634 01 010-2	EA	12	SG				POL	1 Sep 93	
1	4	DUMPCAR	PANEL LOCKS RIGHT	634-01 020 2	EA	12	SG				POL	1 Sep 93	
1	5	DUMPCAR	PANEL SUPPORTS	634 01 150 cb	EA	6	SG				POL	1 Sep 93	
1	6	DUMPCAR	SINGLE ACTION CYLINDER	640-45 010 cb	EA	9 6	SG				POL	1 Sep 93	
1	7	DUMPCAR	PISTON COLLARS	45 129	EA	300	SG				POL	1 Sep 93	
1	8	DUMPCAR	DOUBLE ACTION CYL	640-45 010-1	EA	12	SG				POL	1 Sep 93	
1	9	DUMPCAR	DOUBLE ACTION PISTON	640-45 105 2	EA	6	SG				POL	1 Sep 93	
1	10	DUMPCAR	DISTRIBUTION VALVES	372 000-1 9	EA	30	SG				POL	1 Sep 93	
1	11	DUMPCAR	ROD EQUALIZER	522 00-003 0	EA	3	SG				POL	1 Sep 93	
1	12	DUMPCAR	BOGGEY CONNECTOR	522 00 010 1	EA	3	SG				POL	1 Sep 93	
1	13	DUMPCAR	SQ AXLE CAP ENDS	74 10 116	EA	6	SG				POL	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	14	DUMPCAR	OUTSIDE SPRING	522 38-001 0	EA	24	SG				POL	1 Sep 93	
1	15	DUMPCAR	INSIDE SPRING	522 38 002 0	EA	24	SG				POL	1 Sep 93	
1	16	DUMPCAR	SET SH ABSORBERS	522 38 016-0	EA	6	SG				POL	1 Sep 93	
1	17	DUMPCAR	FRAME	4686-6061 40-016	EA	30	SG				POL	1 Sep 93	
1	18	DUMPCAR	SMALL BRAKE LOCKS	46-03 015	EA	30	SG				POL	1 Sep 93	
1	19	DUMPCAR	PUSH RDS BRAKE PDS	61 40 133	EA	12	SG				POL	1 Sep 93	
1	20	DUMPCAR	FRAME ENDS RIGHT	61 40 110	EA	4 8	SG				POL	1 Sep 93	
1	21	DUMPCAR	FRAME ENDS LEFT	61 40 120	EA	4 8	SG				POL	1 Sep 93	
1	22	DUMPCAR	BRK PADS COMP POLY	TY 38 114 79 72	EA	900	SG				POL	1 Sep 93	
1	23	DUMPCAR	WHEEL PAIRS	61 10 046	EA	6	SG				POL	1 Sep 93	
1	24	DUMPCAR	WHEEL PACKING COVER	TY 519 07	EA	6	SG				POL	1 Sep 93	
1	25	DUMPCAR	BOGGEY CONNECTORS	522 00 020 1	EA	3	SG				POL	1 Sep 93	
1	26	DUMPCAR	DISTRIBUTOR VALVE		EA	24	SG				POL	1 Sep 93	
1	27	DUMPCAR	AUTOMATIC COUPLING		EA	18	SG				POL	1 Sep 93	
1	28	DUMPCAR	AUTO COUPLING HEAD	106 00 00	EA	6	SG				POL	1 Sep 93	
1	29	DUMPCAR	COUPLING LOCK	106 01 002	EA	12	SG				POL	1 Sep 93	
1	30	DUMPCAR	LOCK HOLDER	106 01 003 0	EA	6	SG				POL	1 Sep 93	
1	31	DUMPCAR	COUPLING TRIPPER	106 01 006-0	EA	12	SG				POL	1 Sep 93	
1	32	DUMPCAR	COUPLING HINGE PINS	106 00-012 0	EA	18	SG				POL	1 Sep 93	
1	33	DUMPCAR	COUPLING SHOCK ABS	106 00 001	EA	12	SG				POL	1 Sep 93	
1	34	DUMPCAR	COUPLING SHOCK SLIDE	106 02 00 2	EA	6	SG				POL	1 Sep 93	
1	35	DUMPCAR	COUPLING SH AB LK	106 00-002 2	EA	24	SG				POL	1 Sep 93	
1	36	DUMPCAR	DOOR ACTLATOR ARMS	634 46 010	EA	24	SG				POL	1 Sep 93	
1	37	DUMPCAR	DOOR ACTUATOR ARMS	634 46 020-2	EA	24	SG				POL	1 Sep 93	
1	38	DUMPCAR	DOOR ACTUATOR ARMS	634 46-030	EA	12	SG				POL	1 Sep 93	
1	39	DUMPCAR	END VALVE		EA	30	SG				POL	1 Sep 93	
1	40	DUMPCAR	AIR SPEED REDUCERS		EA	24	SG				POL	1 Sep 93	
1	41	DUMPCAR	RING PACKING	38-72	EA	60	SG				POL	1 Sep 93	
1	42	DUMPCAR	AIR DISTRIBUTOR	482 000	EA	0	SG				POL	1 Sep 93	
1	43	DUMPCAR	PISTON COLLAR	270 397	EA	6	SG				POL	1 Sep 93	
1	44	DUMPCAR	PISTON SPRING	270 397	EA	12	SG				POL	1 Sep 93	
1	45	DUMPCAR	HOUSING ACC AIR	DR 483 00	EA	18	SG				POL	1 Sep 93	
1	46	DUMPCAR	BRAKE CYL PARTS	VR 483 000	EA	18	SG				POL	1 Sep 93	
1	47	DUMPCAR	PIPES	VR 483 000	EA	18	SG				POL	1 Sep 93	
1	48	DUMPCAR	REGULATOR ARM	522 10 050-1	EA	18	SG				POL	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	49	DUMPCAR	CAR CONNECTOR HOSE		EA	90	SG				POL	1 Sep 93	
1	50	DUMPCAR	TOTAL COST US DOLLARS				SG		$300 000		POL	1 Sep 93	
1	1	COAL LOAD	BUSHING	3400 00 005 02	EA	4	SG				CIS	1 Sep 93	
1	2	COAL LOAD	FRONT PLATE	3430 04 200 7	EA	8	SG				CIS	1 Sep 93	
1	3	COAL LOAD	DISC	3430 11 200 00	EA	8	SG				CIS	1 Sep 93	
1	4	COAL LOAD	DISC	3430 11 007 00	EA	8	SG				CIS	1 Sep 93	
1	5	COAL LOAD	DRIVE UNIT LEFT SIDE	7415 53 050 00	EA	1	SG				CIS	1 Sep 93	
1	6	COAL LOAD	VIBRATOR LEFT	GUCL 72 00	EA	1	SG				CIS	1 Sep 93	
1	7	COAL LOAD	VIBRATOR RIGHT	GUCL 72 00	EA	1	SG				CIS	1 Sep 93	
1	8	COAL LOAD	TOTAL COST US DOLLARS				SG		$35 000		CIS	1 Sep 93	
1	1	D TRAIN	DISTRIBUTER	D50 17 101 cb 1	EA	500	SG				CIS	1 Sep 93	
1	2	D TRAIN	PUMP ELEMENT	D50 27 104 cb	EA	50	SG				CIS	1 Sep 93	
1	3	D TRAIN	SEAL	D50 27 204 cb 2	EA	100	SG				CIS	1 Sep 93	
1	4	D TRAIN	DIRECTIONAL VALVE	D50 27 209 cb 1	EA	10	SG				CIS	1 Sep 93	
1	5	D TRAIN	OIL PUMP	D50 12 3 01	EA	30	SG				CIS	1 Sep 93	
1	6	D TRAIN	WATER PUMP	D50 11 01	EA	30	SG				CIS	1 Sep 93	
1	7	D TRAIN	SHOCK	D50 10 111	EA	40	SG				CIS	1 Sep 93	
1	8	D TRAIN	SEAL	D50 34 114 01	EA	50	SG				CIS	1 Sep 93	
1	9	D TRAIN	REGULATOR	D50 27 200cb	EA	10	SG				CIS	1 Sep 93	
1	10	D TRAIN	OUTLET VALVE	KT6 06 001 cb 2	EA	50	SG				CIS	1 Sep 93	
1	11	D TRAIN	INLET VALVE	KT6 06 001 cb 2	EA	50	SG				CIS	1 Sep 93	
1	12	D TRAIN	SPRING VALVE	KT6 06 033 2	EA	2000	SG				CIS	1 Sep 93	
1	13	D TRAIN	INLET FILTER	KT6 06-021	EA	500	SG				CIS	1 Sep 93	
1	14	D TRAIN	DRIVE HUB	T33 55 6 cb	EA	100	SG				CIS	1 Sep 93	
1	15	D TRAIN	BELT	b 2240	EA	100	SG				CIS	1 Sep 93	
1	16	D TRAIN	BELT	b 1250	EA	100	SG				CIS	1 Sep 93	
1	17	D TRAIN	SHOCK ABSORBER SP	3 35 30 101	EA	40	SG				CIS	1 Sep 93	
1	18	D TRAIN	PRESS ELEC GAUGE		EA	15	SG				CIS	1 Sep 93	
1	19	D TRAIN	SWITCHES	TB1 2	EA	50	SG				CIS	1 Sep 93	
1	20	D TRAIN	SWITCHES	TB1 1	EA	50	SG				CIS	1 Sep 93	
1	21	D TRAIN	SWITCHES	TB1 4	EA	50	SG				CIS	1 Sep 93	
1	22	D TRAIN	COUPLES RAIL	GEM 70-85 000	EA	10	SG				CIS	1 Sep 93	
1	23	D TRAIN	BRAKE SHOES	GEM 2 4211	EA	1000	SG				CIS	1 Sep 93	
1	24	D TRAIN	AUTO COUPLINGS	CA 3	EA	40	SG				CIS	1 Sep 93	
1	25	D TRAIN	BATTERY	32TN 450	SET	6	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	26	D TRAIN	LAMP	PX50X50	EA	200	SG				CIS	1 Sep 93	
1	27	D TRAIN	LAMP	24-25	EA	100	SG				CIS	1 Sep-93	
1	28	D TRAIN	TOTAL COST US DOLLARS				SG				CIS	1 Sep 93	
1	1	HEAT PLT	CHAIN	9 08 000	M	125	SG				CIS	1 Sep 93	
1	2	HEAT PLT	HOLDER	T9 05 002	EA	100	SG				CIS	1 Sep 93	
1	3	HEAT PLT	HOLDER	T9 05 001	EA	100	SG				CIS	1 Sep 93	
1	4	HEAT PLT	HOLDER	6 30 2	EA	500	SG				CIS	1 Sep 93	
1	5	HEAT PLT	ROLLER	6 30 25	EA	300	SG				CIS	1 Sep 93	
1	6	HEAT PLT	FRONT PACKING	T197 01 001	EA	5	SG				CIS	1 Sep 93	
1	7	HEAT PLT	MIDDLE PACKING	T197 01 002	EA	5	SG				CIS	1 Sep 93	
1	8	HEAT PLT	END LEFT PACKING	T82 01 001	EA	5	SG				CIS	1 Sep 93	
1	9	HEAT PLT	RIGHT PACKING	T82 01 002	EA	5	SG				CIS	1 Sep 93	
1	10	HEAT PLT	MIDDLE PACKING	T82 01 003	EA	5	SG				CIS	1 Sep 93	
1	13	HEAT PLT	CONNECTING LINK	T82 00 018	EA	300	SG				CIS	1 Sep 93	
1	14	HEAT PLT	SHAFT	6 30 9	EA	300	SG				CIS	1 Sep 93	
1	15	HEAT PLT	WASHER	T82 03 005	EA	0 1	SG				CIS	1 Sep 93	
1	16	HEAT PLT	WASHER	12 10906 66	EA	0 1	SG				CIS	1 Sep 93	
1	17	HEAT PLT	WASHER	16-10906-66	EA	0 1	SG				CIS	1 Sep 93	
1	18	HEAT PLT	WASHER	20-11371 66	EA	0 1	SG				CIS	1 Sep 93	
1	19	HEAT PLT	COTTER PIN	5X25 397 66	EA	0 1	SG				CIS	1 Sep 93	
1	20	HEAT PLT	COTTER PIN	5X28 397 66	EA	0 25	SG				CIS	1 Sep 93	
1	21	HEAT PLT	COTTER PIN	9X50 2319 70	EA	0 25	SG				CIS	1 Sep 93	
1	22	HEAT PLT	CHAIN	9X27 2319 70	M	100	SG				CIS	1 Sep 93	
1	23	HEAT PLT	FT SHFT W/ HALF COUP	T82 03 000	EA	0 5	SG				CIS	1 Sep 93	
1	24	HEAT PLT	END SHAFT	T82 07 000	EA	0 5	SG				CIS	1 Sep 93	
1	25	HEAT PLT	SOCKSHING PAN	DN 17	EA	1	SG				CIS	1 Sep 93	
1	26	HEAT PLT	STEAM BOILER PARTS	1 08 06	SET	100	SG				CIS	1 Sep 93	
1	27	HEAT PLT	STEAM BOILER PARTS	1 08 05	EA	600	SG				CIS	1 Sep 93	
1	28	HEAT PLT	STEAM BOILER PARTS	3P 800	EA	2	SG				CIS	1 Sep 93	
1	29	HEAT PLT	BOILER CONVEC SEC	KVTC 20-150	EA	1	SG				CIS	1 Sep 93	
1	30	HEAT PLT	TOTAL COST US DOLLARS				SG		$300 000		CIS	1 Sep 93	
1	1	RAIL MAT	RAIL TYPE P 50	7174 75	TONNE	1050	SG				CIS	1 Sep 93	
1	2	RAIL MAT	RAIL TYPE P 65	7174-75	TONNE	700	SG				CIS	1 Sep 93	
1	3	RAIL MAT	BEDING PLATE P 50	12135 75	TONNE	84	SG				CIS	1 Sep 93	
1	4	RAIL MAT	BEDING PLATE P 65	12135 75	TONNE	84	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	5	RAIL MAT	CONN PLATE P 50	4133 54	TONNE	84	SG				CIS	1 Sep 93	
1	6	RAIL MAT	CONN PLATE P 65	4133 54	TONNE	84	SG				CIS	1 Sep 93	
1	7	RAIL MAT	RR SPAKE P 50		TONNE	84	SG				CIS	1 Sep 93	
1	8	RAIL MAT	RAIL PLANGE P 50	2953-51	TONNE	21	SG				CIS	1 Sep 93	
1	9	RAIL MAT	RAIL PLANGE P 65	2953 51	TONNE	21	SG				CIS	1 Sep 93	
1	10	RAIL MAT	BOLTS&NUTS P 50	11530-76	TONNE	21	SG				CIS	1 Sep 93	
1	11	RAIL MAT	BOLTS & NUTS P 65	11530 76	TONNE	10 5	SG				CIS	1 Sep 93	
1	12	RAIL MAT	LOCK WASHER P 50	19115 73	TONNE	8 4	SG				CIS	1 Sep 93	
1	13	RAIL MAT	TRACK SWITCH P50 RT		SET	7	SG				CIS	1 Sep 93	
1	14	RAIL MAT	TRACK SWITCH P65 LEFT		SET	7	SG				CIS	1 Sep 93	
1	15	RAIL MAT	Y RAIL P50 DIRECT LEFT		EA	3 5	SG				CIS	1 Sep 93	
1	16	RAIL MAT	Y RAIL P50 DIRECT RIGHT		EA	3 5	SG				CIS	1 Sep 93	
1	17	RAIL MAT	YRAIL P50-BENDED RIGHT		EA	3 5	SG				CIS	1 Sep 93	
1	18	RAIL MAT	RAIL INSOLATOR P50		SET	420	SG				CIS	1 Sep 93	
1	19	RAIL MAT	RAIL INSOLATOR P65		SET	385	SG				CIS	1 Sep 93	
1	20	RAIL MAT	CRESOTA SLEEPER		TONNE	7	SG				CIS	1 Sep 93	
1	21	RAIL MAT	TOTAL COST US DOLLARS				SG		$245 000		CIS	1 Sep 93	
1	1	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	SG				CIS	1 Sep 93	
1	2	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	SG				CIS	1 Sep 93	
1	3	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	SG				CIS	1 Sep 93	
1	4	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	SG				CIS	1 Sep 93	
1	5	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	SG				CIS	1 Sep 93	
1	6	RR COMM	SIGNAL CABLE	GOST6436 75	KM	2	SG				CIS	1 Sep 93	
1	7	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1 5	SG				CIS	1 Sep 93	
1	8	RR COMM	ROAD TRANSFORMER	NFT A	EA	15	SG				CIS	1 Sep 93	
1	9	RR COMM	ROAD TRANSPORMER	NOVC 5A	EA	15	SG				CIS	1 Sep 93	
1	10	RR COMM	SIGNAL TRANSFORMER	ST 6	EA	25	SG				CIS	1 Sep 93	
1	11	RR COMM	SWITCH RELAY	2162 00-V	EA	25	SG				CIS	1 Sep 93	
1	12	RR COMM	RECTIFIER	86-00-00V	EA	25	SG				CIS	1 Sep 93	
1	13	RR COMM	RESISTOR	7165	EA	25	SG				CIS	1 Sep 93	
1	14	RR COMM	SWITCHING GEAR BOX		EA	5	SG				CIS	1 Sep 93	
1	15	RR COMM	LAMPS FOR LINZ		EA	250	SG				CIS	1 Sep 93	
1	16	RR COMM	FRAMEWORK	19402 00-00	EA	5	SG				CIS	1 Sep 93	
1	17	RR COMM	BONDING WIRE	21 00-00	EA	25	SG				CIS	1 Sep 93	
1	18	RR COMM	CONTROL WIRE		EA	50	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	19	RR COMM	LAMPS FOR TERM BD		EA	500	SG				CIS	1 Sep 93	
1	20	RR COMM	SWITCHING RELAY SET	144690000A	EA	5	SG				CIS	1 Sep 93	
1	21	RR COMM	INST FOR ELEC MEAS		EA	5	SG				CIS	1 Sep 93	
1	22	RR COMM	RR LINZ LTS RED	26116-00 00	EA	25	SG				CIS	1 Sep 93	
1	23	RR COMM	RR LINZ LTS GREEN	26116-00-00	EA	25	SG				CIS	1 Sep 93	
1	24	RR COMM	RR LINZ LTS WHITE	26116 00-00	EA	20	SG				CIS	1 Sep 93	
1	25	RR COMM	ELECTROMOTOR		EA	10	SG				CIS	1 Sep 93	
1	26	RR COMM	SWITCHING ARM		EA	15	SG				CIS	1 Sep 93	
1	27	RR COMM	TOTAL COST US DOLLARS				SG		$6 000		CIS	1 Sep 93	
1	1	WATER P	PUMP CENTRIFUGE	SNC 180-65	EA	0 6	SG				CIS	1 Sep 93	
1	2	WATER P	PUMP CENTRIFUGE	D 1250 65	EA	0 6	SG				CIS	1 Sep 93	
1	3	WATER P	PUMP CENTRIFUGE	D 200 95	EA	0 6	SG				CIS	1 Sep 93	
1	4	WATER P	PUMP CENTRIFUGE	NSC 3	EA	1 2	SG				CIS	1 Sep 93	
1	5	WATER P	IMPELLOR		EA	1 8	SG				CIS	1 Sep 93	
1	6	WATER P	IMPELLOR	5KE 224 176A	EA	12	SG				CIS	1 Sep 93	
1	7	WATER P	SHAFT	8KE 200 525 01A	EA	3	SG				CIS	1 Sep 93	
1	8	WATER P	SHAFT	EB 205 320	EA	3	SG				CIS	1 Sep 93	
1	9	WATER P	SHAFT	EB 205 320	EA	3	SG				CIS	1 Sep 93	
1	10	WATER P	COLLAR	1 35 58 2 GOCT 8752 70	EA	6	SG				CIS	1 Sep 93	
1	11	WATER P	SPARING	8KE 211 023	EA	3 6	SG				CIS	1 Sep 93	
1	12	WATER P	BEARING	5KS 253 013	EA	3 6	SG				CIS	1 Sep 93	
1	13	WATER P	IMPELLOR	5KE 224 014	EA	3 6	SG				CIS	1 Sep 93	
1	14	WATER P	SPARING	8KS 210 095	EA	3 6	SG				CIS	1 Sep 93	
1	15	WATER P	COUPLING	8KS 255 000	EA	1 8	SG				CIS	1 Sep 93	
1	16	WATER P	PUMP	VKC 1/16	EA	1 2	SG				CIS	1 Sep 93	
1	17	WATER P	PUMP PART	0G 81/18	EA	0 6	SG				CIS	1 Sep 93	
1	18	WATER P	PUMP CENTRIFUGE	D 320-50	EA	0 6	SG				CIS	1 Sep 93	
1	19	WATER P	PUMP CENTRIFUGE	D 1250 65	EA	1 2	SG				CIS	1 Sep 93	
1	20	WATER P	PUMP PART	GNOM 10-10	EA	2 4	SG				CIS	1 Sep 93	
1	21	WATER P	PUMP PART	NSC 3	EA	0 6	SG				CIS	1 Sep 93	
1	22	WATER P	PUMP PART	FG 144/46	EA	1 2	SG				CIS	1 Sep 93	
1	23	WATER P	PUMP CENTRIFUGE	SHCGA 38 220	EA	1 2	SG				CIS	1 Sep 93	
1	24	WATER P	PUMP CENTRIFUGE	K 20-30	EA	4 8	SG				CIS	1 Sep 93	
1	25	WATER P	PUMP CENTRIFUGE	K 45/55	EA	2 4	SG				CIS	1 Sep 93	
1	26	WATER P	PUMP CENTRIFUGE	SNC 400-105	EA	0 6	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	27	WATER P	PUMP CENTRIFUGE	SNC 240-300	EA	0 6	SG				CIS	1 Sep 93	
1	28	WATER P	PUMP PART	ESB-6-16-75	EA	0 6	SG				CIS	1 Sep 93	
1	29	WATER P	PUMP PART	ESB-8-40-165	EA	1 2	SG				CIS	1 Sep 93	
1	30	WATER P	PUMP PART	ESB 10-120-60	EA	1 2	SG				CIS	1 Sep 93	
1	31	WATER P	PUMP PART	ESB 10-120 60	EA	3	SG				CIS	1 Sep 93	
1	32	WATER P	TOTAL COST US DOLLARS				SG		$150 000		CIS	1 Sep 93	
2	1	DRILL PARTS	TRACK PADS	31 001 008 34	SET	30	SG				CIS	1 Sep 93	
2	2	DRILL PARTS	TRACK RAILS	31 001 008 000	EA	1	SG				CIS	1 Sep 93	
2	3	DRILL PARTS	LEVELING JACKS	B59 14 240	EA	3 5	SG				CIS	1 Sep 93	
2	4	DRILL PARTS	SPROCKET	31C 152 012 06	EA	2	SG				CIS	1 Sep 93	
2	5	DRILL PARTS	SPROCKET	B59 14 052	EA	2	SG				CIS	1 Sep 93	
2	6	DRILL PARTS	SHOCK ABSORBER	B122 22 11 015	EA	5	SG				CIS	1 Sep 93	
2	7	DRILL PARTS	SHOCK ABSORBER	B122 22 00 155	EA	3	SG				CIS	1 Sep 93	
2	8	DRILL PARTS	COMPRESSOR SUPP	B122 0017 000	EA	0 5	SG				CIS	1 Sep 93	
2	9	DRILL PARTS	CARTRIDGE	10 10 080	EA	2	SG				CIS	1 Sep 93	
2	10	DRILL PARTS	DRILL STEEL	722 22 11 00	EA	2	SG				CIS	1 Sep 93	
2	11	DRILL PARTS	BUSHING	31 001 008 037	EA	30	SG				CIS	1 Sep 93	
2	12	DRILL PARTS	BUSHING	31 001 008 102	EA	30	SG				CIS	1 Sep 93	
2	13	DRILL PARTS	HYD DISTRIBUTOR	R102 A4 A222 50	EA	5	SG				CIS	1 Sep 93	
2	14	DRILL PARTS	HYD PUMP	61 12 22	EA	3	SG				CIS	1 Sep 93	
2	15	DRILL PARTS	3 SPEED MOTOR		EA	2 5	SG				CIS	1 Sep 93	
2	16	DRILL PARTS	PULL DOWN CABLE	3X50+1X16	M	300	SG				CIS	1 Sep 93	
2	17	DRILL PARTS	HYD PUMP	N 403E TY2 653260 70	EA	2 5	SG				CIS	1 Sep 93	
2	18	DRILL PARTS	HYD PUMP	BG 12 22 MI TY2 05	EA	5	SG				CIS	1 Sep 93	
2	19	DRILL PARTS	TOTAL COST US DOLLARS				SG		$150 000		CIS	1 Sep 93	
2	10	ELE MOTOR	EKG 8i & 4U SHOVEL	HOIST MOTOR	EA	10	SG				CIS	1 Jan 94	
2	11	ELE MOTOR	EKG 8i & 4U SHOVEL	VEN FAN MOTOR	EA	8	SG				CIS	1 Jan 94	
2	12	ELE MOTOR	EKG 8i & 4U SHOVEL	SW OIL PUMP MOT	EA	4	SG				CIS	1 Jan 94	
2	13	ELE MOTOR	EKG 8i & 4U SHOVEL	FAN M FOR GEN	EA	4	SG				CIS	1 Jan 94	
2	14	ELE MOTOR	EKG 8i & 4U SHOVEL	AIR COMP ELEC MO	EA	2	SG				CIS	1 Jan 94	
2	23	ELE MOTOR	MISC ELEC MOTORS	BAO 81 6 30KVT	EA	1	SG				CIS	1 Jan 94	
2	24	ELE MOTOR	MISC ELEC MOTORS	BAO 82 6 40KVT	EA	1	SG				CIS	1 Jan 94	
2	25	ELE MOTOR	MISC ELEC MOTORS	BAP 160M6 15KVT	EA	1	SG				CIS	1 Jan 94	
2	26	ELE MOTOR	MISC ELEC MOTORS	BAO 81 8Y2 22KVT	EA	1	SG				CIS	1 Jan 94	
2	27	ELE MOTOR	MISC ELEC MOTORS	WOUND MOTOR	EA	1	SG				CIS	1 Jan 94	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	28	ELE MOTOR	MISC ELEC MOTORS	HOIST	EA	1	SG				CIS	1 Jan 94	
2	29	ELE MOTOR	MISC ELEC MOTORS	A/C ELECT MOTOR	EA	5	SG				CIS	1 Jan 94	
2	30	ELE MOTOR	MISC ELEC MOTORS	A/C ELECT MOTOR	EA	1	SG				CIS	1 Jan 94	
2	34	ELE MOTOR	ELEC MOTORS	MTKE 4A33556YE	EA	1	SG				CIS	1 Jan 94	
2	35	ELE MOTOR	ELEC MOTORS	MTKE 4AM200M6YE	EA	2	SG				CIS	1 Jan 94	
2	36	ELE MOTOR	ELEC MOTORS	MTKE AO2 12/8/6/4	EA	1	SG				CIS	1 Jan 94	
2	40	ELEC EQUIP	TWO SHAFT MOTOR	DPE 52 60	EA	3	SG				CIS	1 Jan 94	
2	41	ELEC EQUIP	DC GENERATOR	VP 250M94	EA	1	SG				CIS	1 Jan 94	
2	42	ELEC EQUIP	HI VOLT/VACUM BREK	2KVE 6-630	EA	1	SG				CIS	1 Jan 94	
2	43	ELEC EQUIP	RING TYPE CURR REC	TK3 12 492	EA	2	SG				CIS	1 Jan 94	
2	45	ELEC EQUIP	GEN 30KW 115V 261 A	INDEP BOOSTER	EA	1	SG				CIS	1 Sep 93	
2	1	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	SG				CIS	1 Jan 94	
2	2	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	SG				CIS	1 Jan 94	
2	3	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	SG				CIS	1 Jan 94	
2	4	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	SG				CIS	1 Jan 94	
2	5	RR COMM	SIGNAL CABLE	GOST6436 75	KM	2	SG				CIS	1 Jan 94	
2	6	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	SG				CIS	1 Jan 94	
2	7	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1 5	SG				CIS	1 Jan 94	
2	8	RR COMM	ROAD TRANSFORMER	NFT A	EA	15	SG				CIS	1 Jan 94	
2	9	RR COMM	ROAD TRANSPORMER	NOVC 5A	EA	15	SG				CIS	1 Jan 94	
2	10	RR COMM	SIGNAL TRANSFORMER	ST 6	EA	25	SG				CIS	1 Jan 94	
2	11	RR COMM	SWITCH RELAY	2162 00 V	EA	25	SG				CIS	1 Jan 94	
2	12	RR COMM	RECTIFIER	86 00 00V	EA	25	SG				CIS	1 Jan 94	
2	13	RR COMM	RESISTOR	7165	EA	25	SG				CIS	1 Jan 94	
2	14	RR COMM	SWITCHING GEAR BOX		EA	5	SG				CIS	1 Jan 94	
2	15	RR COMM	LAMPS FOR LINZ		EA	250	SG				CIS	1 Jan 94	
2	16	RR COMM	FRAMEWORK	19402 00-00	EA	5	SG				CIS	1 Jan 94	
2	17	RR COMM	BONDING WIRE	21 00 00	EA	25	SG				CIS	1 Jan 94	
2	18	RR COMM	CONTROL WIRE		EA	50	SG				CIS	1 Jan 94	
2	19	RR COMM	LAMPS FOR TERM BD		EA	500	SG				CIS	1 Jan 94	
2	20	RR COMM	SWITCHING RELAY SET	144690000A	EA	5	SG				CIS	1 Jan 94	
2	21	RR COMM	INST FOR ELEC MEAS		EA	5	SG				CIS	1 Jan 94	
2	22	RR COMM	RR LINZ LTS RED	26116 00-00	EA	25	SG				CIS	1 Jan 94	
2	23	RR COMM	RR LINZ LTS GREEN	26116 00-00	EA	25	SG				CIS	1 Jan 94	
2	24	RR COMM	RR LINZ LTS WHITE	26116-00-00	EA	20	SG				CIS	1 Jan 94	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	25	RR COMM	ELECTROMOTOR		EA	10	SG				CIS	1 Jan 94	
2	26	RR COMM	SWITCHING ARM		EA	15	SG				CIS	1 Jan 94	
2	27	RR COMM	TOTAL COST US DOLLARS				SG		$6 000		CIS	1 Jan 94	
3	1	T130 DOZER	PACKING	2301103160 CBN 1	EA	5	SG				CIS	1 Sep 93	
3	2	T130 DOZER	THIMBLE ?	01466-2	EA	15	SG				CIS	1 Sep 93	
3	3	T130 DOZER	RINGS	51 03 115 CP	EA	15	SG				CIS	1 Sep 93	
3	4	T130 DOZER	CRANKSHAFT	16 03-126 CP	EA	1	SG				CIS	1 Sep 93	
3	5	T130 DOZER	CYLINDER	51 03-23	EA	15	SG				CIS	1 Sep 93	
3	6	T130 DOZER	HYDRALIC SEAL	700-40-2889	EA	7	SG				CIS	1 Sep 93	
3	7	T130 DOZER	FILTER	F A41 20 000 01 CP	EA	15	SG				CIS	1 Sep 93	
3	8	T130 DOZER	FILTER	A41 10 000 02 CP	EA	15	SG				CIS	1 Sep 93	
3	9	T130 DOZER	RING	40843	EA	15	SG				CIS	1 Sep 93	
3	10	T130 DOZER	PACKING	40269	EA	5	SG				CIS	1 Sep 93	
3	11	T130 DOZER	GEAR PINION	74116	EA	0	SG				CIS	1 Sep 93	
3	12	T130 DOZER	REDUCTION GEAR	17 76-8 CP	EA	0	SG				CIS	1 Sep 93	
3	13	T130 DOZER	FUEL INJECTORS	17 69 107 1 CP	EA	15	SG				CIS	1 Sep 93	
3	14	T130 DOZER	SPRAYER	14 69 117 1 CP	EA	15	SG				CIS	1 Sep 93	
3	15	T130 DOZER	PUMP	51 67 11 CP	EA	0	SG				CIS	1 Sep 93	
3	16	T130 DOZER	COMPRESSOR PIPING	92 000 06	EA	2	SG				CIS	1 Sep 93	
3	17	T130 DOZER	AIR INLET	N036 85 770	EA	1	SG				CIS	1 Sep 93	
3	18	T130 DOZER	WATER PUMP	16 8-140 CP	EA	2	SG				CIS	1 Sep 93	
3	19	T130 DOZER	OIL PUMP	29 09 124 CP	EA	2	SG				CIS	1 Sep 93	
3	20	T130 DOZER	HYDRALIC PUMP	NS 100A 3 P	EA	1	SG				CIS	1 Sep 93	
3	21	T130 DOZER	PUMP	NS 32 Y WP	EA	0	SG				CIS	1 Sep 93	
3	22	T130 DOZER	GEAR BOX	24 12 1 CP	EA	0	SG				CIS	1 Sep 93	
3	23	T130 DOZER	FILTER	A23 30 000 01	EA	8	SG				CIS	1 Sep 93	
3	24	T130 DOZER	PACKING SEALS	700-40 2049	EA	5	SG				CIS	1 Sep 93	
3	25	T130 DOZER	CARBURATOR	113-1107011	EA	2	SG				CIS	1 Sep 93	
3	26	T130 DOZER	SUPPORT BRACKET	51 07 102 CP	EA	1	SG				CIS	1 Sep 93	
3	27	T130 DOZER	ENGINE HEAD	07146-1 CP	EA	1	SG				CIS	1 Sep 93	
3	28	T130 DOZER	FUEL SYS CENTRIFUGE	95000	EA	1	SG				CIS	1 Sep 93	
3	29	T130 DOZER	FAN BLADES	51 08-113 CP	EA	1	SG				CIS	1 Sep 93	
3	30	T130 DOZER	RADIATOR	130Y 13 010-1	EA	2	SG				CIS	1 Sep 93	
3	31	T130 DOZER	BRAKE DISC	738-4 CP	EA	2	SG				CIS	1 Sep 93	
3	32	T130 DOZER	MAGNET SOLENOID	M149 A3	EA	2	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	33	T130 DOZER	STARTER	ST 230M	EA	2	SG				CIS	1 Sep 93	
3	34	T130 DOZER	GENERATOR	70-3701	EA	1	SG				CIS	1 Sep 93	
3	35	T130 DOZER	RELAY STARTER	RR 0362B1	EA	2	SG				CIS	1 Sep 93	
3	36	T130 DOZER	DISTRIBUTOR	R 150-A3T001	EA	0	SG				CIS	1 Sep 93	
3	37	T130 DOZER	DRIVE SHAFT	50-14 113	EA	0	SG				CIS	1 Sep 93	
3	38	T130 DOZER	CYLINDER POWER	18-26-270 CP	EA	1	SG				CIS	1 Sep 93	
3	39	T130 DOZER	CYLINDER	DP 26-C 06-140	EA	0	SG				CIS	1 Sep 93	
3	40	T130 DOZER	ELEMENT FILTER	EF 01 00 CP	EA	21	SG				CIS	1 Sep 93	
3	41	T130 DOZER	PUMP BRAKE	14 71 3 CP	EA	0	SG				CIS	1 Sep 93	
3	42	T130 DOZER	MECH	17 74 8 CP	EA	0	SG				CIS	1 Sep 93	
3	43	T130 DOZER	SUPPORT	17 74 284	EA	1	SG				CIS	1 Sep 93	
3	44	T130 DOZER	SHAFT	16 74 10 CP	EA	0	SG				CIS	1 Sep 93	
3	45	T130 DOZER	GEAR	17 01 22	EA	0	SG				CIS	1 Sep 93	
3	46	T130 DOZER	FRICTION CLUTCH PADS	24 16-101 CP	EA	1	SG				CIS	1 Sep 93	
3	47	T130 DOZER	SERVICE MECH	21 17 4 CP	EA	1	SG				CIS	1 Sep 93	
3	48	T130 DOZER	FAN BELT	18360-01 CP	EA	2	SG				CIS	1 Sep 93	
3	49	T130 DOZER	PULLEY WHEEL	24 21 146 CP	EA	1	SG				CIS	1 Sep 93	
3	50	T130 DOZER	DRIVE PULLEY	24 21 169 CP	EA	2	SG				CIS	1 Sep 93	
3	51	T130 DOZER	DOUBLE PULLEY	24 21 170 CP	EA	2	SG				CIS	1 Sep 93	
3	52	T130 DOZER	FILTER	A 410000-2	EA	2	SG				CIS	1 Sep 93	
3	53	T130 DOZER	IDLER PULLEY	24 21 171 CP	EA	2	SG				CIS	1 Sep 93	
3	54	T130 DOZER	FILTER	A 410000-A CP	EA	9	SG				CIS	1 Sep 93	
3	55	T130 DOZER	MIDDLE CUTTING EDGE	D3 110AXP 02 001 0	EA	0	SG				CIS	1 Sep 93	
3	56	T130 DOZER	END CUTTING EDGE RT	D661 02001 02	EA	0	SG				CIS	1 Sep 93	
3	57	T130 DOZER	END CUTTING EDGE LEFT	D661 02 002 02	EA	0	SG				CIS	1 Sep 93	
3	58	T130 DOZER	TRACK ASSEMBLY	24 22 1	SET	0	SG				CIS	1 Sep 93	
3	59	T130 DOZER	DEFLECTOR RK GUARD	2204	EA	30	SG				CIS	1 Sep 93	
3	60	T130 DOZER	DEFLECTOR RK GUARD	2205	EA	30	SG				CIS	1 Sep 93	
3	61	T130 DOZER	PACKING TRACKS ADJ	40201	EA	12	SG				CIS	1 Sep 93	
3	62	T130 DOZER	RING	40210	EA	3	SG				CIS	1 Sep 93	
3	63	T130 DOZER	CYLINDER PACKING	40944 CP	EA	8	SG				CIS	1 Sep 93	
3	64	T130 DOZER	CYLINDER	14 02 101 CP	EA	8	SG				CIS	1 Sep 93	
3	65	T130 DOZER	HEAD CYLINDER	16-02 106 CP	EA	3	SG				CIS	1 Sep 93	
3	66	T130 DOZER	VALVE	14-02 32	EA	2	SG				CIS	1 Sep 93	
3	67	T130 DOZER	VALVE	14 02 33 V	EA	2	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	68	T130 DOZER	PIPE	10663-1	EA	2	SG				CIS	1 Sep 93	
3	69	T130 DOZER	PIPE	10664 1	EA	2	SG				CIS	1 Sep 93	
3	70	T130 DOZER	GEARBOX	50-12 12 CP	EA	0	SG				CIS	1 Sep 93	
3	71	T130 DOZER	COUPLING	18-14 133 CP	EA	0	SG				CIS	1 Sep 93	
3	72	T130 DOZER	DISC	18-14 135 CP	EA	1	SG				CIS	1 Sep 93	
3	73	T130 DOZER	COUPLING	18-14 78	EA	0	SG				CIS	1-Sep 93	
3	74	T130 DOZER	COLLAR	3 48X28 6	EA	1	SG				CIS	1 Sep 93	
3	75	T130 DOZER	RING	N1 35X28 2	EA	1	SG				CIS	1 Sep 93	
3	76	T130 DOZER	DISC	24 16 103 CP	EA	2	SG				CIS	1 Sep 93	
3	77	T130 DOZER	PUMP	51 67 10 CP	EA	0	SG				CIS	1 Sep 93	
3	78	T130 DOZER	PISTON PUMP	16 67 102 CP	EA	5	SG				CIS	1 Sep 93	
3	79	T130 DOZER	PUMP PISTON	16-67 108 CP	EA	5	SG				CIS	1 Sep 93	
3	80	T130 DOZER	DISC	738 4 CP	EA	2	SG				CIS	1-Sep 93	
3	81	T130 DOZER	COUPLING	72118 CP	EA	1	SG				CIS	1-Sep 93	
3	82	T130 DOZER	RING	111 30 123 00	EA	3	SG				CIS	1 Sep 93	
3	83	T130 DOZER	ROTOR	92 55	EA	0	SG				CIS	1 Sep 93	
3	84	T130 DOZER	RADIATOR	21 09 1	EA	0	SG				CIS	1 Sep 93	
3	85	T130 DOZER	PUMP	51 67 11 CP	EA	0	SG				CIS	1 Sep 93	
3	86	T130 DOZER	TOTAL COST US DOLLARS				SG		$27 000		CIS	1 Sep 93	
3	1	T250 DOZER	LINK	748 22 132 CP	EA	20	SG				CIS	1 Sep 93	
3	2	T250 DOZER	LINK	748 22 133 CP	EA	20	SG				CIS	1 Sep 93	
3	3	T250 DOZER	LINK	748 22 134 CP	EA	20	SG				CIS	1 Sep 93	
3	4	T250 DOZER	END PIN	748 22 6	EA	200	SG				CIS	1 Sep 93	
3	5	T250 DOZER	HEAD LAMP SET	748 10-318 CP	EA	18	SG				CIS	1 Sep 93	
3	6	T250 DOZER	PACKING	748-18 234	EA	40	SG				CIS	1 Sep 93	
3	7	T250 DOZER	PACKING	748-18 229	EA	40	SG				CIS	1-Sep 93	
3	8	T250 DOZER	PACKING	748 18-229	EA	40	SG				CIS	1 Sep 93	
3	9	T250 DOZER	CROWN ?	748-19 1	EA	8	SG				CIS	1 Sep 93	
3	10	T250 DOZER	COUPLING	748-19 5	EA	4	SG				CIS	1-Sep 93	
3	11	T250 DOZER	GENERATOR	GNA 222 748-82 349 CP	EA	2	SG				CIS	1-Sep 93	
3	12	T250 DOZER	OIL PUMP	748-60-276-CP	EA	10	SG				CIS	1 Sep 93	
3	13	T250 DOZER	BRUSH	UG2A KG3 16X32X40	EA	72	SG				CIS	1-Sep 93	
3	14	T250 DOZER	BRUSH	UG2A K12 8 2X12 5X40X5	EA	36	SG				CIS	1 Sep 93	
3	15	T250 DOZER	DISTRIBUTOR	748 99 465 CP	EA	1	SG				CIS	1 Sep 93	
3	16	T250 DOZER	HYDROPUMP	933-02 06	EA	1	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	17	T250 DOZER	TOTAL COST US DOLLARS				SG		$45 000		CIS	1 Sep 93	
3	1	YM2 PARTS	CYLINDER	240H 1004008 D	EA	132	SG				CIS	1 Sep 93	
3	2	YM2 PARTS	CRANK SHAFT	240-1000107 B6	EA	4	SG				CIS	1 Sep 93	
3	3	YM2 PARTS	RINGS	236-1000106 B4	EA	132	SG				CIS	1 Sep 93	
3	4	YM2 PARTS	PACKING	240-1000104 B2	EA	10	SG				CIS	1 Sep 93	
3	5	YM2 PARTS	PACKING	240-1000104 P2	EA	5	SG				CIS	1 Sep 93	
3	6	YM2 PARTS	PACKING	240 1000104 P1	EA	5	SG				CIS	1 Sep 93	
3	7	YM2 PARTS	SEAL	240 1003213 A3	EA	100	SG				CIS	1 Sep 93	
3	8	YM2 PARTS	PUMP	240-1011014	EA	3	SG				CIS	1 Sep 93	
3	9	YM2 PARTS	ELEMENT	240-1017038	EA	500	SG				CIS	1 Sep 93	
3	10	YM2 PARTS	ELEMENT	238H 1109080	EA	50	SG				CIS	1 Sep 93	
3	11	YM2 PARTS	TURBOCOMPRESSOR	240H 1118010 B	EA	4	SG				CIS	1 Sep 93	
3	12	YM2 PARTS	TURBOCOMPRESSOR	240H 1118011B	EA	4	SG				CIS	1 Sep 93	
3	13	YM2 PARTS	BLOCK CYLINDER	240H 1002012H	EA	1	SG				CIS	1 Sep 93	
3	14	YM2 PARTS	PUMP	9016111008 02	EA	1	SG				CIS	1 Sep 93	
3	15	YM2 PARTS	SPRAY INJECTOR	26161112110	EA	60	SG				CIS	1 Sep 93	
3	16	YM2 PARTS	RING	236 1002024A	EA	100	SG				CIS	1 Sep 93	
3	17	YM2 PARTS	RING	236 1002040	EA	50	SG				CIS	1 Sep 93	
3	18	YM2 PARTS	ELEMENT FILTER	240T 1017040 A3	EA	100	SG				CIS	1 Sep 93	
3	19	YM2 PARTS	ELEMENT	201T 1105540	EA	100	SG				CIS	1 Sep 93	
3	20	YM2 PARTS	RINGS	236-1004002 A3	EA	48	SG				CIS	1 Sep 93	
3	21	YM2 PARTS	PACKING SEALS	240 1008098	EA	5	SG				CIS	1 Sep 93	
3	22	YM2 PARTS	PACKING SEALS	240T 1009040 A2	EA	5	SG				CIS	1 Sep 93	
3	23	YM2 PARTS	FUEL PUMP	1111008 20	EA	1	SG				CIS	1 Sep 93	
3	24	YM2 PARTS	ELEMENT	201 1117038 A2	EA	250	SG				CIS	1 Sep 93	
3	25	YM2 PARTS	PUMP	240-1307010-A	EA	2 5	SG				CIS	1 Sep 93	
3	26	YM2 PARTS	GENERATOR	45 7371 0209	EA	1 5	SG				CIS	1 Sep 93	
3	27	YM2 PARTS	STARTER	45 7375 1471	EA	1 5	SG				CIS	1 Sep 93	
3	28	YM2 PARTS	TOTAL COST US DOLLARS				SG		$12 500		CIS	1 Sep 93	
2	1	BELAZ	ENGINE	YM3 240N1000411B	SET	2	SG				Bel	1 Jan 94	
2	2	BELAZ	TRANSMISSION	GMP 548T 1700004	SET	3	SG				Bel	1 Jan 94	
2	3	BELAZ	CABIN	548T 5000012 50	SET	3	SG				Bel	1 Jan 94	
2	4	BELAZ	LAMPS	A 24 5 1	EA	1000	SG				Bel	1 Jan 94	
2	5	BELAZ	LAMPS	A 24 55X50	EA	500	SG				Bel	1 Jan 94	
2	6	BELAZ	LAMPS	A 24 60X40	EA	200	SG				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	7	BELAZ	BELT	1950/00368/	EA	60	SG				Bel	1 Jan 94	
2	8	BELAZ	PUMP	NS 50Y 3 T	EA	30	SG				Bel	1 Jan 94	
2	9	BELAZ	PUMP	NS 50Y 2 1	EA	30	SG				Bel	1 Jan 94	
2	10	BELAZ	SHIMMS	240-1000104B2	EA	15	SG				Bel	1 Jan 94	
2	11	BELAZ	SHIMMS	240-1000104B2R1	EA	15	SG				Bel	1 Jan 94	
2	12	BELAZ	SHIMMS	240-100010452R2	EA	10	SG				Bel	1 Jan 94	
2	13	BELAZ	RING SET	236-10000106-B4	EA	240	SG				Bel	1 Jan 94	
2	14	BELAZ	CRANK SHAFT	240-1000107B6	EA	10	SG				Bel	1 Jan 94	
2	15	BELAZ	PACKING	240 1002265	EA	40	SG				Bel	1 Jan 94	
2	16	BELAZ	CRANKCASE (OIL PAN)	240-1002310	EA	4	SG				Bel	1 Jan 94	
2	17	BELAZ	PACKING	240 1003240A3	EA	60	SG				Bel	1 Jan 94	
2	18	BELAZ	PACKING	240-1003213	EA	200	SG				Bel	1 Jan 94	
2	19	BELAZ	PACKING	240-1003270-B	EA	120	SG				Bel	1 Jan 94	
2	20	BELAZ	SET	240N 1004008-B	EA	120	SG				Bel	1 Jan 94	
2	21	BELAZ	LINER	240N 1004008	EA	60	SG				Bel	1 Jan 94	
2	22	BELAZ	COLLAR	236-1005160 A2	EA	30	SG				Bel	1 Jan 94	
2	23	BELAZ	RING	240-1005576	EA	80	SG				Bel	1 Jan 94	
2	24	BELAZ	RING	240-1005582B	EA	80	SG				Bel	1 Jan 94	
2	25	BELAZ	PACKING	240N 1008027	EA	100	SG				Bel	1 Jan 94	
2	26	BELAZ	PACKING	240T 1009040	EA	80	SG				Bel	1 Jan 94	
2	27	BELAZ	PUMP	240 1011014B	EA	15	SG				Bel	1 Jan 94	
2	28	BELAZ	ELEMENT	201T 1017038A	EA	1000	SG				Bel	1 Jan 94	
2	29	BELAZ	OIL CLEANER	236-1029240	EA	6	SG				Bel	1 Jan 94	
2	30	BELAZ	COLLAR	236-1029240	EA	20	SG				Bel	1 Jan 94	
2	31	BELAZ	SHAFT	240-1029336	EA	10	SG				Bel	1 Jan 94	
2	32	BELAZ	ELEMENT	201 1105538	EA	1000	SG				Bel	1 Jan 94	
2	33	BELAZ	ELEMENT	238N 1109080	EA	200	SG				Bel	1 Jan 94	
2	34	BELAZ	PUMP	9016-11110082	EA	4	SG				Bel	1 Jan 94	
2	35	BELAZ	PLUNGER	PARA 60-1111073	EA	60	SG				Bel	1 Jan 94	
2	36	BELAZ	SPRAYER	261 1112110	EA	120	SG				Bel	1 Jan 94	
2	37	BELAZ	ELEMENT	201 1117038-A2	EA	1000	SG				Bel	1 Jan 94	
2	38	BELAZ	TURBOCOMPRESSOR	240N 1118010B	EA	10	SG				Bel	1 Jan 94	
2	39	BELAZ	TURBOCOMPRESSOR	240N 1118011B	EA	10	SG				Bel	1 Jan 94	
2	40	BELAZ	RING	240N 1118106	EA	120	SG				Bel	1 Jan 94	
2	41	BELAZ	FLANGE	240N 1118272	EA	20	SG				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	42	BELAZ	COVER	240N 1116280-B	EA	20	SG				Bel	1 Jan 94	
2	43	BELAZ	BELT	1735/256421 1413	EA	60	SG				Bel	1 Jan 94	
2	44	BELAZ	RADIATOR	548A 1301010	EA	10	SG				Bel	1 Jan 94	
2	45	BELAZ	PIPE	240-1303100-V2	EA	6	SG				Bel	1 Jan 94	
2	46	BELAZ	PIPE	240-1303101 V2	EA	6	SG				Bel	1 Jan 94	
2	47	BELAZ	GEARS	7523 1731002	EA	4	SG				Bel	1 Jan 94	
2	48	BELAZ	AXLE	540-1731030-20	EA	10	SG				Bel	1 Jan 94	
2	49	BELAZ	AXLE	548A 1731101 01	EA	6	SG				Bel	1 Jan 94	
2	50	BELAZ	CROSSET	540-2201025 02	EA	20	SG				Bel	1 Jan 94	
2	51	BELAZ	SHAFT	548T 2208010	EA	4	SG				Bel	1 Jan 94	
2	52	BELAZ	SHAFT	7523 2201010	EA	6	SG				Bel	1 Jan 94	
2	53	BELAZ	SHAFT	540T 2208117	EA	40	SG				Bel	1 Jan 94	
2	54	BELAZ	TRANSMISSION	548 2402010-11	EA	2	SG				Bel	1 Jan 94	
2	55	BELAZ	BUMPER	7523 2803010	EA	4	SG				Bel	1 Jan 94	
2	56	BELAZ	CYLINDER	540-2917056 31	EA	20	SG				Bel	1 Jan 94	
2	57	BELAZ	CYLINDER	548 2917020 11	EA	6	SG				Bel	1 Jan 94	
2	58	BELAZ	SHIFTING FORK	540-2919412 23	EA	6	SG				Bel	1 Jan 94	
2	59	BELAZ	PIN	540M 2919426	EA	10	SG				Bel	1 Jan 94	
2	60	BELAZ	ROD	540 2919429 30	EA	6	SG				Bel	1 Jan 94	
2	61	BELAZ	SEAL	540 2919440 B1	EA	60	SG				Bel	1 Jan 94	
2	62	BELAZ	RING	7540-2919442	EA	40	SG				Bel	1 Jan 94	
2	63	BELAZ	ROD	7548-2919016 01	EA	10	SG				Bel	1 Jan 94	
2	64	BELAZ	SPACERS	548 3001016	EA	30	SG				Bel	1 Jan 94	
2	65	BELAZ	SPACERS	548 3001017	EA	30	SG				Bel	1 Jan 94	
2	66	BELAZ	SPACERS	548 3001026	EA	30	SG				Bel	1 Jan 94	
2	67	BELAZ	PULLEY	540-3003052	EA	6	SG				Bel	1 Jan 94	
2	68	BELAZ	BOOSTER	525 3405010-06	EA	6	SG				Bel	1 Jan 94	
2	69	BELAZ	SET	7522 3405155	EA	10	SG				Bel	1 Jan 94	
2	70	BELAZ	PACKING	548-3501105	EA	240	SG				Bel	1 Jan 94	
2	71	BELAZ	PIPE	540T 3506060-01	EA	20	SG				Bel	1 Jan 94	
2	72	BELAZ	BRAKE PLATE	549A 3507015	EA	60	SG				Bel	1 Jan 94	
2	73	BELAZ	COMPRESSOR	540T 3509015	EA	10	SG				Bel	1 Jan 94	
2	74	BELAZ	RING	130-35L 167	EA	40	SG				Bel	1 Jan 94	
2	75	BELAZ	REGULATOR	11 3512010	EA	8	SG				Bel	1 Jan 94	
2	76	BELAZ	COLLAR	540-3519137 B	EA	40	SG				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	77	BELAZ	CYLINDER	540M 3519310	EA	10	SG				Bel	1 Jan 94	
2	78	BELAZ	BRUSHHOLDER	G263A 3701010	EA	20	SG				Bel	1 Jan-94	
2	79	BELAZ	LOCK	856-3708000	EA	20	SG				Bel	1 Jan 94	
2	80	BELAZ	RELE STARTER	RC103 37078000	EA	10	SG				Bel	1 Jan 94	
2	81	BELAZ	STARTER	45 7375 1451	EA	6	SG				Bel	1 Jan 94	
2	82	BELAZ	VOLTAGE REGULATOR	21 3702	EA	20	SG				Bel	1 Jan 94	
2	83	BELAZ	SOLENOID	CT103 3708120-150	EA	20	SG				Bel	1 Jan 94	
2	84	BELAZ	ROTOR	25 3708200	EA	10	SG				Bel	1 Jan 94	
2	85	BELAZ	EQUALIZER BAR	25 3708320	EA	12	SG				Bel	1 Jan 94	
2	86	BELAZ	SWITCH	P602 3709210	EA	10	SG				Bel	1 Jan 94	
2	87	BELAZ	LIGHT SET	122 3711010-BV	EA	30	SG				Bel	1 Jan 94	
2	88	BELAZ	LIGHT SET	6-3711000KT	EA	30	SG				Bel	1 Jan 94	
2	89	BELAZ	FILTER ELEMENT	140-37112000-01	EA	30	SG				Bel	1 Jan 94	
2	90	BELAZ	INST LIGHTS	130-3712010-B	EA	20	SG				Bel	1 Jan 94	
2	91	BELAZ	INST LIGHTS	130 3716010 V	EA	15	SG				Bel	1 Jan 94	
2	92	BELAZ	INST LIGHTS	130-3716010 G	EA	15	SG				Bel	1 Jan 94	
2	93	BELAZ	REFLECTOR	FN 130 3716210	EA	20	SG				Bel	1 Jan 94	
2	94	BELAZ	REFLECTOR	FN 130 3716210B	EA	20	SG				Bel	1 Jan 94	
2	95	BELAZ	SIGNAL	C40-3721000	EA	12	SG				Bel	1 Jan 94	
2	96	BELAZ	ENGINE DIP STICKS	YP101 3726000-V1T	EA	30	SG				Bel	1 Jan 94	
2	97	BELAZ	SWITCH	P145 3726000T	EA	20	SG				Bel	1 Jan 94	
2	98	BELAZ	RELAY	RC 951A 3726010 70	EA	12	SG				Bel	1 Jan 94	
2	99	BELAZ	SENSOR	MM355 3829010	EA	20	SG				Bel	1 Jan 94	
2	100	BELAZ	HYDRALICK JACK	11107 39103010	EA	10	SG				Bel	1 Jan 94	
2	101	BELAZ	GLASS	540-5206010-10	EA	20	SG				Bel	1 Jan 94	
2	102	BELAZ	WINDOW HANDLES	81 6104013-B	EA	10	SG				Bel	1 Jan 94	
2	103	BELAZ	MIRROR	5040-8201015 01	EA	30	SG				Bel	1 Jan 94	
2	104	BELAZ	HOOD	7523 8402012	EA	6	SG				Bel	1 Jan 94	
2	105	BELAZ	HOOD	548A 8402411	EA	4	SG				Bel	1 Jan 94	
2	106	BELAZ	FENDERS	548A 840-3010	EA	4	SG				Bel	1 Jan 94	
2	107	BELAZ	GENERATOR	G263A 457371 1487	EA	6	SG				Bel	1 Jan 94	
2	108	BELAZ	STARTER	G263A	EA	10	SG				Bel	1 Jan 94	
2	109	BELAZ	ELECTROMOTOR	MN 1	EA	10	SG				Bel	1 Jan 94	
2	110	BELAZ	LAMPA	A24 1	EA	1000	SG				Bel	1 Jan 94	
2	111	BELAZ	LAMPA	A24 21 5	EA	1000	SG				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS

TOTAL COST - US DOLLARS $5 423 671

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	6	BULLDOZER	CAT D 10 BULLDOZER		EA	1	SO	$638 900	$638 900		USA	1 Sep 93	
1	37	DRILLS	160mm				SO	$300 000	$300 000		USA	1 Jan 94	
1	18	FEL	CAT992C FRONT END LOADER		EA	1	SO	$977 672	$977 672		USA	1-Sep-93	
1	11	FUEL TRUCK	FUEL & LUBE TRUCK		EA	1	SO	$90 275	$90 275		USA	1 Sep 93	
1	3	GRADER	CAT 16G MOTORGRADER		EA	1	SO	$385 000	$385 000		USA	1 Sep 93	
1	15	HAUL TRUCK	85 90 TON AHUL TRUCKS		EA	10	SO	$672 750	$6 727 500		USA	1 Sep 93	
1	14	TIRE TRUCK	TIRE HANDLING TRUCK		EA	1	SO	$79 925	$79 925		USA	1 Sep 93	
1	20	TRUCK	3 TON FLATBED FOR PERSONNEL TRANS		EA	1	SO	$40 250	$40 250		USA	1 Sep 93	
1	149	TRUCK TIRE	12x20x16 PLY/W TUBES		EA	20	SO	341 4	$6 828		USA	1 Sep 93	
1	62	WIRE ROPE	39mm (1 5) 4 2 Kg/M 10 TONNE		FT	4 417	SO	$2 31	$10 203		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	66	WIRE ROPE	30mm (1 25) 4 0 Kg/M 5 TONNE		FT	318	SO	$1 73	$550		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	154	BATTERIES	6 CT 132 AMP/HR 12V		EA	20	SO	169 6	$3 392		USA	1 Sep 93	
2	159	BATTERIES	6 CT 182 AMP/HR 12V		EA	20	SO	204 06	$4 081		USA	1 Jan 94	
1	1	WATER P	PUMP CENTRIFUGE	SNC 180-65	EA	0 4	SO				CIS	1 Sep 93	
1	2	WATER P	PUMP CENTRIFUGE	D 1250 65	EA	0 4	SO				CIS	1 Sep 93	
1	3	WATER P	PUMP CENTRIFUGE	D 200 95	EA	0 4	SO				CIS	1 Sep 93	
1	4	WATER P	PUMP CENTRIFUGE	NSC 3	EA	0 8	SO				CIS	1 Sep 93	
1	5	WATER P	IMPELLOR		EA	1 2	SO				CIS	1 Sep 93	
1	6	WATER P	IMPELLOR	5KE 224 176A	EA	8	SO				CIS	1 Sep 93	
1	7	WATER P	SHAFT	8KE 200 525 01A	EA	2	SO				CIS	1 Sep 93	
1	8	WATER P	SHAFT	EB 205 320	EA	2	SO				CIS	1 Sep 93	
1	9	WATER P	SHAFT	EB 205 320	EA	2	SO				CIS	1 Sep 93	
1	10	WATER P	COLLAR	1 35 58 2 GOCT 8752 70	EA	4	SO				CIS	1-Sep 93	
1	11	WATER P	SPARING	8KE 211 023	EA	2 4	SO				CIS	1 Sep 93	
1	12	WATER P	BEARING	5KS 253 013	EA	2 4	SO				CIS	1 Sep 93	
1	13	WATER P	IMPELLOR	5KE 224 014	EA	2 4	SO				CIS	1 Sep 93	
1	14	WATER P	SPARING	8KS 210 095	EA	2 4	SO				CIS	1 Sep 93	
1	15	WATER P	COUPLING	8KS 255 000	EA	1 2	SO				CIS	1 Sep 93	
1	16	WATER P	PUMP	VKC 1/16	EA	0 8	SO				CIS	1 Sep 93	
1	17	WATER P	PUMP PART	0G 81/18	EA	0 4	SO				CIS	1 Sep 93	
1	18	WATER P	PUMP CENTRIFUGE	D 320 50	EA	0 4	SO				CIS	1 Sep 93	
1	19	WATER P	PUMP CENTRIFUGE	D 1250-65	EA	0 8	SO				CIS	1 Sep 93	
1	20	WATER P	PUMP PART	GNOM 10-10	EA	1 6	SO				CIS	1 Sep-93	
1	21	WATER P	PUMP PART	NSC 3	EA	0 4	SO				CIS	1 Sep 93	
1	22	WATER P	PUMP PART	FG 144/46	EA	0 8	SO				CIS	1 Sep 93	
1	23	WATER P	PUMP CENTRIFUGE	SHCGA 38-220	EA	0 8	SO				CIS	1 Sep 93	
1	24	WATER P	PUMP CENTRIFUGE	K 20-30	EA	3 2	SO				CIS	1 Sep 93	
1	25	WATER P	PUMP CENTRIFUGE	K 45/55	EA	1 6	SO				CIS	1 Sep 93	
1	26	WATER P	PUMP CENTRIFUGE	SNC 400-105	EA	0 4	SO				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	27	WATER P	PUMP CENTRIFUGE	SNC 240-300	EA	0 4	SO				CIS	1 Sep 93	
1	28	WATER P	PUMP PART	ESB-6-16-75	EA	0 4	SO				CIS	1 Sep 93	
1	29	WATER P	PUMP PART	ESB 8-40-165	EA	0 8	SO				CIS	1 Sep 93	
1	30	WATER P	PUMP PART	ESB-10 120-60	EA	0 8	SO				CIS	1 Sep 93	
1	31	WATER P	PUMP PART	ESB 10-120-60	EA	2	SO				CIS	1 Sep 93	
1	32	WATER P	TOTAL COST US DOLLARS				SO		$100 000		CIS	1 Sep 93	
2	1	SM ENG PTS	ENGINE	D160	SET	0 75	SO				CIS	1 Sep 93	
2	2	SM ENG PTS	COTTER PINS	1434	EA	12	SO				CIS	1 Sep 93	
2	3	SM ENG PTS	COTTER PINS	2971	EA	12	SO				CIS	1 Sep 93	
2	4	SM ENG PTS	BLOCK ENGINE	51 01 2 cb	EA	0 75	SO				CIS	1 Sep 93	
2	5	SM ENG PTS	PACKING	40201	EA	2 5	SO				CIS	1 Sep 93	
2	6	SM ENG PTS	RINGS	40210	EA	25	SO				CIS	1 Sep 93	
2	7	SM ENG PTS	PACKING SETS UPPER	A 230113160 cbn1	SET	5	SO				CIS	1 Sep 93	
2	8	SM ENG PTS	PACKINGSETS LOWER	A230110311	SET	5	SO				CIS	1 Sep 93	
2	9	SM ENG PTS	PACKING SETS	A23 0110312 AN2	SET	5	SO				CIS	1 Sep 93	
2	10	SM ENG PTS	PACKING	14 02 101 cb	EA	5	SO				CIS	1 Sep 93	
2	11	SM ENG PTS	ENGINE REBUILD KIT	1 02 10 cp	SET	1	SO				CIS	1 Sep 93	
2	12	SM ENG PTS	GUSHING	03325	EA	2 5	SO				CIS	1 Sep 93	
2	13	SM ENG PTS	PACKING UPPER	023 02 10002 AN1	SET	5	SO				CIS	1 Sep 93	
2	14	SM ENG PTS	PACKING LOWER	A23 0 10004 DN1	ET	5	SO				CIS	1 Sep 93	
2	15	SM ENG PTS	RING SETS	A27 00 011	SET	7 5	SO				CIS	1 Sep 93	
2	16	SM ENG PTS	RING SETS	027 00 024	SET	7 5	SO				CIS	1 Sep 93	
2	17	SM ENG PTS	RING SETS	A27 00 043	SET	7 5	SO				CIS	1 Sep 93	
2	18	SM ENG PTS	PISTON RING SETS	03694 1 cp	SET	1	SO				CIS	1 Sep 93	
2	19	SM ENG PTS	GENERATOR BELT	5X9X1090	EA	5	SO				CIS	1 Sep 93	
2	20	SM ENG PTS	FAN BELTS	16X11X1650	EA	5	SO				CIS	1 Sep 93	
2	21	SM ENG PTS	WATER PUMP	16 08 140 cp	EA	2 5	SO				CIS	1 Sep 93	
2	22	SM ENG PTS	OIL PUMP	29 09 124 cp	EA	2	SO				CIS	1 Sep 93	
2	23	SM ENG PTS	CYLINDER LINER	01466	EA	3	SO				CIS	1 Sep 93	
2	24	SM ENG PTS	RING SETS	51 03 115 cp	EA	25	SO				CIS	1 Sep 93	
2	25	SM ENG PTS	CRANKSHAFT	16 03 1120 cp	EA	1	SO				CIS	1 Sep 93	
2	26	SM ENG PTS	PISTON	51 03 103	SET	2 5	SO				CIS	1 Sep 93	
2	27	SM ENG PTS	PACKING	700-40-2886	EA	5	SO				CIS	1 Sep 93	
2	28	SM ENG PTS	FILTER	A41 20 000 1 cp	EA	10	SO				CIS	1 Sep 93	
2	29	SM ENG PTS	FILTER	A41 10 000-02	EA	10	SO				CIS	1 Sep 93	
2	30	SM ENG PTS	RING	40843	EA	25	SO				CIS	1 Sep 93	
2	31	SM ENG PTS	PACKING	40269	EA	2 5	SO				CIS	1 Sep 93	
2	32	SM ENG PTS	SPRAYER	14 69 107 1 cp	EA	25	SO				CIS	1 Sep 93	
2	33	SM ENG PTS	INJECTOR FITTINGS	14 69 117 1 cp	EA	25	SO				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	34	SM ENG PTS	CYLINDER HEAD	29 02 30 cp	EA	0 75	SO				CIS	1 Sep 93	
2	35	SM ENG PTS	STARTER	1723 cp	EA	0 75	SO				CIS	1 Sep 93	
2	36	SM ENG PTS	RADIATOR	1304130101 cp	EA	2 5	SO				CIS	1 Sep 93	
2	37	SM ENG PTS	MAGNETO	M 149A	EA	2 5	SO				CIS	1 Sep 93	
2	38	SM ENG PTS	CARBURATOR	113 110-70-11	EA	2 5	SO				CIS	1 Sep 93	
2	39	SM ENG PTS	GENERATOR	69 063701	EA	2	SO				CIS	1 Sep 93	
2	40	SM ENG PTS	STARTER	CT 230E	EA	2	SO				CIS	1 Sep 93	
2	41	SM ENG PTS	TRUBO COMPRESSOR	111 30 001 10	EA	1 5	SO				CIS	1 Sep 93	
2	42	SM ENG PTS	FUEL SYSTEM UPPER	16 67 1 cp	EA	1 5	SO				CIS	1 Sep 93	
2	43	SM ENG PTS	TOTAL COST US DOLLARS				SO		$30 000		CIS	1 Sep 93	
3	1	T250 DOZER	CUTTING EDGES	D3 132 T 0200T	EA	4	SO				CIS	1 Sep 93	
3	2	T250 DOZER	CUTTING EDGES	D3 132 1 02002	EA	4	SO				CIS	1 Sep 93	
3	3	T250 DOZER	CUTTING EDGES	D3 59XL 0T00030	EA	2	SO				CIS	1 Sep 93	
3	4	T250 DOZER	CUTTING EDGES	D3-TT8 TO OOT	EA	2	SO				CIS	1 Sep 93	
3	5	T250 DOZER	TOTAL COST US DOLLARS				SO		$45 000		CIS	1 Sep 93	

TOTAL COST - US DOLLARS $9 439 577

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORIT NUM	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	155	BATTERIES	6 CT 132 AMP/HR 12V		EA	60	AD	169 6	$10 176		USA	1 Sep 93	
1	160	BATTERIES	6 CT 182 AMP/HR 12V		EA	60	AD	204 06	$12 244		USA	1 Jan 94	
2	63	WIRE ROPE	39mm (1 5) 4 2 Kg/M 10 TONNE		FT	4 417	AD	$2 31	$10 203		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	2	T250 DOZER	TRACK ASSEMBLEY	748 27 TOT CP	SET	2	AD				CIS	1 Sep 93	
2	1	T250 DOZER	HOSE	700 40-3505	EA	2	AD				CIS	1 Sep 93	
2	3	T250 DOZER	PINS TRACK	748 22 6	EA	10	AD				CIS	1 Sep 93	
2	4	T250 DOZER	REGULATOR RELAY		EA	2	AD				CIS	1 Sep 93	
2	5	T250 DOZER	ELEMENT	CB 3329 00-6G	EA	48	AD				CIS	1 Sep 93	
2	6	T250 DOZER	PUMP	933 02 06	EA	1	AD				CIS	1 Sep 93	
2	7	T250 DOZER	FILTER HOUSING	748-05 T20 CP	EA	2	AD				CIS	1 Sep 93	
2	8	T250 DOZER	FILTER HOUSING	748-65 272 CP	EA	2	AD				CIS	1 Sep 93	
2	9	T250 DOZER	ELEMENT	54 57 020A	EA	10	AD				CIS	1 Sep 93	
2	10	T250 DOZER	PUMP	BNK 12	EA	2	AD				CIS	1 Sep 93	
2	11	T250 DOZER	TOTAL COST US DOLLARS				AD		$45 000		CIS	1 Sep 93	

TOTAL COST US DOLLARS $77 623

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	156	BATTERIES	6 CT 132 AMP/HR 12V		EA	20	OT	169 6	$3 392		USA	1 Sep 93	
1	161	BATTERIES	6 CT 182 AMP/HR 12V		EA	20	OT	204 06	$4 081		USA	1 Jan 94	
1	150	TRUCK TIRE	12x20x16 PLY/W TUBES		EA	140	OT	341 4	$47 796		USA	1 Sep 93	
1	67	WIRE ROPE	30mm (1 25) 4 0 Kg/M 5 TONNE		FT	318	OT	$1 73	$550		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	1	KRAZ	ENGINE	238M 1000186	EA	4 8	OT				URK	1 Sep 93	
2	2	KRAZ	SHIM	238 1000102 B2R1	EA	25 6	OT				URK	1 Sep 93	
2	3	KRAZ	SHIM	238 1000102 B2	EA	25 6	OT				URK	1 Sep 93	
2	4	KRAZ	SHIM	23831000104 V2	EA	25 6	OT				URK	1 Sep 93	
2	5	KRAZ	CLIPS	256 1001005 A1	EA	40	OT				URK	1 Sep 93	
2	6	KRAZ	ENG RING SETS	236 1000106 B2	EA	160	OT				URK	1 Sep 93	
2	7	KRAZ	ENG MOUNTS	236 1001008 01	EA	24	OT				URK	1 Sep 93	
2	8	KRAZ	SHAFT	2383 1000107 V2	EA	6 4	OT				URK	1 Sep 93	
2	9	KRAZ	BLOCK	238 1002012 B2	EA	3 2	OT				URK	1 Sep 93	
2	10	KRAZ	RING	236 100202 A	EA	40	OT				URK	1 Sep 93	
2	11	KRAZ	RING	236-1002040	EA	32	OT				URK	1 Sep 93	
2	12	KRAZ	OIL INS	236 1002272	EA	8	OT				URK	1 Sep 93	
2	13	KRAZ	PIPE	238-1003290 V	EA	8	OT				URK	1 Sep 93	
2	14	KRAZ	PIPE	238 1003291 V	EA	8	OT				URK	1 Sep 93	
2	15	KRAZ	CYL WIPER COLLAR	236-1002314 B	EA	32	OT				URK	1 Sep 93	
2	16	KRAZ	HEAD C76G	238 1003013 D	EA	8	OT				URK	1 Sep 93	
2	17	KRAZ	RING	237 1003114 V	EA	8	OT				URK	1 Sep 93	
2	18	KRAZ	PACKING	238-1003210 V2	EA	80	OT				URK	1 Sep 93	
2	19	KRAZ	PACKING	238 1003270	EA	80	OT				URK	1 Sep 93	
2	20	KRAZ	LINER CYLINDER	236 1004008	EA	128	OT				URK	1 Sep 93	
2	21	KRAZ	ROCKER ARM	236 1004045 V2	EA	32	OT				URK	1 Sep 93	
2	22	KRAZ	RING	400-1004030 80	EA	32	OT				URK	1 Sep 93	
2	23	KRAZ	SEAL	201 1005034 B3	EA	32	OT				URK	1 Sep 93	
2	24	KRAZ	GEAR	236-1005030-A	EA	32	OT				URK	1 Sep 93	
2	25	KRAZ	COLLAR	236-1005160-A2	EA	80	OT				URK	1 Sep 93	
2	26	KRAZ	SHAFT	238 1006015 G2	EA	1 6	OT				URK	1 Sep 93	
2	27	KRAZ	SPACERS	236-1006026-AR	EA	48	OT				URK	1 Sep 93	
2	28	KRAZ	SPACERS	236-1006037 AR	EA	38 4	OT				URK	1 Sep 93	
2	29	KRAZ	VALVE	236-1007010-V	EA	40	OT				URK	1 Sep 93	
2	30	KRAZ	VALVE	236-1007015 V4	EA	40	OT				URK	1 Sep 93	
2	31	KRAZ	ROD PUSH	236 1007176-A	EA	33 6	OT				URK	1 Sep 93	
2	32	KRAZ	PACKING	236-1008050	EA	40	OT				URK	1 Sep 93	
2	33	KRAZ	PACKING	238T 1009040	EA	40	OT				URK	1 Sep 93	
2	34	KRAZ	PUMP	236-1011014 V3	EA	8	OT				URK	1 Sep 93	
2	35	KRAZ	RADIATOR	157 1013010-A	EA	8	OT				URK	1 Sep 93	
2	36	KRAZ	EXHAUST PIPE	256B 1013408 B	EA	12 8	OT				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	37	KRAZ	ELEMENT FILTER	201T 1105540	EA	480	OT				URK	1 Sep 93	
2	38	KRAZ	PUMP	240-1106210	EA	8	OT				URK	1 Sep 93	
2	39	KRAZ	PUMP	236T1106288-A2	EA	8	OT				URK	1 Sep 93	
2	40	KRAZ	COLLAR	236-102940	EA	80	OT				URK	1 Sep 93	
2	41	KRAZ	1/2 HUB COUPLING	236 1029268 B	EA	4	OT				URK	1 Sep 93	
2	42	KRAZ	PIPE	236-1104308-V	EA	16	OT				URK	1 Sep 93	
2	43	KRAZ	PUMP	8006-1111005	EA	4 8	OT				URK	1 Sep 93	
2	44	KRAZ	PLUNGER RODS	60 1111074 01	EA	120	OT				URK	1 Sep 93	
2	45	KRAZ	INJECTOR	2606-1112010 02	EA	224	OT				URK	1 Sep 93	
2	46	KRAZ	SPRAYER	26 111211	EA	224	OT				URK	1 Sep 93	
2	47	KRAZ	FILTER	201T 1117038	EA	160	OT				URK	1 Sep 93	
2	48	KRAZ	COUPLING	09000 1121010 000	EA	1 6	OT				URK	1 Sep 93	
2	49	KRAZ	MUFFLER	256 1201010	EA	8	OT				URK	1 Sep 93	
2	50	KRAZ	PACKING	256B 1203002	EA	80	OT				URK	1 Sep 93	
2	51	KRAZ	SLEEVE	256 B1 1203096	EA	20	OT				URK	1 Sep 93	
2	52	KRAZ	PACKING	256B 1203039	EA	32	OT				URK	1 Sep 93	
2	53	KRAZ	RADIATOR	256B 1301008 10	EA	16	OT				URK	1 Sep 93	
2	54	KRAZ	ENG MOUNTS	256-1302025	EA	8	OT				URK	1 Sep 93	
2	55	KRAZ	ENG/ MOUNTS	256 1302139	EA	8	OT				URK	1 Sep 93	
2	56	KRAZ	RODS	214B 1303010	EA	24	OT				URK	1 Sep 93	
2	57	KRAZ	RODS	255 1303012	EA	16	OT				URK	1 Sep 93	
2	58	KRAZ	EXHAUST PIPE	256-1303016	EA	4 8	OT				URK	1 Sep 93	
2	59	KRAZ	PUMP	236-1307010 A3	EA	20	OT				URK	1 Sep 93	
2	60	KRAZ	SET	236-1307029 A	EA	40	OT				URK	1 Sep 93	
2	61	KRAZ	COLLAR	236-1307090	EA	64	OT				URK	1 Sep 93	
2	62	KRAZ	BELTS	25 6411 1404	EA	160	OT				URK	1 Sep 93	
2	63	KRAZ	BELTS	6421 1403	EA	160	OT				URK	1 Sep 93	
2	64	KRAZ	MOTOR	236-1308011 G2	EA	4 8	OT				URK	1 Sep 93	
2	65	KRAZ	DISCS	238-1601690 G	EA	8	OT				URK	1 Sep 93	
2	66	KRAZ	DISCS	238 1601094	EA	8	OT				URK	1 Sep 93	
2	67	KRAZ	DISCS	238-1601130-B	EA	8	OT				URK	1 Sep 93	
2	68	KRAZ	DISCS	238-1601131	EA	12	OT				URK	1 Sep 93	
2	69	KRAZ	BRAKE FRICTION PLATE	236-1601138 A3	EA	40	OT				URK	1 Sep 93	
2	70	KRAZ	COUPLING	236-1601180-B2	EA	8	OT				URK	1 Sep 93	
2	71	KRAZ	GEAR BOX	236NT 1700003	EA	6 4	OT				URK	1 Sep 93	
2	72	KRAZ	BOX	257 18000020-V2	EA	1 6	OT				URK	1 Sep 93	
2	73	KRAZ	BOX	256-1800020-V2	EA	1 6	OT				URK	1 Sep 93	
2	74	KRAZ	HEAD CROSS	131 2201025 A	EA	16	OT				URK	1 Sep 93	
2	75	KRAZ	SHAFT	527 2202010-16	EA	6 4	OT				URK	1 Sep 93	
2	76	KRAZ	DRIVE SHAFT	210G 2202045 04	EA	6 4	OT				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	77	KRAZ	SHAFT	210G 2204010-16	EA	6 4	OT				URK	1 Sep 93	
2	78	KRAZ	SUPPORT	210-2204080 B2	EA	8	OT				URK	1 Sep 93	
2	79	KRAZ	REAR DRIVE AXLE	255P 2400015 02	EA	8	OT				URK	1 Sep 93	
2	80	KRAZ	SET OF GEARS	256B 2402020	EA	1 6	OT				URK	1 Sep 93	
2	81	KRAZ	DIFFERENTIAL SEAL	210-2402052 A1	EA	48	OT				URK	1 Sep 93	
2	82	KRAZ	DIFFERENTIAL	200-2403010-A2	EA	3 2	OT				URK	1 Sep 93	
2	83	KRAZ	FLANGE	200-2403072 B1	EA	3 2	OT				URK	1 Sep 93	
2	84	KRAZ	AXLE	2550-2500015 02	EA	1 6	OT				URK	1 Sep 93	
2	85	KRAZ	SHOCK ABSORBER	256B1 2902012	EA	16	OT				URK	1 Sep 93	
2	86	KRAZ	1ST PLATE	255B 2902074 01	EA	16	OT				URK	1 Sep 93	
2	87	KRAZ	2ND PLATE	255B 2902076 01	EA	16	OT				URK	1 Sep 93	
2	88	KRAZ	SHOCK SPRINGS	500-2905006	EA	40	OT				URK	1 Sep 93	
2	89	KRAZ	SHOCK ABSORBER	256B 2912012 11	EA	20 8	OT				URK	1 Sep 93	
2	90	KRAZ	CONN BRACKETS	219 2912408	EA	48	OT				URK	1 Sep 93	
2	91	KRAZ	EQUALIZER	256B 2918005	EA	24	OT				URK	1 Sep 93	
2	92	KRAZ	SHAFT	256B 2918054	EA	3 2	OT				URK	1 Sep 93	
2	93	KRAZ	ROD	214 2919011 02	EA	40	OT				URK	1 Sep 93	
2	94	KRAZ	ROD	210-2919012 03	EA	40	OT				URK	1 Sep 93	
2	95	KRAZ	BUSHING	200-3001016	EA	32	OT				URK	1 Sep 93	
2	96	KRAZ	SEAL	200-3103035	EA	11 2	OT				URK	1 Sep 93	
2	97	KRAZ	SEAL	210 3104036	EA	11 2	OT				URK	1 Sep 93	
2	98	KRAZ	COTTER PINS	200-3104050-A	EA	400	OT				URK	1 Sep 93	
2	99	KRAZ	COTTER PINS	200-3104050 A	EA	400	OT				URK	1 Sep 93	
2	100	KRAZ	RELAYS	500 3401005 D	EA	4	OT				URK	1 Sep 93	
2	101	KRAZ	HYD BOOSTER BRAKES	256B 3405010 14	EA	8	OT				URK	1 Sep 93	
2	102	KRAZ	DISTRIBUTOR	255B 3405016	EA	8	OT				URK	1 Sep 93	
2	103	KRAZ	PUMP	256B 3407199	EA	8	OT				URK	1 Sep 93	
2	104	KRAZ	FRIC PLATES SHOE	200-3501105	EA	240	OT				URK	1 Sep 93	
2	105	KRAZ	LEVER	210-3501136 A2	EA	6 4	OT				URK	1 Sep 93	
2	106	KRAZ	FRIC PLATES SHOES	200-3502105 A	EA	240	OT				URK	1 Sep 93	
2	107	KRAZ	COMPRESSOR	130-3509009 11	EA	6 4	OT				URK	1 Sep 93	
2	108	KRAZ	GENERATOR	4573711587	EA	16	OT				URK	1 Sep 93	
2	109	KRAZ	REGULATOR	1112 3702	EA	16	OT				URK	1 Sep 93	
2	110	KRAZ	SWITCH	VK318T 3704000	EA	8	OT				URK	1 Sep 93	
2	111	KRAZ	ELECTRO BRUSHES	2501 370805	EA	208	OT				URK	1 Sep 93	
2	112	KRAZ	SWITCH	P305 3709000	EA	12	OT				URK	1 Sep 93	
2	113	KRAZ	SWITCH	P39 371000-T	EA	12	OT				URK	1 Sep 93	
2	114	KRAZ	STARTER	45 7375 1471	EA	20	OT				URK	1 Sep 93	
2	115	KRAZ	RELAY	RC103 3708000	EA	8	OT				URK	1 Sep 93	
2	116	KRAZ	LAMPS	A 24 60-40	EA	320	OT				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	117	KRAZ	FILTERS	FG122 3711200-V	EA	24	OT				URK	1 Sep 93	
2	118	KRAZ	LAMPS	A24 324	EA	320	OT				URK	1 Sep 93	
2	119	KRAZ	LAMPS	A 24 2	EA	320	OT				URK	1 Sep 93	
2	120	KRAZ	LAMPS	A 24 5	EA	320	OT				URK	1 Sep 93	
2	121	KRAZ	LAMPS	A 24 21 2	EA	320	OT				URK	1 Sep 93	
2	122	KRAZ	SPEEDOMETER	CP135 3802010	EA	8	OT				URK	1 Sep 93	
2	123	KRAZ	RELAY	RC401 3726010	EA	8	OT				URK	1 Sep 93	
2	124	KRAZ	RECIEVER	YK143 3807010 G4	EA	3 2	OT				URK	1 Sep 93	
2	125	KRAZ	SENSOR	BM146-3806600D	EA	3 2	OT				URK	1 Sep 93	
2	126	KRAZ	AMP METER	AP110-3811010	EA	6 4	OT				URK	1 Sep 93	
2	127	KRAZ	PRESSURE GAUGE	MD103-3816010	EA	3 2	OT				URK	1 Sep 93	
2	128	KRAZ	SENSOR	TM100 3808000 G	EA	8	OT				URK	1 Sep 93	
2	129	KRAZ	MIRRORS	256-8201012	EA	24	OT				URK	1 Sep 93	
2	130	KRAZ	EQUALIZER	220V 8702010A	EA	1 6	OT				URK	1 Sep 93	
2	131	KRAZ	TOTAL COST US DOLLARS				OT		$88 000		URK	1 Sep 93	
1	40	EXPLOSIVES	AMMONIT 20mm CARRIDGES		TONNE	20	OT	$650 00	$13 000		CIS	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	1	SM ENG PTS	ENGINE	D160	SET	2 25	OT				CIS	1 Sep 93	
1	2	SM ENG PTS	COTTER PINS	1434	EA	36	OT				CIS	1 Sep 93	
1	3	SM ENG PTS	COTTER PINS	2971	EA	36	OT				CIS	1 Sep 93	
1	4	SM ENG PTS	BLOCK ENGINE	51 01 2 cb	EA	2 25	OT				CIS	1 Sep 93	
1	5	SM ENG PTS	PACKING	40201	EA	7 5	OT				CIS	1 Sep 93	
1	6	SM ENG PTS	RINGS	40210	EA	75	OT				CIS	1 Sep 93	
1	7	SM ENG PTS	PACKING SETS UPPER	A 230113160 cbn1	SET	15	OT				CIS	1 Sep 93	
1	8	SM ENG PTS	PACKINGSETS LOWER	A230110311	SET	15	OT				CIS	1 Sep 93	
1	9	SM ENG PTS	PACKING SETS	A23 0110312 AN2	SET	15	OT				CIS	1 Sep 93	
1	10	SM ENG PTS	PACKING	14 02 101 cb	EA	15	OT				CIS	1 Sep 93	
1	11	SM ENG PTS	ENGINE REBUILD KIT	1 02 10 cp	SET	3	OT				CIS	1 Sep 93	
1	12	SM ENG PTS	GUSHING	03325	EA	7 5	OT				CIS	1 Sep 93	
1	13	SM ENG PTS	PACKING UPPER	023 02 10002 AN1	SET	15	OT				CIS	1 Sep 93	
1	14	SM ENG PTS	PACKING LOWER	A23 0 10004 DN1	ET	15	OT				CIS	1 Sep 93	
1	15	SM ENG PTS	RING SETS	A27 00 011	SET	22 5	OT				CIS	1 Sep 93	
1	16	SM ENG PTS	RING SETS	027 00 024	SET	22 5	OT				CIS	1 Sep 93	
1	17	SM ENG PTS	RING SETS	A27 00 043	SET	22 5	OT				CIS	1 Sep 93	
1	18	SM ENG PTS	PISTON RING SETS	03694 1 cp	SET	3	OT				CIS	1 Sep 93	
1	19	SM ENG PTS	GENERATOR BELT	5X9X1090	EA	15	OT				CIS	1 Sep 93	
1	20	SM ENG PTS	FAN BELTS	16X11X1650	EA	15	OT				CIS	1 Sep 93	
1	21	SM ENG PTS	WATER PUMP	16 08 140 cp	EA	7 5	OT				CIS	1 Sep 93	
1	22	SM ENG PTS	OIL PUMP	29 09 124 cp	EA	6	OT				CIS	1 Sep 93	
1	23	SM ENG PTS	CYLINDER LINER	01466	EA	9	OT				CIS	1 Sep 93	
1	24	SM ENG PTS	RING SETS	51 03-115 cp	EA	75	OT				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	25	SM ENG PTS	CRANKSHAFT	16-03 1120 cp	EA	3	OT				CIS	1 Sep 93	
1	26	SM ENG PTS	PISTON	51 03-103	SET	7 5	OT				CIS	1 Sep 93	
1	27	SM ENG PTS	PACKING	700-40-2886	EA	15	OT				CIS	1 Sep 93	
1	28	SM ENG PTS	FILTER	A41 20 000-1 cp	EA	30	OT				CIS	1 Sep 93	
1	29	SM ENG PTS	FILTER	A41 10 000-02	EA	30	OT				CIS	1 Sep 93	
1	30	SM ENG PTS	RING	40843	EA	75	OT				CIS	1 Sep 93	
1	31	SM ENG PTS	PACKING	40269	EA	7 5	OT				CIS	1 Sep 93	
1	32	SM ENG PTS	SPRAYER	14 69 107 1 cp	EA	75	OT				CIS	1 Sep 93	
1	33	SM ENG PTS	INJECTOR FITTINGS	14 69 117 1 cp	EA	75	OT				CIS	1 Sep 93	
1	34	SM ENG PTS	CYLINDER HEAD	29 02 30 cp	EA	2 25	OT				CIS	1 Sep 93	
1	35	SM ENG PTS	STARTER	1723 cp	EA	2 25	OT				CIS	1 Sep 93	
1	36	SM ENG PTS	RADIATOR	1304130101 cp	EA	7 5	OT				CIS	1 Sep 93	
1	37	SM ENG PTS	MAGNETO	M 149A	EA	7 5	OT				CIS	1 Sep 93	
1	38	SM ENG PTS	CARBURATOR	113 110-70-11	EA	7 5	OT				CIS	1 Sep 93	
1	39	SM ENG PTS	GENERATOR	69 063701	EA	6	OT				CIS	1 Sep 93	
1	40	SM ENG PTS	STARTER	CT 230E	EA	6	OT				CIS	1 Sep 93	
1	41	SM ENG PTS	TRUBO COMPRESSOR	111 30 001 10	EA	4 5	OT				CIS	1 Sep 93	
1	42	SM ENG PTS	FUEL SYSTEM UPPER	16 67 1 cp	EA	4 5	OT				CIS	1 Sep 93	
1	43	SM ENG PTS	TOTAL COST US DOLLARS				OT		$90 000		CIS	1 Sep 93	
3	1	T130 DOZER	PACKING	2301103160 CBN 1	EA	23	OT				CIS	1 Sep 93	
3	2	T130 DOZER	THIMBLE ?	01466-2	EA	75	OT				CIS	1 Sep 93	
3	3	T130 DOZER	RINGS	51 03 115 CP	EA	75	OT				CIS	1 Sep 93	
3	4	T130 DOZER	CRANKSHAFT	16 03 126 CP	EA	5	OT				CIS	1 Sep 93	
3	5	T130 DOZER	CYLINDER	51 03 23	EA	75	OT				CIS	1 Sep 93	
3	6	T130 DOZER	HYDRALIC SEAL	700-40-2889	EA	36	OT				CIS	1 Sep 93	
3	7	T130 DOZER	FILTER	F A41 20 000 01 CP	EA	75	OT				CIS	1 Sep 93	
3	8	T130 DOZER	FILTER	A41 10 000 02 CP	EA	75	OT				CIS	1 Sep 93	
3	9	T130 DOZER	RING	40843	EA	75	OT				CIS	1 Sep 93	
3	10	T130 DOZER	PACKING	40269	EA	23	OT				CIS	1 Sep 93	
3	11	T130 DOZER	GEAR PINION	74116	EA	2	OT				CIS	1 Sep 93	
3	12	T130 DOZER	REDUCTION GEAR	17 76 8 CP	EA	1	OT				CIS	1 Sep 93	
3	13	T130 DOZER	FUEL INJECTORS	17 69 107 1 CP	EA	75	OT				CIS	1 Sep 93	
3	14	T130 DOZER	SPRAYER	14 69 117 1 CP	EA	75	OT				CIS	1-Sep 93	
3	15	T130 DOZER	PUMP	51 67 11 CP	EA	2	OT				CIS	1 Sep 93	
3	16	T130 DOZER	COMPRESSOR PIPING	92 000-06	EA	8	OT				CIS	1 Sep 93	
3	17	T130 DOZER	AIR INLET	N036-85 770	EA	7	OT				CIS	1 Sep 93	
3	18	T130 DOZER	WATER PUMP	16-8 140-CP	EA	8	OT				CIS	1-Sep 93	
3	19	T130 DOZER	OIL PUMP	29 09 124 CP	EA	8	OT				CIS	1 Sep 93	
3	20	T130 DOZER	HYDRALIC PUMP	NS 100A 3 P	EA	5	OT				CIS	1 Sep 93	
3	21	T130 DOZER	PUMP	NS 32 Y WP	EA	2	OT				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	22	T130 DOZER	GEAR BOX	24-12 1 CP	EA	2	OT				CIS	1 Sep 93	
3	23	T130 DOZER	FILTER	A23 30 000 01	EA	38	OT				CIS	1 Sep 93	
3	24	T130 DOZER	PACKING SEALS	700-40-2049	EA	23	OT				CIS	1 Sep 93	
3	25	T130 DOZER	CARBURATOR	113-1107011	EA	9	OT				CIS	1 Sep 93	
3	26	T130 DOZER	SUPPORT BRACKET	51 07 102 CP	EA	3	OT				CIS	1 Sep 93	
3	27	T130 DOZER	ENGINE HEAD	07146-1 CP	EA	5	OT				CIS	1 Sep 93	
3	28	T130 DOZER	FUEL SYS CENTRIFUGE	95000	EA	4	OT				CIS	1 Sep 93	
3	29	T130 DOZER	FAN BLADES	51 08 113 CP	EA	3	OT				CIS	1 Sep 93	
3	30	T130 DOZER	RADIATOR	130Y 13 010 1	EA	8	OT				CIS	1 Sep 93	
3	31	T130 DOZER	BRAKE DISC	738-4 CP	EA	11	OT				CIS	1 Sep 93	
3	32	T130 DOZER	MAGNET SOLENOID	M149 A3	EA	11	OT				CIS	1 Sep 93	
3	33	T130 DOZER	STARTER	ST 230M	EA	11	OT				CIS	1 Sep 93	
3	34	T130 DOZER	GENERATOR	70-3701	EA	4	OT				CIS	1 Sep 93	
3	35	T130 DOZER	RELAY STARTER	RR 0362B1	EA	11	OT				CIS	1 Sep 93	
3	36	T130 DOZER	DISTRIBUTOR	R 150-A3T001	EA	2	OT				CIS	1 Sep 93	
3	37	T130 DOZER	DRIVE SHAFT	50-14-113	EA	2	OT				CIS	1 Sep 93	
3	38	T130 DOZER	CYLINDER POWER	18 26 270 CP	EA	4	OT				CIS	1 Sep 93	
3	39	T130 DOZER	CYLINDER	DP 26-C 06 140	EA	2	OT				CIS	1 Sep 93	
3	40	T130 DOZER	ELEMENT FILTER	EF 01 00 CP	EA	105	OT				CIS	1 Sep 93	
3	41	T130 DOZER	PUMP BRAKE	14 71 3 CP	EA	2	OT				CIS	1 Sep 93	
3	42	T130 DOZER	MECH	17 74 8 CP	EA	2	OT				CIS	1 Sep 93	
3	43	T130 DOZER	SUPPORT	17 74 284	EA	3	OT				CIS	1 Sep 93	
3	44	T130 DOZER	SHAFT	16 74 10 CP	EA	2	OT				CIS	1 Sep 93	
3	45	T130 DOZER	GEAR	17 01 22	EA	2	OT				CIS	1 Sep 93	
3	46	T130 DOZER	FRICTION CLUTCH PADS	24 16 101 CP	EA	5	OT				CIS	1 Sep 93	
3	47	T130 DOZER	SERVICE MECH	21 17 4 CP	EA	4	OT				CIS	1 Sep 93	
3	48	T130 DOZER	FAN BELT	18360-01 CP	EA	9	OT				CIS	1 Sep 93	
3	49	T130 DOZER	PULLEY WHEEL	24 21 146 CP	EA	3	OT				CIS	1 Sep 93	
3	50	T130 DOZER	DRIVE PULLEY	24 21 169 CP	EA	12	OT				CIS	1 Sep 93	
3	51	T130 DOZER	DOUBLE PULLEY	24 21 170 CP	EA	12	OT				CIS	1 Sep 93	
3	52	T130 DOZER	FILTER	A 410000-2	EA	8	OT				CIS	1 Sep 93	
3	53	T130 DOZER	IDLER PULLEY	24-21 171 CP	EA	12	OT				CIS	1 Sep 93	
3	54	T130 DOZER	FILTER	A 410000-A CP	EA	45	OT				CIS	1 Sep 93	
3	55	T130 DOZER	MIDDLE CUTTING EDGE	D3 110AXP 02 001 0	EA	2	OT				CIS	1 Sep 93	
3	56	T130 DOZER	END CUTTING EDGE RT	D661 02001 02	EA	2	OT				CIS	1 Sep 93	
3	57	T130 DOZER	END CUTTING EDGE LEFT	D661 02 002 02	EA	2	OT				CIS	1 Sep 93	
3	58	T130 DOZER	TRACK ASSEMBLY	24 22 1	SET	2	OT				CIS	1 Sep 93	
3	59	T130 DOZER	DEFLECTOR RK GUARD	2204	EA	150	OT				CIS	1 Sep 93	
3	60	T130 DOZER	DEFLECTOR RK GUARD	2205	EA	150	OT				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	61	T130 DOZER	PACKING TRACKS ADJ	40201	EA	60	OT				CIS	1 Sep 93	
3	62	T130 DOZER	RING	40210	EA	15	OT				CIS	1 Sep 93	
3	63	T130 DOZER	CYLINDER PACKING	40944 CP	EA	38	OT				CIS	1 Sep 93	
3	64	T130 DOZER	CYLINDER	14 02 101 CP	EA	38	OT				CIS	1 Sep 93	
3	65	T130 DOZER	HEAD CYLINDER	16-02 106 CP	EA	15	OT				CIS	1 Sep 93	
3	66	T130 DOZER	VALVE	14 02 32	EA	8	OT				CIS	1 Sep 93	
3	67	T130 DOZER	VALVE	14 02 33 V	EA	8	OT				CIS	1 Sep 93	
3	68	T130 DOZER	PIPE	10663-1	EA	8	OT				CIS	1 Sep 93	
3	69	T130 DOZER	PIPE	10664 1	EA	8	OT				CIS	1 Sep 93	
3	70	T130 DOZER	GEARBOX	50-12 12 CP	EA	2	OT				CIS	1 Sep 93	
3	71	T130 DOZER	COUPLING	18 14 133 CP	EA	2	OT				CIS	1 Sep 93	
3	72	T130 DOZER	DISC	18 14 135 CP	EA	3	OT				CIS	1 Sep 93	
3	73	T130 DOZER	COUPLING	18-14 78	EA	2	OT				CIS	1 Sep 93	
3	74	T130 DOZER	COLLAR	3 48X28 6	EA	3	OT				CIS	1 Sep 93	
3	75	T130 DOZER	RING	N1 35X28 2	EA	5	OT				CIS	1 Sep 93	
3	76	T130 DOZER	DISC	24 16-103 CP	EA	8	OT				CIS	1 Sep 93	
3	77	T130 DOZER	PUMP	51 67 10 CP	EA	2	OT				CIS	1 Sep 93	
3	78	T130 DOZER	PISTON PUMP	16 67 102 CP	EA	27	OT				CIS	1 Sep 93	
3	79	T130 DOZER	PUMP PISTON	16-67 108 CP	EA	27	OT				CIS	1 Sep 93	
3	80	T130 DOZER	DISC	738 4 CP	EA	8	OT				CIS	1 Sep 93	
3	81	T130 DOZER	COUPLING	72118 CP	EA	4	OT				CIS	1 Sep 93	
3	82	T130 DOZER	RING	111 30 123 00	EA	15	OT				CIS	1 Sep 93	
3	83	T130 DOZER	ROTOR	92 55	EA	2	OT				CIS	1 Sep 93	
3	84	T130 DOZER	RADIATOR	21 09 1	EA	2	OT				CIS	1 Sep 93	
3	85	T130 DOZER	PUMP	51 67 11 CP	EA	2	OT				CIS	1 Sep 93	
3	86	T130 DOZER	TOTAL COST US DOLLARS				OT		$135 000		CIS	1 Sep 93	

TOTAL COST US DOLLARS $381 819

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	164	ALUM WIRE	OVERHEAD FIELD LINE		TONNE	7 5	BA	4 912	$36 844		USA	1 Sep 93	
1	165	ALUM WIRE	OVERHEAD FIELD LINE		TONNE	7 5	SG	4912	$35 844		USA	1 Sep 93	
1	8	ANFO TR	ANFO MIX TRUCK		EA	1	BA	$135 125	$135 125		USA	1 Sep 93	
1	7	ANFO TR	ANFO MIX TRUCK		EA	1	SG	$135 125	$135 125		USA	1 Sep 93	
1	162	BATTERIES	32 CT 450 AMP/HR 24 V	8 BAT /SET	EA	32	BA	414	$13 248		USA	1 Sep 94	
1	155	BATTERIES	6 CT 132 AMP/HR 12V		EA	60	AD	169 6	$10 176		USA	1 Sep 93	
1	160	BATTERIES	6 CT 182 AMP/HR 12V		EA	60	AD	204 06	$12 244		USA	1 Jan 94	
1	156	BATTERIES	6 CT 132 AMP/HR 12V		EA	20	OT	169 6	$3 392		USA	1 Sep 93	
1	161	BATTERIES	6 CT 182 AMP/HR 12V		EA	20	OT	204 06	$4 081		USA	1 Jan 94	
1	158	BATTERIES	6 CT 182 AMP/HR 12V		EA	50	SG	204 06	$10 203		USA	1 Jan 94	
1	163	BATTERIES	32 CT 450 AMP/HR 24 V		EA	32	SG	414	$13 248		USA	1 Jan 94	
1	5	BULLDOZER	CAT D 10 BULLDOZER		EA	1	BA	$638 900	$638 900		USA	1 Sep 93	
1	4	BULLDOZER	CAT D 10 BULLDOZER		EA	1	SG	$638 900	$638 900		USA	1 Sep 93	
1	6	BULLDOZER	CAT D 10 BULLDOZER		EA	1	SO	$638 900	$638 900		USA	1 Sep 93	
1	21	COAL CRUS	STAMLER FEEDER BREAKER		EA	1	BA	$400 000	$400 000		USA	1 Jan 94	3 MO SHIPPING TINE
1	29	DRAG W PTS	13/50 15/90 /20/90		LOT		BA	$187 000	$187 000		USA	1 Sep 93	
1	30	DRAG W PTS	10/70		LOT		BA	$30 000	$30 000		USA	1 Sep 93	
1	31	DRAG W PTS	10/70		LOT		SG	$30 000	$30 000		USA	1 Sep 93	
1	26	DRAG BUCK	10/70 DRAG BUCKET/COMP		EA	1	SG	$113 000	$113 000		USA	1 Sep 93	
1	22	DRAG BUCK	20/90 DRAG BUCKET/COMPLETE		EA	1	BA	$220 000	$220 000		USA	1 Sep 93	
1	23	DRAG BUCK	15/90 DRAG BUCKET/COMPLETE		EA	1	BA	$180 000	$180 000		USA	1 Sep 93	
1	24	DRAG BUCK	13/50 DRAG BUCKET/COMPLETE		EA	1	BA	$180 000	$180 000		USA	1 Sep 93	
1	25	DRAG BUCK	10/70 DRAG BUCKET/COMP		EA	1	BA	$113 000	$113 000		USA	1 Sep 93	
1	37	DRILLS	160mm				SO	$300 000	$300 000		USA	1 Jan 94	
1	39	EXPLOSIVES	75lb CAST PRIMERS		EA	130 000	BA	$1 75	$227 500		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	41	EXPLOSIVES	PRIMADETS #12/30FT		EA	100 000	BA	$2 00	$200 000		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	42	EXPLOSIVES	PRIMADETS #12/12FT		EA	30 000	BA	$1 75	$52 500		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	44	EXPLOSIVES	MSGS SURFACE DELAYS		EA	13 000	BA	$2 60	$33 800		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	46	EXPLOSIVES	25 GRAIN DETONATING CORD		KM	450	BA	$280 00	$126 000		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	38	EXPLOSIVES	75lb CAST PRIMERS		EA	30 000	SG	$1 75	$52 500		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	43	EXPLOSIVES	PRIMADETS #12/12FT		EA	12 000	SG	$1 75	$21 000		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	45	EXPLOSIVES	MSGS SURFACE DELAYS		EA	7 000	SG	$2 60	$18 200		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	47	EXPLOSIVES	26 GRAIN DETONATING CORD		KM	200	SG	$280 00	$56 000		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	48	EXPLOSIVES	EZ DET 25 350/18m Length		EA	15 000	SG	$4 38	$65 700		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	49	EXPLOSIVES	EZ TRUNK LINES 17MS/9M LENGTH		EA	900	SG	$2 95	$2 655		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	16	FEL	CAT992C FRONT END LOADER		EA	1	SG	$977 672	$977 672		USA	1 Sep 93	
1	18	FEL	CAT992C FRONT END LOADER		EA	1	SO	$977 672	$977 672		USA	1 Sep 93	
1	10	FUEL TRUCK	FUEL & LUBE TRUCK		EA	1	BA	$90 275	$90 275		USA	1 Sep 93	
1	9	FUEL TRUCK	FUEL & LUBE TRUCK		EA	1	SG	$90 275	$90 275		USA	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	11	FUEL TRUCK	FUEL & LUBE TRUCK		EA	1	SO	$90 275	$90 275		USA	1 Sep 93	
1	113	GEN BRUSH	ER4 25x32x40		EA	500	SG	2 92	$1 460		USA	1 Sep 93	
1	114	GEN BRUSH	ER4 2/12 5x32x40		EA	1000	SG				USA	1 Sep 93	
1	115	GEN BRUSH	ER4 16x25x32		EA	200	SG	5 88	$1 176		USA	1 Sep 93	
1	116	GEN BRUSH	ER4 25x50x64		EA	300	SG	3 97	$1 191		USA	1 Sep 93	
1	117	GEN BRUSH	ER4 25x32x40		EA	200	SG	4 11	$822		USA	1 Sep 93	
1	118	GEN BRUSH	ER4 16x32x40		EA	200	SG				USA	1 Sep 93	
1	119	GEN BRUSH	ER4 25x32x64		EA	1000	SG				USA	1 Sep 93	
1	120	GEN BRUSH	ER4 16x25x40		EA	100	SG				USA	1 Sep 93	
1	121	GEN BRUSH	ER4 30x25x40		EA	100	SG				USA	1 Sep 93	
1	122	GEN BRUSH	ER4 8x10x25		EA	200	SG				USA	1 Sep 93	
1	123	GEN BRUSH	ER4 2/12 55x32x40		EA	300	SG	2 92	$876		USA	1 Sep 93	
1	124	GEN BRUSH	ER74 25x32x51		EA	1000	SG	2 92	$2 920		USA	1 Sep 93	
1	125	GEN BRUSH	ER74 2/12 55x32x64		EA	200	SG				USA	1 Sep 93	
1	126	GEN BRUSH	ER74 2/12 5x44x40		EA	200	SG				USA	1 Sep 93	
1	127	GEN BRUSH	ER74 2/20x32x40		EA	100	SG				USA	1 Sep 93	
1	128	GEN BRUSH	ER74 2/25x30x64		EA	100	SG				USA	1 Sep 93	
1	129	GEN BRUSH	ER14 16x32x40		EA	400	SG	4 11	$1 644		USA	1 Sep 93	
1	130	GEN BRUSH	ER14 25x50x64		EA	1500	SG	5 88	$8 820		USA	1 Sep 93	
1	131	GEN BRUSH	ER14 2/12 5x16x25		EA	200	SG				USA	1 Sep 93	
1	132	GEN BRUSH	ER14 2/12 5x32x40		EA	2000	SG				USA	1 Sep 93	
1	133	GEN BRUSH	ER14 20x32x32		EA	200	SG				USA	1 Sep 93	
1	134	GEN BRUSH	ER14 25x50x60		EA	200	SG	5 88	$1 176		USA	1 Sep 93	
1	135	GEN BRUSH	ER74 20x52x40		EA	100	SG				USA	1 Sep 93	
1	136	GEN BRUSH	ER74 25x30x64		EA	100	SG				USA	1 Sep 93	
1	137	GEN BRUSH	ER74 12 5x32x65		EA	200	SG				USA	1 Sep 93	
1	138	GEN BRUSH	ER2A 2/12 5x40x60		EA	100	SG				USA	1 Sep 93	
1	139	GEN BRUSH	ER2A 5x9x17 5		EA	100	SG				USA	1 Sep 93	
1	140	GEN BRUSH	ER2A 8x10x25		EA	100	SG				USA	1 Sep 93	
1	141	GEN BRUSH	ER2A 16x32x40		EA	400	SG	4 11	$1 644		USA	1 Sep 93	
1	142	GEN BRUSH	ER2A 16x40x60		EA	100	SG				USA	1 Sep 93	
1	143	GEN BRUSH	ER61 2/10x40x52		EA	400	SG				USA	1 Sep 93	
1	144	GEN BRUSH	ER61 2/8x32x50		EA	400	SG				USA	1 Sep 93	
1	145	GEN BRUSH	ER61 2/8x32x52		EA	100	SG				USA	1 Sep 93	
1	146	GEN BRUSH	ER61 2/12 5x40x52		EA	100	SG				USA	1 Sep 93	
1	2	GRADER	CAT 16G MOTORGRADER		EA	1	BA	$385 000	$385 000		USA	1 Sep 93	
1	1	GRADER	CAT 16G MOTORGRADER		EA	1	SG	$385 000	$385 000		USA	1 Sep 93	
1	3	GRADER	CAT 16G MOTORGRADER		EA	1	SO	$385 000	$385 000		USA	1 Sep 93	
1	15	HAUL TRUCK	85 90 TON AHUL TRUCKS		EA	10	SO	$672 750	$6 727 500		USA	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	35	INSTRU	ELECT TEST INSTRUMENTS				SG	$3 000	$3 000		USA	1 Sep 93	
1	92	REWIND CU	4 ARMOURED POLY THERMALEZE		lbs	220	SG	$2 82	$620		USA	1 Sep 93	
1	93	REWIND CU	45 ARMOURED POLY THERMALEZE		lbs	440	SG	$2 75	$1 211		USA	1 Sep 93	
1	94	REWIND CU	47 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 75	$5 505		USA	1 Sep 93	
1	95	REWIND CU	55 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 63	$5 265		USA	1 Sep 93	
1	96	REWIND CU	6 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 53	$5 065		USA	1 Sep 93	
1	97	REWIND CU	63 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 52	$5 045		USA	1 Sep 93	
1	98	REWIND CU	67 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 40	$4 805		USA	1 Sep 93	
1	99	REWIND CU	7 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 40	$4 805		USA	1 Sep 93	
1	100	REWIND CU	8 ARMOURED POLY THERMALEZE		lbs	440	SG	$2 33	$1 027		USA	1 Sep 93	
1	101	REWIND CU	83 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 33	$4 669		USA	1 Sep 93	
1	102	REWIND CU	95 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 26	$4 529		USA	1 Sep 93	
1	103	REWIND CU	1 0 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 26	$4 529		USA	1 Sep 93	
1	104	REWIND CU	1 12 ARMOURED POLY THERMALEZE		lbs	2 860	SG	$2 17	$6 209		USA	1 Sep 93	
1	105	REWIND CU	1 18 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 17	$4 342		USA	1 Sep 93	
1	106	REWIND CU	1 20 ARMOURED POLY THERMALEZE		lbs	2 200	SG	$2 17	$4 776		USA	1 Sep 93	
1	107	REWIND CU	1 30 ARMOURED POLY THERMALEZE		lbs	2 200	SG	$2 12	$4 666		USA	1 Sep 93	
1	108	REWIND CU	1 32 ARMOURED POLY THERMALEZE		lbs	2 200	SG	$2 12	$4 666		USA	1 Sep 93	
1	109	REWIND CU	1 40 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 12	$4 241		USA	1 Sep 93	
1	110	REWIND CU	1 45 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 12	$4 241		USA	1 Sep 93	
1	111	REWIND CU	1 47 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 12	$4 241		USA	1 Sep 93	
1	112	REWIND CU	1 60 ARMOURED POLY THERMALESE		lbs	2 000	SG	$2 07	$4 146		USA	1 Sep 93	
1	32	SHOV BUCK	WEAR PARTS		LOT		BA	$23 000	$23 000		USA	1 Sep 93	
1	33	SHOV BUCK	WEAR PARTS		LOT		SG	$22 000	$22 000		USA	1 Sep 93	
1	27	SHOVEL B	EKG 4 6 SHOVEL BUCKET		EA	1	BA	$79 000	$79 000		USA	1 Sep 93	
1	28	SHOVEL B	EKG 4 6 SHOVEL BUCKET		EA	1	SG	$79 000	$79 000		USA	1 Sep 93	
1	13	TIRE TRUCK	TIRE HANDLING TRUCK		EA	1	BA	$79 925	$79 925		USA	1 Sep 93	
1	12	TIRE TRUCK	TIRE HANDLING TRUCK		EA	1	SG	$79 925	$79 925		USA	1 Sep 93	
1	14	TIRE TRUCK	TIRE HANDLING TRUCK		EA	1	SO	$79 925	$79 925		USA	1 Sep 93	
1	19	TRUCK	2 TON FLATBED FOR PERSONNEL TRANS		EA	1	SG	$40 250	$40 250		USA	1 Sep 93	
1	20	TRUCK	3 TON FLATBED FOR PERSONNEL TRANS		EA	1	SO	$40 250	$40 250		USA	1 Sep 93	
1	150	TRUCK TIRE	12x20x16 PLY/W TUBES		EA	140	OT	341 4	$47 796		USA	1 Sep 93	
1	149	TRUCK TIRE	12x20x16 PLY/W TUBES		EA	20	SO	341 4	$6 828		USA	1 Sep 93	
1	90	WELDING RD	ZETA HARD FACING ROD 5/32		lbs	10 000	BA	$0 55	$5 480		USA	1 Sep 93	
1	91	WELDING RD	6011 GEN PURPOSE ROD 5/32		lbs	10 000	SG	$0 57	$5 710		USA	1 Sep 93	
1	54	WIRE ROPE	64 mm(2 5) 16 8 Kg/M 15 TONNE		FT	2 851	BA	$8 05	$22 951		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	55	WIRE ROPE	57mm(2 25) 13 6 Kg/M - 35 TONNE		FT	8 244	BA	$5 97	$49 217		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	56	WIRE ROPE	52 mm(2) 10 7 Kg/M 25 TONNE		FT	7 458	BA	$4 60	$34 307		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	60	WIRE ROPE	39mm (1 5) 4 2 Kg/M 25 TONNE		FT	11 040	BA	$2 31	$25 502		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94

MOFRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	67	WIRE ROPE	30mm (1 25) 4 0 Kg/M 5 TONNE		FT	318	OT	$1 73	$550		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	57	WIRE ROPE	52 mm(2) 10 7 Kg/M 15 TONNE		FT	4 475	SG	$4 60	$20 585		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	61	WIRE ROPE	39mm (1 5) 4 2 Kg/M 15 TONNE		FT	6 625	SG	$2 31	$15 304		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	62	WIRE ROPE	39mm (1 5") 4 2 Kg/M 10 TONNE		FT	4 417	SO	$2 31	$10 203		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	66	WIRE ROPE	30mm (1 25") 4 0 Kg/M 5 TONNE		FT	318	SO	$1 73	$550		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	1	ELEC RR	ARC SHOE PLATES	3E 14D	EA	10	BA				URK	1 Sep 93	
1	2	ELEC RR	ARC SHOE PLATES	3E 14 1D	EA	10	BA				URK	1 Sep 93	
1	3	ELEC RR	AUTO SWITCHES	KPD 131	EA	2	BA				URK	1 Sep 93	
1	4	ELEC RR	AIR COMPRESSOR	KB 1V	EA	4	BA				URK	1 Sep 93	
1	5	ELEC RR	CONT TROLLEY LEFT	TB 13D	EA	4	BA				URK	1 Sep 93	
1	6	ELEC RR	CONT TROLLEY RIGHT	TB 12D	EA	4	BA				URK	1 Sep 93	
1	7	ELEC RR	AUTO CON COUPLING	CA 3M	EA	20	BA				URK	1 Sep 93	
1	8	ELEC RR	PACKING SHAFT MOTOR		SET	6	BA				URK	1 Sep 93	
1	9	ELEC RR	AIR VALVE		EA	10	BA				URK	1 Sep 93	
1	10	ELEC RR	AIR VALVE		EA	20	BA				URK	1 Sep 93	
1	11	ELEC RR	SWITCH START&STOP		EA	5	BA				URK	1 Sep 93	
1	12	ELEC RR	SWITCH BLK W/MAG		EA	20	BA				URK	1 Sep 93	
1	13	ELEC RR	CONDENSORS		EA	2	BA				URK	1 Sep 93	
1	14	ELEC RR	GROUNDING ROD		EA	6	BA				URK	1 Sep 93	
1	15	ELEC RR	TRIRISTER ELEC		EA	30	BA				URK	1 Sep 93	
1	16	ELEC RR	DIRISTER ELEC		EA	200	BA				URK	1 Sep 93	
1	17	ELEC RR	HOUSING FOR AUTO COUP		EA	5	BA				URK	1 Sep 93	
1	18	ELEC RR	TOTAL COST US DOLLARS				BA		$130 000		URK	1 Sep 93	
1	50	EXPLOSIVES	AN BLASTING PRILL		TONNE	1 600	BA	$190 00	$304 000		SWD	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	53	EXPLOSIVES	ENULSION		KG	200 000	BA	$0 66	$132 000		SWD	1 Sep 93	
1	51	EXPLOSIVES	AN BLASTING PRILL		TONNE	1 000	SG	$190 00	$190 000		SWD	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	52	EXPLOSIVES	5 x30 (20KG) BAGGED EMULSION		KG	500 000	SG	$0 66	$330 000		SWD	1 Sep 93	
1	1	DUMPCAR	SIDE PANELS	634 01 000-0 cb	EA	8	BA				POL	1 Sep 93	
1	2	DUMPCAR	FRONT PANEL	634 04 000 3	EA	8	BA				POL	1 Sep 93	
1	3	DUMPCAR	PANEL LOCKS LEFT	634 01 010-2	EA	8	BA				POL	1 Sep 93	
1	4	DUMPCAR	PANEL LOCKS RIGHT	634 01 020-2	EA	8	BA				POL	1 Sep 93	
1	5	DUMPCAR	PANEL SUPPORTS	634 01 150 cb	EA	4	BA				POL	1 Sep 93	
1	6	DUMPCAR	SINGLE ACTION CYLINDER	640 45 010 cb	EA	6 4	BA				POL	1 Sep 93	
1	7	DUMPCAR	PISTON COLLARS	45 129	EA	200	BA				POL	1 Sep 93	
1	8	DUMPCAR	DOUBLE ACTION CYL	640 45 010-1	EA	8	BA				POL	1 Sep 93	
1	9	DUMPCAR	DOUBLE ACTION PISTON	640-45 105 2	EA	4	BA				POL	1 Sep 93	
1	10	DUMPCAR	DISTRIBUTION VALVES	372 000-1 9	EA	20	BA				POL	1 Sep 93	
1	11	DUMPCAR	ROD EQUALIZER	522 00-003 0	EA	2	BA				POL	1 Sep 93	
1	12	DUMPCAR	BOGGEY CONNECTOR	522 00 010 1	EA	2	BA				POL	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	13	DUMPCAR	SQ AXLE CAP ENDS	74 10 116	EA	4	BA				POL	1 Sep 93	
1	14	DUMPCAR	OUTSIDE SPRING	522 38-001 0	EA	16	BA				POL	1 Sep 93	
1	15	DUMPCAR	INSIDE SPRING	522 38 002 0	EA	16	BA				POL	1 Sep 93	
1	16	DUMPCAR	SET SH ABSORBERS	522 38 016-0	EA	4	BA				POL	1 Sep 93	
1	17	DUMPCAR	FRAME	4686-6061 40-016	EA	20	BA				POL	1 Sep 93	
1	18	DUMPCAR	SMALL BRAKE LOCKS	46-03 015	EA	20	BA				POL	1 Sep 93	
1	19	DUMPCAR	PUSH RDS BRAKE PDS	61 40-133	EA	8	BA				POL	1 Sep 93	
1	20	DUMPCAR	FRAME ENDS RIGHT	61 40 110	EA	3 2	BA				POL	1 Sep 93	
1	21	DUMPCAR	FRAME ENDS LEFT	61 40 120	EA	3 2	BA				POL	1 Sep 93	
1	22	DUMPCAR	BRK PADS COMP POLY	TY 38 114 79 72	EA	600	BA				POL	1 Sep 93	
1	23	DUMPCAR	WHEEL PAIRS	61 10 046	EA	4	BA				POL	1 Sep 93	
1	24	DUMPCAR	WHEEL PACKING COVER	TY 519 07	EA	4	BA				POL	1 Sep 93	
1	25	DUMPCAR	BOGGEY CONNECTORS	522 00 020 1	EA	2	BA				POL	1 Sep 93	
1	26	DUMPCAR	DISTRIBUTOR VALVE		EA	16	BA				POL	1 Sep 93	
1	27	DUMPCAR	AUTOMATIC COUPLING		EA	12	BA				POL	1 Sep 93	
1	28	DUMPCAR	AUTO COUPLING HEAD	106 00 00	EA	4	BA				POL	1 Sep 93	
1	29	DUMPCAR	COUPLING LOCK	106 01 002	EA	8	BA				POL	1 Sep 93	
1	30	DUMPCAR	LOCK HOLDER	106 01 003 0	EA	4	BA				POL	1 Sep 93	
1	31	DUMPCAR	COUPLING TRIPPER	106 01 006 0	EA	8	BA				POL	1 Sep 93	
1	32	DUMPCAR	COUPLING HINGE PINS	106 00-012 0	EA	12	BA				POL	1 Sep 93	
1	33	DUMPCAR	COUPLING SHOCK ABS	106-00 001	EA	8	BA				POL	1 Sep 93	
1	34	DUMPCAR	COUPLING SHOCK SLIDE	106 02 00 2	EA	4	BA				POL	1 Sep 93	
1	35	DUMPCAR	COUPLING SH AB LK	106 00 002 2	EA	16	BA				POL	1 Sep 93	
1	36	DUMPCAR	DOOR ACTLATOR ARMS	634 46 010	EA	16	BA				POL	1 Sep 93	
1	37	DUMPCAR	DOOR ACTUATOR ARMS	634 46-020 2	EA	16	BA				POL	1 Sep 93	
1	38	DUMPCAR	DOOR ACTUATOR ARMS	634 46 030	EA	8	BA				POL	1 Sep 93	
1	39	DUMPCAR	END VALVE		EA	20	BA				POL	1 Sep 93	
1	40	DUMPCAR	AIR SPEED REDUCERS		EA	16	BA				POL	1 Sep 93	
1	41	DUMPCAR	RING PACKING	38-72	EA	40	BA				POL	1 Sep 93	
1	42	DUMPCAR	AIR DISTRIBUTOR	482 000	EA	0	BA				POL	1 Sep 93	
1	43	DUMPCAR	PISTON COLLAR	270 397	EA	4	BA				POL	1 Sep 93	
1	44	DUMPCAR	PISTON SPRING	270 397	EA	8	BA				POL	1 Sep 93	
1	45	DUMPCAR	HOUSING ACC AIR	DR 483 00	EA	12	BA				POL	1 Sep 93	
1	46	DUMPCAR	BRAKE CYL PARTS	VR 483 000	EA	12	BA				POL	1 Sep 93	
1	47	DUMPCAR	PIPES	VR 483 000	EA	12	BA				POL	1 Sep 93	
1	48	DUMPCAR	REGULATOR ARM	522 10 050-1	EA	12	BA				POL	1 Sep 93	
1	49	DUMPCAR	CAR CONNECTOR HOSE		EA	60	BA				POL	1 Sep 93	
1	50	DUMPCAR	TOTAL COST US DOLLARS				BA		$200 000		POL	1 Sep 93	
1	1	DUMPCAR	SIDE PANELS	634 01 000-0 cb	EA	12	SG				POL	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	2	DUMPCAR	FRONT PANEL	634 04 000 3	EA	12	SG				POL	1 Sep 93	
1	3	DUMPCAR	PANEL LOCKS LEFT	634 01 010-2	EA	12	SG				POL	1 Sep 93	
1	4	DUMPCAR	PANEL LOCKS RIGHT	634 01 020-2	EA	12	SG				POL	1 Sep 93	
1	5	DUMPCAR	PANEL SUPPORTS	634 01 150 cb	EA	6	SG				POL	1 Sep 93	
1	6	DUMPCAR	SINGLE ACTION CYLINDER	640-45 010 cb	EA	9 6	SG				POL	1 Sep 93	
1	7	DUMPCAR	PISTON COLLARS	45 129	EA	300	SG				POL	1 Sep 93	
1	8	DUMPCAR	DOUBLE ACTION CYL	640-45 010-1	EA	12	SG				POL	1 Sep 93	
1	9	DUMPCAR	DOUBLE ACTION PISTON	640 45 105 2	EA	6	SG				POL	1 Sep 93	
1	10	DUMPCAR	DISTRIBUTION VALVES	372 000 1 9	EA	30	SG				POL	1 Sep 93	
1	11	DUMPCAR	ROD EQUALIZER	522 00 003 0	EA	3	SG				POL	1 Sep 93	
1	12	DUMPCAR	BOGGEY CONNECTOR	522 00 010 1	EA	3	SG				POL	1 Sep 93	
1	13	DUMPCAR	SQ AXLE CAP ENDS	74 10 116	EA	6	SG				POL	1 Sep 93	
1	14	DUMPCAR	OUTSIDE SPRING	522 38-001 0	EA	24	SG				POL	1 Sep 93	
1	15	DUMPCAR	INSIDE SPRING	522 38 002 0	EA	24	SG				POL	1 Sep 93	
1	16	DUMPCAR	SET SH ABSORBERS	522 38 016 0	EA	6	SG				POL	1 Sep 93	
1	17	DUMPCAR	FRAME	4686-6061 40-016	EA	30	SG				POL	1 Sep 93	
1	18	DUMPCAR	SMALL BRAKE LOCKS	46-03 015	EA	30	SG				POL	1 Sep 93	
1	19	DUMPCAR	PUSH RDS BRAKE PDS	61 40-133	EA	12	SG				POL	1 Sep 93	
1	20	DUMPCAR	FRAME ENDS RIGHT	61 40 110	EA	4 8	SG				POL	1 Sep 93	
1	21	DUMPCAR	FRAME ENDS LEFT	61 40 120	EA	4 8	SG				POL	1 Sep 93	
1	22	DUMPCAR	BRK PADS COMP POLY	TY 38 114 79 72	EA	900	SG				POL	1 Sep 93	
1	23	DUMPCAR	WHEEL PAIRS	61 10 046	EA	6	SG				POL	1 Sep 93	
1	24	DUMPCAR	WHEEL PACKING COVER	TY 519 07	EA	6	SG				POL	1 Sep 93	
1	25	DUMPCAR	BOGGEY CONNECTORS	522 00-020-1	EA	3	SG				POL	1 Sep 93	
1	26	DUMPCAR	DISTRIBUTOR VALVE		EA	24	SG				POL	1 Sep 93	
1	27	DUMPCAR	AUTOMATIC COUPLING		EA	18	SG				POL	1 Sep 93	
1	28	DUMPCAR	AUTO COUPLING HEAD	106 00 00	EA	6	SG				POL	1 Sep 93	
1	29	DUMPCAR	COUPLING LOCK	106 01 002	EA	12	SG				POL	1 Sep 93	
1	30	DUMPCAR	LOCK HOLDER	106 01 003 0	EA	6	SG				POL	1 Sep 93	
1	31	DUMPCAR	COUPLING TRIPPER	106 01 006 0	EA	12	SG				POL	1 Sep 93	
1	32	DUMPCAR	COUPLING HINGE PINS	106 00-012 0	EA	18	SG				POL	1 Sep 93	
1	33	DUMPCAR	COUPLING SHOCK ABS	106-00-001	EA	12	SG				POL	1 Sep 93	
1	34	DUMPCAR	COUPLING SHOCK SLIDE	106-02 00-2	EA	6	SG				POL	1 Sep 93	
1	35	DUMPCAR	COUPLING SH AB LK	106-00-002 2	EA	24	SG				POL	1 Sep 93	
1	36	DUMPCAR	DOOR ACTLATOR ARMS	634 46 010	EA	24	SG				POL	1 Sep 93	
1	37	DUMPCAR	DOOR ACTUATOR ARMS	634 46 020 2	EA	24	SG				POL	1 Sep 93	
1	38	DUMPCAR	DOOR ACTUATOR ARMS	634 46-030	EA	12	SG				POL	1 Sep 93	
1	39	DUMPCAR	END VALVE		EA	30	SG				POL	1 Sep 93	
1	40	DUMPCAR	AIR SPEED REDUCERS		EA	24	SG				POL	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	41	DUMPCAR	RING PACKING	38-72	EA	60	SG				POL	1 Sep 93	
1	42	DUMPCAR	AIR DISTRIBUTOR	482 000	EA	0	SG				POL	1 Sep 93	
1	43	DUMPCAR	PISTON COLLAR	270 397	EA	6	SG				POL	1 Sep 93	
1	44	DUMPCAR	PISTON SPRING	270 397	EA	12	SG				POL	1 Sep 93	
1	45	DUMPCAR	HOUSING ACC AIR	DR 483 00	EA	18	SG				POL	1 Sep 93	
1	46	DUMPCAR	BRAKE CYL PARTS	VR 483 000	EA	18	SG				POL	1 Sep 93	
1	47	DUMPCAR	PIPES	VR 483 000	EA	18	SG				POL	1 Sep 93	
1	48	DUMPCAR	REGULATOR ARM	522 10 050 1	EA	18	SG				POL	1 Sep 93	
1	49	DUMPCAR	CAR CONNECTOR HOSE		EA	90	SG				POL	1 Sep 93	
1	50	DUMPCAR	TOTAL COST US DOLLARS				SG		$300 000		POL	1 Sep 93	
1	1	COAL LOAD	PUMP STATION	CMJ V3A00 OCY 2	EA	1	BA				CIS	1 Sep 93	
1	2	COAL LOAD	PULLEY HOIST	3460 03 03600/3430 11 2	EA	4	BA				CIS	1 Sep 93	
1	3	COAL LOAD	PULLEY IDLER	3460 03 03600/3430 11 0	EA	20	BA				CIS	1 Sep 93	
1	4	COAL LOAD	BELTS		EA	20	BA				CIS	1 Sep 93	
1	5	COAL LOAD	FRONT PLATE	3460 00 005 02	EA	1	BA				CIS	1 Sep 93	
1	6	COAL LOAD	VIBRATOR SCREEN	7204 001	EA	2	BA				CIS	1 Sep 93	
1	7	COAL LOAD	SCREEN SPRINGS	1R0 72	EA	6	BA				CIS	1 Sep 93	
1	8	COAL LOAD	REDUCTION GEAR BOX	MY25 AM 01 03 160	EA	1	BA				CIS	1 Sep 93	
1	9	COAL LOAD	ROLLARS	200001 01 00 04	EA	1000	BA				CIS	1 Sep 93	
1	10	COAL LOAD	ROLLARS	200022 01 00 04	EA	1000	BA				CIS	1 Sep 93	
1	11	COAL LOAD	ROLLARS	1E4 952 306	EA	100	BA				CIS	1 Sep 93	
1	12	COAL LOAD	ROLLARS	1E4 992 11CB	EA	60	BA				CIS	1 Sep 93	
1	13	COAL LOAD	ROLLARS	1E4 954 3CB	EA	30	BA				CIS	1 Sep 93	
1	14	COAL LOAD	REDUCTION GEAR BOX	KS1 300	EA	1	BA				CIS	1 Sep 93	
1	15	COAL LOAD	CONVEYOR BELTS	B 1000	M	400	BA				CIS	1 Sep 93	
1	16	COAL LOAD	CONVEYOR BELTS	B-1400	M	300	BA				CIS	1 Sep 93	
1	17	COAL LOAD	CONVEYOR BELTS	B 1200	M	400	BA				CIS	1 Sep 93	
1	18	COAL LOAD	CONVEYOR DR MOTORS	4A3556Y3 160	EA	1	BA				CIS	1 Sep 93	
1	19	COAL LOAD	CONVEYOR DR MOTORS	4AM200M6Y3 22	EA	2	BA				CIS	1 Sep 93	
1	20	COAL LOAD	CONVEYOR DR MOTORS	AO102 12 6-6-4 24/37	EA	1	BA				CIS	1 Sep 93	
1	21	COAL LOAD	CONVEYOR DR MOTORS	AO102 12 B 3 4 24/35	EA	1	BA				CIS	1 Sep 93	
1	22	COAL LOAD	CRUSHER SPRING	5460 00 004 60	EA	4	BA				CIS	1 Sep 93	
1	23	COAL LOAD	CRUSHER COLLAR	8752 79	EA	4	BA				CIS	1 Sep 93	
1	24	COAL LOAD	CRUSHER COLLAR	8752 79	EA	4	BA				CIS	1 Sep 93	
1	25	COAL LOAD	CRUSHER SHIM	3450-01 011	EA	2	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	26	COAL LOAD	CRUSHER BEARING	GOST 5721 75	EA	2	BA				CIS	1 Sep 93	
1	27	COAL LOAD	TOTAL COST US DOLLARS				BA		$315 000		CIS	1 Sep 93	
1	1	COAL LOAD	BUSHING	3400 00 005 02	EA	4	SG				CIS	1 Sep 93	
1	2	COAL LOAD	FRONT PLATE	3430 04 200 7	EA	8	SG				CIS	1 Sep 93	
1	3	COAL LOAD	DISC	3430 11 200 00	EA	8	SG				CIS	1 Sep 93	
1	4	COAL LOAD	DISC	3430 11 007 00	EA	8	SG				CIS	1 Sep 93	
1	5	COAL LOAD	DRIVE UNIT LEFT SIDE	7415 53 050 00	EA	1	SG				CIS	1 Sep 93	
1	6	COAL LOAD	VIBRATOR LEFT	GUCL 72 00	EA	1	SG				CIS	1 Sep 93	
1	7	COAL LOAD	VIBRATOR RIGHT	GUCL 72 00	EA	1	SG				CIS	1 Sep 93	
1	8	COAL LOAD	TOTAL COST US DOLLARS				SG		$35 000		CIS	1 Sep 93	
1	1	D TRAIN	DISTRIBUTER	D50 17 101 cb 1	EA	500	SG				CIS	1 Sep 93	
1	2	D TRAIN	PUMP ELEMENT	D50 27 104 cb	EA	50	SG				CIS	1 Sep 93	
1	3	D TRAIN	SEAL	D50 27 204 cb 2	EA	100	SG				CIS	1 Sep 93	
1	4	D TRAIN	DIRECTIONAL VALVE	D50 27 209 cb 1	EA	10	SG				CIS	1 Sep 93	
1	5	D TRAIN	OIL PUMP	D50 12 3 01	EA	30	SG				CIS	1 Sep 93	
1	6	D TRAIN	WATER PUMP	D50 11 01	EA	30	SG				CIS	1 Sep 93	
1	7	D TRAIN	SHOCK	D50 10 111	EA	40	SG				CIS	1 Sep 93	
1	8	D TRAIN	SEAL	D50 34 114 01	EA	50	SG				CIS	1 Sep 93	
1	9	D TRAIN	REGULATOR	D50 27 200cb	EA	10	SG				CIS	1 Sep 93	
1	10	D TRAIN	OUTLET VALVE	KT6 06-001 cb 2	EA	50	SG				CIS	1 Sep 93	
1	11	D TRAIN	INLET VALVE	KT6 06 001 cb 2	EA	50	SG				CIS	1 Sep 93	
1	12	D TRAIN	SPRING VALVE	KT6 06 033 2	EA	2000	SG				CIS	1 Sep 93	
1	13	D TRAIN	INLET FILTER	KT6-06 021	EA	500	SG				CIS	1 Sep 93	
1	14	D TRAIN	DRIVE HUB	T33 55 6 cb	EA	100	SG				CIS	1 Sep 93	
1	15	D TRAIN	BELT	b 2240	EA	100	SG				CIS	1 Sep 93	
1	16	D TRAIN	BELT	b 1250	EA	100	SG				CIS	1 Sep 93	
1	17	D TRAIN	SHOCK ABSORBER SP	3 35 30 101	EA	40	SG				CIS	1 Sep 93	
1	18	D TRAIN	PRESS ELEC GAUGE		EA	15	SG				CIS	1 Sep 93	
1	19	D TRAIN	SWITCHES	TB1 2	EA	50	SG				CIS	1 Sep 93	
1	20	D TRAIN	SWITCHES	TB1 1	EA	50	SG				CIS	1 Sep 93	
1	21	D TRAIN	SWITCHES	TB1 4	EA	50	SG				CIS	1 Sep 93	
1	22	D TRAIN	COUPLES RAIL	GEM 70-85 000	EA	10	SG				CIS	1 Sep 93	
1	23	D TRAIN	BRAKE SHOES	GEM 2 4211	EA	1000	SG				CIS	1 Sep 93	
1	24	D TRAIN	AUTO COUPLINGS	CA 3	EA	40	SG				CIS	1 Sep 93	
1	25	D TRAIN	BATTERY	32TN 450	SET	6	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	26	D TRAIN	LAMP	PX50X50	EA	200	SG				CIS	1 Sep 93	
1	27	D TRAIN	LAMP	24 25	EA	100	SG				CIS	1 Sep 93	
1	28	D TRAIN	TOTAL COST US DOLLARS				SG				CIS	1 Sep 93	
1	1	DRILL PARTS	TRACK PADS	31 001 008 34	SET	30	BA				CIS	1 Sep 93	
1	2	DRILL PARTS	TRACK RAILS	31 001 008 000	EA	1	BA				CIS	1 Sep 93	
1	3	DRILL PARTS	LEVELING JACKS	B59 14 240	EA	3 5	BA				CIS	1 Sep 93	
1	4	DRILL PARTS	SPROCKET	31C 152 012 06	EA	2	BA				CIS	1 Sep 93	
1	5	DRILL PARTS	SPROCKET	B59 14 052	EA	2	BA				CIS	1 Sep 93	
1	6	DRILL PARTS	SHOCK ABSORBER	B122 22 11 015	EA	5	BA				CIS	1 Sep 93	
1	7	DRILL PARTS	SHOCK ABSORBER	B122 22 00 155	EA	3	BA				CIS	1 Sep 93	
1	8	DRILL PARTS	COMPRESSOR SUPP	B122 0017 000	EA	0 5	BA				CIS	1 Sep 93	
1	9	DRILL PARTS	CARTRIDGE	10 10 080	EA	2	BA				CIS	1 Sep 93	
1	10	DRILL PARTS	DRILL STEEL	722 22 11 00	EA	2	BA				CIS	1 Sep 93	
1	11	DRILL PARTS	BUSHING	31 001 008 037	EA	30	BA				CIS	1 Sep 93	
1	12	DRILL PARTS	BUSHING	31 001 008 102	EA	30	BA				CIS	1 Sep 93	
1	13	DRILL PARTS	HYD DISTRIBUTOR	R102 A4 A222 50	EA	5	BA				CIS	1 Sep 93	
1	14	DRILL PARTS	HYD PUMP	61 12 22	EA	3	BA				CIS	1 Sep 93	
1	15	DRILL PARTS	3 SPEED MOTOR		EA	2 5	BA				CIS	1 Sep 93	
1	16	DRILL PARTS	PULL DOWN CABLE	3X50+1X16	M	300	BA				CIS	1 Sep 93	
1	17	DRILL PARTS	HYD PUMP	N 403E TY2 653260-70	EA	2 5	BA				CIS	1 Sep 93	
1	18	DRILL PARTS	HYD PUMP	BG 12 22 MI TY2 05	EA	5	BA				CIS	1 Sep 93	
1	19	DRILL PARTS	TOTAL COST US DOLLARS				BA		$150 000		CIS	1 Sep 93	
1	37	ELEC EQUIP	SYNC MOTOR	CDE 2 15 34-642	EA	1	BA				CIS	1 Jan 94	
1	40	EXPLOSIVES	AMMONIT 20mm CARRIDGES		TONNE	20	OT	$650 00	$13 000		CIS	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	1	HEAT PLT	CHAIN	9 08 000	M	125	BA				CIS	1 Sep 93	
1	2	HEAT PLT	HOLDER	T9 05 002	EA	100	BA				CIS	1 Sep 93	
1	3	HEAT PLT	HOLDER	T9 05 001	EA	100	BA				CIS	1 Sep 93	
1	4	HEAT PLT	HOLDER	6 30 2	EA	500	BA				CIS	1 Sep 93	
1	5	HEAT PLT	ROLLER	6 30 25	EA	300	BA				CIS	1 Sep 93	
1	6	HEAT PLT	FRONT PACKING	T197 01 001	EA	5	BA				CIS	1 Sep 93	
1	7	HEAT PLT	MIDDLE PACKING	T197 01 002	EA	5	BA				CIS	1 Sep 93	
1	8	HEAT PLT	END LEFT PACKING	T82 01 001	EA	5	BA				CIS	1 Sep 93	
1	9	HEAT PLT	RIGHT PACKING	T82 01 002	EA	5	BA				CIS	1 Sep 93	
1	10	HEAT PLT	MIDDLE PACKING	T82 01 003	EA	5	BA				CIS	1 Sep 93	
1	13	HEAT PLT	CONNECTING LINK	T82 00 018	EA	300	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	14	HEAT PLT	SHAFT	6 30 9	EA	300	BA				CIS	1 Sep 93	
1	15	HEAT PLT	WASHER	T82 03 005	EA	0 1	BA				CIS	1 Sep 93	
1	16	HEAT PLT	WASHER	12 10906-66	EA	0 1	BA				CIS	1 Sep 93	
1	17	HEAT PLT	WASHER	16-10906-66	EA	0 1	BA				CIS	1 Sep 93	
1	18	HEAT PLT	WASHER	20 11371 66	EA	0 1	BA				CIS	1 Sep 93	
1	19	HEAT PLT	COTTER PIN	5X25 397 66	EA	0 1	BA				CIS	1 Sep 93	
1	20	HEAT PLT	COTTER PIN	5X28 397 66	EA	0 25	BA				CIS	1 Sep 93	
1	21	HEAT PLT	COTTER PIN	9X50 2319 70	EA	0 25	BA				CIS	1 Sep 93	
1	22	HEAT PLT	CHAIN	9X27 2319 70	M	100	BA				CIS	1 Sep 93	
1	23	HEAT PLT	FT SHFT W/ HALF COUP	T82 03 000	EA	0 5	BA				CIS	1 Sep 93	
1	24	HEAT PLT	END SHAFT	T82 07 000	EA	0 5	BA				CIS	1 Sep 93	
1	25	HEAT PLT	SOCKSHING PAN	DN 17	EA	1	BA				CIS	1 Sep 93	
1	26	HEAT PLT	STEAM BOILER PARTS	1 08 06	SET	100	BA				CIS	1 Sep 93	
1	27	HEAT PLT	STEAM BOILER PARTS	1 08 05	EA	600	BA				CIS	1 Sep 93	
1	28	HEAT PLT	STEAM BOILER PARTS	3P 800	EA	2	BA				CIS	1 Sep 93	
1	29	HEAT PLT	BOILER CONVEC SEC	KVTC 20 150	EA	1	BA				CIS	1 Sep 93	
1	30	HEAT PLT	TOTAL COST US DOLLARS				BA		$300 000		CIS	1 Sep 93	
1	1	HEAT PLT	CHAIN	9 08 000	M	125	SG				CIS	1 Sep 93	
1	2	HEAT PLT	HOLDER	T9 05 002	EA	100	SG				CIS	1 Sep 93	
1	3	HEAT PLT	HOLDER	T9 05 001	EA	100	SG				CIS	1 Sep 93	
1	4	HEAT PLT	HOLDER	6 30 2	EA	500	SG				CIS	1 Sep 93	
1	5	HEAT PLT	ROLLER	6 30 25	EA	300	SG				CIS	1 Sep 93	
1	6	HEAT PLT	FRONT PACKING	T197 01 001	EA	5	SG				CIS	1 Sep 93	
1	7	HEAT PLT	MIDDLE PACKING	T197 01 002	EA	5	SG				CIS	1 Sep 93	
1	8	HEAT PLT	END LEFT PACKING	T82 01 001	EA	5	SG				CIS	1 Sep 93	
1	9	HEAT PLT	RIGHT PACKING	T82 01 002	EA	5	SG				CIS	1 Sep 93	
1	10	HEAT PLT	MIDDLE PACKING	T82 01 003	EA	5	SG				CIS	1 Sep 93	
1	13	HEAT PLT	CONNECTING LINK	T82 00 018	EA	300	SG				CIS	1 Sep 93	
1	14	HEAT PLT	SHAFT	6 30 9	EA	300	SG				CIS	1 Sep 93	
1	15	HEAT PLT	WASHER	T82 03 005	EA	0 1	SG				CIS	1 Sep 93	
1	16	HEAT PLT	WASHER	12 10906-66	EA	0 1	SG				CIS	1 Sep 93	
1	17	HEAT PLT	WASHER	16-10906-66	EA	0 1	SG				CIS	1 Sep 93	
1	18	HEAT PLT	WASHER	20-11371 66	EA	0 1	SG				CIS	1 Sep 93	
1	19	HEAT PLT	COTTER PIN	5X25 397 66	EA	0 1	SG				CIS	1 Sep 93	
1	20	HEAT PLT	COTTER PIN	5X28 397 66	EA	0 25	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	21	HEAT PLT	COTTER PIN	9X50 2319 70	EA	0 25	SG				CIS	1 Sep 93	
1	22	HEAT PLT	CHAIN	9X27 2319 70	M	100	SG				CIS	1 Sep 93	
1	23	HEAT PLT	FT SHFT W/ HALF COUP	T82 03 000	EA	0 5	SG				CIS	1 Sep 93	
1	24	HEAT PLT	END SHAFT	T82 07 000	EA	0 5	SG				CIS	1 Sep 93	
1	25	HEAT PLT	SOCKSHING PAN	DN 17	EA	1	SG				CIS	1 Sep 93	
1	26	HEAT PLT	STEAM BOILER PARTS	1 08 06	SET	100	SG				CIS	1 Sep 93	
1	27	HEAT PLT	STEAM BOILER PARTS	1 08 05	EA	600	SG				CIS	1 Sep 93	
1	28	HEAT PLT	STEAM BOILER PARTS	3P 800	EA	2	SG				CIS	1 Sep 93	
1	29	HEAT PLT	BOILER CONVEC SEC	KVTC 20 150	EA	1	SG				CIS	1 Sep 93	
1	30	HEAT PLT	TOTAL COST US DOLLARS				SG		$300 000		CIS	1 Sep 93	
1	1	RAIL MAT	RAIL TYPE P 50	7174 75	TONNE	450	BA				CIS	1 Sep 93	
1	2	RAIL MAT	RAIL TYPE P 65	7174 75	TONNE	300	BA				CIS	1 Sep 93	
1	3	RAIL MAT	BEDING PLATE P 50	12135 75	TONNE	36	BA				CIS	1 Sep 93	
1	4	RAIL MAT	BEDING PLATE P 65	12135 75	TONNE	36	BA				CIS	1 Sep 93	
1	5	RAIL MAT	CONN PLATE P 50	4133 54	TONNE	36	BA				CIS	1 Sep 93	
1	6	RAIL MAT	CONN PLATE P 65	4133 54	TONNE	36	BA				CIS	1 Sep 93	
1	7	RAIL MAT	RR SPAKE P 50		TONNE	36	BA				CIS	1 Sep 93	
1	8	RAIL MAT	RAIL PLANGE P 50	2953 51	TONNE	9	BA				CIS	1 Sep 93	
1	9	RAIL MAT	RAIL PLANGE P 65	2953 51	TONNE	9	BA				CIS	1 Sep 93	
1	10	RAIL MAT	BOLTS&NUTS P 50	11530 76	TONNE	9	BA				CIS	1 Sep 93	
1	11	RAIL MAT	BOLTS & NUTS P 65	11530-76	TONNE	4 5	BA				CIS	1 Sep 93	
1	12	RAIL MAT	LOCK WASHER P 50	19115 73	TONNE	3 6	BA				CIS	1 Sep 93	
1	13	RAIL MAT	TRACK SWITCH P50 RT		SET	3	BA				CIS	1 Sep 93	
1	14	RAIL MAT	TRACK SWITCH P65 LEFT		SET	3	BA				CIS	1 Sep 93	
1	15	RAIL MAT	Y RAIL P50-DIRECT LEFT		EA	1 5	BA				CIS	1 Sep 93	
1	16	RAIL MAT	Y RAIL P50 DIRECT RIGHT		EA	1 5	BA				CIS	1 Sep 93	
1	17	RAIL MAT	YRAIL P50-BENDED RIGHT		EA	1 5	BA				CIS	1 Sep 93	
1	18	RAIL MAT	RAIL INSOLATOR P50		SET	180	BA				CIS	1 Sep 93	
1	19	RAIL MAT	RAIL INSOLATOR P65		SET	165	BA				CIS	1 Sep 93	
1	20	RAIL MAT	CRESOTA SLEEPER		TONNE	3	BA				CIS	1 Sep 93	
1	21	RAIL MAT	TOTAL COST US DOLLARS				BA		$105 000		CIS	1 Sep 93	
1	1	RAIL MAT	RAIL TYPE P 50	7174 75	TONNE	1050	SG				CIS	1 Sep 93	
1	2	RAIL MAT	RAIL TYPE P 65	7174 75	TONNE	700	SG				CIS	1 Sep 93	
1	3	RAIL MAT	BEDING PLATE P 50	12135 75	TONNE	84	SG				CIS	1 Sep 93	
1	4	RAIL MAT	BEDING PLATE P 65	12135 75	TONNE	84	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	5	RAIL MAT	CONN PLATE P 50	4133 54	TONNE	84	SG				CIS	1 Sep 93	
1	6	RAIL MAT	CONN PLATE P 65	4133 54	TONNE	84	SG				CIS	1 Sep 93	
1	7	RAIL MAT	RR SPAKE P 50		TONNE	84	SG				CIS	1 Sep 93	
1	8	RAIL MAT	RAIL PLANGE P 50	2953 51	TONNE	21	SG				CIS	1 Sep 93	
1	9	RAIL MAT	RAIL PLANGE P 65	2953 51	TONNE	21	SG				CIS	1 Sep 93	
1	10	RAIL MAT	BOLTS&NUTS P 50	11530-76	TONNE	21	SG				CIS	1 Sep 93	
1	11	RAIL MAT	BOLTS & NUTS P 65	11530-76	TONNE	10 5	SG				CIS	1 Sep 93	
1	12	RAIL MAT	LOCK WASHER P 50	19115 73	TONNE	8 4	SG				CIS	1 Sep 93	
1	13	RAIL MAT	TRACK SWITCH P50-RT		SET	7	SG				CIS	1 Sep 93	
1	14	RAIL MAT	TRACK SWITCH P65 LEFT		SET	7	SG				CIS	1 Sep 93	
1	15	RAIL MAT	Y RAIL P50 DIRECT LEFT		EA	3 5	SG				CIS	1 Sep 93	
1	16	RAIL MAT	Y RAIL P50 DIRECT RIGHT		EA	3 5	SG				CIS	1 Sep 93	
1	17	RAIL MAT	YRAIL P50 BENDED RIGHT		EA	3 5	SG				CIS	1 Sep 93	
1	18	RAIL MAT	RAIL INSOLATOR P50		SET	420	SG				CIS	1 Sep 93	
1	19	RAIL MAT	RAIL INSOLATOR P65		SET	385	SG				CIS	1 Sep 93	
1	20	RAIL MAT	CRESOTA SLEEPER		TONNE	7	SG				CIS	1 Sep 93	
1	21	RAIL MAT	TOTAL COST US DOLLARS				SG		$245 000		CIS	1 Sep 93	
1	1	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	BA				CIS	1 Sep 93	
1	1	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	BA				CIS	1 Jan 94	
1	2	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	BA				CIS	1 Sep 93	
1	2	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	BA				CIS	1 Jan 94	
1	3	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	BA				CIS	1 Sep 93	
1	3	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	BA				CIS	1 Jan 94	
1	4	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	BA				CIS	1 Sep 93	
1	4	RR COMM	SIGNAL CABLE	GOST6436 75	KM	2	BA				CIS	1 Jan 94	
1	5	RR COMM	SIGNAL CABLE	GOST6436 75	KM	2	BA				CIS	1 Sep 93	
1	5	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	BA				CIS	1 Jan 94	
1	6	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	BA				CIS	1 Sep 93	
1	6	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	BA				CIS	1 Jan 94	
1	7	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1 5	BA				CIS	1 Sep 93	
1	7	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1 5	BA				CIS	1 Jan 94	
1	8	RR COMM	ROAD TRANSFORMER	NFT A	EA	15	BA				CIS	1 Sep 93	
1	8	RR COMM	ROAD TRANSFORMER	NFT A	EA	15	BA				CIS	1 Jan 94	
1	9	RR COMM	ROAD TRANSPORMER	NOVC 5A	EA	15	BA				CIS	1 Sep 93	
1	9	RR COMM	ROAD TRANSPORMER	NOVC 5A	EA	15	BA				CIS	1 Jan 94	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	10	RR COMM	SIGNAL TRANSFORMER	ST 6	EA	25	BA				CIS	1 Sep 93	
1	10	RR COMM	SIGNAL TRANSFORMER	ST 6	EA	25	BA				CIS	1 Jan 94	
1	11	RR COMM	SWITCH RELAY	2162 00-V	EA	25	BA				CIS	1 Sep 93	
1	11	RR COMM	SWITCH RELAY	2162 00-V	EA	25	BA				CIS	1 Jan 94	
1	12	RR COMM	RECTIFIER	86-00-00V	EA	25	BA				CIS	1 Sep 93	
1	12	RR COMM	RECTIFIER	86 00 00V	EA	25	BA				CIS	1 Jan 94	
1	13	RR COMM	RESISTOR	7165	EA	25	BA				CIS	1 Sep 93	
1	13	RR COMM	RESISTOR	7165	EA	25	BA				CIS	1 Jan 94	
1	14	RR COMM	SWITCHING GEAR BOX		EA	5	BA				CIS	1 Sep 93	
1	14	RR COMM	SWITCHING GEAR BOX		EA	5	BA				CIS	1 Jan 94	
1	15	RR COMM	LAMPS FOR LINZ		EA	250	BA				CIS	1 Sep 93	
1	15	RR COMM	LAMPS FOR LINZ		EA	250	BA				CIS	1 Jan 94	
1	16	RR COMM	FRAMEWORK	19402 00 00	EA	5	BA				CIS	1 Sep 93	
1	16	RR COMM	FRAMEWORK	19402 00 00	EA	5	BA				CIS	1 Jan 94	
1	17	RR COMM	BONDING WIRE	21 00 00	EA	25	BA				CIS	1 Sep 93	
1	17	RR COMM	BONDING WIRE	21 00 00	EA	25	BA				CIS	1 Jan 94	
1	18	RR COMM	CONTROL WIRE		EA	50	BA				CIS	1 Sep 93	
1	18	RR COMM	CONTROL WIRE		EA	50	BA				CIS	1 Jan 94	
1	19	RR COMM	LAMPS FOR TERM BD		EA	500	BA				CIS	1 Sep 93	
1	19	RR COMM	LAMPS FOR TERM BD		EA	500	BA				CIS	1 Jan 94	
1	20	RR COMM	SWITCHING RELAY SET	144690000A	EA	5	BA				CIS	1 Sep 93	
1	20	RR COMM	SWITCHING RELAY SET	144690000A	EA	5	BA				CIS	1 Jan 94	
1	21	RR COMM	INST FOR ELEC MEAS		EA	5	BA				CIS	1 Sep 93	
1	21	RR COMM	INST FOR ELEC MEAS		EA	5	BA				CIS	1 Jan 94	
1	22	RR COMM	RR LINZ LTS RED	26116 00-00	EA	25	BA				CIS	1 Sep 93	
1	22	RR COMM	RR LINZ LTS RED	26116-00 00	EA	25	BA				CIS	1 Jan 94	
1	23	RR COMM	RR LINZ LTS GREEN	26116-00-00	EA	25	BA				CIS	1 Sep 93	
1	23	RR COMM	RR LINZ LTS GREEN	26116-00-00	EA	25	BA				CIS	1 Jan 94	
1	24	RR COMM	RR LINZ LTS WHITE	26116 00-00	EA	20	BA				CIS	1 Sep 93	
1	24	RR COMM	RR LINZ LTS WHITE	26116-00-00	EA	20	BA				CIS	1 Jan 94	
1	25	RR COMM	ELECTROMOTOR		EA	10	BA				CIS	1 Sep 93	
1	25	RR COMM	ELECTROMOTOR		EA	10	BA				CIS	1 Jan 94	
1	26	RR COMM	SWITCHING ARM		EA	15	BA				CIS	1 Sep 93	
1	26	RR COMM	SWITCHING ARM		EA	15	BA				CIS	1 Jan 94	
1	27	RR COMM	TOTAL COST US DOLLARS				BA		$4 000		CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	27	RR COMM	TOTAL COST US DOLLARS				BA		$4 000		CIS	1 Jan 94	
1	1	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	SG				CIS	1 Sep 93	
1	2	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	SG				CIS	1 Sep 93	
1	3	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	SG				CIS	1 Sep 93	
1	4	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	SG				CIS	1 Sep 93	
1	5	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	SG				CIS	1 Sep 93	
1	6	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	SG				CIS	1 Sep 93	
1	7	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1 5	SG				CIS	1 Sep 93	
1	8	RR COMM	ROAD TRANSFORMER	NFT A	EA	15	SG				CIS	1 Sep 93	
1	9	RR COMM	ROAD TRANSPORMER	NOVC 5A	EA	15	SG				CIS	1 Sep 93	
1	10	RR COMM	SIGNAL TRANSFORMER	ST 6	EA	25	SG				CIS	1 Sep 93	
1	11	RR COMM	SWITCH RELAY	2162 00 V	EA	25	SG				CIS	1 Sep 93	
1	12	RR COMM	RECTIFIER	86 00-00V	EA	25	SG				CIS	1 Sep 93	
1	13	RR COMM	RESISTOR	7165	EA	25	SG				CIS	1 Sep 93	
1	14	RR COMM	SWITCHING GEAR BOX		EA	5	SG				CIS	1 Sep 93	
1	15	RR COMM	LAMPS FOR LINZ		EA	250	SG				CIS	1 Sep 93	
1	16	RR COMM	FRAMEWORK	19402 00 00	EA	5	SG				CIS	1 Sep 93	
1	17	RR COMM	BONDING WIRE	21 00 00	EA	25	SG				CIS	1 Sep 93	
1	18	RR COMM	CONTROL WIRE		EA	50	SG				CIS	1 Sep 93	
1	19	RR COMM	LAMPS FOR TERM BD		EA	500	SG				CIS	1 Sep 93	
1	20	RR COMM	SWITCHING RELAY SET	144690000A	EA	5	SG				CIS	1 Sep 93	
1	21	RR COMM	INST FOR ELEC MEAS		EA	5	SG				CIS	1 Sep 93	
1	22	RR COMM	RR LINZ LTS RED	26116 00 00	EA	25	SG				CIS	1 Sep 93	
1	23	RR COMM	RR LINZ LTS GREEN	26116 00 00	EA	25	SG				CIS	1 Sep 93	
1	24	RR COMM	RR LINZ LTS WHITE	26116-00-00	EA	20	SG				CIS	1 Sep 93	
1	25	RR COMM	ELECTROMOTOR		EA	10	SG				CIS	1 Sep 93	
1	26	RR COMM	SWITCHING ARM		EA	15	SG				CIS	1 Sep 93	
1	27	RR COMM	TOTAL COST US DOLLARS				SG		$6 000		CIS	1 Sep 93	
1	1	SM ENG PTS	ENGINE	D160	SET	2 25	OT				CIS	1 Sep 93	
1	2	SM ENG PTS	COTTER PINS	1434	EA	36	OT				CIS	1 Sep 93	
1	3	SM ENG PTS	COTTER PINS	2971	EA	36	OT				CIS	1 Sep 93	
1	4	SM ENG PTS	BLOCK ENGINE	51 01 2 cb	EA	2 25	OT				CIS	1 Sep 93	
1	5	SM ENG PTS	PACKING	40201	EA	7 5	OT				CIS	1 Sep 93	
1	6	SM ENG PTS	RINGS	40210	EA	75	OT				CIS	1 Sep 93	
1	7	SM ENG PTS	PACKING SETS UPPER	A 230113160 cbn1	SET	15	OT				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	8	SM ENG PTS	PACKINGSETS LOWER	A230110311	SET	15	OT				CIS	1 Sep 93	
1	9	SM ENG PTS	PACKING SETS	A23 0110312 AN2	SET	15	OT				CIS	1 Sep 93	
1	10	SM ENG PTS	PACKING	14 02 101 cb	EA	15	OT				CIS	1 Sep 93	
1	11	SM ENG PTS	ENGINE REBUILD KIT	1 02 10 cp	SET	3	OT				CIS	1 Sep 93	
1	12	SM ENG PTS	GUSHING	03325	EA	7 5	OT				CIS	1 Sep 93	
1	13	SM ENG PTS	PACKING UPPER	023 02 10002 AN1	SET	15	OT				CIS	1 Sep 93	
1	14	SM ENG PTS	PACKING LOWER	A23 0 10004 DN1	ET	15	OT				CIS	1 Sep 93	
1	15	SM ENG PTS	RING SETS	A27 00 011	SET	22 5	OT				CIS	1 Sep 93	
1	16	SM ENG PTS	RING SETS	027 00 024	SET	22 5	OT				CIS	1 Sep 93	
1	17	SM ENG PTS	RING SETS	A27 00 043	SET	22 5	OT				CIS	1 Sep 93	
1	18	SM ENG PTS	PISTON RING SETS	03694 1 cp	SET	3	OT				CIS	1 Sep 93	
1	19	SM ENG PTS	GENERATOR BELT	5X9X1090	EA	15	OT				CIS	1 Sep 93	
1	20	SM ENG PTS	FAN BELTS	16X11X1650	EA	15	OT				CIS	1 Sep 93	
1	21	SM ENG PTS	WATER PUMP	16 08 140 cp	EA	7 5	OT				CIS	1 Sep 93	
1	22	SM ENG PTS	OIL PUMP	29 09 124 cp	EA	6	OT				CIS	1 Sep 93	
1	23	SM ENG PTS	CYLINDER LINER	01466	EA	9	OT				CIS	1 Sep 93	
1	24	SM ENG PTS	RING SETS	51 03 115 cp	EA	75	OT				CIS	1 Sep 93	
1	25	SM ENG PTS	CRANKSHAFT	16 03 1120 cp	EA	3	OT				CIS	1 Sep 93	
1	26	SM ENG PTS	PISTON	51 03 103	SET	7 5	OT				CIS	1 Sep 93	
1	27	SM ENG PTS	PACKING	700 40 2886	EA	15	OT				CIS	1 Sep 93	
1	28	SM ENG PTS	FILTER	A41 20 000 1 cp	EA	30	OT				CIS	1 Sep 93	
1	29	SM ENG PTS	FILTER	A41 10 000 02	EA	30	OT				CIS	1 Sep 93	
1	30	SM ENG PTS	RING	40843	EA	75	OT				CIS	1 Sep 93	
1	31	SM ENG PTS	PACKING	40269	EA	7 5	OT				CIS	1 Sep 93	
1	32	SM ENG PTS	SPRAYER	14 69 107 1 cp	EA	75	OT				CIS	1 Sep 93	
1	33	SM ENG PTS	INJECTOR FITTINGS	14 69 117 1 cp	EA	75	OT				CIS	1 Sep 93	
1	34	SM ENG PTS	CYLINDER HEAD	29 02 30 cp	EA	2 25	OT				CIS	1 Sep 93	
1	35	SM ENG PTS	STARTER	1723 cp	EA	2 25	OT				CIS	1 Sep 93	
1	36	SM ENG PTS	RADIATOR	1304130101 cp	EA	7 5	OT				CIS	1 Sep 93	
1	37	SM ENG PTS	MAGNETO	M 149A	EA	7 5	OT				CIS	1 Sep 93	
1	38	SM ENG PTS	CARBURATOR	113 110-70-11	EA	7 5	OT				CIS	1 Sep 93	
1	39	SM ENG PTS	GENERATOR	69 063701	EA	6	OT				CIS	1 Sep 93	
1	40	SM ENG PTS	STARTER	CT 230E	EA	6	OT				CIS	1 Sep 93	
1	41	SM ENG PTS	TRUBO COMPRESSOR	111 30 001 10	EA	4 5	OT				CIS	1 Sep 93	
1	42	SM ENG PTS	FUEL SYSTEM UPPER	16 67 1 cp	EA	4 5	OT				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	43	SM ENG PTS	TOTAL COST US DOLLARS				OT		$90 000		CIS	1 Sep 93	
1	2	T250 DOZER	TRACK ASSEMBLEY	748-27 TOT CP	SET	2	AD				CIS	1 Sep 93	
1	1	WATER P	PUMP CENTRIFUGE	SNC 180-65	EA	0 6	SG				CIS	1 Sep 93	
1	2	WATER P	PUMP CENTRIFUGE	D 1250 65	EA	0 6	SG				CIS	1 Sep 93	
1	3	WATER P	PUMP CENTRIFUGE	D 200 95	EA	0 6	SG				CIS	1 Sep 93	
1	4	WATER P	PUMP CENTRIFUGE	NSC 3	EA	1 2	SG				CIS	1 Sep 93	
1	5	WATER P	IMPELLOR		EA	1 8	SG				CIS	1 Sep 93	
1	6	WATER P	IMPELLOR	5KE 224 176A	EA	12	SG				CIS	1 Sep 93	
1	7	WATER P	SHAFT	8KE 200 525 01A	EA	3	SG				CIS	1 Sep 93	
1	8	WATER P	SHAFT	EB 205 320	EA	3	SG				CIS	1 Sep 93	
1	9	WATER P	SHAFT	EB 205 320	EA	3	SG				CIS	1 Sep 93	
1	10	WATER P	COLLAR	1 35 58 2 GOCT 8752 70	EA	6	SG				CIS	1 Sep 93	
1	11	WATER P	SPARING	8KE 211 023	EA	3 6	SG				CIS	1 Sep 93	
1	12	WATER P	BEARING	5KS 253 013	EA	3 6	SG				CIS	1 Sep 93	
1	13	WATER P	IMPELLOR	5KE 224 014	EA	3 6	SG				CIS	1 Sep 93	
1	14	WATER P	SPARING	8KS 210 095	EA	3 6	SG				CIS	1 Sep 93	
1	15	WATER P	COUPLING	8KS 255 000	EA	1 8	SG				CIS	1 Sep 93	
1	16	WATER P	PUMP	VKC 1/16	EA	1 2	SG				CIS	1 Sep 93	
1	17	WATER P	PUMP PART	0G 81/18	EA	0 6	SG				CIS	1 Sep 93	
1	18	WATER P	PUMP CENTRIFUGE	D 320 50	EA	0 6	SG				CIS	1 Sep 93	
1	19	WATER P	PUMP CENTRIFUGE	D 1250 65	EA	1 2	SG				CIS	1 Sep 93	
1	20	WATER P	PUMP PART	GNOM 10 10	EA	2 4	SG				CIS	1 Sep 93	
1	21	WATER P	PUMP PART	NSC 3	EA	0 6	SG				CIS	1 Sep 93	
1	22	WATER P	PUMP PART	FG 144/46	EA	1 2	SG				CIS	1 Sep 93	
1	23	WATER P	PUMP CENTRIFUGE	SHCGA 38-220	EA	1 2	SG				CIS	1 Sep 93	
1	24	WATER P	PUMP CENTRIFUGE	K 20 30	EA	4 8	SG				CIS	1 Sep 93	
1	25	WATER P	PUMP CENTRIFUGE	K 45/55	EA	2 4	SG				CIS	1 Sep 93	
1	26	WATER P	PUMP CENTRIFUGE	SNC 400-105	EA	0 6	SG				CIS	1 Sep 93	
1	27	WATER P	PUMP CENTRIFUGE	SNC 240-300	EA	0 6	SG				CIS	1 Sep 93	
1	28	WATER P	PUMP PART	ESB 6 16-75	EA	0 6	SG				CIS	1 Sep 93	
1	29	WATER P	PUMP PART	ESB 8 40-165	EA	1 2	SG				CIS	1 Sep 93	
1	30	WATER P	PUMP PART	ESB-10-120-60	EA	1 2	SG				CIS	1 Sep 93	
1	31	WATER P	PUMP PART	ESB-10-120-60	EA	3	SG				CIS	1 Sep 93	
1	32	WATER P	TOTAL COST US DOLLARS				SG		$150 000		CIS	1 Sep 93	
1	1	WATER P	PUMP CENTRIFUGE	SNC 180-65	EA	0 4	SO				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	2	WATER P	PUMP CENTRIFUGE	D 1250-65	EA	0 4	SO				CIS	1 Sep 93	
1	3	WATER P	PUMP CENTRIFUGE	D 200-95	EA	0 4	SO				CIS	1 Sep 93	
1	4	WATER P	PUMP CENTRIFUGE	NSC 3	EA	0 8	SO				CIS	1 Sep 93	
1	5	WATER P	IMPELLOR		EA	1 2	SO				CIS	1 Sep 93	
1	6	WATER P	IMPELLOR	5KE 224 176A	EA	8	SO				CIS	1 Sep 93	
1	7	WATER P	SHAFT	8KE 200 525 01A	EA	2	SO				CIS	1 Sep 93	
1	8	WATER P	SHAFT	EB-205 320	EA	2	SO				CIS	1 Sep 93	
1	9	WATER P	SHAFT	EB 205 320	EA	2	SO				CIS	1 Sep 93	
1	10	WATER P	COLLAR	1 35 58 2 GOCT 8752 70	EA	4	SO				CIS	1 Sep 93	
1	11	WATER P	SPARING	8KE 211 023	EA	2 4	SO				CIS	1 Sep 93	
1	12	WATER P	BEARING	5KS 253 013	EA	2 4	SO				CIS	1 Sep 93	
1	13	WATER P	IMPELLOR	5KE 224 014	EA	2 4	SO				CIS	1 Sep 93	
1	14	WATER P	SPARING	8KS 210 095	EA	2 4	SO				CIS	1 Sep 93	
1	15	WATER P	COUPLING	8KS 255 000	EA	1 2	SO				CIS	1 Sep 93	
1	16	WATER P	PUMP	VKC 1/16	EA	0 8	SO				CIS	1 Sep 93	
1	17	WATER P	PUMP PART	0G 81/18	EA	0 4	SO				CIS	1 Sep 93	
1	18	WATER P	PUMP CENTRIFUGE	D 320-50	EA	0 4	SO				CIS	1 Sep 93	
1	19	WATER P	PUMP CENTRIFUGE	D 1250 65	EA	0 8	SO				CIS	1 Sep 93	
1	20	WATER P	PUMP PART	GNOM 10 10	EA	1 6	SO				CIS	1 Sep 93	
1	21	WATER P	PUMP PART	NSC 3	EA	0 4	SO				CIS	1 Sep 93	
1	22	WATER P	PUMP PART	FG 144/46	EA	0 8	SO				CIS	1 Sep 93	
1	23	WATER P	PUMP CENTRIFUGE	SHCGA 38 220	EA	0 8	SO				CIS	1 Sep 93	
1	24	WATER P	PUMP CENTRIFUGE	K 20 30	EA	3 2	SO				CIS	1 Sep 93	
1	25	WATER P	PUMP CENTRIFUGE	K 45/55	EA	1 6	SO				CIS	1 Sep 93	
1	26	WATER P	PUMP CENTRIFUGE	SNC 400-105	EA	0 4	SO				CIS	1 Sep 93	
1	27	WATER P	PUMP CENTRIFUGE	SNC 240 300	EA	0 4	SO				CIS	1 Sep 93	
1	28	WATER P	PUMP PART	ESB 6-16-75	EA	0 4	SO				CIS	1 Sep 93	
1	29	WATER P	PUMP PART	ESB 8 40-165	EA	0 8	SO				CIS	1 Sep 93	
1	30	WATER P	PUMP PART	ESB 10-120-60	EA	0 8	SO				CIS	1 Sep 93	
1	31	WATER P	PUMP PART	ESB 10-120-60	EA	2	SO				CIS	1 Sep 93	
1	32	WATER P	TOTAL COST US DOLLARS				SO		$100 000		CIS	1 Sep 93	
2	152	BATTERIES	6 CT 132 AMP/HR 12V		EA	50	BA	169 6	$8 480		USA	1 Sep 93	
2	157	BATTERIES	6 CT 182 AMP/HR 12V		EA	50	BA	204 06	$10 203		USA	1 Jan 94	
2	153	BATTERIES	6 CT 132 AMP/HR 12V		EA	50	SG	169 6	$8 480		USA	1 Sep 93	
2	154	BATTERIES	6 CT 132 AMP/HR 12V		EA	20	SO	169 6	$3 392		USA	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	159	BATTERIES	6 CT 182 AMP/HR 12V		EA	20	SO	204 06	$4 081		USA	1 Jan-94	
2	82	BELT SUPP	SPLICING KITS 1600 mm		EA	10	BA	$564 98	$5 650		USA	1 Jan 94	
2	83	BELT SUPP	SPLICING KITS 1400 mm		EA	10	BA	$461 10	$4 611		USA	1 Jan 94	
2	84	BELT SUPP	SPLICING KITS 1200 mm		EA	10	BA	$368 88	$3 689		USA	1 Jan 94	
2	86	BELT SUPP	SPLICING KITS 1000 mm		EA	10	BA	$322 24	$3 222		USA	1 Jan 94	
2	88	BELT SUPP	SPLICING KITS 800 mm		EA	10	BA	$276 66	$2 767		USA	1 Jan 94	
2	85	BELT SUPP	SPLICING KITS 1200 mm		EA	10	SG	$368 88	$3 689		USA	1 Jan 94	
2	87	BELT SUPP	SPLICING KITS 1000 mm		EA	10	SG	$322 24	$3 222		USA	1 Jan 94	
2	89	BELT SUPP	SPLICING KITS 800 mm		EA	10	SG	$276 66	$2 767		USA	1 Jan 94	
2	75	CONV BELT	1000 mm 5 PLY FABRIC		M	800	SG	$106 89	$85 512		USA	1 Jan 94	
2	77	CONV BELT	1200 mm 6 PLY FABRIC		M	670	SG	$147 53	$98 845		USA	1 Jan 94	
2	81	CONV BELT	800 mm 6 PLY FABRIC		M	500	SG	$107 99	$53 995		USA	1 Jan 94	
2	36	DRILLS	160mm				SG	$300 000	$300 000		USA	1 Jan 94	
2	17	FEL	CAT992C FRONT END LOADER		EA	1	BA	$977 672	$977 672		USA	1 Sep 93	
2	151	TRUCK TIRE	18x33x32 PLY EH		EA	120	BA	1706	$204 720		USA	1 Jan 94	
2	58	WIRE ROPE	45 5mm(1 75) 8 2 Kg/M 10 TONNE		FT	3 888	BA	$2 91	$11 314		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	64	WIRE ROPE	30mm (1 25) 4 0 Kg/M 3TONNE		FT	1 907	BA	$1 73	$3 299		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	68	WIRE ROPE	30mm (5/8) 9 Kg/M 1 5 TONNE		FT	4 563	BA	$0 55	$2 510		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	70	WIRE ROPE	13 5mm(9/16) 2 5 TONNE		FT	9 340	BA	$0 50	$4 670		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	72	WIRE ROPE	9 11 mm(7/16) 2 TONNE		FT	12 958	BA	$0 40	$5 183		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	63	WIRE ROPE	39mm (1 5) 4 2 Kg/M 10 TONNE		FT	4 417	AD	$2 31	$10 203		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	59	WIRE ROPE	45 5mm(1 75") 8 2 Kg/M 15 TONNE		FT	5 832	SG	$2 91	$16 971		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	65	WIRE ROPE	30mm (1 25) 4 0 Kg/M 2 TONNE		FT	1 271	SG	$1 73	$2 199		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	69	WIRE ROPE	30mm (5/8) 9 Kg/M 1 5 TONNE		FT	4 593	SG	$0 55	$2 526		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	71	WIRE ROPE	13 5mm(9/16) 2 5 TONNE		FT	9 340	SG	$0 50	$4 670		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	73	WIRE ROPE	9 11 mm(7/16) 2 TONNE		FT	12 598	SG	$0 40	$5 039		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	1	KRAZ	ENGINE	238M 1000186	EA	4 8	OT				URK	1 Sep 93	
2	2	KRAZ	SHIM	238 1000102 B2R1	EA	25 6	OT				URK	1 Sep 93	
2	3	KRAZ	SHIM	238 1000102 B2	EA	25 6	OT				URK	1 Sep 93	
2	4	KRAZ	SHIM	23831000104 V2	EA	25 6	OT				URK	1 Sep 93	
2	5	KRAZ	CLIPS	256-1001005 A1	EA	40	OT				URK	1 Sep 93	
2	6	KRAZ	ENG RING SETS	236-1000106 B2	EA	160	OT				URK	1 Sep 93	
2	7	KRAZ	ENG MOUNTS	236-1001008-01	EA	24	OT				URK	1 Sep 93	
2	8	KRAZ	SHAFT	2383 1000107 V2	EA	6 4	OT				URK	1 Sep 93	
2	9	KRAZ	BLOCK	238 1002012 B2	EA	3 2	OT				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	10	KRAZ	RING	236-100202 A	EA	40	OT				URK	1 Sep 93	
2	11	KRAZ	RING	236-1002040	EA	32	OT				URK	1 Sep 93	
2	12	KRAZ	OIL INS	236-1002272	EA	8	OT				URK	1 Sep 93	
2	13	KRAZ	PIPE	238 1003290-V	EA	8	OT				URK	1 Sep 93	
2	14	KRAZ	PIPE	238 1003291 V	EA	8	OT				URK	1 Sep 93	
2	15	KRAZ	CYL WIPER COLLAR	236-1002314 B	EA	32	OT				URK	1 Sep 93	
2	16	KRAZ	HEAD C76G	238 1003013 D	EA	8	OT				URK	1 Sep 93	
2	17	KRAZ	RING	237 1003114 V	EA	8	OT				URK	1 Sep 93	
2	18	KRAZ	PACKING	238 1003210-V2	EA	80	OT				URK	1 Sep 93	
2	19	KRAZ	PACKING	238 1003270	EA	80	OT				URK	1 Sep 93	
2	20	KRAZ	LINER CYLINDER	236 1004008	EA	128	OT				URK	1 Sep 93	
2	21	KRAZ	ROCKER ARM	236 1004045 V2	EA	32	OT				URK	1 Sep 93	
2	22	KRAZ	RING	400 1004030 80	EA	32	OT				URK	1 Sep 93	
2	23	KRAZ	SEAL	201 1005034 B3	EA	32	OT				URK	1 Sep 93	
2	24	KRAZ	GEAR	236 1005030 A	EA	32	OT				URK	1 Sep 93	
2	25	KRAZ	COLLAR	236 1005160-A2	EA	80	OT				URK	1 Sep 93	
2	26	KRAZ	SHAFT	238 1006015 G2	EA	1 6	OT				URK	1 Sep 93	
2	27	KRAZ	SPACERS	236 1006026 AR	EA	48	OT				URK	1 Sep 93	
2	28	KRAZ	SPACERS	236-1006037 AR	EA	38 4	OT				URK	1 Sep 93	
2	29	KRAZ	VALVE	236 1007010 V	EA	40	OT				URK	1 Sep 93	
2	30	KRAZ	VALVE	236 1007015 V4	EA	40	OT				URK	1 Sep 93	
2	31	KRAZ	ROD PUSH	236 1007176 A	EA	33 6	OT				URK	1 Sep 93	
2	32	KRAZ	PACKING	236-1008050	EA	40	OT				URK	1 Sep 93	
2	33	KRAZ	PACKING	238T 1009040	EA	40	OT				URK	1 Sep 93	
2	34	KRAZ	PUMP	236 1011014 V3	EA	8	OT				URK	1 Sep 93	
2	35	KRAZ	RADIATOR	157 1013010-A	EA	8	OT				URK	1 Sep 93	
2	36	KRAZ	EXHAUST PIPE	256B 1013408 B	EA	12 8	OT				URK	1 Sep 93	
2	37	KRAZ	ELEMENT FILTER	201T 1105540	EA	480	OT				URK	1 Sep 93	
2	38	KRAZ	PUMP	240-1106210	EA	8	OT				URK	1 Sep 93	
2	39	KRAZ	PUMP	236T1106288-A2	EA	8	OT				URK	1 Sep 93	
2	40	KRAZ	COLLAR	236-102940	EA	80	OT				URK	1 Sep 93	
2	41	KRAZ	1/2 HUB COUPLING	236-1029268 B	EA	4	OT				URK	1 Sep 93	
2	42	KRAZ	PIPE	236-1104308 V	EA	16	OT				URK	1 Sep 93	
2	43	KRAZ	PUMP	8006-1111005	EA	4 8	OT				URK	1 Sep 93	
2	44	KRAZ	PLUNGER RODS	60-1111074 01	EA	120	OT				URK	1 Sep 93	
2	45	KRAZ	INJECTOR	2606-1112010 02	EA	224	OT				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	46	KRAZ	SPRAYER	26 111211	EA	224	OT				URK	1 Sep 93	
2	47	KRAZ	FILTER	201T 1117038	EA	160	OT				URK	1 Sep 93	
2	48	KRAZ	COUPLING	09000 1121010 000	EA	1 6	OT				URK	1 Sep 93	
2	49	KRAZ	MUFFLER	256-1201010	EA	8	OT				URK	1 Sep 93	
2	50	KRAZ	PACKING	256B 1203002	EA	80	OT				URK	1 Sep 93	
2	51	KRAZ	SLEEVE	256 B1 1203096	EA	20	OT				URK	1 Sep 93	
2	52	KRAZ	PACKING	256B 1203039	EA	32	OT				URK	1 Sep 93	
2	53	KRAZ	RADIATOR	256B 1301008-10	EA	16	OT				URK	1 Sep 93	
2	54	KRAZ	ENG MOUNTS	256 1302025	EA	8	OT				URK	1 Sep 93	
2	55	KRAZ	ENG/ MOUNTS	256 1302139	EA	8	OT				URK	1 Sep 93	
2	56	KRAZ	RODS	214B 1303010	EA	24	OT				URK	1 Sep 93	
2	57	KRAZ	RODS	255 1303012	EA	16	OT				URK	1 Sep 93	
2	58	KRAZ	EXHAUST PIPE	256 1303016	EA	4 8	OT				URK	1 Sep 93	
2	59	KRAZ	PUMP	236-1307010 A3	EA	20	OT				URK	1 Sep 93	
2	60	KRAZ	SET	236 1307029 A	EA	40	OT				URK	1 Sep 93	
2	61	KRAZ	COLLAR	236 1307090	EA	64	OT				URK	1 Sep 93	
2	62	KRAZ	BELTS	25 6411 1404	EA	160	OT				URK	1 Sep 93	
2	63	KRAZ	BELTS	6421 1403	EA	160	OT				URK	1 Sep 93	
2	64	KRAZ	MOTOR	236 1308011 G2	EA	4 8	OT				URK	1 Sep 93	
2	65	KRAZ	DISCS	238 1601690-G	EA	8	OT				URK	1 Sep 93	
2	66	KRAZ	DISCS	238 1601094	EA	8	OT				URK	1 Sep 93	
2	67	KRAZ	DISCS	238 1601130 B	EA	8	OT				URK	1 Sep 93	
2	68	KRAZ	DISCS	238 1601131	EA	12	OT				URK	1 Sep 93	
2	69	KRAZ	BRAKE FRICTION PLATE	236 1601138-A3	EA	40	OT				URK	1 Sep 93	
2	70	KRAZ	COUPLING	236 1601180-B2	EA	8	OT				URK	1 Sep 93	
2	71	KRAZ	GEAR BOX	236NT 1700003	EA	6 4	OT				URK	1 Sep 93	
2	72	KRAZ	BOX	257 18000020-V2	EA	1 6	OT				URK	1 Sep 93	
2	73	KRAZ	BOX	256-1800020-V2	EA	1 6	OT				URK	1 Sep 93	
2	74	KRAZ	HEAD CROSS	131 2201025 A	EA	16	OT				URK	1 Sep 93	
2	75	KRAZ	SHAFT	527 2202010-16	EA	6 4	OT				URK	1 Sep 93	
2	76	KRAZ	DRIVE SHAFT	210G 2202045 04	EA	6 4	OT				URK	1 Sep 93	
2	77	KRAZ	SHAFT	210G 2204010-16	EA	6 4	OT				URK	1 Sep 93	
2	78	KRAZ	SUPPORT	210-2204080 B2	EA	8	OT				URK	1 Sep 93	
2	79	KRAZ	REAR DRIVE AXLE	255P 2400015 02	EA	8	OT				URK	1 Sep 93	
2	80	KRAZ	SET OF GEARS	256B 2402020	EA	1 6	OT				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	116	KRAZ	LAMPS	A 24 60-40	EA	320	OT				URK	1 Sep 93	
2	117	KRAZ	FILTERS	FG122 3711200-V	EA	24	OT				URK	1 Sep 93	
2	118	KRAZ	LAMPS	A24 324	EA	320	OT				URK	1 Sep 93	
2	119	KRAZ	LAMPS	A 24 2	EA	320	OT				URK	1 Sep 93	
2	120	KRAZ	LAMPS	A 24 5	EA	320	OT				URK	1 Sep 93	
2	121	KRAZ	LAMPS	A 24 21 2	EA	320	OT				URK	1 Sep 93	
2	122	KRAZ	SPEEDOMETER	CP135 3802010	EA	8	OT				URK	1 Sep 93	
2	123	KRAZ	RELAY	RC401 3726010	EA	8	OT				URK	1 Sep 93	
2	124	KRAZ	RECIEVER	YK143 3807010 G4	EA	3 2	OT				URK	1 Sep 93	
2	125	KRAZ	SENSOR	BM146 3806600D	EA	3 2	OT				URK	1 Sep 93	
2	126	KRAZ	AMP METER	AP110-3811010	EA	6 4	OT				URK	1 Sep 93	
2	127	KRAZ	PRESSURE GAUGE	MD103 3816010	EA	3 2	OT				URK	1 Sep 93	
2	128	KRAZ	SENSOR	TM100 3808000 G	EA	8	OT				URK	1 Sep 93	
2	129	KRAZ	MIRRORS	256 8201012	EA	24	OT				URK	1 Sep 93	
2	130	KRAZ	EQUALIZER	220V 8702010A	EA	1 6	OT				URK	1 Sep 93	
2	131	KRAZ	TOTAL COST US DOLLARS				OT		$88 000		URK	1 Sep 93	
2	1	DRILL PARTS	TRACK PADS	31 001 008 34	SET	30	SG				CIS	1 Sep 93	
2	2	DRILL PARTS	TRACK RAILS	31 001 008 000	EA	1	SG				CIS	1 Sep 93	
2	3	DRILL PARTS	LEVELING JACKS	B59 14 240	EA	3 5	SG				CIS	1 Sep 93	
2	4	DRILL PARTS	SPROCKET	31C 152 012 06	EA	2	SG				CIS	1 Sep 93	
2	5	DRILL PARTS	SPROCKET	B59 14 052	EA	2	SG				CIS	1 Sep 93	
2	6	DRILL PARTS	SHOCK ABSORBER	B122 22 11 015	EA	5	SG				CIS	1 Sep 93	
2	7	DRILL PARTS	SHOCK ABSORBER	B122 22 00 155	EA	3	SG				CIS	1 Sep 93	
2	8	DRILL PARTS	COMPRESSOR SUPP	B122 0017 000	EA	0 5	SG				CIS	1 Sep 93	
2	9	DRILL PARTS	CARTRIDGE	10 10 080	EA	2	SG				CIS	1 Sep 93	
2	10	DRILL PARTS	DRILL STEEL	722 22 11 00	EA	2	SG				CIS	1 Sep 93	
2	11	DRILL PARTS	BUSHING	31 001 008 037	EA	30	SG				CIS	1 Sep 93	
2	12	DRILL PARTS	BUSHING	31 001 008 102	EA	30	SG				CIS	1 Sep 93	
2	13	DRILL PARTS	HYD DISTRIBUTOR	R102 A4 A222 50	EA	5	SG				CIS	1 Sep 93	
2	14	DRILL PARTS	HYD PUMP	61 12 22	EA	3	SG				CIS	1 Sep 93	
2	15	DRILL PARTS	3 SPEED MOTOR		EA	2 5	SG				CIS	1 Sep 93	
2	16	DRILL PARTS	PULL DOWN CABLE	3X50+1X16	M	300	SG				CIS	1 Sep 93	
2	17	DRILL PARTS	HYD PUMP	N 403E TY2 653260-70	EA	2 5	SG				CIS	1 Sep 93	
2	18	DRILL PARTS	HYD PUMP	BG 12 22 MI TY2 05	EA	5	SG				CIS	1 Sep 93	
2	19	DRILL PARTS	TOTAL COST US DOLLARS				SG		$150 000		CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	81	KRAZ	DIFFERENTIAL SEAL	210-2402052 A1	EA	48	OT				URK	1 Sep 93	
2	82	KRAZ	DIFFERENTIAL	200-2403010-A2	EA	3 2	OT				URK	1 Sep 93	
2	83	KRAZ	FLANGE	200-2403072 B1	EA	3 2	OT				URK	1 Sep 93	
2	84	KRAZ	AXLE	2550-2500015 02	EA	1 6	OT				URK	1 Sep 93	
2	85	KRAZ	SHOCK ABSORBER	256B1 2902012	EA	16	OT				URK	1 Sep 93	
2	86	KRAZ	1ST PLATE	255B 2902074 01	EA	16	OT				URK	1 Sep 93	
2	87	KRAZ	2ND PLATE	255B 2902076-01	EA	16	OT				URK	1 Sep 93	
2	88	KRAZ	SHOCK SPRINGS	500 2905006	EA	40	OT				URK	1 Sep 93	
2	89	KRAZ	SHOCK ABSORBER	256B 2912012 11	EA	20 8	OT				URK	1 Sep 93	
2	90	KRAZ	CONN BRACKETS	219 2912408	EA	48	OT				URK	1 Sep 93	
2	91	KRAZ	EQUALIZER	256B 2918005	EA	24	OT				URK	1 Sep 93	
2	92	KRAZ	SHAFT	256B 2918054	EA	3 2	OT				URK	1 Sep 93	
2	93	KRAZ	ROD	214 2919011 02	EA	40	OT				URK	1 Sep 93	
2	94	KRAZ	ROD	210 2919012 03	EA	40	OT				URK	1 Sep 93	
2	95	KRAZ	BUSHING	200 3001016	EA	32	OT				URK	1 Sep 93	
2	96	KRAZ	SEAL	200 3103035	EA	11 2	OT				URK	1 Sep 93	
2	97	KRAZ	SEAL	210-3104036	EA	11 2	OT				URK	1 Sep 93	
2	98	KRAZ	COTTER PINS	200-3104050 A	EA	400	OT				URK	1 Sep 93	
2	99	KRAZ	COTTER PINS	200-3104050 A	EA	400	OT				URK	1 Sep 93	
2	100	KRAZ	RELAYS	500 3401005 D	EA	4	OT				URK	1 Sep 93	
2	101	KRAZ	HYD BOOSTER BRAKES	256B 3405010 14	EA	8	OT				URK	1 Sep 93	
2	102	KRAZ	DISTRIBUTOR	255B 3405016	EA	8	OT				URK	1 Sep 93	
2	103	KRAZ	PUMP	256B 3407199	EA	8	OT				URK	1 Sep 93	
2	104	KRAZ	FRIC PLATES SHOE	200-3501105	EA	240	OT				URK	1 Sep 93	
2	105	KRAZ	LEVER	210 3501136 A2	EA	6 4	OT				URK	1 Sep 93	
2	106	KRAZ	FRIC PLATES SHOES	200 3502105 A	EA	240	OT				URK	1 Sep 93	
2	107	KRAZ	COMPRESSOR	130-3509009 11	EA	6 4	OT				URK	1 Sep 93	
2	108	KRAZ	GENERATOR	4573711587	EA	16	OT				URK	1 Sep 93	
2	109	KRAZ	REGULATOR	1112 3702	EA	16	OT				URK	1 Sep 93	
2	110	KRAZ	SWITCH	VK318T 3704000	EA	8	OT				URK	1 Sep 93	
2	111	KRAZ	ELECTRO BRUSHES	2501 370805	EA	208	OT				URK	1 Sep 93	
2	112	KRAZ	SWITCH	P305 3709000	EA	12	OT				URK	1 Sep 93	
2	113	KRAZ	SWITCH	P39 371000-T	EA	12	OT				URK	1 Sep 93	
2	114	KRAZ	STARTER	45 7375 1471	EA	20	OT				URK	1 Sep 93	
2	115	KRAZ	RELAY	RC103 3708000	EA	8	OT				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	1	ELE MOTOR	20/90 DRAGLINE	AO2 72 4Y2 30 KVT	EA	2	BA				CIS	1 Jan 94	
2	2	ELE MOTOR	20/90 DRAGLINE	AO2 72 4Y2 22 KVT	EA	2	BA				CIS	1 Jan 94	
2	3	ELE MOTOR	20/90 DRAGLINE	MPE 1000-630 YXLE	EA	2	BA				CIS	1 Jan 94	
2	4	ELE MOTOR	20/90 DRAGLINE	HOISE GENERATOR	EA	5	BA				CIS	1 Jan 94	
2	5	ELE MOTOR	10/70-13/50 DRAGLINE	GENERATOR	EA	3	BA				CIS	1 Jan 94	
2	6	ELE MOTOR	10/70-13/50 DRAGLINE	SYNC MOTOR	EA	10	BA				CIS	1 Sep 93	
2	7	ELE MOTOR	10/70-13/50 DRAGLINE	EXCITER MOTOR	EA	8	BA				CIS	1 Jan 94	
2	8	ELE MOTOR	10/70-13/50 DRAGLINE	EXCITER MOTOR	EA	4	BA				CIS	1 Jan 94	
2	9	ELE MOTOR	10/70-13/50 DRAGLINE	GENERATOR	EA	2	BA				CIS	1 Jan 94	
2	15	ELE MOTOR	MISC ELEC MOTORS	BAO 61 4 13KVT	EA	1	BA				CIS	1 Jan-94	
2	16	ELE MOTOR	MISC ELEC MOTORS	BAO 62 4 17KVT	EA	1	BA				CIS	1 Jan 94	
2	17	ELE MOTOR	MISC ELEC MOTORS	BAO 71 4 22KVT	EA	1	BA				CIS	1 Jan 94	
2	18	ELE MOTOR	MISC ELEC MOTORS	BAO 72 4 30KVT	EA	1	BA				CIS	1 Jan 94	
2	19	ELE MOTOR	MISC ELEC MOTORS	BAO 82 4 55KVT	EA	1	BA				CIS	1 Jan 94	
2	20	ELE MOTOR	MISC ELEC MOTORS	BAO 180M4 30KVT	EA	2	BA				CIS	1 Jan 94	
2	21	ELE MOTOR	MISC ELEC MOTORS	BAO 62 6 13KVT	EA	1	BA				CIS	1 Jan 94	
2	22	ELE MOTOR	MISC ELEC MOTORS	BAO 72 6 22KVT	EA	2	BA				CIS	1 Jan 94	
2	31	ELE MOTOR	ELEC MOTORS	MTKE 4AC18054	EA	1	BA				CIS	1 Jan 94	
2	32	ELE MOTOR	ELEC MOTORS	MTKE 4A10024YE	EA	1	BA				CIS	1 Jan 94	
2	33	ELE MOTOR	ELEC MOTORS	MTKE 4A71A2YE	EA	1	BA				CIS	1 Jan 94	
2	10	ELE MOTOR	EKG 8i & 4U SHOVEL	HOIST MOTOR	EA	10	SG				CIS	1 Jan 94	
2	11	ELE MOTOR	EKG 8i & 4U SHOVEL	VEN FAN MOTOR	EA	8	SG				CIS	1 Jan 94	
2	12	ELE MOTOR	EKG 8i & 4U SHOVEL	SW OIL PUMP MOT	EA	4	SG				CIS	1 Jan 94	
2	13	ELE MOTOR	EKG 8i & 4U SHOVEL	FAN M FOR GEN	EA	4	SG				CIS	1 Jan 94	
2	14	ELE MOTOR	EKG 8i & 4U SHOVEL	AIR COMP ELEC MO	EA	2	SG				CIS	1 Jan 94	
2	23	ELE MOTOR	MISC ELEC MOTORS	BAO 81 6 30KVT	EA	1	SG				CIS	1 Jan 94	
2	24	ELE MOTOR	MISC ELEC MOTORS	BAO 82 6 40KVT	EA	1	SG				CIS	1 Jan 94	
2	25	ELE MOTOR	MISC ELEC MOTORS	BAP 160M6 15KVT	EA	1	SG				CIS	1 Jan 94	
2	26	ELE MOTOR	MISC ELEC MOTORS	BAO 81 8Y2 22KVT	EA	1	SG				CIS	1 Jan 94	
2	27	ELE MOTOR	MISC ELEC MOTORS	WOUND MOTOR	EA	1	SG				CIS	1 Jan 94	
2	28	ELE MOTOR	MISC ELEC MOTORS	HOIST	EA	1	SG				CIS	1 Jan 94	
2	29	ELE MOTOR	MISC ELEC MOTORS	A/C ELECT MOTOR	EA	5	SG				CIS	1 Jan 94	
2	30	ELE MOTOR	MISC ELEC MOTORS	A/C ELECT MOTOR	EA	1	SG				CIS	1 Jan 94	
2	34	ELE MOTOR	ELEC MOTORS	MTKE 4A33556YE	EA	1	SG				CIS	1 Jan 94	
2	35	ELE MOTOR	ELEC MOTORS	MTKE 4AM200M6YE	EA	2	SG				CIS	1 Jan 94	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	36	ELE MOTOR	ELEC MOTORS	MTKE AO2 12/8/6/4	EA	1	SG				CIS	1 Jan 94	
2	38	ELEC EQUIP	SINGLE SHAFT EL MO	DE 816Y2	EA	2	BA				CIS	1 Jan 94	
2	39	ELEC EQUIP	HORIZ MOTOR	DEB 12	EA	2	BA				CIS	1 Jan 94	
2	44	ELEC EQUIP	GEN 30KW 115V 261 A	MIXED BOOSTER	EA	2	BA				CIS	1 Sep 93	
2	40	ELEC EQUIP	TWO SHAFT MOTOR	DPE 52 60	EA	3	SG				CIS	1 Jan 94	
2	41	ELEC EQUIP	DC GENERATOR	VP 250M94	EA	1	SG				CIS	1 Jan 94	
2	42	ELEC EQUIP	HI VOLT/VACUM BREK	2KVE 6-630	EA	1	SG				CIS	1 Jan 94	
2	43	ELEC EQUIP	RING TYPE CURR REC	TK3 12 492	EA	2	SG				CIS	1 Jan 94	
2	45	ELEC EQUIP	GEN 30KW 115V 261 A	INDEP BOOSTER	EA	1	SG				CIS	1 Sep 93	
2	1	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	SG				CIS	1 Jan 94	
2	2	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	SG				CIS	1 Jan 94	
2	3	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	SG				CIS	1 Jan 94	
2	4	RR COMM	SIGNAL CABLE	GOST6436 75	KM	2	SG				CIS	1 Jan 94	
2	5	RR COMM	SIGNAL CABLE	GOST6436 75	KM	2	SG				CIS	1 Jan 94	
2	6	RR COMM	SIGNAL CABLE	GOST6436 75	KM	2	SG				CIS	1 Jan 94	
2	7	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1 5	SG				CIS	1 Jan 94	
2	8	RR COMM	ROAD TRANSFORMER	NFT A	EA	15	SG				CIS	1 Jan 94	
2	9	RR COMM	ROAD TRANSPORMER	NOVC 5A	EA	15	SG				CIS	1 Jan 94	
2	10	RR COMM	SIGNAL TRANSFORMER	ST 6	EA	25	SG				CIS	1 Jan 94	
2	11	RR COMM	SWITCH RELAY	2162 00 V	EA	25	SG				CIS	1 Jan 94	
2	12	RR COMM	RECTIFIER	86 00-00V	EA	25	SG				CIS	1 Jan 94	
2	13	RR COMM	RESISTOR	7165	EA	25	SG				CIS	1 Jan 94	
2	14	RR COMM	SWITCHING GEAR BOX		EA	5	SG				CIS	1 Jan 94	
2	15	RR COMM	LAMPS FOR LINZ		EA	250	SG				CIS	1 Jan 94	
2	16	RR COMM	FRAMEWORK	19402 00 00	EA	5	SG				CIS	1 Jan 94	
2	17	RR COMM	BONDING WIRE	21 00-00	EA	25	SG				CIS	1 Jan 94	
2	18	RR COMM	CONTROL WIRE		EA	50	SG				CIS	1 Jan 94	
2	19	RR COMM	LAMPS FOR TERM BD		EA	500	SG				CIS	1 Jan 94	
2	20	RR COMM	SWITCHING RELAY SET	144690000A	EA	5	SG				CIS	1 Jan 94	
2	21	RR COMM	INST FOR ELEC MEAS		EA	5	SG				CIS	1 Jan 94	
2	22	RR COMM	RR LINZ LTS RED	26116-00-00	EA	25	SG				CIS	1 Jan 94	
2	23	RR COMM	RR LINZ LTS GREEN	26116-00-00	EA	25	SG				CIS	1 Jan 94	
2	24	RR COMM	RR LINZ LTS WHITE	26116 00-00	EA	20	SG				CIS	1 Jan 94	
2	25	RR COMM	ELECTROMOTOR		EA	10	SG				CIS	1 Jan 94	
2	26	RR COMM	SWITCHING ARM		EA	15	SG				CIS	1 Jan 94	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	27	RR COMM	TOTAL COST US DOLLARS				SG		$6 000		CIS	1 Jan 94	
2	1	SM ENG PTS	ENGINE	D160	SET	0 75	SO				CIS	1 Sep 93	
2	2	SM ENG PTS	COTTER PINS	1434	EA	12	SO				CIS	1 Sep 93	
2	3	SM ENG PTS	COTTER PINS	2971	EA	12	SO				CIS	1 Sep 93	
2	4	SM ENG PTS	BLOCK ENGINE	51 01 2 cb	EA	0 75	SO				CIS	1 Sep 93	
2	5	SM ENG PTS	PACKING	40201	EA	2 5	SO				CIS	1 Sep 93	
2	6	SM ENG PTS	RINGS	40210	EA	25	SO				CIS	1 Sep 93	
2	7	SM ENG PTS	PACKING SETS UPPER	A 230113160 cbn1	SET	5	SO				CIS	1 Sep 93	
2	8	SM ENG PTS	PACKINGSETS LOWER	A230110311	SET	5	SO				CIS	1 Sep 93	
2	9	SM ENG PTS	PACKING SETS	A23 0110312 AN2	SET	5	SO				CIS	1 Sep 93	
2	10	SM ENG PTS	PACKING	14 02 101 cb	EA	5	SO				CIS	1 Sep 93	
2	11	SM ENG PTS	ENGINE REBUILD KIT	1 02 10 cp	SET	1	SO				CIS	1 Sep 93	
2	12	SM ENG PTS	GUSHING	03325	EA	2 5	SO				CIS	1 Sep 93	
2	13	SM ENG PTS	PACKING UPPER	023 02 10002 AN1	SET	5	SO				CIS	1 Sep 93	
2	14	SM ENG PTS	PACKING LOWER	A23 0 10004 DN1	ET	5	SO				CIS	1 Sep 93	
2	15	SM ENG PTS	RING SETS	A27 00 011	SET	7 5	SO				CIS	1 Sep 93	
2	16	SM ENG PTS	RING SETS	027 00 024	SET	7 5	SO				CIS	1 Sep 93	
2	17	SM ENG PTS	RING SETS	A27 00 043	SET	7 5	SO				CIS	1 Sep 93	
2	18	SM ENG PTS	PISTON RING SETS	03694 1 cp	SET	1	SO				CIS	1 Sep 93	
2	19	SM ENG PTS	GENERATOR BELT	5X9X1090	EA	5	SO				CIS	1 Sep 93	
2	20	SM ENG PTS	FAN BELTS	16X11X1650	EA	5	SO				CIS	1 Sep 93	
2	21	SM ENG PTS	WATER PUMP	16 08 140 cp	EA	2 5	SO				CIS	1 Sep 93	
2	22	SM ENG PTS	OIL PUMP	29 09 124 cp	EA	2	SO				CIS	1 Sep 93	
2	23	SM ENG PTS	CYLINDER LINER	01466	EA	3	SO				CIS	1 Sep 93	
2	24	SM ENG PTS	RING SETS	51 03 115 cp	EA	25	SO				CIS	1 Sep 93	
2	25	SM ENG PTS	CRANKSHAFT	16 03 1120 cp	EA	1	SO				CIS	1 Sep 93	
2	26	SM ENG PTS	PISTON	51 03 103	SET	2 5	SO				CIS	1 Sep 93	
2	27	SM ENG PTS	PACKING	700 40-2886	EA	5	SO				CIS	1 Sep 93	
2	28	SM ENG PTS	FILTER	A41 20 000-1 cp	EA	10	SO				CIS	1 Sep 93	
2	29	SM ENG PTS	FILTER	A41 10 000-02	EA	10	SO				CIS	1 Sep 93	
2	30	SM ENG PTS	RING	40843	EA	25	SO				CIS	1 Sep 93	
2	31	SM ENG PTS	PACKING	40269	EA	2 5	SO				CIS	1 Sep 93	
2	32	SM ENG PTS	SPRAYER	14 69 107 1 cp	EA	25	SO				CIS	1 Sep 93	
2	33	SM ENG PTS	INJECTOR FITTINGS	14 69 117 1 cp	EA	25	SO				CIS	1 Sep 93	
2	34	SM ENG PTS	CYLINDER HEAD	29 02 30 cp	EA	0 75	SO				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	35	SM ENG PTS	STARTER	1723 cp	EA	0 75	SO				CIS	1 Sep 93	
2	36	SM ENG PTS	RADIATOR	1304130101 cp	EA	2 5	SO				CIS	1 Sep 93	
2	37	SM ENG PTS	MAGNETO	M 149A	EA	2 5	SO				CIS	1 Sep 93	
2	38	SM ENG PTS	CARBURATOR	113-110-70-11	EA	2 5	SO				CIS	1 Sep 93	
2	39	SM ENG PTS	GENERATOR	69 063701	EA	2	SO				CIS	1 Sep 93	
2	40	SM ENG PTS	STARTER	CT 230E	EA	2	SO				CIS	1 Sep 93	
2	41	SM ENG PTS	TRUBO COMPRESSOR	111 30 001 10	EA	1 5	SO				CIS	1 Sep 93	
2	42	SM ENG PTS	FUEL SYSTEM UPPER	16 67 1 cp	EA	1 5	SO				CIS	1 Sep 93	
2	43	SM ENG PTS	TOTAL COST US DOLLARS				SO		$30 000		CIS	1 Sep 93	
2	1	T250 DOZER	HOSE	700 40 3505	EA	2	AD				CIS	1 Sep 93	
2	3	T250 DOZER	PINS TRACK	748-22 6	EA	10	AD				CIS	1 Sep 93	
2	4	T250 DOZER	REGULATOR RELAY		EA	2	AD				CIS	1 Sep 93	
2	5	T250 DOZER	ELEMENT	CB 3329 00 6G	EA	48	AD				CIS	1 Sep 93	
2	6	T250 DOZER	PUMP	933 02 06	EA	1	AD				CIS	1 Sep 93	
2	7	T250 DOZER	FILTER HOUSING	748 05 T20 CP	EA	2	AD				CIS	1 Sep 93	
2	8	T250 DOZER	FILTER HOUSING	748 65 272 CP	EA	2	AD				CIS	1 Sep 93	
2	9	T250 DOZER	ELEMENT	54 57 020A	EA	10	AD				CIS	1 Sep 93	
2	10	T250 DOZER	PUMP	BNK 12	EA	2	AD				CIS	1 Sep 93	
2	11	T250 DOZER	TOTAL COST US DOLLARS				AD		$45 000		CIS	1 Sep 93	
2	1	YM2 PARTS	CYLINDER	240H 1004008 D	EA	132	BA				CIS	1 Sep 93	
2	2	YM2 PARTS	CRANK SHAFT	240 1000107 B6	EA	4	BA				CIS	1 Sep 93	
2	3	YM2 PARTS	RINGS	236 1000106 B4	EA	132	BA				CIS	1 Sep 93	
2	4	YM2 PARTS	PACKING	240-1000104 B2	EA	10	BA				CIS	1 Sep 93	
2	5	YM2 PARTS	PACKING	240 1000104 P2	EA	5	BA				CIS	1 Sep 93	
2	6	YM2 PARTS	PACKING	240 1000104 P1	EA	5	BA				CIS	1 Sep 93	
2	7	YM2 PARTS	SEAL	240-1003213 A3	EA	100	BA				CIS	1 Sep 93	
2	8	YM2 PARTS	PUMP	240-1011014	EA	3	BA				CIS	1 Sep 93	
2	9	YM2 PARTS	ELEMENT	240-1017038	EA	500	BA				CIS	1 Sep 93	
2	10	YM2 PARTS	ELEMENT	238H 1109080	EA	50	BA				CIS	1 Sep 93	
2	11	YM2 PARTS	TURBOCOMPRESSOR	240H 1118010 B	EA	4	BA				CIS	1 Sep 93	
2	12	YM2 PARTS	TURBOCOMPRESSOR	240H 1118011B	EA	4	BA				CIS	1 Sep 93	
2	13	YM2 PARTS	BLOCK CYLINDER	240H 1002012H	EA	1	BA				CIS	1 Sep 93	
2	14	YM2 PARTS	PUMP	9016111008-02	EA	1	BA				CIS	1 Sep 93	
2	15	YM2 PARTS	SPRAY INJECTOR	26161112110	EA	60	BA				CIS	1 Sep 93	
2	16	YM2 PARTS	RING	236-1002024A	EA	100	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	17	YM2 PARTS	RING	236-1002040	EA	50	BA				CIS	1 Sep 93	
2	18	YM2 PARTS	ELEMENT FILTER	240T 1017040 A3	EA	100	BA				CIS	1 Sep 93	
2	19	YM2 PARTS	ELEMENT	201T 1105540	EA	100	BA				CIS	1 Sep 93	
2	20	YM2 PARTS	RINGS	236 1004002 A3	EA	48	BA				CIS	1 Sep 93	
2	21	YM2 PARTS	PACKING SEALS	240-1008098	EA	5	BA				CIS	1 Sep 93	
2	22	YM2 PARTS	PACKING SEALS	240T 1009040 A2	EA	5	BA				CIS	1 Sep 93	
2	23	YM2 PARTS	FUEL PUMP	1111008 20	EA	1	BA				CIS	1 Sep 93	
2	24	YM2 PARTS	ELEMENT	201 1117038-A2	EA	250	BA				CIS	1 Sep 93	
2	25	YM2 PARTS	PUMP	240 1307010-A	EA	2 5	BA				CIS	1 Sep 93	
2	26	YM2 PARTS	GENERATOR	45 7371 0209	EA	1 5	BA				CIS	1 Sep 93	
2	27	YM2 PARTS	STARTER	45 7375 1471	EA	1 5	BA				CIS	1 Sep 93	
2	28	YM2 PARTS	TOTAL COST US DOLLARS				BA		$12 500		CIS	1 Sep 93	
2	1	BELAZ	ENGINE	240N 1000187	SET	4	BA				Bel	1 Jan 94	
2	2	BELAZ	CYLINDER LINER SETS	240N 1004006D	SET	144	BA				Bel	1 Jan 94	
2	3	BELAZ	PACKING	240 1003213	EA	300	BA				Bel	1 Jan 94	
2	4	BELAZ	RING SETS	236 100106 B3	EA	200	BA				Bel	1 Jan 94	
2	5	BELAZ	CLUTCH SHIMS	240 1000104	EA	16	BA				Bel	1 Jan 94	
2	6	BELAZ	SHIMS	240 1000104 BR	EA	10	BA				Bel	1 Jan 94	
2	7	BELAZ	PACKING	240 1009040A2	EA	30	BA				Bel	1 Jan 94	
2	8	BELAZ	FILTER	240 1017040A2	EA	2000	BA				Bel	1 Jan 94	
2	9	BELAZ	FILTER	201 1105538	EA	1500	BA				Bel	1 Jan 94	
2	10	BELAZ	INJECTOR	236 1112110B2	EA	240	BA				Bel	1 Jan 94	
2	11	BELAZ	TURBOCHARGER	240N 118010B	EA	10	BA				Bel	1 Jan 94	
2	12	BELAZ	TURBOCHARGER	240N 1118011B	EA	10	BA				Bel	1 Jan 94	
2	13	BELAZ	FILTER	201 1117040 A	EA	1000	BA				Bel	1 Jan 94	
2	14	BELAZ	FILTER	238 1109080	EA	500	BA				Bel	1 Jan 94	
2	15	BELAZ	FILTER COVER	240-1002264	EA	5	BA				Bel	1 Jan 94	
2	16	BELAZ	PACKING	240 1002314	EA	20	BA				Bel	1 Jan 94	
2	17	BELAZ	HARMONIC BALANCER	240-1002310	EA	5	BA				Bel	1 Jan 94	
2	18	BELAZ	CRANK SHAFT	240-1005008G4	EA	5	BA				Bel	1 Jan 94	
2	19	BELAZ	PUSH RODS	236-1007180	EA	24	BA				Bel	1 Jan 94	
2	20	BELAZ	PACKING	240-1008098	EA	30	BA				Bel	1 Jan 94	
2	21	BELAZ	PUMP	240-1011014 B	EA	5	BA				Bel	1 Jan 94	
2	22	BELAZ	PIPE HOSE	240-1104308 G	EA	24	BA				Bel	1 Jan 94	
2	23	BELAZ	PIPE	240-1104300-B	EA	13	BA				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	24	BELAZ	PIPE	240-1104390A	EA	6	BA				Bel	1 Jan 94	
2	25	BELAZ	PIPE	240-1104346A	EA	8	BA				Bel	1 Jan 94	
2	26	BELAZ	PUMP	240-1106210	EA	5	BA				Bel	1 Jan 94	
2	27	BELAZ	PISTON PLUNGER	60 1111074	EA	24	BA				Bel	1 Jan 94	
2	28	BELAZ	VALVE	33 1111102	EA	38	BA				Bel	1 Jan 94	
2	29	BELAZ	INJECTORS	262 111201	EA	24	BA				Bel	1 Jan 94	
2	30	BELAZ	ROTORS	240N 1118080B	EA	20	BA				Bel	1 Jan 94	
2	31	BELAZ	COVER	240N 1118280B	EA	30	BA				Bel	1 Jan 94	
2	32	BELAZ	RING	240N 1118240	EA	40	BA				Bel	1 Jan 94	
2	33	BELAZ	PUMP	240N 1307010A	EA	3	BA				Bel	1 Jan 94	
2	34	BELAZ	SET	240 1307029	EA	20	BA				Bel	1 Jan 94	
2	35	BELAZ	STARTER	25 3708	EA	5	BA				Bel	1 Jan 94	
2	36	BELAZ	GENERATOR	G263	EA	5	BA				Bel	1 Jan 94	
2	37	BELAZ	REGULATOR RELAY	RR 363 3702000	EA	5	BA				Bel	1 Jan 94	
2	38	BELAZ	COMPRESSOR	540 3509015	EA	10	BA				Bel	1 Jan 94	
2	39	BELAZ	WASHER	540A 3509130	EA	5	BA				Bel	1 Jan 94	
2	40	BELAZ	SHIMS	130 3509092	EA	5	BA				Bel	1 Jan 94	
2	41	BELAZ	PISTON	130-350909160	EA	10	BA				Bel	1 Jan 94	
2	42	BELAZ	RING	130 3509164	EA	20	BA				Bel	1 Jan 94	
2	43	BELAZ	RING	130 350 9166	EA	20	BA				Bel	1 Jan 94	
2	44	BELAZ	RING	130 3509167	EA	20	BA				Bel	1 Jan 94	
2	45	BELAZ	FILTER	740 1109560	EA	100	BA				Bel	1 Jan 94	
2	46	BELAZ	ROLLER	540-1308110-01	EA	5	BA				Bel	1 Jan 94	
2	47	BELAZ	ROLLER	540-1308111 01	EA	5	BA				Bel	1 Jan 94	
2	48	BELAZ	BELT	P21X14X1950	EA	100	BA				Bel	1 Jan 94	
2	49	BELAZ	BELT	P21X14X1735	EA	100	BA				Bel	1 Jan 94	
2	50	BELAZ	HYDRAULIC BOOSTER	548A 1700004 10	EA	4	BA				Bel	1 Jan 94	
2	51	BELAZ	FRICTION PLATES BRAKE	540 1701330-01	EA	12	BA				Bel	1 Jan 94	
2	52	BELAZ	DISC	540-1701352 11	EA	120	BA				Bel	1 Jan 94	
2	53	BELAZ	DISC	540-1701344	EA	140	BA				Bel	1 Jan-94	
2	54	BELAZ	BRAKE DRUM	540 1701312 10	EA	12	BA				Bel	1 Jan 94	
2	55	BELAZ	PACKING RING	540-1701326B	EA	50	BA				Bel	1 Jan 94	
2	56	BELAZ	ELECTRIC MAGNETO	RC330 1705000	EA	20	BA				Bel	1 Jan 94	
2	57	BELAZ	RADIATOR	548A 1301010	EA	5	BA				Bel	1 Jan 94	
2	58	BELAZ	DRIVE SHAFT	548A 2201010-02	EA	5	BA				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	59	BELAZ	DRIVE SHAFT	548A 2208010	EA	5	BA				Bel	1 Jan 94	
2	60	BELAZ	TRANSMISSION GEAR	548P 2402010-10	EA	2	BA				Bel	1 Jan 94	
2	61	BELAZ	CYLINDER	548-2917020-11	EA	6	BA				Bel	1 Jan 94	
2	62	BELAZ	COLLAR	540-2917062	EA	200	BA				Bel	1 Jan 94	
2	63	BELAZ	CYLINDER	540-2917080-01	EA	100	BA				Bel	1 Jan 94	
2	64	BELAZ	RINGS	540-2917064	EA	400	BA				Bel	1 Jan 94	
2	65	BELAZ	SHIFTING FORK	7540-2919412	EA	3	BA				Bel	1 Jan 94	
2	66	BELAZ	LEVER	548 3001031	EA	5	BA				Bel	1 Jan 94	
2	67	BELAZ	PULLEY	540 3003052 02	EA	3	BA				Bel	1 Jan 94	
2	68	BELAZ	HYDRALIC BOOSTER	525 3405010-06	EA	5	BA				Bel	1 Jan 94	
2	69	BELAZ	RINGS	016 020 25 2 2	EA	50	BA				Bel	1 Jan 94	
2	70	BELAZ	RINGS	080 090 58 2 2	EA	20	BA				Bel	1 Jan 94	
2	71	BELAZ	PISTON	130-3509160-02	EA	40	BA				Bel	1 Jan 94	
2	72	BELAZ	RINGS	130 3509167	EA	40	BA				Bel	1 Jan 94	
2	73	BELAZ	SPRAYER DEFLECTORS	FG 140 371200	EA	100	BA				Bel	1 Jan 94	
2	74	BELAZ	LAMPS	A2M 55 50	EA	300	BA				Bel	1 Jan 94	
2	75	BELAZ	LAMPS	A24 5	EA	300	BA				Bel	1 Jan 94	
2	76	BELAZ	LAMPS	A24 21 2	EA	200	BA				Bel	1 Jan 94	
2	77	BELAZ	LAMPS	A24 60-40	EA	100	BA				Bel	1 Jan 94	
2	78	BELAZ	SPRAYERS DEFLECTORS	FP 130 3716200 B	EA	50	BA				Bel	1 Jan 94	
2	79	BELAZ	LOCK	VK 856 3708000	EA	10	BA				Bel	1 Jan 94	
2	80	BELAZ	*TOTAL COST US DOLLLARS*				BA		$565 000		Bel	1 Jan 94	
2	1	BELAZ	ENGINE	YM3 240N1000411B	SET	2	SG				Bel	1 Jan 94	
2	2	BELAZ	TRANSMISSION	GMP 548T 1700004	SET	3	SG				Bel	1 Jan 94	
2	3	BELAZ	CABIN	548T 5000012 50	SET	3	SG				Bel	1 Jan 94	
2	4	BELAZ	LAMPS	A 24 5 1	EA	1000	SG				Bel	1 Jan 94	
2	5	BELAZ	LAMPS	A 24 55X50	EA	500	SG				Bel	1 Jan 94	
2	6	BELAZ	LAMPS	A 24 60X40	EA	200	SG				Bel	1 Jan 94	
2	7	BELAZ	BELT	1950/00368/	EA	60	SG				Bel	1 Jan 94	
2	8	BELAZ	PUMP	NS 50Y 3-T	EA	30	SG				Bel	1 Jan 94	
2	9	BELAZ	PUMP	NS 50Y 2 1	EA	30	SG				Bel	1 Jan 94	
2	10	BELAZ	SHIMMS	240-1000104B2	EA	15	SG				Bel	1 Jan 94	
2	11	BELAZ	SHIMMS	240-1000104B2R1	EA	15	SG				Bel	1 Jan 94	
2	12	BELAZ	SHIMMS	240-100010452R2	EA	10	SG				Bel	1 Jan 94	
2	13	BELAZ	RING SET	236-10000106 B4	EA	240	SG				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	14	BELAZ	CRANK SHAFT	240-1000107B6	EA	10	SG				Bel	1 Jan 94	
2	15	BELAZ	PACKING	240-1002265	EA	40	SG				Bel	1 Jan 94	
2	16	BELAZ	CRANKCASE (OIL PAN)	240-1002310	EA	4	SG				Bel	1 Jan 94	
2	17	BELAZ	PACKING	240-1003240A3	EA	60	SG				Bel	1 Jan 94	
2	18	BELAZ	PACKING	240-1003213	EA	200	SG				Bel	1 Jan 94	
2	19	BELAZ	PACKING	240-1003270 B	EA	120	SG				Bel	1 Jan 94	
2	20	BELAZ	SET	240N 1004008 B	EA	120	SG				Bel	1 Jan 94	
2	21	BELAZ	LINER	240N 1004008	EA	60	SG				Bel	1 Jan 94	
2	22	BELAZ	COLLAR	236-1005160 A2	EA	30	SG				Bel	1 Jan 94	
2	23	BELAZ	RING	240 1005576	EA	80	SG				Bel	1 Jan 94	
2	24	BELAZ	RING	240-1005582B	EA	80	SG				Bel	1 Jan 94	
2	25	BELAZ	PACKING	240N 1008027	EA	100	SG				Bel	1 Jan 94	
2	26	BELAZ	PACKING	240T 1009040	EA	80	SG				Bel	1 Jan 94	
2	27	BELAZ	PUMP	240 1011014B	EA	15	SG				Bel	1 Jan 94	
2	28	BELAZ	ELEMENT	201T 1017038A	EA	1000	SG				Bel	1 Jan 94	
2	29	BELAZ	OIL CLEANER	236-1029240	EA	6	SG				Bel	1 Jan 94	
2	30	BELAZ	COLLAR	236 1029240	EA	20	SG				Bel	1 Jan 94	
2	31	BELAZ	SHAFT	240 1029336	EA	10	SG				Bel	1 Jan 94	
2	32	BELAZ	ELEMENT	201 1105538	EA	1000	SG				Bel	1 Jan 94	
2	33	BELAZ	ELEMENT	238N 1109080	EA	200	SG				Bel	1 Jan 94	
2	34	BELAZ	PUMP	9016 11110082	EA	4	SG				Bel	1 Jan 94	
2	35	BELAZ	PLUNGER	PARA 60-1111073	EA	60	SG				Bel	1 Jan 94	
2	36	BELAZ	SPRAYER	261 1112110	EA	120	SG				Bel	1 Jan 94	
2	37	BELAZ	ELEMENT	201 1117038 A2	EA	1000	SG				Bel	1 Jan 94	
2	38	BELAZ	TURBOCOMPRESSOR	240N 1118010B	EA	10	SG				Bel	1 Jan 94	
2	39	BELAZ	TURBOCOMPRESSOR	240N 1118011B	EA	10	SG				Bel	1 Jan 94	
2	40	BELAZ	RING	240N 1118106	EA	120	SG				Bel	1 Jan 94	
2	41	BELAZ	FLANGE	240N 1118272	EA	20	SG				Bel	1 Jan 94	
2	42	BELAZ	COVER	240N 1118280-B	EA	20	SG				Bel	1 Jan 94	
2	43	BELAZ	BELT	1735/256421 1413	EA	60	SG				Bel	1-Jan 94	
2	44	BELAZ	RADIATOR	548A 1301010	EA	10	SG				Bel	1 Jan 94	
2	45	BELAZ	PIPE	240-1303100-V2	EA	6	SG				Bel	1 Jan 94	
2	46	BELAZ	PIPE	240-1303101 V2	EA	6	SG				Bel	1 Jan 94	
2	47	BELAZ	GEARS	7523 1731002	EA	4	SG				Bel	1 Jan 94	
2	48	BELAZ	AXLE	540 1731030-20	EA	10	SG				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	49	BELAZ	AXLE	548A 1731101 01	EA	6	SG				Bel	1 Jan 94	
2	50	BELAZ	CROSSET	540-2201025 02	EA	20	SG				Bel	1 Jan 94	
2	51	BELAZ	SHAFT	548T 2208010	EA	4	SG				Bel	1 Jan 94	
2	52	BELAZ	SHAFT	7523 2201010	EA	6	SG				Bel	1 Jan 94	
2	53	BELAZ	SHAFT	540T 2208117	EA	40	SG				Bel	1 Jan 94	
2	54	BELAZ	TRANSMISSION	548 2402010-11	EA	2	SG				Bel	1 Jan 94	
2	55	BELAZ	BUMPER	7523 2803010	EA	4	SG				Bel	1 Jan 94	
2	56	BELAZ	CYLINDER	540-2917056-31	EA	20	SG				Bel	1 Jan 94	
2	57	BELAZ	CYLINDER	548-2917020-11	EA	6	SG				Bel	1 Jan 94	
2	58	BELAZ	SHIFTING FORK	540-2919412 23	EA	6	SG				Bel	1 Jan 94	
2	59	BELAZ	PIN	540M 2919426	EA	10	SG				Bel	1 Jan 94	
2	60	BELAZ	ROD	540 2919429 30	EA	6	SG				Bel	1 Jan 94	
2	61	BELAZ	SEAL	540 2919440 B1	EA	60	SG				Bel	1 Jan 94	
2	62	BELAZ	RING	7540 2919442	EA	40	SG				Bel	1 Jan 94	
2	63	BELAZ	ROD	7548 2919016 01	EA	10	SG				Bel	1 Jan 94	
2	64	BELAZ	SPACERS	548-3001016	EA	30	SG				Bel	1 Jan 94	
2	65	BELAZ	SPACERS	548 3001017	EA	30	SG				Bel	1 Jan 94	
2	66	BELAZ	SPACERS	548-3001026	EA	30	SG				Bel	1 Jan 94	
2	67	BELAZ	PULLEY	540-3003052	EA	6	SG				Bel	1 Jan 94	
2	68	BELAZ	BOOSTER	525 3405010 06	EA	6	SG				Bel	1 Jan 94	
2	69	BELAZ	SET	7522 3405155	EA	10	SG				Bel	1 Jan 94	
2	70	BELAZ	PACKING	548-3501105	EA	240	SG				Bel	1 Jan 94	
2	71	BELAZ	PIPE	540T 3506060 01	EA	20	SG				Bel	1 Jan 94	
2	72	BELAZ	BRAKE PLATE	549A 3507015	EA	60	SG				Bel	1 Jan 94	
2	73	BELAZ	COMPRESSOR	540T 3509015	EA	10	SG				Bel	1 Jan 94	
2	74	BELAZ	RING	130-35L 167	EA	40	SG				Bel	1 Jan 94	
2	75	BELAZ	REGULATOR	11 3512010	EA	8	SG				Bel	1 Jan 94	
2	76	BELAZ	COLLAR	540-3519137 B	EA	40	SG				Bel	1 Jan 94	
2	77	BELAZ	CYLINDER	540M 3519310	EA	10	SG				Bel	1 Jan 94	
2	78	BELAZ	BRUSHHOLDER	G263A 3701010	EA	20	SG				Bel	1 Jan 94	
2	79	BELAZ	LOCK	856-3708000	EA	20	SG				Bel	1 Jan 94	
2	80	BELAZ	RELE STARTER	RC103-37078000	EA	10	SG				Bel	1 Jan 94	
2	81	BELAZ	STARTER	45 7375 1451	EA	6	SG				Bel	1 Jan 94	
2	82	BELAZ	VOLTAGE REGULATOR	21 3702	EA	20	SG				Bel	1 Jan 94	
2	83	BELAZ	SOLENOID	CT103 3708120-150	EA	20	SG				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	84	BELAZ	ROTOR	25 3708200	EA	10	SG				Bel	1 Jan 94	
2	85	BELAZ	EQUALIZER BAR	25 3708320	EA	12	SG				Bel	1 Jan 94	
2	86	BELAZ	SWITCH	P602 3709210	EA	10	SG				Bel	1 Jan 94	
2	87	BELAZ	LIGHT SET	122 3711010-BV	EA	30	SG				Bel	1 Jan 94	
2	88	BELAZ	LIGHT SET	6-3711000KT	EA	30	SG				Bel	1 Jan 94	
2	89	BELAZ	FILTER ELEMENT	140 37112000-01	EA	30	SG				Bel	1 Jan 94	
2	90	BELAZ	INST LIGHTS	130-3712010-B	EA	20	SG				Bel	1 Jan 94	
2	91	BELAZ	INST LIGHTS	130 3716010-V	EA	15	SG				Bel	1 Jan 94	
2	92	BELAZ	INST LIGHTS	130 3716010 G	EA	15	SG				Bel	1 Jan 94	
2	93	BELAZ	REFLECTOR	FN 130 3716210	EA	20	SG				Bel	1 Jan 94	
2	94	BELAZ	REFLECTOR	FN 130 3716210B	EA	20	SG				Bel	1 Jan 94	
2	95	BELAZ	SIGNAL	C40 3721000	EA	12	SG				Bel	1 Jan 94	
2	96	BELAZ	ENGINE DIP STICKS	YP101 3726000 V1T	EA	30	SG				Bel	1 Jan 94	
2	97	BELAZ	SWITCH	P145 3726000T	EA	20	SG				Bel	1 Jan 94	
2	98	BELAZ	RELAY	RC 951A 3726010 70	EA	12	SG				Bel	1 Jan 94	
2	99	BELAZ	SENSOR	MM355 3829010	EA	20	SG				Bel	1 Jan 94	
2	100	BELAZ	HYDRALICK JACK	11107 39103010	EA	10	SG				Bel	1 Jan 94	
2	101	BELAZ	GLASS	540-5206010-10	EA	20	SG				Bel	1 Jan 94	
2	102	BELAZ	WINDOW HANDLES	81 6104013 B	EA	10	SG				Bel	1 Jan 94	
2	103	BELAZ	MIRROR	5040 8201015 01	EA	30	SG				Bel	1 Jan 94	
2	104	BELAZ	HOOD	7523 8402012	EA	6	SG				Bel	1 Jan 94	
2	105	BELAZ	HOOD	548A 8402411	EA	4	SG				Bel	1 Jan 94	
2	106	BELAZ	FENDERS	548A 840-3010	EA	4	SG				Bel	1 Jan 94	
2	107	BELAZ	GENERATOR	G263A 457371 1487	EA	6	SG				Bel	1 Jan 94	
2	108	BELAZ	STARTER	G263A	EA	10	SG				Bel	1 Jan 94	
2	109	BELAZ	ELECTROMOTOR	MN 1	EA	10	SG				Bel	1 Jan 94	
2	110	BELAZ	LAMPA	A24 1	EA	1000	SG				Bel	1 Jan 94	
2	111	BELAZ	LAMPA	A24 21 5	EA	1000	SG				Bel	1 Jan 94	
3	74	CONV BELT	1000 mm 5 PLY FABRIC		M	800	BA	$106 89	$85 512		USA	1 Jan 94	
3	76	CONV BELT	1200 mm 6 PLY FABRIC		M	1 000	BA	$147 53	$147 530		USA	1 Jan 94	
3	78	CONV BELT	1400 mm 6 PLY FABRIC		M	1 430	BA	$181 07	$258 930		USA	1 Jan 94	
3	79	CONV BELT	1600 mm 4 PLY FABRIC		M	1 875	BA	$157 71	$295 706		USA	1 Jan 94	
3	80	CONV BELT	800 mm 6 PLY FABRIC		M	500	BA	$107 99	$53 995		USA	1 Jan 94	
3	147	TRUCK TIRE	12x20x16 PLY/W TUBES		EA	20	BA	341 4	$6 828		USA	1 Sep 93	
3	148	TRUCK TIRE	12x20x16 PLY/W TUBES		EA	20	SG	341 4	$6 828		USA	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	1	KRAZ	ENGINE	238M 1000186	EA	0 6	BA				URK	1 Sep 93	
3	2	KRAZ	SHIM	238-1000102 B2R1	EA	3 2	BA				URK	1 Sep 93	
3	3	KRAZ	SHIM	238-1000102 B2	EA	3 2	BA				URK	1 Sep 93	
3	4	KRAZ	SHIM	23831000104 V2	EA	3 2	BA				URK	1 Sep 93	
3	5	KRAZ	CLIPS	256-1001005 A1	EA	5	BA				URK	1 Sep 93	
3	6	KRAZ	ENG RING SETS	236-1000106 B2	EA	20	BA				URK	1 Sep 93	
3	7	KRAZ	ENG MOUNTS	236-1001008 01	EA	3	BA				URK	1 Sep 93	
3	8	KRAZ	SHAFT	2383 1000107 V2	EA	0 8	BA				URK	1 Sep 93	
3	9	KRAZ	BLOCK	238 1002012 B2	EA	0 4	BA				URK	1 Sep 93	
3	10	KRAZ	RING	236-100202 A	EA	5	BA				URK	1 Sep 93	
3	11	KRAZ	RING	236 1002040	EA	4	BA				URK	1 Sep 93	
3	12	KRAZ	OIL INS	236 1002272	EA	1	BA				URK	1 Sep 93	
3	13	KRAZ	PIPE	238 1003290 V	EA	1	BA				URK	1 Sep 93	
3	14	KRAZ	PIPE	238 1003291 V	EA	1	BA				URK	1 Sep 93	
3	15	KRAZ	CYL WIPER COLLAR	236-1002314 B	EA	4	BA				URK	1 Sep 93	
3	16	KRAZ	HEAD C76G	238 1003013 D	EA	1	BA				URK	1 Sep 93	
3	17	KRAZ	RING	237 1003114 V	EA	1	BA				URK	1 Sep 93	
3	18	KRAZ	PACKING	238 1003210 V2	EA	10	BA				URK	1 Sep 93	
3	19	KRAZ	PACKING	238 1003270	EA	10	BA				URK	1 Sep 93	
3	20	KRAZ	LINER CYLINDER	236-1004008	EA	16	BA				URK	1 Sep 93	
3	21	KRAZ	ROCKER ARM	236 1004045 V2	EA	4	BA				URK	1 Sep 93	
3	22	KRAZ	RING	400 1004030 80	EA	4	BA				URK	1 Sep 93	
3	23	KRAZ	SEAL	201 1005034 B3	EA	4	BA				URK	1 Sep 93	
3	24	KRAZ	GEAR	236-1005030-A	EA	4	BA				URK	1 Sep 93	
3	25	KRAZ	COLLAR	236-1005160 A2	EA	10	BA				URK	1 Sep 93	
3	26	KRAZ	SHAFT	238 1006015 G2	EA	0 2	BA				URK	1 Sep 93	
3	27	KRAZ	SPACERS	236-1006026-AR	EA	6	BA				URK	1 Sep 93	
3	28	KRAZ	SPACERS	236-1006037 AR	EA	4 8	BA				URK	1 Sep 93	
3	29	KRAZ	VALVE	236-1007010-V	EA	5	BA				URK	1 Sep 93	
3	30	KRAZ	VALVE	236-1007015 V4	EA	5	BA				URK	1 Sep 93	
3	31	KRAZ	ROD PUSH	236-1007176-A	EA	4 2	BA				URK	1 Sep 93	
3	32	KRAZ	PACKING	236-1008050	EA	5	BA				URK	1 Sep 93	
3	33	KRAZ	PACKING	238T 1009040	EA	5	BA				URK	1 Sep 93	
3	34	KRAZ	PUMP	236-1011014 V3	EA	1	BA				URK	1 Sep 93	
3	35	KRAZ	RADIATOR	157 1013010-A	EA	1	BA				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	36	KRAZ	EXHAUST PIPE	256B-1013408-B	EA	1 6	BA				URK	1 Sep 93	
3	37	KRAZ	ELEMENT FILTER	201T 1105540	EA	60	BA				URK	1 Sep 93	
3	38	KRAZ	PUMP	240-1106210	EA	1	BA				URK	1 Sep 93	
3	39	KRAZ	PUMP	236T1106288-A2	EA	1	BA				URK	1 Sep 93	
3	40	KRAZ	COLLAR	236 102940	EA	10	BA				URK	1 Sep 93	
3	41	KRAZ	1/2 HUB COUPLING	236-1029268-B	EA	0 5	BA				URK	1 Sep 93	
3	42	KRAZ	PIPE	236-1104308 V	EA	2	BA				URK	1 Sep 93	
3	43	KRAZ	PUMP	8006-1111005	EA	0 6	BA				URK	1 Sep 93	
3	44	KRAZ	PLUNGER RODS	60-1111074 01	EA	15	BA				URK	1 Sep 93	
3	45	KRAZ	INJECTOR	2606 1112010 02	EA	28	BA				URK	1 Sep 93	
3	46	KRAZ	SPRAYER	26 111211	EA	28	BA				URK	1 Sep 93	
3	47	KRAZ	FILTER	201T 1117038	EA	20	BA				URK	1 Sep 93	
3	48	KRAZ	COUPLING	09000 1121010 000	EA	0 2	BA				URK	1 Sep 93	
3	49	KRAZ	MUFFLER	256 1201010	EA	1	BA				URK	1 Sep 93	
3	50	KRAZ	PACKING	256B 1203002	EA	10	BA				URK	1 Sep 93	
3	51	KRAZ	SLEEVE	256-B1 1203096	EA	2 5	BA				URK	1 Sep 93	
3	52	KRAZ	PACKING	256B 1203039	EA	4	BA				URK	1 Sep 93	
3	53	KRAZ	RADIATOR	256B-1301008 10	EA	2	BA				URK	1 Sep 93	
3	54	KRAZ	ENG MOUNTS	256-1302025	EA	1	BA				URK	1 Sep 93	
3	55	KRAZ	ENG/ MOUNTS	256 1302139	EA	1	BA				URK	1 Sep 93	
3	56	KRAZ	RODS	214B 1303010	EA	3	BA				URK	1 Sep 93	
3	57	KRAZ	RODS	255 1303012	EA	2	BA				URK	1 Sep 93	
3	58	KRAZ	EXHAUST PIPE	256 1303016	EA	0 6	BA				URK	1 Sep 93	
3	59	KRAZ	PUMP	236-1307010-A3	EA	2 5	BA				URK	1 Sep 93	
3	60	KRAZ	SET	236-1307029 A	EA	5	BA				URK	1 Sep 93	
3	61	KRAZ	COLLAR	236-1307090	EA	8	BA				URK	1 Sep 93	
3	62	KRAZ	BELTS	25 6411 1404	EA	20	BA				URK	1 Sep 93	
3	63	KRAZ	BELTS	6421 1403	EA	20	BA				URK	1 Sep 93	
3	64	KRAZ	MOTOR	236-1308011 G2	EA	0 6	BA				URK	1 Sep 93	
3	65	KRAZ	DISCS	238-1601690-G	EA	1	BA				URK	1 Sep 93	
3	66	KRAZ	DISCS	238-1601094	EA	1	BA				URK	1 Sep 93	
3	67	KRAZ	DISCS	238-1601130-B	EA	1	BA				URK	1 Sep 93	
3	68	KRAZ	DISCS	238-1601131	EA	1 5	BA				URK	1 Sep 93	
3	69	KRAZ	BRAKE FRICTION PLATE	236-1601138-A3	EA	5	BA				URK	1 Sep 93	
3	70	KRAZ	COUPLING	236-1601180-B2	EA	1	BA				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	71	KRAZ	GEAR BOX	236NT 1700003	EA	0 8	BA				URK	1 Sep 93	
3	72	KRAZ	BOX	257 18000020-V2	EA	0 2	BA				URK	1 Sep 93	
3	73	KRAZ	BOX	256-1800020-V2	EA	0 2	BA				URK	1 Sep 93	
3	74	KRAZ	HEAD CROSS	131 2201025 A	EA	2	BA				URK	1 Sep 93	
3	75	KRAZ	SHAFT	527 2202010-16	EA	0 8	BA				URK	1 Sep 93	
3	76	KRAZ	DRIVE SHAFT	210G 2202045 04	EA	0 8	BA				URK	1 Sep 93	
3	77	KRAZ	SHAFT	210G 2204010-16	EA	0 8	BA				URK	1 Sep 93	
3	78	KRAZ	SUPPORT	210-2204080-B2	EA	1	BA				URK	1 Sep 93	
3	79	KRAZ	REAR DRIVE AXLE	255P 2400015 02	EA	1	BA				URK	1 Sep 93	
3	80	KRAZ	SET OF GEARS	256B 2402020	EA	0 2	BA				URK	1 Sep 93	
3	81	KRAZ	DIFFERENTIAL SEAL	210-2402052 A1	EA	6	BA				URK	1 Sep 93	
3	82	KRAZ	DIFFERENTIAL	200-2403010-A2	EA	0 4	BA				URK	1 Sep 93	
3	83	KRAZ	FLANGE	200 2403072 B1	EA	0 4	BA				URK	1 Sep 93	
3	84	KRAZ	AXLE	2550-2500015 02	EA	0 2	BA				URK	1 Sep 93	
3	85	KRAZ	SHOCK ABSORBER	256B1 2902012	EA	2	BA				URK	1 Sep 93	
3	86	KRAZ	1ST PLATE	255B 2902074 01	EA	2	BA				URK	1 Sep 93	
3	87	KRAZ	2ND PLATE	255B 2902076 01	EA	2	BA				URK	1 Sep 93	
3	88	KRAZ	SHOCK SPRINGS	500 2905006	EA	5	BA				URK	1 Sep 93	
3	89	KRAZ	SHOCK ABSORBER	256B 2912012 11	EA	2 6	BA				URK	1 Sep 93	
3	90	KRAZ	CONN BRACKETS	219 2912408	EA	6	BA				URK	1 Sep 93	
3	91	KRAZ	EQUALIZER	256B 2918005	EA	3	BA				URK	1 Sep 93	
3	92	KRAZ	SHAFT	256B 2918054	EA	0 4	BA				URK	1 Sep 93	
3	93	KRAZ	ROD	214 2919011 02	EA	5	BA				URK	1 Sep 93	
3	94	KRAZ	ROD	210-2919012 03	EA	5	BA				URK	1 Sep 93	
3	95	KRAZ	BUSHING	200-3001016	EA	4	BA				URK	1 Sep 93	
3	96	KRAZ	SEAL	200 3103035	EA	1 4	BA				URK	1 Sep 93	
3	97	KRAZ	SEAL	210-3104036	EA	1 4	BA				URK	1 Sep 93	
3	98	KRAZ	COTTER PINS	200-3104050-A	EA	50	BA				URK	1 Sep 93	
3	99	KRAZ	COTTER PINS	200-3104050-A	EA	50	BA				URK	1 Sep 93	
3	100	KRAZ	RELAYS	500-3401005 D	EA	0 5	BA				URK	1 Sep 93	
3	101	KRAZ	HYD BOOSTER BRAKES	256B 3405010-14	EA	1	BA				URK	1 Sep 93	
3	102	KRAZ	DISTRIBUTOR	255B 3405016	EA	1	BA				URK	1 Sep 93	
3	103	KRAZ	PUMP	256B-3407199	EA	1	BA				URK	1 Sep 93	
3	104	KRAZ	FRIC PLATES SHOE	200-3501105	EA	30	BA				URK	1 Sep 93	
3	105	KRAZ	LEVER	210-3501136-A2	EA	0 8	BA				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	106	KRAZ	FRIC PLATES SHOES	200-3502105 A	EA	30	BA				URK	1 Sep 93	
3	107	KRAZ	COMPRESSOR	130-3509009 11	EA	0 8	BA				URK	1 Sep 93	
3	108	KRAZ	GENERATOR	4573711587	EA	2	BA				URK	1 Sep 93	
3	109	KRAZ	REGULATOR	1112 3702	EA	2	BA				URK	1 Sep 93	
3	110	KRAZ	SWITCH	VK318T 3704000	EA	1	BA				URK	1 Sep 93	
3	111	KRAZ	ELECTRO BRUSHES	2501 370805	EA	26	BA				URK	1 Sep 93	
3	112	KRAZ	SWITCH	P305 3709000	EA	1 5	BA				URK	1 Sep 93	
3	113	KRAZ	SWITCH	P39 371000 T	EA	1 5	BA				URK	1 Sep 93	
3	114	KRAZ	STARTER	45 7375 1471	EA	2 5	BA				URK	1 Sep 93	
3	115	KRAZ	RELAY	RC103 3708000	EA	1	BA				URK	1 Sep 93	
3	116	KRAZ	LAMPS	A 24 60-40	EA	40	BA				URK	1 Sep 93	
3	117	KRAZ	FILTERS	FG122 3711200-V	EA	3	BA				URK	1 Sep 93	
3	118	KRAZ	LAMPS	A24 324	EA	40	BA				URK	1 Sep 93	
3	119	KRAZ	LAMPS	A 24 2	EA	40	BA				URK	1 Sep 93	
3	120	KRAZ	LAMPS	A 24 5	EA	40	BA				URK	1 Sep 93	
3	121	KRAZ	LAMPS	A 24 21 2	EA	40	BA				URK	1 Sep 93	
3	122	KRAZ	SPEEDOMETER	CP135 3802010	EA	1	BA				URK	1 Sep 93	
3	123	KRAZ	RELAY	RC401 3726010	EA	1	BA				URK	1 Sep 93	
3	124	KRAZ	RECIEVER	YK143 3807010 G4	EA	0 4	BA				URK	1 Sep 93	
3	125	KRAZ	SENSOR	BM146-3806600D	EA	0 4	BA				URK	1 Sep 93	
3	126	KRAZ	AMP METER	AP110-3811010	EA	0 8	BA				URK	1 Sep 93	
3	127	KRAZ	PRESSURE GAUGE	MD103 3816010	EA	0 4	BA				URK	1 Sep 93	
3	128	KRAZ	SENSOR	TM100-3808000 G	EA	1	BA				URK	1 Sep 93	
3	129	KRAZ	MIRRORS	256-8201012	EA	3	BA				URK	1 Sep 93	
3	130	KRAZ	EQUALIZER	220V 8702010A	EA	0 2	BA				URK	1 Sep 93	
3	131	KRAZ	TOTAL COST US DOLLARS				BA		$11 000		URK	1 Sep 93	
3	1	KRAZ	ENGINE	238M 1000186	EA	0 6	SG				URK	1 Sep 93	
3	2	KRAZ	SHIM	238 1000102 B2R1	EA	3 2	SG				URK	1 Sep 93	
3	3	KRAZ	SHIM	238-1000102 B2	EA	3 2	SG				URK	1 Sep 93	
3	4	KRAZ	SHIM	23831000104 V2	EA	3 2	SG				URK	1 Sep 93	
3	5	KRAZ	CLIPS	256-1001005 A1	EA	5	SG				URK	1 Sep 93	
3	6	KRAZ	ENG RING SETS	236-1000106-B2	EA	20	SG				URK	1 Sep 93	
3	7	KRAZ	ENG MOUNTS	236-1001008 01	EA	3	SG				URK	1 Sep 93	
3	8	KRAZ	SHAFT	2383-1000107 V2	EA	0 8	SG				URK	1 Sep 93	
3	9	KRAZ	BLOCK	238-1002012 B2	EA	0 4	SG				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	10	KRAZ	RING	236-100202 A	EA	5	SG				URK	1 Sep 93	
3	11	KRAZ	RING	236-1002040	EA	4	SG				URK	1 Sep 93	
3	12	KRAZ	OIL INS	236-1002272	EA	1	SG				URK	1 Sep 93	
3	13	KRAZ	PIPE	238-1003290-V	EA	1	SG				URK	1 Sep 93	
3	14	KRAZ	PIPE	238 1003291 V	EA	1	SG				URK	1 Sep 93	
3	15	KRAZ	CYL WIPER COLLAR	236-1002314 B	EA	4	SG				URK	1 Sep 93	
3	16	KRAZ	HEAD C76G	238 1003013 D	EA	1	SG				URK	1 Sep 93	
3	17	KRAZ	RING	237 1003114 V	EA	1	SG				URK	1 Sep 93	
3	18	KRAZ	PACKING	238 1003210-V2	EA	10	SG				URK	1 Sep 93	
3	19	KRAZ	PACKING	238-1003270	EA	10	SG				URK	1 Sep 93	
3	20	KRAZ	LINER CYLINDER	236 1004008	EA	16	SG				URK	1 Sep 93	
3	21	KRAZ	ROCKER ARM	236 1004045 V2	EA	4	SG				URK	1 Sep 93	
3	22	KRAZ	RING	400 1004030 80	EA	4	SG				URK	1 Sep 93	
3	23	KRAZ	SEAL	201 1005034 B3	EA	4	SG				URK	1 Sep 93	
3	24	KRAZ	GEAR	236-1005030-A	EA	4	SG				URK	1 Sep 93	
3	25	KRAZ	COLLAR	236 1005160 A2	EA	10	SG				URK	1 Sep 93	
3	26	KRAZ	SHAFT	238 1006015 G2	EA	0 2	SG				URK	1 Sep 93	
3	27	KRAZ	SPACERS	236 1006026 AR	EA	6	SG				URK	1 Sep 93	
3	28	KRAZ	SPACERS	236 1006037 AR	EA	4 8	SG				URK	1 Sep 93	
3	29	KRAZ	VALVE	236-1007010-V	EA	5	SG				URK	1 Sep 93	
3	30	KRAZ	VALVE	236 1007015 V4	EA	5	SG				URK	1 Sep 93	
3	31	KRAZ	ROD PUSH	236 1007176-A	EA	4 2	SG				URK	1 Sep 93	
3	32	KRAZ	PACKING	236 1008050	EA	5	SG				URK	1 Sep 93	
3	33	KRAZ	PACKING	238T 1009040	EA	5	SG				URK	1 Sep 93	
3	34	KRAZ	PUMP	236 1011014 V3	EA	1	SG				URK	1 Sep 93	
3	35	KRAZ	RADIATOR	157 1013010-A	EA	1	SG				URK	1 Sep 93	
3	36	KRAZ	EXHAUST PIPE	256B-1013408 B	EA	1 6	SG				URK	1 Sep 93	
3	37	KRAZ	ELEMENT FILTER	201T 1105540	EA	60	SG				URK	1 Sep 93	
3	38	KRAZ	PUMP	240-1106210	EA	1	SG				URK	1 Sep 93	
3	39	KRAZ	PUMP	236T1106288-A2	EA	1	SG				URK	1 Sep 93	
3	40	KRAZ	COLLAR	236-102940	EA	10	SG				URK	1 Sep 93	
3	41	KRAZ	1/2 HUB COUPLING	236-1029268-B	EA	0 5	SG				URK	1 Sep 93	
3	42	KRAZ	PIPE	236-1104308 V	EA	2	SG				URK	1 Sep 93	
3	43	KRAZ	PUMP	8006-1111005	EA	0 6	SG				URK	1 Sep 93	
3	44	KRAZ	PLUNGER RODS	60-1111074 01	EA	15	SG				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	45	KRAZ	INJECTOR	2606-1112010-02	EA	28	SG				URK	1 Sep 93	
3	46	KRAZ	SPRAYER	26 111211	EA	28	SG				URK	1 Sep 93	
3	47	KRAZ	FILTER	201T 1117038	EA	20	SG				URK	1 Sep 93	
3	48	KRAZ	COUPLING	09000 1121010 000	EA	0 2	SG				URK	1 Sep 93	
3	49	KRAZ	MUFFLER	256-1201010	EA	1	SG				URK	1 Sep 93	
3	50	KRAZ	PACKING	256B-1203002	EA	10	SG				URK	1 Sep 93	
3	51	KRAZ	SLEEVE	256 B1 1203096	EA	2 5	SG				URK	1 Sep 93	
3	52	KRAZ	PACKING	256B 1203039	EA	4	SG				URK	1 Sep 93	
3	53	KRAZ	RADIATOR	256B 1301008 10	EA	2	SG				URK	1 Sep 93	
3	54	KRAZ	ENG MOUNTS	256-1302025	EA	1	SG				URK	1 Sep 93	
3	55	KRAZ	ENG/ MOUNTS	256 1302139	EA	1	SG				URK	1 Sep 93	
3	56	KRAZ	RODS	214B-1303010	EA	3	SG				URK	1 Sep 93	
3	57	KRAZ	RODS	255 1303012	EA	2	SG				URK	1 Sep 93	
3	58	KRAZ	EXHAUST PIPE	256 1303016	EA	0 6	SG				URK	1 Sep 93	
3	59	KRAZ	PUMP	236-1307010 A3	EA	2 5	SG				URK	1 Sep 93	
3	60	KRAZ	SET	236 1307029 A	EA	5	SG				URK	1 Sep 93	
3	61	KRAZ	COLLAR	236-1307090	EA	8	SG				URK	1 Sep 93	
3	62	KRAZ	BELTS	25 6411 1404	EA	20	SG				URK	1 Sep 93	
3	63	KRAZ	BELTS	6421 1403	EA	20	SG				URK	1 Sep 93	
3	64	KRAZ	MOTOR	236 1308011 G2	EA	0 6	SG				URK	1 Sep 93	
3	65	KRAZ	DISCS	238 1601690-G	EA	1	SG				URK	1 Sep 93	
3	66	KRAZ	DISCS	238 1601094	EA	1	SG				URK	1 Sep 93	
3	67	KRAZ	DISCS	238 1601130 B	EA	1	SG				URK	1 Sep 93	
3	68	KRAZ	DISCS	238 1601131	EA	1 5	SG				URK	1 Sep 93	
3	69	KRAZ	BRAKE FRICTION PLATE	236-1601138 A3	EA	5	SG				URK	1 Sep 93	
3	70	KRAZ	COUPLING	236-1601180-B2	EA	1	SG				URK	1 Sep 93	
3	71	KRAZ	GEAR BOX	236NT 1700003	EA	0 8	SG				URK	1 Sep 93	
3	72	KRAZ	BOX	257 18000020-V2	EA	0 2	SG				URK	1 Sep 93	
3	73	KRAZ	BOX	256 1800020 V2	EA	0 2	SG				URK	1 Sep 93	
3	74	KRAZ	HEAD CROSS	131 2201025 A	EA	2	SG				URK	1 Sep 93	
3	75	KRAZ	SHAFT	527 2202010-16	EA	0 8	SG				URK	1 Sep 93	
3	76	KRAZ	DRIVE SHAFT	210G 2202045 04	EA	0 8	SG				URK	1 Sep 93	
3	77	KRAZ	SHAFT	210G 2204010-16	EA	0 8	SG				URK	1 Sep 93	
3	78	KRAZ	SUPPORT	210-2204080-B2	EA	1	SG				URK	1 Sep 93	
3	79	KRAZ	REAR DRIVE AXLE	255P 2400015 02	EA	1	SG				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	80	KRAZ	SET OF GEARS	256B-2402020	EA	0 2	SG				URK	1 Sep 93	
3	81	KRAZ	DIFFERENTIAL SEAL	210-2402052 A1	EA	6	SG				URK	1 Sep 93	
3	82	KRAZ	DIFFERENTIAL	200-2403010-A2	EA	0 4	SG				URK	1 Sep 93	
3	83	KRAZ	FLANGE	200-2403072 B1	EA	0 4	SG				URK	1 Sep 93	
3	84	KRAZ	AXLE	2550-2500015 02	EA	0 2	SG				URK	1 Sep 93	
3	85	KRAZ	SHOCK ABSORBER	256B1 2902012	EA	2	SG				URK	1 Sep 93	
3	86	KRAZ	1ST PLATE	255B 2902074 01	EA	2	SG				URK	1 Sep 93	
3	87	KRAZ	2ND PLATE	255B-2902076-01	EA	2	SG				URK	1 Sep 93	
3	88	KRAZ	SHOCK SPRINGS	500-2905006	EA	5	SG				URK	1 Sep 93	
3	89	KRAZ	SHOCK ABSORBER	256B-2912012 11	EA	2 6	SG				URK	1 Sep 93	
3	90	KRAZ	CONN BRACKETS	219 2912408	EA	6	SG				URK	1 Sep 93	
3	91	KRAZ	EQUALIZER	256B 2918005	EA	3	SG				URK	1 Sep 93	
3	92	KRAZ	SHAFT	256B 2918054	EA	0 4	SG				URK	1 Sep 93	
3	93	KRAZ	ROD	214 2919011 02	EA	5	SG				URK	1 Sep 93	
3	94	KRAZ	ROD	210-2919012 03	EA	5	SG				URK	1 Sep 93	
3	95	KRAZ	BUSHING	200 3001016	EA	4	SG				URK	1 Sep 93	
3	96	KRAZ	SEAL	200 3103035	EA	1 4	SG				URK	1 Sep 93	
3	97	KRAZ	SEAL	210-3104036	EA	1 4	SG				URK	1 Sep 93	
3	98	KRAZ	COTTER PINS	200-3104050-A	EA	50	SG				URK	1 Sep 93	
3	99	KRAZ	COTTER PINS	200-3104050 A	EA	50	SG				URK	1 Sep 93	
3	100	KRAZ	RELAYS	500 3401005 D	EA	0 5	SG				URK	1 Sep 93	
3	101	KRAZ	HYD BOOSTER BRAKES	256B 3405010 14	EA	1	SG				URK	1 Sep 93	
3	102	KRAZ	DISTRIBUTOR	255B 3405016	EA	1	SG				URK	1 Sep 93	
3	103	KRAZ	PUMP	256B 3407199	EA	1	SG				URK	1 Sep 93	
3	104	KRAZ	FRIC PLATES SHOE	200-3501105	EA	30	SG				URK	1 Sep 93	
3	105	KRAZ	LEVER	210-3501136 A2	EA	0 8	SG				URK	1 Sep 93	
3	106	KRAZ	FRIC PLATES SHOES	200-3502105 A	EA	30	SG				URK	1 Sep 93	
3	107	KRAZ	COMPRESSOR	130-3509009 11	EA	0 8	SG				URK	1 Sep 93	
3	108	KRAZ	GENERATOR	4573711587	EA	2	SG				URK	1 Sep 93	
3	109	KRAZ	REGULATOR	1112 3702	EA	2	SG				URK	1 Sep 93	
3	110	KRAZ	SWITCH	VK318T 3704000	EA	1	SG				URK	1 Sep 93	
3	111	KRAZ	ELECTRO BRUSHES	2501 370805	EA	26	SG				URK	1 Sep 93	
3	112	KRAZ	SWITCH	P305 3709000	EA	1 5	SG				URK	1 Sep 93	
3	113	KRAZ	SWITCH	P39 371000-T	EA	1 5	SG				URK	1 Sep 93	
3	114	KRAZ	STARTER	45 7375 1471	EA	2 5	SG				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	115	KRAZ	RELAY	RC103-3708000	EA	1	SG				URK	1 Sep 93	
3	116	KRAZ	LAMPS	A 24-60-40	EA	40	SG				URK	1 Sep 93	
3	117	KRAZ	FILTERS	FG122 3711200-V	EA	3	SG				URK	1 Sep 93	
3	118	KRAZ	LAMPS	A24 324	EA	40	SG				URK	1 Sep 93	
3	119	KRAZ	LAMPS	A 24 2	EA	40	SG				URK	1 Sep 93	
3	120	KRAZ	LAMPS	A 24-5	EA	40	SG				URK	1 Sep 93	
3	121	KRAZ	LAMPS	A 24 21 2	EA	40	SG				URK	1 Sep 93	
3	122	KRAZ	SPEEDOMETER	CP135 3802010	EA	1	SG				URK	1 Sep 93	
3	123	KRAZ	RELAY	RC401 3726010	EA	1	SG				URK	1 Sep 93	
3	124	KRAZ	RECIEVER	YK143 3807010-G4	EA	0 4	SG				URK	1 Sep 93	
3	125	KRAZ	SENSOR	BM146 3806600D	EA	0 4	SG				URK	1 Sep 93	
3	126	KRAZ	AMP METER	AP110-3811010	EA	0 8	SG				URK	1 Sep 93	
3	127	KRAZ	PRESSURE GAUGE	MD103 3816010	EA	0 4	SG				URK	1 Sep 93	
3	128	KRAZ	SENSOR	TM100-3808000 G	EA	1	SG				URK	1 Sep 93	
3	129	KRAZ	MIRRORS	256 8201012	EA	3	SG				URK	1 Sep 93	
3	130	KRAZ	EQUALIZER	220V 8702010A	EA	0 2	SG				URK	1 Sep 93	
3	131	KRAZ	TOTAL COST *US DOLLARS*				SG		$11 000		URK	1 Sep 93	
3	1	T130 DOZER	PACKING	2301103160 CBN 1	EA	3	BA				CIS	1 Sep 93	
3	2	T130 DOZER	THIMBLE ?	01466 2	EA	10	BA				CIS	1 Sep 93	
3	3	T130 DOZER	RINGS	51 03 115 CP	EA	10	BA				CIS	1 Sep 93	
3	4	T130 DOZER	CRANKSHAFT	16 03 126 CP	EA	0 6	BA				CIS	1 Sep 93	
3	5	T130 DOZER	CYLINDER	51 03 23	EA	10	BA				CIS	1 Sep 93	
3	6	T130 DOZER	HYDRALIC SEAL	700-40-2889	EA	4 8	BA				CIS	1 Sep 93	
3	7	T130 DOZER	FILTER	F A41 20 000 01 CP	EA	10	BA				CIS	1 Sep 93	
3	8	T130 DOZER	FILTER	A41 10 000 02 CP	EA	10	BA				CIS	1 Sep 93	
3	9	T130 DOZER	RING	40843	EA	10	BA				CIS	1 Sep 93	
3	10	T130 DOZER	PACKING	40269	EA	3	BA				CIS	1 Sep 93	
3	11	T130 DOZER	GEAR PINION	74116	EA	0 3	BA				CIS	1 Sep 93	
3	12	T130 DOZER	REDUCTION GEAR	17 76-8 CP	EA	0 1	BA				CIS	1 Sep 93	
3	13	T130 DOZER	FUEL INJECTORS	17 69 107 1 CP	EA	10	BA				CIS	1 Sep 93	
3	14	T130 DOZER	SPRAYER	14 69 117 1 CP	EA	10	BA				CIS	1 Sep 93	
3	15	T130 DOZER	PUMP	51 67 11 CP	EA	0 3	BA				CIS	1 Sep 93	
3	16	T130 DOZER	COMPRESSOR PIPING	92 000-06	EA	1	BA				CIS	1 Sep 93	
3	17	T130 DOZER	AIR INLET	N036-85 770	EA	0 9	BA				CIS	1 Sep 93	
3	18	T130 DOZER	WATER PUMP	16-8-140-CP	EA	1	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	19	T130 DOZER	OIL PUMP	29 09 124 CP	EA	1	BA				CIS	1 Sep 93	
3	20	T130 DOZER	HYDRALIC PUMP	NS 100A 3 P	EA	0 6	BA				CIS	1 Sep 93	
3	21	T130 DOZER	PUMP	NS 32 Y WP	EA	0 2	BA				CIS	1 Sep 93	
3	22	T130 DOZER	GEAR BOX	24 12 1 CP	EA	0 2	BA				CIS	1 Sep 93	
3	23	T130 DOZER	FILTER	A23 30 000 01	EA	5	BA				CIS	1 Sep 93	
3	24	T130 DOZER	PACKING SEALS	700-40 2049	EA	3	BA				CIS	1 Sep 93	
3	25	T130 DOZER	CARBURATOR	113 1107011	EA	1 2	BA				CIS	1 Sep 93	
3	26	T130 DOZER	SUPPORT BRACKET	51 07 102 CP	EA	0 4	BA				CIS	1 Sep 93	
3	27	T130 DOZER	ENGINE HEAD	07146 1 CP	EA	0 6	BA				CIS	1 Sep 93	
3	28	T130 DOZER	FUEL SYS CENTRIFUGE	95000	EA	0 5	BA				CIS	1 Sep 93	
3	29	T130 DOZER	FAN BLADES	51 08 113 CP	EA	0 4	BA				CIS	1 Sep 93	
3	30	T130 DOZER	RADIATOR	130Y 13 010 1	EA	1	BA				CIS	1 Sep 93	
3	31	T130 DOZER	BRAKE DISC	738 4 CP	EA	1 5	BA				CIS	1 Sep 93	
3	32	T130 DOZER	MAGNET SOLENOID	M149 A3	EA	1 4	BA				CIS	1 Sep 93	
3	33	T130 DOZER	STARTER	ST 230M	EA	1 4	BA				CIS	1 Sep 93	
3	34	T130 DOZER	GENERATOR	70-3701	EA	0 5	BA				CIS	1 Sep 93	
3	35	T130 DOZER	RELAY STARTER	RR 0362B1	EA	1 5	BA				CIS	1 Sep 93	
3	36	T130 DOZER	DISTRIBUTOR	R 150-A3T001	EA	0 3	BA				CIS	1 Sep 93	
3	37	T130 DOZER	DRIVE SHAFT	50 14 113	EA	0 2	BA				CIS	1 Sep 93	
3	38	T130 DOZER	CYLINDER POWER	18 26-270 CP	EA	0 5	BA				CIS	1 Sep 93	
3	39	T130 DOZER	CYLINDER	DP 26 C 06 140	EA	0 2	BA				CIS	1 Sep 93	
3	40	T130 DOZER	ELEMENT FILTER	EF 01 00 CP	EA	14	BA				CIS	1 Sep 93	
3	41	T130 DOZER	PUMP BRAKE	14 71 3 CP	EA	0 3	BA				CIS	1 Sep 93	
3	42	T130 DOZER	MECH	17 74 8 CP	EA	0 2	BA				CIS	1 Sep 93	
3	43	T130 DOZER	SUPPORT	17 74 284	EA	0 4	BA				CIS	1 Sep 93	
3	44	T130 DOZER	SHAFT	16-74 10 CP	EA	0 3	BA				CIS	1 Sep 93	
3	45	T130 DOZER	GEAR	17 01 22	EA	0 3	BA				CIS	1 Sep 93	
3	46	T130 DOZER	FRICTION CLUTCH PADS	24 16-101 CP	EA	0 6	BA				CIS	1 Sep 93	
3	47	T130 DOZER	SERVICE MECH	21 17 4 CP	EA	0 5	BA				CIS	1 Sep 93	
3	48	T130 DOZER	FAN BELT	18360 01 CP	EA	1 2	BA				CIS	1 Sep 93	
3	49	T130 DOZER	PULLEY WHEEL	24 21 146 CP	EA	0 4	BA				CIS	1 Sep 93	
3	50	T130 DOZER	DRIVE PULLEY	24 21 169 CP	EA	1 6	BA				CIS	1 Sep 93	
3	51	T130 DOZER	DOUBLE PULLEY	24 21 170 CP	EA	1 6	BA				CIS	1 Sep 93	
3	52	T130 DOZER	FILTER	A 410000-2	EA	1	BA				CIS	1 Sep 93	
3	53	T130 DOZER	IDLER PULLEY	24-21 171 CP	EA	1 6	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	54	T130 DOZER	FILTER	A 410000-A CP	EA	6	BA				CIS	1 Sep 93	
3	55	T130 DOZER	MIDDLE CUTTING EDGE	D3-110AXP 02-001 0	EA	0 3	BA				CIS	1 Sep 93	
3	56	T130 DOZER	END CUTTING EDGE RT	D661 02001 02	EA	0 3	BA				CIS	1 Sep 93	
3	57	T130 DOZER	END CUTTING EDGE LEFT	D661 02 002 02	EA	0 3	BA				CIS	1 Sep 93	
3	58	T130 DOZER	TRACK ASSEMBLY	24 22 1	SET	0 3	BA				CIS	1 Sep 93	
3	59	T130 DOZER	DEFLECTOR RK GUARD	2204	EA	20	BA				CIS	1 Sep 93	
3	60	T130 DOZER	DEFLECTOR RK GUARD	2205	EA	20	BA				CIS	1 Sep 93	
3	61	T130 DOZER	PACKING TRACKS ADJ	40201	EA	8	BA				CIS	1 Sep 93	
3	62	T130 DOZER	RING	40210	EA	2	BA				CIS	1 Sep 93	
3	63	T130 DOZER	CYLINDER PACKING	40944 CP	EA	5	BA				CIS	1 Sep 93	
3	64	T130 DOZER	CYLINDER	14 02 101 CP	EA	5	BA				CIS	1 Sep 93	
3	65	T130 DOZER	HEAD CYLINDER	16 02 106 CP	EA	2	BA				CIS	1 Sep 93	
3	66	T130 DOZER	VALVE	14 02 32	EA	1	BA				CIS	1 Sep 93	
3	67	T130 DOZER	VALVE	14 02 33 V	EA	1	BA				CIS	1 Sep 93	
3	68	T130 DOZER	PIPE	10663 1	EA	1	BA				CIS	1 Sep 93	
3	69	T130 DOZER	PIPE	10664 1	EA	1	BA				CIS	1 Sep 93	
3	70	T130 DOZER	GEARBOX	50-12 12 CP	EA	0 2	BA				CIS	1 Sep 93	
3	71	T130 DOZER	COUPLING	18 14 133 CP	EA	0 3	BA				CIS	1 Sep 93	
3	72	T130 DOZER	DISC	18 14 135 CP	EA	0 4	BA				CIS	1 Sep 93	
3	73	T130 DOZER	COUPLING	18 14 78	EA	0 3	BA				CIS	1 Sep 93	
3	74	T130 DOZER	COLLAR	3 48X28 6	EA	0 4	BA				CIS	1 Sep 93	
3	75	T130 DOZER	RING	N1 35X28 2	EA	0 6	BA				CIS	1 Sep 93	
3	76	T130 DOZER	DISC	24 16-103 CP	EA	1	BA				CIS	1 Sep 93	
3	77	T130 DOZER	PUMP	51 67 10 CP	EA	0 2	BA				CIS	1 Sep 93	
3	78	T130 DOZER	PISTON PUMP	16 67 102 CP	EA	3 6	BA				CIS	1 Sep 93	
3	79	T130 DOZER	PUMP PISTON	16-67 108 CP	EA	3 6	BA				CIS	1 Sep 93	
3	80	T130 DOZER	DISC	738 4 CP	EA	1	BA				CIS	1 Sep 93	
3	81	T130 DOZER	COUPLING	72118 CP	EA	0 5	BA				CIS	1 Sep 93	
3	82	T130 DOZER	RING	111 30 123 00	EA	2	BA				CIS	1 Sep 93	
3	83	T130 DOZER	ROTOR	92 55	EA	0 2	BA				CIS	1 Sep 93	
3	84	T130 DOZER	RADIATOR	21 09 1	EA	0 2	BA				CIS	1 Sep 93	
3	85	T130 DOZER	PUMP	51 67 11 CP	EA	0 2	BA				CIS	1 Sep 93	
3	86	T130 DOZER	TOTAL COST US DOLLARS				BA		$18 000		CIS	1 Sep 93	
3	1	T130 DOZER	PACKING	2301103160 CBN 1	EA	23	OT				CIS	1 Sep 93	
3	2	T130 DOZER	THIMBLE ?	01466-2	EA	75	OT				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	3	T130 DOZER	RINGS	51 03-115 CP	EA	75	OT				CIS	1 Sep 93	
3	4	T130 DOZER	CRANKSHAFT	16-03 126 CP	EA	5	OT				CIS	1 Sep 93	
3	5	T130 DOZER	CYLINDER	51 03 23	EA	75	OT				CIS	1 Sep 93	
3	6	T130 DOZER	HYDRALIC SEAL	700 40-2889	EA	36	OT				CIS	1 Sep 93	
3	7	T130 DOZER	FILTER	F A41 20 000 01 CP	EA	75	OT				CIS	1 Sep 93	
3	8	T130 DOZER	FILTER	A41 10 000 02 CP	EA	75	OT				CIS	1 Sep 93	
3	9	T130 DOZER	RING	40843	EA	75	OT				CIS	1 Sep 93	
3	10	T130 DOZER	PACKING	40269	EA	23	OT				CIS	1 Sep 93	
3	11	T130 DOZER	GEAR PINION	74116	EA	2	OT				CIS	1 Sep 93	
3	12	T130 DOZER	REDUCTION GEAR	17 76 8 CP	EA	1	OT				CIS	1 Sep 93	
3	13	T130 DOZER	FUEL INJECTORS	17 69 107 1 CP	EA	75	OT				CIS	1 Sep 93	
3	14	T130 DOZER	SPRAYER	14 69 117 1 CP	EA	75	OT				CIS	1 Sep 93	
3	15	T130 DOZER	PUMP	51 67 11 CP	EA	2	OT				CIS	1 Sep 93	
3	16	T130 DOZER	COMPRESSOR PIPING	92 000 06	EA	8	OT				CIS	1 Sep 93	
3	17	T130 DOZER	AIR INLET	N036 85 770	EA	7	OT				CIS	1 Sep 93	
3	18	T130 DOZER	WATER PUMP	16-8 140 CP	EA	8	OT				CIS	1 Sep 93	
3	19	T130 DOZER	OIL PUMP	29 09 124 CP	EA	8	OT				CIS	1 Sep 93	
3	20	T130 DOZER	HYDRALIC PUMP	NS 100A 3 P	EA	5	OT				CIS	1 Sep 93	
3	21	T130 DOZER	PUMP	NS 32 Y WP	EA	2	OT				CIS	1 Sep 93	
3	22	T130 DOZER	GEAR BOX	24 12 1 CP	EA	2	OT				CIS	1 Sep 93	
3	23	T130 DOZER	FILTER	A23 30 000 01	EA	38	OT				CIS	1 Sep 93	
3	24	T130 DOZER	PACKING SEALS	700 40 2049	EA	23	OT				CIS	1 Sep 93	
3	25	T130 DOZER	CARBURATOR	113 1107011	EA	9	OT				CIS	1 Sep 93	
3	26	T130 DOZER	SUPPORT BRACKET	51 07 102 CP	EA	3	OT				CIS	1 Sep 93	
3	27	T130 DOZER	ENGINE HEAD	07146-1 CP	EA	5	OT				CIS	1 Sep 93	
3	28	T130 DOZER	FUEL SYS CENTRIFUGE	95000	EA	4	OT				CIS	1 Sep 93	
3	29	T130 DOZER	FAN BLADES	51 08-113 CP	EA	3	OT				CIS	1 Sep 93	
3	30	T130 DOZER	RADIATOR	130Y 13 010 1	EA	8	OT				CIS	1 Sep 93	
3	31	T130 DOZER	BRAKE DISC	738 4 CP	EA	11	OT				CIS	1 Sep 93	
3	32	T130 DOZER	MAGNET SOLENOID	M149 A3	EA	11	OT				CIS	1 Sep 93	
3	33	T130 DOZER	STARTER	ST 230M	EA	11	OT				CIS	1 Sep 93	
3	34	T130 DOZER	GENERATOR	70-3701	EA	4	OT				CIS	1 Sep 93	
3	35	T130 DOZER	RELAY STARTER	RR 0362B1	EA	11	OT				CIS	1 Sep 93	
3	36	T130 DOZER	DISTRIBUTOR	R 150-A3T001	EA	2	OT				CIS	1 Sep 93	
3	37	T130 DOZER	DRIVE SHAFT	50-14 113	EA	2	OT				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIOR.TY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	38	T130 DOZER	CYLINDER POWER	18-26-270 CP	EA	4	OT				CIS	1 Sep 93	
3	39	T130 DOZER	CYLINDER	DP 26-C 06-140	EA	2	OT				CIS	1 Sep 93	
3	40	T130 DOZER	ELEMENT FILTER	EF 01 00 CP	EA	105	OT				CIS	1 Sep 93	
3	41	T130 DOZER	PUMP BRAKE	14 71 3 CP	EA	2	OT				CIS	1 Sep 93	
3	42	T130 DOZER	MECH	17 74 8 CP	EA	2	OT				CIS	1 Sep 93	
3	43	T130 DOZER	SUPPORT	17 74 284	EA	3	OT				CIS	1 Sep 93	
3	44	T130 DOZER	SHAFT	16-74 10 CP	EA	2	OT				CIS	1 Sep 93	
3	45	T130 DOZER	GEAR	17 01 22	EA	2	OT				CIS	1 Sep 93	
3	46	T130 DOZER	FRICTION CLUTCH PADS	24 16 101 CP	EA	5	OT				CIS	1 Sep 93	
3	47	T130 DOZER	SERVICE MECH	21 17 4 CP	EA	4	OT				CIS	1 Sep 93	
3	48	T130 DOZER	FAN BELT	18360 01 CP	EA	9	OT				CIS	1 Sep 93	
3	49	T130 DOZER	PULLEY WHEEL	24 21 146 CP	EA	3	OT				CIS	1 Sep 93	
3	50	T130 DOZER	DRIVE PULLEY	24 21 169 CP	EA	12	OT				CIS	1 Sep 93	
3	51	T130 DOZER	DOUBLE PULLEY	24 21 170 CP	EA	12	OT				CIS	1 Sep 93	
3	52	T130 DOZER	FILTER	A 410000-2	EA	8	OT				CIS	1 Sep 93	
3	53	T130 DOZER	IDLER PULLEY	24 21 171 CP	EA	12	OT				CIS	1 Sep 93	
3	54	T130 DOZER	FILTER	A 410000 A CP	EA	45	OT				CIS	1 Sep 93	
3	55	T130 DOZER	MIDDLE CUTTING EDGE	D3 110AXP 02 001 0	EA	2	OT				CIS	1 Sep 93	
3	56	T130 DOZER	END CUTTING EDGE RT	D661 02001 02	EA	2	OT				CIS	1 Sep 93	
3	57	T130 DOZER	END CUTTING EDGE LEFT	D661 02 002 02	EA	2	OT				CIS	1 Sep 93	
3	58	T130 DOZER	TRACK ASSEMBLY	24 22 1	SET	2	OT				CIS	1 Sep 93	
3	59	T130 DOZER	DEFLECTOR RK GUARD	2204	EA	150	OT				CIS	1 Sep 93	
3	60	T130 DOZER	DEFLECTOR RK GUARD	2205	EA	150	OT				CIS	1 Sep 93	
3	61	T130 DOZER	PACKING TRACKS ADJ	40201	EA	60	OT				CIS	1 Sep 93	
3	62	T130 DOZER	RING	40210	EA	15	OT				CIS	1 Sep 93	
3	63	T130 DOZER	CYLINDER PACKING	40944 CP	EA	38	OT				CIS	1 Sep 93	
3	64	T130 DOZER	CYLINDER	14 02 101 CP	EA	38	OT				CIS	1 Sep 93	
3	65	T130 DOZER	HEAD CYLINDER	16 02 106 CP	EA	15	OT				CIS	1 Sep 93	
3	66	T130 DOZER	VALVE	14 02 32	EA	8	OT				CIS	1 Sep 93	
3	67	T130 DOZER	VALVE	14 02 33 V	EA	8	OT				CIS	1 Sep 93	
3	68	T130 DOZER	PIPE	10663 1	EA	8	OT				CIS	1 Sep 93	
3	69	T130 DOZER	PIPE	10664 1	EA	8	OT				CIS	1 Sep 93	
3	70	T130 DOZER	GEARBOX	50-12 12 CP	EA	2	OT				CIS	1 Sep 93	
3	71	T130 DOZER	COUPLING	18-14 133 CP	EA	2	OT				CIS	1 Sep 93	
3	72	T130 DOZER	DISC	18-14 135 CP	EA	3	OT				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	73	T130 DOZER	COUPLING	18-14-78	EA	2	OT				CIS	1 Sep 93	
3	74	T130 DOZER	COLLAR	3-48X28 6	EA	3	OT				CIS	1 Sep 93	
3	75	T130 DOZER	RING	N1 35X28 2	EA	5	OT				CIS	1 Sep 93	
3	76	T130 DOZER	DISC	24 16-103 CP	EA	8	OT				CIS	1 Sep 93	
3	77	T130 DOZER	PUMP	51 67 10 CP	EA	2	OT				CIS	1 Sep 93	
3	78	T130 DOZER	PISTON PUMP	16-67 102 CP	EA	27	OT				CIS	1 Sep 93	
3	79	T130 DOZER	PUMP PISTON	16 67 108 CP	EA	27	OT				CIS	1 Sep 93	
3	80	T130 DOZER	DISC	738 4 CP	EA	8	OT				CIS	1 Sep 93	
3	81	T130 DOZER	COUPLING	72118 CP	EA	4	OT				CIS	1 Sep 93	
3	82	T130 DOZER	RING	111 30 123 00	EA	15	OT				CIS	1 Sep 93	
3	83	T130 DOZER	ROTOR	92 55	EA	2	OT				CIS	1 Sep 93	
3	84	T130 DOZER	RADIATOR	21 09 1	EA	2	OT				CIS	1 Sep 93	
3	85	T130 DOZER	PUMP	51 67 11 CP	EA	2	OT				CIS	1 Sep 93	
3	86	T130 DOZER	TOTAL COST US DOLLARS				OT		$135 000		CIS	1 Sep 93	
3	1	T130 DOZER	PACKING	2301103160 CBN 1	EA	5	SG				CIS	1 Sep 93	
3	2	T130 DOZER	THIMBLE ?	01466-2	EA	15	SG				CIS	1 Sep 93	
3	3	T130 DOZER	RINGS	51 03 115 CP	EA	15	SG				CIS	1 Sep 93	
3	4	T130 DOZER	CRANKSHAFT	16 03 126 CP	EA	1	SG				CIS	1 Sep 93	
3	5	T130 DOZER	CYLINDER	51 03 23	EA	15	SG				CIS	1 Sep 93	
3	6	T130 DOZER	HYDRALIC SEAL	700 40-2889	EA	7	SG				CIS	1 Sep 93	
3	7	T130 DOZER	FILTER	F A41 20 000 01 CP	EA	15	SG				CIS	1 Sep 93	
3	8	T130 DOZER	FILTER	A41 10 000 02 CP	EA	15	SG				CIS	1 Sep 93	
3	9	T130 DOZER	RING	40843	EA	15	SG				CIS	1 Sep 93	
3	10	T130 DOZER	PACKING	40269	EA	5	SG				CIS	1 Sep 93	
3	11	T130 DOZER	GEAR PINION	74116	EA	0	SG				CIS	1 Sep 93	
3	12	T130 DOZER	REDUCTION GEAR	17 76 8 CP	EA	0	SG				CIS	1 Sep 93	
3	13	T130 DOZER	FUEL INJECTORS	17 69 107 1 CP	EA	15	SG				CIS	1 Sep 93	
3	14	T130 DOZER	SPRAYER	14 69 117 1 CP	EA	15	SG				CIS	1 Sep 93	
3	15	T130 DOZER	PUMP	51 67 11 CP	EA	0	SG				CIS	1 Sep 93	
3	16	T130 DOZER	COMPRESSOR PIPING	92 000-06	EA	2	SG				CIS	1 Sep 93	
3	17	T130 DOZER	AIR INLET	N036 85 770	EA	1	SG				CIS	1 Sep 93	
3	18	T130 DOZER	WATER PUMP	16-8-140 CP	EA	2	SG				CIS	1 Sep 93	
3	19	T130 DOZER	OIL PUMP	29 09 124 CP	EA	2	SG				CIS	1 Sep 93	
3	20	T130 DOZER	HYDRALIC PUMP	NS 100A 3 P	EA	1	SG				CIS	1 Sep 93	
3	21	T130 DOZER	PUMP	NS 32 Y WP	EA	0	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	22	T130 DOZER	GEAR BOX	24 12 1 CP	EA	0	SG				CIS	1 Sep 93	
3	23	T130 DOZER	FILTER	A23 30 000 01	EA	8	SG				CIS	1 Sep 93	
3	24	T130 DOZER	PACKING SEALS	700-40-2049	EA	5	SG				CIS	1 Sep 93	
3	25	T130 DOZER	CARBURATOR	113 1107011	EA	2	SG				CIS	1 Sep 93	
3	26	T130 DOZER	SUPPORT BRACKET	51 07 102 CP	EA	1	SG				CIS	1 Sep 93	
3	27	T130 DOZER	ENGINE HEAD	07146-1 CP	EA	1	SG				CIS	1 Sep 93	
3	28	T130 DOZER	FUEL SYS CENTRIFUGE	95000	EA	1	SG				CIS	1 Sep 93	
3	29	T130 DOZER	FAN BLADES	51 08 113 CP	EA	1	SG				CIS	1 Sep 93	
3	30	T130 DOZER	RADIATOR	130Y 13 010 1	EA	2	SG				CIS	1 Sep 93	
3	31	T130 DOZER	BRAKE DISC	738 4 CP	EA	2	SG				CIS	1 Sep 93	
3	32	T130 DOZER	MAGNET SOLENOID	M149 A3	EA	2	SG				CIS	1 Sep 93	
3	33	T130 DOZER	STARTER	ST 230M	EA	2	SG				CIS	1 Sep 93	
3	34	T130 DOZER	GENERATOR	70-3701	EA	1	SG				CIS	1 Sep 93	
3	35	T130 DOZER	RELAY STARTER	RR 0362B1	EA	2	SG				CIS	1 Sep 93	
3	36	T130 DOZER	DISTRIBUTOR	R 150-A3T001	EA	0	SG				CIS	1 Sep 93	
3	37	T130 DOZER	DRIVE SHAFT	50 14 113	EA	0	SG				CIS	1 Sep 93	
3	38	T130 DOZER	CYLINDER POWER	18 26 270 CP	EA	1	SG				CIS	1 Sep 93	
3	39	T130 DOZER	CYLINDER	DP 26 C 06 140	EA	0	SG				CIS	1 Sep 93	
3	40	T130 DOZER	ELEMENT FILTER	EF 01 00 CP	EA	21	SG				CIS	1 Sep 93	
3	41	T130 DOZER	PUMP BRAKE	14 71 3 CP	EA	0	SG				CIS	1 Sep 93	
3	42	T130 DOZER	MECH	17 74 8 CP	EA	0	SG				CIS	1 Sep 93	
3	43	T130 DOZER	SUPPORT	17 74 284	EA	1	SG				CIS	1 Sep 93	
3	44	T130 DOZER	SHAFT	16 74 10 CP	EA	0	SG				CIS	1 Sep 93	
3	45	T130 DOZER	GEAR	17 01 22	EA	0	SG				CIS	1 Sep 93	
3	46	T130 DOZER	FRICTION CLUTCH PADS	24 16-101 CP	EA	1	SG				CIS	1 Sep 93	
3	47	T130 DOZER	SERVICE MECH	21 17 4 CP	EA	1	SG				CIS	1 Sep 93	
3	48	T130 DOZER	FAN BELT	18360-01 CP	EA	2	SG				CIS	1 Sep 93	
3	49	T130 DOZER	PULLEY WHEEL	24 21 146 CP	EA	1	SG				CIS	1 Sep 93	
3	50	T130 DOZER	DRIVE PULLEY	24 21 169 CP	EA	2	SG				CIS	1 Sep 93	
3	51	T130 DOZER	DOUBLE PULLEY	24 21 170 CP	EA	2	SG				CIS	1 Sep 93	
3	52	T130 DOZER	FILTER	A 410000 2	EA	2	SG				CIS	1 Sep 93	
3	53	T130 DOZER	IDLER PULLEY	24 21 171 CP	EA	2	SG				CIS	1 Sep 93	
3	54	T130 DOZER	FILTER	A 410000 A CP	EA	9	SG				CIS	1 Sep 93	
3	55	T130 DOZER	MIDDLE CUTTING EDGE	D3 110AXP 02 001 0	EA	0	SG				CIS	1 Sep 93	
3	56	T130 DOZER	END CUTTING EDGE RT	D661 02001 02	EA	0	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	57	T130 DOZER	END CUTTING EDGE LEFT	D661 02 002 02	EA	0	SG				CIS	1 Sep 93	
3	58	T130 DOZER	TRACK ASSEMBLY	24 22 1	SET	0	SG				CIS	1 Sep 93	
3	59	T130 DOZER	DEFLECTOR RK GUARD	2204	EA	30	SG				CIS	1 Sep 93	
3	60	T130 DOZER	DEFLECTOR RK GUARD	2205	EA	30	SG				CIS	1 Sep 93	
3	61	T130 DOZER	PACKING TRACKS ADJ	40201	EA	12	SG				CIS	1 Sep 93	
3	62	T130 DOZER	RING	40210	EA	3	SG				CIS	1 Sep 93	
3	63	T130 DOZER	CYLINDER PACKING	40944 CP	EA	8	SG				CIS	1 Sep 93	
3	64	T130 DOZER	CYLINDER	14 02 101 CP	EA	8	SG				CIS	1 Sep 93	
3	65	T130 DOZER	HEAD CYLINDER	16 02 106 CP	EA	3	SG				CIS	1 Sep 93	
3	66	T130 DOZER	VALVE	14 02 32	EA	2	SG				CIS	1 Sep 93	
3	67	T130 DOZER	VALVE	14 02 33 V	EA	2	SG				CIS	1 Sep 93	
3	68	T130 DOZER	PIPE	10663 1	EA	2	SG				CIS	1 Sep 93	
3	69	T130 DOZER	PIPE	10664 1	EA	2	SG				CIS	1 Sep 93	
3	70	T130 DOZER	GEARBOX	50-12 12 CP	EA	0	SG				CIS	1 Sep 93	
3	71	T130 DOZER	COUPLING	18 14 133 CP	EA	0	SG				CIS	1 Sep 93	
3	72	T130 DOZER	DISC	18-14 135 CP	EA	1	SG				CIS	1 Sep 93	
3	73	T130 DOZER	COUPLING	18 14 78	EA	0	SG				CIS	1 Sep 93	
3	74	T130 DOZER	COLLAR	3 48X28 6	EA	1	SG				CIS	1 Sep 93	
3	75	T130 DOZER	RING	N1 35X28 2	EA	1	SG				CIS	1 Sep 93	
3	76	T130 DOZER	DISC	24 16-103 CP	EA	2	SG				CIS	1 Sep 93	
3	77	T130 DOZER	PUMP	51 67 10 CP	EA	0	SG				CIS	1 Sep 93	
3	78	T130 DOZER	PISTON PUMP	16 67 102 CP	EA	5	SG				CIS	1 Sep 93	
3	79	T130 DOZER	PUMP PISTON	16 67 108 CP	EA	5	SG				CIS	1 Sep 93	
3	80	T130 DOZER	DISC	738 4 CP	EA	2	SG				CIS	1 Sep 93	
3	81	T130 DOZER	COUPLING	72118 CP	EA	1	SG				CIS	1 Sep 93	
3	82	T130 DOZER	RING	111 30 123 00	EA	3	SG				CIS	1 Sep 93	
3	83	T130 DOZER	ROTOR	92 55	EA	0	SG				CIS	1 Sep 93	
3	84	T130 DOZER	RADIATOR	21 09 1	EA	0	SG				CIS	1 Sep 93	
3	85	T130 DOZER	PUMP	51 67 11 CP	EA	0	SG				CIS	1 Sep 93	
3	86	T130 DOZER	TOTAL COST US DOLLARS				SG		$27 000		CIS	1 Sep 93	
3	1	T250 DOZER	ENGINE	B 31M 748-01 4 cb	EA	2	BA				CIS	1 Sep 93	
3	2	T250 DOZER	HOUSING	748 05 120 CP	EA	20	BA				CIS	1 Sep 93	
3	3	T250 DOZER	HOUSING	748 05 271 CP	EA	20	BA				CIS	1 Sep 93	
3	4	T250 DOZER	REFLECTOR LIGHTS	748-07 182 CP	EA	1	BA				CIS	1 Sep 93	
3	5	T250 DOZER	REFLECTOR LIGHTS	748-07 212 CP	EA	1	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	6	T250 DOZER	REGULATOR	P5M	EA	10	BA				CIS	1 Sep 93	
3	7	T250 DOZER	LIGHT SET	FG 122B	EA	20	BA				CIS	1 Sep 93	
3	8	T250 DOZER	LAMP	A 24 75X60	EA	1000	BA				CIS	1 Sep 93	
3	9	T250 DOZER	PLANETARY MECH	748-16-141 cb	EA	1	BA				CIS	1 Sep 93	
3	10	T250 DOZER	RINGS	748-16-86	EA	4	BA				CIS	1 Sep 93	
3	11	T250 DOZER	RINGS	748-58 2059	EA	4	BA				CIS	1 Sep 93	
3	12	T250 DOZER	SHIMS	748-18 226 232	EA	160	BA				CIS	1 Sep 93	
3	13	T250 DOZER	CLIPS	3629	EA	10000	BA				CIS	1 Sep 93	
3	14	T250 DOZER	GEAR BOX	748 19	EA	2	BA				CIS	1 Sep 93	
3	15	T250 DOZER	SHIFTING FORK	748 19 1	EA	30	BA				CIS	1 Sep 93	
3	16	T250 DOZER	IDLER	748 21 112 CP	EA	48	BA				CIS	1 Sep 93	
3	17	T250 DOZER	IDLER	748 21 130 CP	EA	48	BA				CIS	1 Sep 93	
3	18	T250 DOZER	SETS TRACK	748 22 101 CP	SET	4	BA				CIS	1 Sep 93	
3	19	T250 DOZER	GROUSERS	748 22 132 CP	EA	20	BA				CIS	1 Sep 93	
3	20	T250 DOZER	TRACK BOLTS	700 28-232	EA	1000	BA				CIS	1 Sep 93	
3	21	T250 DOZER	TRACK BUSHINGS	748 22 3	EA	100	BA				CIS	1 Sep 93	
3	22	T250 DOZER	TRACK LINKS	748 22 1	EA	40	BA				CIS	1 Sep 93	
3	23	T250 DOZER	TRACK LINKS	748 22 2	EA	40	BA				CIS	1 Sep 93	
3	24	T250 DOZER	TRACK PINS	748 22 6	EA	100	BA				CIS	1 Sep 93	
3	25	T250 DOZER	CONE ?	748 22 71	EA	200	BA				CIS	1 Sep 93	
3	26	T250 DOZER	WASHERS	748 22 50	EA	1000	BA				CIS	1 Sep 93	
3	27	T250 DOZER	BLOWER	748 27 208 CP	EA	2	BA				CIS	1 Sep 93	
3	28	T250 DOZER	PACKING	748 31 11	EA	10	BA				CIS	1 Sep 93	
3	29	T250 DOZER	PACKING	748 31 138	EA	10	BA				CIS	1 Sep 93	
3	30	T250 DOZER	COUPLING	748 13 75	EA	2	BA				CIS	1 Sep 93	
3	31	T250 DOZER	AXLE	748 50-206	EA	2	BA				CIS	1 Sep 93	
3	32	T250 DOZER	COUPLING	748 50 171 CP	EA	2	BA				CIS	1 Sep 93	
3	33	T250 DOZER	DISC	748-50-302 CP	EA	4	BA				CIS	1 Sep 93	
3	34	T250 DOZER	DISC	748 50-152 CP	EA	4	BA				CIS	1 Sep 93	
3	35	T250 DOZER	PUMP	748 50-232 cb	EA	5	BA				CIS	1 Sep 93	
3	36	T250 DOZER	CONTACTOR	TKC 611D0D	EA	8	BA				CIS	1 Sep 93	
3	37	T250 DOZER	CONTROLLER	KB30G 748 82 371	EA	2	BA				CIS	1 Sep 93	
3	38	T250 DOZER	ELECT BRUSH	UG 2A 2/12 5X40X60	EA	300	BA				CIS	1 Sep 93	
3	39	T250 DOZER	ELECT BRUSH	UG 2A /16X32X40/	EA	500	BA				CIS	1 Sep 93	
3	40	T250 DOZER	INITIATOR	DK 913A	EA	2	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	41	T250 DOZER	HYDRO PUMP	748-99 230 cb	EA	2	BA				CIS	1 Sep 93	
3	42	T250 DOZER	WASHER	748-99 993	EA	20	BA				CIS	1 Sep 93	
3	43	T250 DOZER	RINGS	748 99 446	EA	20	BA				CIS	1 Sep 93	
3	44	T250 DOZER	DISTRIBUTOR	748-99 465 cb	EA	2	BA				CIS	1 Sep 93	
3	45	T250 DOZER	POWER CYLINDER	748 99 10 cb	EA	6	BA				CIS	1 Sep 93	
3	46	T250 DOZER	SHOCK ABSORBER	402 50-7	EA	24	BA				CIS	1 Sep 93	
3	47	T250 DOZER	PACKING	3303 08 1	EA	4	BA				CIS	1 Sep 93	
3	48	T250 DOZER	RING	303 10-2	EA	72	BA				CIS	1 Sep 93	
3	49	T250 DOZER	PIPE	303 18 1A	EA	72	BA				CIS	1 Sep 93	
3	50	T250 DOZER	GENERATOR	CBV 30940 3	EA	4	BA				CIS	1 Sep 93	
3	51	T250 DOZER	BUSHING	3308-233 2	EA	2	BA				CIS	1 Sep 93	
3	52	T250 DOZER	PUMP	CB 3311 00 4	EA	1	BA				CIS	1 Sep 93	
3	53	T250 DOZER	SHAFT	CB411 22 16	EA	2	BA				CIS	1 Sep 93	
3	54	T250 DOZER	PUMP	CB412 00-5	EA	2	BA				CIS	1 Sep 93	
3	55	T250 DOZER	TOTAL COST US DOLLARS				BA		$45 000		CIS	1 Sep 93	
3	1	T250 DOZER	LINK	748 22 132 CP	EA	20	SG				CIS	1 Sep 93	
3	2	T250 DOZER	LINK	748 22 133 CP	EA	20	SG				CIS	1 Sep 93	
3	3	T250 DOZER	LINK	748 22 134 CP	EA	20	SG				CIS	1 Sep 93	
3	4	T250 DOZER	END PIN	748 22 6	EA	200	SG				CIS	1 Sep 93	
3	5	T250 DOZER	HEAD LAMP SET	748 10 318 CP	EA	18	SG				CIS	1 Sep 93	
3	6	T250 DOZER	PACKING	748 18 234	EA	40	SG				CIS	1 Sep 93	
3	7	T250 DOZER	PACKING	748 18-229	EA	40	SG				CIS	1 Sep 93	
3	8	T250 DOZER	PACKING	748 18 229	EA	40	SG				CIS	1 Sep 93	
3	9	T250 DOZER	CROWN 7	748-19 1	EA	8	SG				CIS	1 Sep 93	
3	10	T250 DOZER	COUPLING	748 19 5	EA	4	SG				CIS	1 Sep 93	
3	11	T250 DOZER	GENERATOR	GNA 222 748 82 349 CP	EA	2	SG				CIS	1 Sep 93	
3	12	T250 DOZER	OIL PUMP	748 60-276-CP	EA	10	SG				CIS	1 Sep 93	
3	13	T250 DOZER	BRUSH	UG2A KG3 16X32X40	EA	72	SG				CIS	1 Sep 93	
3	14	T250 DOZER	BRUSH	UG2A K12 8 2X12 5X40X5	EA	36	SG				CIS	1 Sep 93	
3	15	T250 DOZER	DISTRIBUTOR	748 99 465 CP	EA	1	SG				CIS	1 Sep 93	
3	16	T250 DOZER	HYDROPUMP	933 02 06	EA	1	SG				CIS	1 Sep 93	
3	17	T250 DOZER	TOTAL COST US DOLLARS				SG		$45 000		CIS	1 Sep 93	
3	1	T250 DOZER	CUTTING EDGES	D3 132 T 0200T	EA	4	SO				CIS	1 Sep 93	
3	2	T250 DOZER	CUTTING EDGES	D3 132 1 02002	EA	4	SO				CIS	1 Sep 93	
3	3	T250 DOZER	CUTTING EDGES	D3-59XL 0T00030	EA	2	SO				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	4	T250 DOZER	CUTTING EDGES	D3-TT8 TO OOT	EA	2	SO				CIS	1 Sep 93	
3	5	T250 DOZER	TOTAL COST US DOLLARS				SO		$45 000		CIS	1 Sep 93	
3	1	YM2 PARTS	CYLINDER	240H 1004008-D	EA	132	SG				CIS	1 Sep 93	
3	2	YM2 PARTS	CRANK SHAFT	240-1000107 B6	EA	4	SG				CIS	1 Sep 93	
3	3	YM2 PARTS	RINGS	236-1000106-B4	EA	132	SG				CIS	1 Sep 93	
3	4	YM2 PARTS	PACKING	240 1000104 B2	EA	10	SG				CIS	1 Sep 93	
3	5	YM2 PARTS	PACKING	240-1000104 P2	EA	5	SG				CIS	1 Sep 93	
3	6	YM2 PARTS	PACKING	240-1000104 P1	EA	5	SG				CIS	1 Sep 93	
3	7	YM2 PARTS	SEAL	240-1003213 A3	EA	100	SG				CIS	1 Sep 93	
3	8	YM2 PARTS	PUMP	240 1011014	EA	3	SG				CIS	1 Sep 93	
3	9	YM2 PARTS	ELEMENT	240-1017038	EA	500	SG				CIS	1 Sep 93	
3	10	YM2 PARTS	ELEMENT	238H 1109080	EA	50	SG				CIS	1 Sep 93	
3	11	YM2 PARTS	TURBOCOMPRESSOR	240H 1118010 B	EA	4	SG				CIS	1 Sep 93	
3	12	YM2 PARTS	TURBOCOMPRESSOR	240H 1118011B	EA	4	SG				CIS	1 Sep 93	
3	13	YM2 PARTS	BLOCK CYLINDER	240H 1002012H	EA	1	SG				CIS	1 Sep 93	
3	14	YM2 PARTS	PUMP	9016111008 02	EA	1	SG				CIS	1 Sep 93	
3	15	YM2 PARTS	SPRAY INJECTOR	26161112110	EA	60	SG				CIS	1 Sep 93	
3	16	YM2 PARTS	RING	236-1002024A	EA	100	SG				CIS	1 Sep 93	
3	17	YM2 PARTS	RING	236 1002040	EA	50	SG				CIS	1 Sep 93	
3	18	YM2 PARTS	ELEMENT FILTER	240T 1017040 A3	EA	100	SG				CIS	1 Sep 93	
3	19	YM2 PARTS	ELEMENT	201T 1105540	EA	100	SG				CIS	1 Sep 93	
3	20	YM2 PARTS	RINGS	236-1004002 A3	EA	48	SG				CIS	1 Sep 93	
3	21	YM2 PARTS	PACKING SEALS	240 1008098	EA	5	SG				CIS	1 Sep 93	
3	22	YM2 PARTS	PACKING SEALS	240T 1009040 A2	EA	5	SG				CIS	1 Sep 93	
3	23	YM2 PARTS	FUEL PUMP	1111008 20	EA	1	SG				CIS	1 Sep 93	
3	24	YM2 PARTS	ELEMENT	201 1117038 A2	EA	250	SG				CIS	1 Sep 93	
3	25	YM2 PARTS	PUMP	240-1307010-A	EA	2 5	SG				CIS	1 Sep 93	
3	26	YM2 PARTS	GENERATOR	45 7371 0209	EA	1 5	SG				CIS	1 Sep 93	
3	27	YM2 PARTS	STARTER	45 7375 1471	EA	1 5	SG				CIS	1 Sep 93	
3	28	YM2 PARTS	TOTAL COST US DOLLARS				SG		$12 500		CIS	1 Sep 93	

TOTAL COST US DOLLARS $23 283 254

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	164	ALUM WIRE	OVERHEAD FIELD LINE		TONNE	7 5	BA	4 912	$36 844		USA	1 Sep 93	
1	165	ALUM WIRE	OVERHEAD FIELD LINE		TONNE	7 5	SG	4912	$35 844		USA	1 Sep 93	
1	8	ANFO TR	ANFO MIX TRUCK		EA	1	BA	$135 125	$135 125		USA	1 Sep 93	
1	7	ANFO TR	ANFO MIX TRUCK		EA	1	SG	$135 125	$135 125		USA	1 Sep 93	
1	162	BATTERIES	32 CT 450 AMP/HR 24 V	8 BAT /SET	EA	32	BA	414	$13 248		USA	1 Sep 94	
1	155	BATTERIES	6 CT 132 AMP/HR 12V		EA	60	AD	169 6	$10 176		USA	1 Sep 93	
1	160	BATTERIES	6 CT 182 AMP/HR 12V		EA	60	AD	204 06	$12 244		USA	1 Jan 94	
1	156	BATTERIES	6 CT 132 AMP/HR 12V		EA	20	OT	169 6	$3 392		USA	1 Sep 93	
1	161	BATTERIES	6 CT 182 AMP/HR 12V		EA	20	OT	204 06	$4 081		USA	1 Jan 94	
1	158	BATTERIES	6 CT 182 AMP/HR 12V		EA	50	SG	204 06	$10 203		USA	1 Jan 94	
1	163	BATTERIES	32 CT 450 AMP/HR 24 V		EA	32	SG	414	$13 248		USA	1 Jan 94	
1	5	BULLDOZER	CAT D 10 BULLDOZER		EA	1	BA	$638 900	$638 900		USA	1 Sep 93	
1	4	BULLDOZER	CAT D 10 BULLDOZER		EA	1	SG	$638 900	$638 900		USA	1 Sep 93	
1	6	BULLDOZER	CAT D 10 BULLDOZER		EA	1	SO	$638 900	$638 900		USA	1 Sep 93	
1	21	COAL CRUS	STAMLER FEEDER BREAKER		EA	1	BA	$400 000	$400 000		USA	1 Jan 94	3 MO SHIPPING TINE
1	29	DRAG W PTS	13/50 15/90 /20/90		LOT		BA	$187 000	$187 000		USA	1 Sep 93	
1	30	DRAG W PTS	10/70		LOT		BA	$30 000	$30 000		USA	1 Sep 93	
1	31	DRAG W PTS	10/70		LOT		SG	$30 000	$30 000		USA	1 Sep 93	
1	26	DRAG BUCK	10/70 DRAG BUCKET/COMP		EA	1	SG	$113 000	$113 000		USA	1 Sep 93	
1	22	DRAG BUCK	20/90 DRAG BUCKET/COMPLETE		EA	1	BA	$220 000	$220 000		USA	1 Sep 93	
1	23	DRAG BUCK	15/90 DRAG BUCKET/COMPLETE		EA	1	BA	$180 000	$180 000		USA	1 Sep 93	
1	24	DRAG BUCK	13/50 DRAG BUCKET/COMPLETE		EA	1	BA	$180 000	$180 000		USA	1 Sep 93	
1	25	DRAG BUCK	10/70 DRAG BUCKET/COMP		EA	1	BA	$113 000	$113 000		USA	1 Sep 93	
1	37	DRILLS	160mm				SO	$300 000	$300 000		USA	1 Jan 94	
1	39	EXPLOSIVES	75lb CAST PRIMERS		EA	130 000	BA	$1 75	$227 500		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	41	EXPLOSIVES	PRIMADETS #12/30FT		EA	100 000	BA	$2 00	$200 000		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	42	EXPLOSIVES	PRIMADETS #12/12FT		EA	30 000	BA	$1 75	$52 500		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	44	EXPLOSIVES	MSGS SURFACE DELAYS		EA	13 000	BA	$2 60	$33 800		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	46	EXPLOSIVES	25 GRAIN DETONATING CORD		KM	450	BA	$280 00	$126 000		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	38	EXPLOSIVES	75lb CAST PRIMERS		EA	30 000	SG	$1 75	$52 500		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	43	EXPLOSIVES	PRIMADETS #12/12FT		EA	12 000	SG	$1 75	$21 000		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	45	EXPLOSIVES	MSGS SURFACE DELAYS		EA	7 000	SG	$2 60	$18 200		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	47	EXPLOSIVES	26 GRAIN DETONATING CORD		KM	200	SG	$280 00	$56 000		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	48	EXPLOSIVES	EZ DET 25 350/18m Length		EA	15 000	SG	$4 38	$65 700		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	49	EXPLOSIVES	EZ TRUNK LINES 17MS/9M LENGTH		EA	900	SG	$2 95	$2 655		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	16	FEL	CAT992C FRONT END LOADER		EA	1	SG	$977 672	$977 672		USA	1 Sep 93	
1	18	FEL	CAT992C FRONT END LOADER		EA	1	SO	$977 672	$977 672		USA	1 Sep 93	
1	10	FUEL TRUCK	FUEL & LUBE TRUCK		EA	1	BA	$90 275	$90 275		USA	1 Sep-93	
1	9	FUEL TRUCK	FUEL & LUBE TRUCK		EA	1	SG	$90 275	$90 275		USA	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	11	FUEL TRUCK	FUEL & LUBE TRUCK		EA	1	SO	$90 275	$90 275		USA	1 Sep 93	
1	113	GEN BRUSH	ER4 25x32x40		EA	500	SG	2 92	$1 460		USA	1 Sep 93	
1	114	GEN BRUSH	ER4 2/12 5x32x40		EA	1000	SG				USA	1 Sep 93	
1	115	GEN BRUSH	ER4 16x25x32		EA	200	SG	5 88	$1 176		USA	1 Sep 93	
1	116	GEN BRUSH	ER4 25x50x64		EA	300	SG	3 97	$1 191		USA	1 Sep 93	
1	117	GEN BRUSH	ER4 25x32x40		EA	200	SG	4 11	$822		USA	1 Sep 93	
1	118	GEN BRUSH	ER4 16x32x40		EA	200	SG				USA	1 Sep 93	
1	119	GEN BRUSH	ER4 25x32x64		EA	1000	SG				USA	1 Sep 93	
1	120	GEN BRUSH	ER4 16x25x40		EA	100	SG				USA	1 Sep 93	
1	121	GEN BRUSH	ER4 30x25x40		EA	100	SG				USA	1 Sep 93	
1	122	GEN BRUSH	ER4 8x10x25		EA	200	SG				USA	1 Sep 93	
1	123	GEN BRUSH	ER4 2/12 55x32x40		EA	300	SG	2 92	$876		USA	1 Sep 93	
1	124	GEN BRUSH	ER74 25x32x51		EA	1000	SG	2 92	$2 920		USA	1 Sep 93	
1	125	GEN BRUSH	ER74 2/12 55x32x64		EA	200	SG				USA	1 Sep 93	
1	126	GEN BRUSH	ER74 2/12 5x44x40		EA	200	SG				USA	1 Sep 93	
1	127	GEN BRUSH	ER74 2/20x32x40		EA	100	SG				USA	1 Sep 93	
1	128	GEN BRUSH	ER74 2/25x30x64		EA	100	SG				USA	1 Sep 93	
1	129	GEN BRUSH	ER14 16x32x40		EA	400	SG	4 11	$1 644		USA	1 Sep 93	
1	130	GEN BRUSH	ER14 25x50x64		EA	1500	SG	5 88	$8 820		USA	1 Sep 93	
1	131	GEN BRUSH	ER14 2/12 5x16x25		EA	200	SG				USA	1 Sep 93	
1	132	GEN BRUSH	ER14 2/12 5x32x40		EA	2000	SG				USA	1 Sep 93	
1	133	GEN BRUSH	ER14 20x32x32		EA	200	SG				USA	1 Sep 93	
1	134	GEN BRUSH	ER14 25x50x60		EA	200	SG	5 88	$1 176		USA	1 Sep 93	
1	135	GEN BRUSH	ER74 20x52x40		EA	100	SG				USA	1 Sep 93	
1	136	GEN BRUSH	ER74 25x30x64		EA	100	SG				USA	1 Sep 93	
1	137	GEN BRUSH	ER74 12 5x32x65		EA	200	SG				USA	1 Sep 93	
1	138	GEN BRUSH	ER2A 2/12 5x40x60		EA	100	SG				USA	1 Sep 93	
1	139	GEN BRUSH	ER2A 5x9x17 5		EA	100	SG				USA	1 Sep 93	
1	140	GEN BRUSH	ER2A 8x10x25		EA	100	SG				USA	1 Sep 93	
1	141	GEN BRUSH	ER2A 16x32x40		EA	400	SG	4 11	$1 644		USA	1 Sep 93	
1	142	GEN BRUSH	ER2A 16x40x60		EA	100	SG				USA	1 Sep 93	
1	143	GEN BRUSH	ER61 2/10x40x52		EA	400	SG				USA	1 Sep 93	
1	144	GEN BRUSH	ER61 2/8x32x50		EA	400	SG				USA	1 Sep 93	
1	145	GEN BRUSH	ER61 2/8x32x52		EA	100	SG				USA	1 Sep 93	
1	146	GEN BRUSH	ER61 2/12 5x40x52		EA	100	SG				USA	1 Sep 93	
1	2	GRADER	CAT 16G MOTORGRADER		EA	1	BA	$385 000	$385 000		USA	1 Sep 93	
1	1	GRADER	CAT 16G MOTORGRADER		EA	1	SG	$385 000	$385 000		USA	1 Sep 93	
1	3	GRADER	CAT 16G MOTORGRADER		EA	1	SO	$385 000	$385 000		USA	1 Sep 93	
1	15	HAUL TRUCK	85 90 TON AHUL TRUCKS		EA	10	SO	$672 750	$6 727 500		USA	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	35	INSTRU	ELECT TEST INSTRUMENTS				SG	$3 000	$3 000		USA	1 Sep 93	
1	92	REWIND CU	4 ARMOURED POLY THERMALEZE		lbs	220	SG	$2 82	$620		USA	1 Sep 93	
1	93	REWIND CU	45 ARMOURED POLY THERMALEZE		lbs	440	SG	$2 75	$1 211		USA	1 Sep 93	
1	94	REWIND CU	47 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 75	$5 505		USA	1 Sep 93	
1	95	REWIND CU	55 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 63	$5 265		USA	1 Sep 93	
1	96	REWIND CU	6 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 53	$5 065		USA	1 Sep 93	
1	97	REWIND CU	63 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 52	$5 045		USA	1 Sep 93	
1	98	REWIND CU	67 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 40	$4 805		USA	1 Sep 93	
1	99	REWIND CU	7 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 40	$4 805		USA	1 Sep 93	
1	100	REWIND CU	8 ARMOURED POLY THERMALEZE		lbs	440	SG	$2 33	$1 027		USA	1 Sep 93	
1	101	REWIND CU	83 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 33	$4 669		USA	1 Sep 93	
1	102	REWIND CU	95 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 26	$4 529		USA	1 Sep 93	
1	103	REWIND CU	1 0 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 26	$4 529		USA	1 Sep 93	
1	104	REWIND CU	1 12 ARMOURED POLY THERMALEZE		lbs	2 860	SG	$2 17	$6 209		USA	1 Sep 93	
1	105	REWIND CU	1 18 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 17	$4 342		USA	1 Sep 93	
1	106	REWIND CU	1 20 ARMOURED POLY THERMALEZE		lbs	2 200	SG	$2 17	$4 776		USA	1 Sep 93	
1	107	REWIND CU	1 30 ARMOURED POLY THERMALEZE		lbs	2 200	SG	$2 12	$4 666		USA	1 Sep 93	
1	108	REWIND CU	1 32 ARMOURED POLY THERMALEZE		lbs	2 200	SG	$2 12	$4 666		USA	1 Sep 93	
1	109	REWIND CU	1 40 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 12	$4 241		USA	1 Sep 93	
1	110	REWIND CU	1 45 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 12	$4 241		USA	1 Sep 93	
1	111	REWIND CU	1 47 ARMOURED POLY THERMALEZE		lbs	2 000	SG	$2 12	$4 241		USA	1 Sep 93	
1	112	REWIND CU	1 60 ARMOURED POLY THERMALESE		lbs	2 000	SG	$2 07	$4 146		USA	1 Sep 93	
1	32	SHOV BUCK	WEAR PARTS		LOT		BA	$23 000	$23 000		USA	1 Sep 93	
1	33	SHOV BUCK	WEAR PARTS		LOT		SG	$22 000	$22 000		USA	1 Sep 93	
1	27	SHOVEL B	EKG 4 6 SHOVEL BUCKET		EA	1	BA	$79 000	$79 000		USA	1 Sep 93	
1	28	SHOVEL B	EKG 4 6 SHOVEL BUCKET		EA	1	SG	$79 000	$79 000		USA	1 Sep 93	
1	13	TIRE TRUCK	TIRE HANDLING TRUCK		EA	1	BA	$79 925	$79 925		USA	1 Sep 93	
1	12	TIRE TRUCK	TIRE HANDLING TRUCK		EA	1	SG	$79 925	$79 925		USA	1 Sep 93	
1	14	TIRE TRUCK	TIRE HANDLING TRUCK		EA	1	SO	$79 925	$79 925		USA	1 Sep 93	
1	19	TRUCK	2 TON FLATBED FOR PERSONNEL TRANS		EA	1	SG	$40 250	$40 250		USA	1 Sep 93	
1	20	TRUCK	3 TON FLATBED FOR PERSONNEL TRANS		EA	1	SO	$40 250	$40 250		USA	1 Sep 93	
1	150	TRUCK TIRE	12x20x16 PLY/W TUBES		EA	140	OT	341 4	$47 796		USA	1 Sep 93	
1	149	TRUCK TIRE	12x20x16 PLY/W TUBES		EA	20	SO	341 4	$6 828		USA	1 Sep 93	
1	90	WELDING RD	ZETA HARD FACING ROD 5/32		lbs	10 000	BA	$0 55	$5 480		USA	1 Sep 93	
1	91	WELDING RD	6011 GEN PURPOSE ROD 5/32		lbs	10 000	SG	$0 57	$5 710		USA	1 Sep 93	
1	54	WIRE ROPE	64 mm(2 5) 16 8 Kg/M 15 TONNE		FT	2 851	BA	$8 05	$22 951		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	55	WIRE ROPE	57mm(2 25) 13 6 Kg/M 35 TONNE		FT	8 244	BA	$5 97	$49 217		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	56	WIRE ROPE	52 mm(2) 10 7 Kg/M 25 TONNE		FT	7 458	BA	$4 60	$34 307		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	60	WIRE ROPE	39mm (1 5) 4 2 Kg/M 25 TONNE		FT	11 040	BA	$2 31	$25 502		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94

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MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	67	WIRE ROPE	30mm (1 25) 4 0 Kg/M 5 TONNE		FT	318	OT	$1 73	$550		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	57	WIRE ROPE	52 mm(2) 10 7 Kg/M 15 TONNE		FT	4 475	SG	$4 60	$20 585		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	61	WIRE ROPE	39mm (1 5) 4 2 Kg/M 15 TONNE		FT	6 625	SG	$2 31	$15 304		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	62	WIRE ROPE	39mm (1 5) 4 2 Kg/M 10 TONNE		FT	4 417	SO	$2 31	$10 203		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	66	WIRE ROPE	30mm (1 25) 4 0 Kg/M 5 TONNE		FT	318	SO	$1 73	$550		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	152	BATTERIES	6 CT 132 AMP/HR 12V		EA	50	BA	169 6	$8 480		USA	1 Sep 93	
2	157	BATTERIES	6 CT 182 AMP/HR 12V		EA	50	BA	204 06	$10 203		USA	1 Jan 94	
2	153	BATTERIES	6 CT 132 AMP/HR 12V		EA	50	SG	169 6	$8 480		USA	1 Sep 93	
2	154	BATTERIES	6 CT 132 AMP/HR 12V		EA	20	SO	169 6	$3 392		USA	1 Sep 93	
2	159	BATTERIES	6 CT 182 AMP/HR 12V		EA	20	SO	204 06	$4 081		USA	1 Jan 94	
2	82	BELT SUPP	SPLICING KITS 1600 mm		EA	10	BA	$564 98	$5 650		USA	1 Jan 94	
2	83	BELT SUPP	SPLICING KITS 1400 mm		EA	10	BA	$461 10	$4 611		USA	1 Jan 94	
2	84	BELT SUPP	SPLICING KITS 1200 mm		EA	10	BA	$368 88	$3 689		USA	1 Jan 94	
2	86	BELT SUPP	SPLICING KITS 1000 mm		EA	10	BA	$322 24	$3 222		USA	1 Jan 94	
2	88	BELT SUPP	SPLICING KITS 800 mm		EA	10	BA	$276 66	$2 767		USA	1 Jan 94	
2	85	BELT SUPP	SPLICING KITS 1200 mm		EA	10	SG	$368 88	$3 689		USA	1 Jan 94	
2	87	BELT SUPP	SPLICING KITS 1000 mm		EA	10	SG	$322 24	$3 222		USA	1 Jan 94	
2	89	BELT SUPP	SPLICING KITS 800 mm		EA	10	SG	$276 66	$2 767		USA	1 Jan 94	
2	75	CONV BELT	1000 mm 5 PLY FABRIC		M	800	SG	$106 89	$85 512		USA	1 Jan 94	
2	77	CONV BELT	1200 mm 6 PLY FABRIC		M	670	SG	$147 53	$98 845		USA	1 Jan 94	
2	81	CONV BELT	800 mm 6 PLY FABRIC		M	500	SG	$107 99	$53 995		USA	1 Jan 94	
2	36	DRILLS	160mm				SG	$300 000	$300 000		USA	1 Jan 94	
2	17	FEL	CAT992C FRONT END LOADER		EA	1	BA	$977 672	$977 672		USA	1 Sep 93	
2	151	TRUCK TIRE	18x33x32 PLY EH		EA	120	BA	1706	$204 720		USA	1 Jan 94	
2	58	WIRE ROPE	45 5mm(1 75) 8 2 Kg/M 10 TONNE		FT	3 888	BA	$2 91	$11 314		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	64	WIRE ROPE	30mm (1 25) 4 0 Kg/M 3TONNE		FT	1 907	BA	$1 73	$3 299		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	68	WIRE ROPE	30mm (5/8) 9 Kg/M 1 5 TONNE		FT	4 563	BA	$0 55	$2 510		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	70	WIRE ROPE	13 5mm(9/16) 2 5 TONNE		FT	9 340	BA	$0 50	$4 670		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	72	WIRE ROPE	9 11 mm(7/16) 2 TONNE		FT	12 958	BA	$0 40	$5 183		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	63	WIRE ROPE	39mm (1 5) 4 2 Kg/M 10 TONNE		FT	4 417	AD	$2 31	$10 203		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	59	WIRE ROPE	45 5mm(1 75) 8 2 Kg/M 15 TONNE		FT	5 832	SG	$2 91	$16 971		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	65	WIRE ROPE	30mm (1 25) 4 0 Kg/M 2 TONNE		FT	1 271	SG	$1 73	$2 199		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	69	WIRE ROPE	30mm (5/8) 9 Kg/M 1 5 TONNE		FT	4 593	SG	$0 55	$2 526		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	71	WIRE ROPE	13 5mm(9/16) 2 5 TONNE		FT	9 340	SG	$0 50	$4 670		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
2	73	WIRE ROPE	9 11 mm(7/16) 2 TONNE		FT	12 598	SG	$0 40	$5 039		USA	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
3	74	CONV BELT	1000 mm 5 PLY FABRIC		M	800	BA	$106 89	$85 512		USA	1 Jan 94	
3	76	CONV BELT	1200 mm 6 PLY FABRIC		M	1 000	BA	$147 53	$147 530		USA	1 Jan 94	
3	78	CONV BELT	1400 mm 6 PLY FABRIC		M	1 430	BA	$181 07	$258 930		USA	1 Jan 94	
3	79	CONV BELT	1600 mm 4 PLY FABRIC		M	1 875	BA	$157 71	$295 706		USA	1 Jan 94	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	80	CONV BELT	800 mm 6 PLY FABRIC		M	500	BA	$107 99	$53 995		USA	1 Jan 94	
3	147	TRUCK TIRE	12x20x16 PLY/W TUBES		EA	20	BA	341 4	$6 828		USA	1 Sep 93	
3	148	TRUCK TIRE	12x20x16 PLY/W TUBES		EA	20	SG	341 4	$6 828		USA	1 Sep-93	
1	1	ELEC RR	ARC SHOE PLATES	3E 14D	EA	10	BA				URK	1 Sep 93	
1	2	ELEC RR	ARC SHOE PLATES	3E 14 1D	EA	10	BA				URK	1 Sep 93	
1	3	ELEC RR	AUTO SWITCHES	KPD 131	EA	2	BA				URK	1 Sep 93	
1	4	ELEC RR	AIR COMPRESSOR	KB 1V	EA	4	BA				URK	1 Sep 93	
1	5	ELEC RR	CONT TROLLEY LEFT	TB 13D	EA	4	BA				URK	1 Sep 93	
1	6	ELEC RR	CONT TROLLEY RIGHT	TB 12D	EA	4	BA				URK	1 Sep 93	
1	7	ELEC RR	AUTO CON COUPLING	CA 3M	EA	20	BA				URK	1 Sep 93	
1	8	ELEC RR	PACKING SHAFT MOTOR		SET	6	BA				URK	1 Sep 93	
1	9	ELEC RR	AIR VALVE		EA	10	BA				URK	1 Sep 93	
1	10	ELEC RR	AIR VALVE		EA	20	BA				URK	1 Sep 93	
1	11	ELEC RR	SWITCH START&STOP		EA	5	BA				URK	1 Sep 93	
1	12	ELEC RR	SWITCH BLK W/MAG		EA	20	BA				URK	1 Sep 93	
1	13	ELEC RR	CONDENSORS		EA	2	BA				URK	1 Sep 93	
1	14	ELEC RR	GROUNDING ROD		EA	6	BA				URK	1 Sep 93	
1	15	ELEC RR	TRIRISTER ELEC		EA	30	BA				URK	1 Sep 93	
1	16	ELEC RR	DIRISTER ELEC		EA	200	BA				URK	1 Sep 93	
1	17	ELEC RR	HOUSING FOR AUTO COUP		EA	5	BA				URK	1 Sep 93	
1	18	ELEC RR	TOTAL COST US DOLLARS				BA		$130 000		URK	1 Sep 93	
2	1	KRAZ	ENGINE	238M 1000186	EA	4 8	OT				URK	1 Sep 93	
2	2	KRAZ	SHIM	238 1000102 B2R1	EA	25 6	OT				URK	1 Sep 93	
2	3	KRAZ	SHIM	238-1000102 B2	EA	25 6	OT				URK	1 Sep 93	
2	4	KRAZ	SHIM	23831000104 V2	EA	25 6	OT				URK	1 Sep 93	
2	5	KRAZ	CLIPS	256-1001005 A1	EA	40	OT				URK	1 Sep 93	
2	6	KRAZ	ENG RING SETS	236 1000106-B2	EA	160	OT				URK	1 Sep 93	
2	7	KRAZ	ENG MOUNTS	236-1001008 01	EA	24	OT				URK	1 Sep 93	
2	8	KRAZ	SHAFT	2383-1000107 V2	EA	6 4	OT				URK	1 Sep 93	
2	9	KRAZ	BLOCK	238 1002012 B2	EA	3 2	OT				URK	1 Sep 93	
2	10	KRAZ	RING	236 100202 A	EA	40	OT				URK	1 Sep 93	
2	11	KRAZ	RING	236 1002040	EA	32	OT				URK	1 Sep 93	
2	12	KRAZ	OIL INS	236-1002272	EA	8	OT				URK	1 Sep 93	
2	13	KRAZ	PIPE	238 1003290-V	EA	8	OT				URK	1 Sep 93	
2	14	KRAZ	PIPE	238 1003291 V	EA	8	OT				URK	1 Sep 93	
2	15	KRAZ	CYL WIPER COLLAR	236-1002314 B	EA	32	OT				URK	1 Sep 93	
2	16	KRAZ	HEAD C76G	238 1003013 D	EA	8	OT				URK	1 Sep 93	
2	17	KRAZ	RING	237 1003114 V	EA	8	OT				URK	1 Sep 93	
2	18	KRAZ	PACKING	238-1003210-V2	EA	80	OT				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	19	KRAZ	PACKING	238-1003270	EA	80	OT				URK	1 Sep 93	
2	20	KRAZ	LINER CYLINDER	236-1004008	EA	128	OT				URK	1 Sep 93	
2	21	KRAZ	ROCKER ARM	236-1004045 V2	EA	32	OT				URK	1 Sep 93	
2	22	KRAZ	RING	400-1004030-80	EA	32	OT				URK	1 Sep 93	
2	23	KRAZ	SEAL	201 1005034 B3	EA	32	OT				URK	1 Sep 93	
2	24	KRAZ	GEAR	236-1005030 A	EA	32	OT				URK	1 Sep 93	
2	25	KRAZ	COLLAR	236-1005160 A2	EA	80	OT				URK	1 Sep 93	
2	26	KRAZ	SHAFT	238 1006015 G2	EA	1 6	OT				URK	1 Sep 93	
2	27	KRAZ	SPACERS	236 1006026 AR	EA	48	OT				URK	1 Sep 93	
2	28	KRAZ	SPACERS	236-1006037 AR	EA	38 4	OT				URK	1 Sep 93	
2	29	KRAZ	VALVE	236 1007010 V	EA	40	OT				URK	1 Sep 93	
2	30	KRAZ	VALVE	236 1007015 V4	EA	40	OT				URK	1 Sep 93	
2	31	KRAZ	ROD PUSH	236-1007176 A	EA	33 6	OT				URK	1 Sep 93	
2	32	KRAZ	PACKING	236 1008050	EA	40	OT				URK	1 Sep 93	
2	33	KRAZ	PACKING	238T 1009040	EA	40	OT				URK	1 Sep 93	
2	34	KRAZ	PUMP	236 1011014 V3	EA	8	OT				URK	1 Sep 93	
2	35	KRAZ	RADIATOR	157 1013010-A	EA	8	OT				URK	1 Sep 93	
2	36	KRAZ	EXHAUST PIPE	256B 1013408 B	EA	12 8	OT				URK	1 Sep 93	
2	37	KRAZ	ELEMENT FILTER	201T 1105540	EA	480	OT				URK	1 Sep 93	
2	38	KRAZ	PUMP	240-1106210	EA	8	OT				URK	1 Sep 93	
2	39	KRAZ	PUMP	236T1106288 A2	EA	8	OT				URK	1 Sep 93	
2	40	KRAZ	COLLAR	236-102940	EA	80	OT				URK	1 Sep 93	
2	41	KRAZ	1/2 HUB COUPLING	236-1029268 B	EA	4	OT				URK	1 Sep 93	
2	42	KRAZ	PIPE	236 1104308 V	EA	16	OT				URK	1 Sep 93	
2	43	KRAZ	PUMP	8006 1111005	EA	4 8	OT				URK	1 Sep 93	
2	44	KRAZ	PLUNGER RODS	60 1111074 01	EA	120	OT				URK	1 Sep 93	
2	45	KRAZ	INJECTOR	2606 1112010 02	EA	224	OT				URK	1 Sep 93	
2	46	KRAZ	SPRAYER	26 111211	EA	224	OT				URK	1 Sep 93	
2	47	KRAZ	FILTER	201T 1117038	EA	160	OT				URK	1 Sep 93	
2	48	KRAZ	COUPLING	09000 1121010 000	EA	1 6	OT				URK	1 Sep 93	
2	49	KRAZ	MUFFLER	256-1201010	EA	8	OT				URK	1 Sep 93	
2	50	KRAZ	PACKING	256B 1203002	EA	80	OT				URK	1 Sep 93	
2	51	KRAZ	SLEEVE	256 B1 1203096	EA	20	OT				URK	1 Sep 93	
2	52	KRAZ	PACKING	256B 1203039	EA	32	OT				URK	1 Sep 93	
2	53	KRAZ	RADIATOR	256B 1301008 10	EA	16	OT				URK	1 Sep 93	
2	54	KRAZ	ENG MOUNTS	256-1302025	EA	8	OT				URK	1 Sep 93	
2	55	KRAZ	ENG/ MOUNTS	256-1302139	EA	8	OT				URK	1 Sep 93	
2	56	KRAZ	RODS	214B 1303010	EA	24	OT				URK	1 Sep 93	
2	57	KRAZ	RODS	255 1303012	EA	16	OT				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	58	KRAZ	EXHAUST PIPE	256-1303016	EA	4 8	OT				URK	1 Sep 93	
2	59	KRAZ	PUMP	236-1307010-A3	EA	20	OT				URK	1 Sep 93	
2	60	KRAZ	SET	236-1307029 A	EA	40	OT				URK	1 Sep 93	
2	61	KRAZ	COLLAR	236-1307090	EA	64	OT				URK	1 Sep 93	
2	62	KRAZ	BELTS	25 6411 1404	EA	160	OT				URK	1 Sep 93	
2	63	KRAZ	BELTS	6421 1403	EA	160	OT				URK	1 Sep 93	
2	64	KRAZ	MOTOR	236 1308011 G2	EA	4 8	OT				URK	1 Sep 93	
2	65	KRAZ	DISCS	238 1601690-G	EA	8	OT				URK	1 Sep 93	
2	66	KRAZ	DISCS	238 1601094	EA	8	OT				URK	1 Sep 93	
2	67	KRAZ	DISCS	238 1601130 B	EA	8	OT				URK	1 Sep 93	
2	68	KRAZ	DISCS	238-1601131	EA	12	OT				URK	1 Sep 93	
2	69	KRAZ	BRAKE FRICTION PLATE	236 1601138 A3	EA	40	OT				URK	1 Sep 93	
2	70	KRAZ	COUPLING	236 1601180 B2	EA	8	OT				URK	1 Sep 93	
2	71	KRAZ	GEAR BOX	236NT 1700003	EA	6 4	OT				URK	1 Sep 93	
2	72	KRAZ	BOX	257 18000020 V2	EA	1 6	OT				URK	1 Sep 93	
2	73	KRAZ	BOX	256 1800020 V2	EA	1 6	OT				URK	1 Sep 93	
2	74	KRAZ	HEAD CROSS	131 2201025 A	EA	16	OT				URK	1 Sep 93	
2	75	KRAZ	SHAFT	527 2202010-16	EA	6 4	OT				URK	1 Sep 93	
2	76	KRAZ	DRIVE SHAFT	210G 2202045 04	EA	6 4	OT				URK	1 Sep 93	
2	77	KRAZ	SHAFT	210G 2204010 16	EA	6 4	OT				URK	1 Sep 93	
2	78	KRAZ	SUPPORT	210-2204080-B2	EA	8	OT				URK	1 Sep 93	
2	79	KRAZ	REAR DRIVE AXLE	255P 2400015 02	EA	8	OT				URK	1 Sep 93	
2	80	KRAZ	SET OF GEARS	256B 2402020	EA	1 6	OT				URK	1 Sep 93	
2	81	KRAZ	DIFFERENTIAL SEAL	210 2402052 A1	EA	48	OT				URK	1 Sep 93	
2	82	KRAZ	DIFFERENTIAL	200 2403010-A2	EA	3 2	OT				URK	1 Sep 93	
2	83	KRAZ	FLANGE	200-2403072 B1	EA	3 2	OT				URK	1 Sep 93	
2	84	KRAZ	AXLE	2550-2500015 02	EA	1 6	OT				URK	1 Sep 93	
2	85	KRAZ	SHOCK ABSORBER	256B1 2902012	EA	16	OT				URK	1 Sep 93	
2	86	KRAZ	1ST PLATE	255B-2902074 01	EA	16	OT				URK	1 Sep 93	
2	87	KRAZ	2ND PLATE	255B 2902076-01	EA	16	OT				URK	1 Sep 93	
2	88	KRAZ	SHOCK SPRINGS	500 2905006	EA	40	OT				URK	1 Sep 93	
2	89	KRAZ	SHOCK ABSORBER	256B-2912012 11	EA	20 8	OT				URK	1 Sep 93	
2	90	KRAZ	CONN BRACKETS	219 2912408	EA	48	OT				URK	1 Sep 93	
2	91	KRAZ	EQUALIZER	256B-2918005	EA	24	OT				URK	1 Sep 93	
2	92	KRAZ	SHAFT	256B 2918054	EA	3 2	OT				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	93	KRAZ	ROD	214-2919011 02	EA	40	OT				URK	1 Sep 93	
2	94	KRAZ	ROD	210-2919012 03	EA	40	OT				URK	1 Sep 93	
2	95	KRAZ	BUSHING	200-3001016	EA	32	OT				URK	1 Sep 93	
2	96	KRAZ	SEAL	200-3103035	EA	11 2	OT				URK	1 Sep 93	
2	97	KRAZ	SEAL	210-3104036	EA	11 2	OT				URK	1 Sep 93	
2	98	KRAZ	COTTER PINS	200-3104050-A	EA	400	OT				URK	1 Sep 93	
2	99	KRAZ	COTTER PINS	200 3104050-A	EA	400	OT				URK	1 Sep 93	
2	100	KRAZ	RELAYS	500 3401005 D	EA	4	OT				URK	1 Sep 93	
2	101	KRAZ	HYD BOOSTER BRAKES	256B-3405010-14	EA	8	OT				URK	1 Sep 93	
2	102	KRAZ	DISTRIBUTOR	255B 3405016	EA	8	OT				URK	1 Sep 93	
2	103	KRAZ	PUMP	256B 3407199	EA	8	OT				URK	1 Sep 93	
2	104	KRAZ	FRIC PLATES SHOE	200 3501105	EA	240	OT				URK	1 Sep 93	
2	105	KRAZ	LEVER	210 3501136-A2	EA	6 4	OT				URK	1 Sep 93	
2	106	KRAZ	FRIC PLATES SHOES	200 3502105 A	EA	240	OT				URK	1 Sep 93	
2	107	KRAZ	COMPRESSOR	130 3509009 11	EA	6 4	OT				URK	1 Sep 93	
2	108	KRAZ	GENERATOR	4573711587	EA	16	OT				URK	1 Sep 93	
2	109	KRAZ	REGULATOR	1112 3702	EA	16	OT				URK	1 Sep 93	
2	110	KRAZ	SWITCH	VK318T 3704000	EA	8	OT				URK	1 Sep 93	
2	111	KRAZ	ELECTRO BRUSHES	2501 370805	EA	208	OT				URK	1 Sep 93	
2	112	KRAZ	SWITCH	P305 3709000	EA	12	OT				URK	1 Sep 93	
2	113	KRAZ	SWITCH	P39 371000 T	EA	12	OT				URK	1 Sep 93	
2	114	KRAZ	STARTER	45 7375 1471	EA	20	OT				URK	1 Sep 93	
2	115	KRAZ	RELAY	RC103 3708000	EA	8	OT				URK	1 Sep 93	
2	116	KRAZ	LAMPS	A 24 60 40	EA	320	OT				URK	1 Sep 93	
2	117	KRAZ	FILTERS	FG122 3711200-V	EA	24	OT				URK	1 Sep 93	
2	118	KRAZ	LAMPS	A24 324	EA	320	OT				URK	1 Sep 93	
2	119	KRAZ	LAMPS	A 24 2	EA	320	OT				URK	1 Sep 93	
2	120	KRAZ	LAMPS	A 24 5	EA	320	OT				URK	1 Sep 93	
2	121	KRAZ	LAMPS	A 24 21 2	EA	320	OT				URK	1 Sep 93	
2	122	KRAZ	SPEEDOMETER	CP135 3802010	EA	8	OT				URK	1 Sep 93	
2	123	KRAZ	RELAY	RC401 3726010	EA	8	OT				URK	1 Sep 93	
2	124	KRAZ	RECIEVER	YK143 3807010 G4	EA	3 2	OT				URK	1 Sep 93	
2	125	KRAZ	SENSOR	BM146-3806600D	EA	3 2	OT				URK	1 Sep 93	
2	126	KRAZ	AMP METER	AP110-3811010	EA	6 4	OT				URK	1 Sep 93	
2	127	KRAZ	PRESSURE GAUGE	MD103-3816010	EA	3 2	OT				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	128	KRAZ	SENSOR	TM100-3808000-G	EA	8	OT				URK	1 Sep 93	
2	129	KRAZ	MIRRORS	256-8201012	EA	24	OT				URK	1 Sep 93	
2	130	KRAZ	EQUALIZER	220V 8702010A	EA	1 6	OT				URK	1 Sep 93	
2	131	KRAZ	TOTAL COST US DOLLARS				OT		$88 000		URK	1 Sep 93	
3	1	KRAZ	ENGINE	238M 1000186	EA	0 6	BA				URK	1 Sep 93	
3	2	KRAZ	SHIM	238 1000102 B2R1	EA	3 2	BA				URK	1 Sep 93	
3	3	KRAZ	SHIM	238 1000102 B2	EA	3 2	BA				URK	1 Sep 93	
3	4	KRAZ	SHIM	23831000104 V2	EA	3 2	BA				URK	1 Sep 93	
3	5	KRAZ	CLIPS	256 1001005 A1	EA	5	BA				URK	1 Sep 93	
3	6	KRAZ	ENG RING SETS	236-1000106 B2	EA	20	BA				URK	1 Sep 93	
3	7	KRAZ	ENG MOUNTS	236 1001008 01	EA	3	BA				URK	1 Sep 93	
3	8	KRAZ	SHAFT	2383 1000107 V2	EA	0 8	BA				URK	1 Sep 93	
3	9	KRAZ	BLOCK	238 1002012 B2	EA	0 4	BA				URK	1 Sep 93	
3	10	KRAZ	RING	236 100202 A	EA	5	BA				URK	1 Sep 93	
3	11	KRAZ	RING	236 1002040	EA	4	BA				URK	1 Sep 93	
3	12	KRAZ	OIL INS	236 1002272	EA	1	BA				URK	1 Sep 93	
3	13	KRAZ	PIPE	238 1003290 V	EA	1	BA				URK	1 Sep 93	
3	14	KRAZ	PIPE	238 1003291 V	EA	1	BA				URK	1 Sep 93	
3	15	KRAZ	CYL WIPER COLLAR	236 1002314 B	EA	4	BA				URK	1 Sep 93	
3	16	KRAZ	HEAD C76G	238 1003013 D	EA	1	BA				URK	1 Sep 93	
3	17	KRAZ	RING	237 1003114 V	EA	1	BA				URK	1 Sep 93	
3	18	KRAZ	PACKING	238 1003210 V2	EA	10	BA				URK	1 Sep 93	
3	19	KRAZ	PACKING	238 1003270	EA	10	BA				URK	1 Sep 93	
3	20	KRAZ	LINER CYLINDER	236-1004008	EA	16	BA				URK	1 Sep 93	
3	21	KRAZ	ROCKER ARM	236 1004045 V2	EA	4	BA				URK	1 Sep 93	
3	22	KRAZ	RING	400-1004030-80	EA	4	BA				URK	1 Sep 93	
3	23	KRAZ	SEAL	201 1005034-B3	EA	4	BA				URK	1 Sep 93	
3	24	KRAZ	GEAR	236 1005030-A	EA	4	BA				URK	1 Sep 93	
3	25	KRAZ	COLLAR	236-1005160-A2	EA	10	BA				URK	1 Sep 93	
3	26	KRAZ	SHAFT	238 1006015 G2	EA	0 2	BA				URK	1 Sep 93	
3	27	KRAZ	SPACERS	236 1006026-AR	EA	6	BA				URK	1 Sep 93	
3	28	KRAZ	SPACERS	236-1006037 AR	EA	4 8	BA				URK	1 Sep 93	
3	29	KRAZ	VALVE	236-1007010-V	EA	5	BA				URK	1 Sep 93	
3	30	KRAZ	VALVE	236-1007015 V4	EA	5	BA				URK	1 Sep 93	
3	31	KRAZ	ROD PUSH	236-1007176-A	EA	4 2	BA				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	32	KRAZ	PACKING	236-1008050	EA	5	BA				URK	1 Sep 93	
3	33	KRAZ	PACKING	238T 1009040	EA	5	BA				URK	1 Sep 93	
3	34	KRAZ	PUMP	236-1011014-V3	EA	1	BA				URK	1 Sep 93	
3	35	KRAZ	RADIATOR	157 1013010-A	EA	1	BA				URK	1 Sep 93	
3	36	KRAZ	EXHAUST PIPE	256B 1013408-B	EA	1 6	BA				URK	1 Sep 93	
3	37	KRAZ	ELEMENT FILTER	201T 1105540	EA	60	BA				URK	1 Sep 93	
3	38	KRAZ	PUMP	240 1106210	EA	1	BA				URK	1 Sep 93	
3	39	KRAZ	PUMP	236T1106288 A2	EA	1	BA				URK	1 Sep 93	
3	40	KRAZ	COLLAR	236-102940	EA	10	BA				URK	1 Sep 93	
3	41	KRAZ	1/2 HUB COUPLING	236-1029268 B	EA	0 5	BA				URK	1 Sep 93	
3	42	KRAZ	PIPE	236 1104308 V	EA	2	BA				URK	1 Sep 93	
3	43	KRAZ	PUMP	8006 1111005	EA	0 6	BA				URK	1 Sep 93	
3	44	KRAZ	PLUNGER RODS	60-1111074 01	EA	15	BA				URK	1 Sep 93	
3	45	KRAZ	INJECTOR	2606 1112010 02	EA	28	BA				URK	1 Sep 93	
3	46	KRAZ	SPRAYER	26 111211	EA	28	BA				URK	1 Sep 93	
3	47	KRAZ	FILTER	201T 1117038	EA	20	BA				URK	1 Sep 93	
3	48	KRAZ	COUPLING	09000 1121010 000	EA	0 2	BA				URK	1 Sep 93	
3	49	KRAZ	MUFFLER	256-1201010	EA	1	BA				URK	1 Sep 93	
3	50	KRAZ	PACKING	256B 1203002	EA	10	BA				URK	1 Sep 93	
3	51	KRAZ	SLEEVE	256 B1 1203096	EA	2 5	BA				URK	1 Sep 93	
3	52	KRAZ	PACKING	256B 1203039	EA	4	BA				URK	1 Sep 93	
3	53	KRAZ	RADIATOR	256B 1301008 10	EA	2	BA				URK	1 Sep 93	
3	54	KRAZ	ENG MOUNTS	256 1302025	EA	1	BA				URK	1 Sep 93	
3	55	KRAZ	ENG/ MOUNTS	256-1302139	EA	1	BA				URK	1 Sep 93	
3	56	KRAZ	RODS	214B 1303010	EA	3	BA				URK	1 Sep 93	
3	57	KRAZ	RODS	255 1303012	EA	2	BA				URK	1 Sep 93	
3	58	KRAZ	EXHAUST PIPE	256 1303016	EA	0 6	BA				URK	1 Sep 93	
3	59	KRAZ	PUMP	236-1307010 A3	EA	2 5	BA				URK	1 Sep 93	
3	60	KRAZ	SET	236-1307029 A	EA	5	BA				URK	1 Sep 93	
3	61	KRAZ	COLLAR	236-1307090	EA	8	BA				URK	1 Sep 93	
3	62	KRAZ	BELTS	25 6411 1404	EA	20	BA				URK	1 Sep 93	
3	63	KRAZ	BELTS	6421 1403	EA	20	BA				URK	1 Sep 93	
3	64	KRAZ	MOTOR	236-1308011 G2	EA	0 6	BA				URK	1 Sep 93	
3	65	KRAZ	DISCS	238-1601690 G	EA	1	BA				URK	1 Sep 93	
3	66	KRAZ	DISCS	238 1601094	EA	1	BA				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	67	KRAZ	DISCS	238 1601130-B	EA	1	BA				URK	1 Sep 93	
3	68	KRAZ	DISCS	238-1601131	EA	1 5	BA				URK	1 Sep 93	
3	69	KRAZ	BRAKE FRICTION PLATE	236-1601138-A3	EA	5	BA				URK	1 Sep 93	
3	70	KRAZ	COUPLING	236 1601180-B2	EA	1	BA				URK	1 Sep 93	
3	71	KRAZ	GEAR BOX	236NT 1700003	EA	0 8	BA				URK	1 Sep 93	
3	72	KRAZ	BOX	257 18000020-V2	EA	0 2	BA				URK	1 Sep 93	
3	73	KRAZ	BOX	256-1800020 V2	EA	0 2	BA				URK	1 Sep 93	
3	74	KRAZ	HEAD CROSS	131 2201025 A	EA	2	BA				URK	1 Sep 93	
3	75	KRAZ	SHAFT	527 2202010 16	EA	0 8	BA				URK	1 Sep 93	
3	76	KRAZ	DRIVE SHAFT	210G 2202045 04	EA	0 8	BA				URK	1 Sep 93	
3	77	KRAZ	SHAFT	210G 2204010-16	EA	0 8	BA				URK	1 Sep 93	
3	78	KRAZ	SUPPORT	210 2204080 B2	EA	1	BA				URK	1 Sep 93	
3	79	KRAZ	REAR DRIVE AXLE	255P 2400015 02	EA	1	BA				URK	1 Sep 93	
3	80	KRAZ	SET OF GEARS	256B 2402020	EA	0 2	BA				URK	1 Sep 93	
3	81	KRAZ	DIFFERENTIAL SEAL	210-2402052 A1	EA	6	BA				URK	1 Sep 93	
3	82	KRAZ	DIFFERENTIAL	200 2403010 A2	EA	0 4	BA				URK	1 Sep 93	
3	83	KRAZ	FLANGE	200-2403072 B1	EA	0 4	BA				URK	1 Sep 93	
3	84	KRAZ	AXLE	2550-2500015 02	EA	0 2	BA				URK	1 Sep 93	
3	85	KRAZ	SHOCK ABSORBER	256B1 2902012	EA	2	BA				URK	1 Sep 93	
3	86	KRAZ	1ST PLATE	255B 2902074 01	EA	2	BA				URK	1 Sep 93	
3	87	KRAZ	2ND PLATE	255B 2902076 01	EA	2	BA				URK	1 Sep 93	
3	88	KRAZ	SHOCK SPRINGS	500 2905006	EA	5	BA				URK	1 Sep 93	
3	89	KRAZ	SHOCK ABSORBER	256B 2912012 11	EA	2 6	BA				URK	1 Sep 93	
3	90	KRAZ	CONN BRACKETS	219 2912408	EA	6	BA				URK	1 Sep 93	
3	91	KRAZ	EQUALIZER	256B 2918005	EA	3	BA				URK	1 Sep 93	
3	92	KRAZ	SHAFT	256B 2918054	EA	0 4	BA				URK	1 Sep 93	
3	93	KRAZ	ROD	214 2919011 02	EA	5	BA				URK	1 Sep 93	
3	94	KRAZ	ROD	210 2919012 03	EA	5	BA				URK	1 Sep 93	
3	95	KRAZ	BUSHING	200 3001016	EA	4	BA				URK	1 Sep 93	
3	96	KRAZ	SEAL	200-3103035	EA	1 4	BA				URK	1 Sep 93	
3	97	KRAZ	SEAL	210 3104036	EA	1 4	BA				URK	1 Sep 93	
3	98	KRAZ	COTTER PINS	200-3104050-A	EA	50	BA				URK	1 Sep 93	
3	99	KRAZ	COTTER PINS	200-3104050-A	EA	50	BA				URK	1 Sep 93	
3	100	KRAZ	RELAYS	500-3401005 D	EA	0 5	BA				URK	1 Sep 93	
3	101	KRAZ	HYD BOOSTER BRAKES	256B 3405010-14	EA	1	BA				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	102	KRAZ	DISTRIBUTOR	255B 3405016	EA	1	BA				URK	1 Sep 93	
3	103	KRAZ	PUMP	256B-3407199	EA	1	BA				URK	1 Sep 93	
3	104	KRAZ	FRIC PLATES SHOE	200-3501105	EA	30	BA				URK	1 Sep 93	
3	105	KRAZ	LEVER	210-3501136-A2	EA	0 8	BA				URK	1 Sep 93	
3	106	KRAZ	FRIC PLATES SHOES	200-3502105 A	EA	30	BA				URK	1 Sep 93	
3	107	KRAZ	COMPRESSOR	130 3509009 11	EA	0 8	BA				URK	1 Sep 93	
3	108	KRAZ	GENERATOR	4573711587	EA	2	BA				URK	1 Sep 93	
3	109	KRAZ	REGULATOR	1112 3702	EA	2	BA				URK	1 Sep 93	
3	110	KRAZ	SWITCH	VK318T 3704000	EA	1	BA				URK	1 Sep 93	
3	111	KRAZ	ELECTRO BRUSHES	2501 370805	EA	26	BA				URK	1 Sep 93	
3	112	KRAZ	SWITCH	P305 3709000	EA	1 5	BA				URK	1 Sep 93	
3	113	KRAZ	SWITCH	P39 371000 T	EA	1 5	BA				URK	1 Sep 93	
3	114	KRAZ	STARTER	45 7375 1471	EA	2 5	BA				URK	1 Sep 93	
3	115	KRAZ	RELAY	RC103 3708000	EA	1	BA				URK	1 Sep 93	
3	116	KRAZ	LAMPS	A 24 60 40	EA	40	BA				URK	1 Sep 93	
3	117	KRAZ	FILTERS	FG122 3711200 V	EA	3	BA				URK	1 Sep 93	
3	118	KRAZ	LAMPS	A24 324	EA	40	BA				URK	1 Sep 93	
3	119	KRAZ	LAMPS	A 24 2	EA	40	BA				URK	1 Sep 93	
3	120	KRAZ	LAMPS	A 24 5	EA	40	BA				URK	1 Sep 93	
3	121	KRAZ	LAMPS	A 24 21 2	EA	40	BA				URK	1 Sep 93	
3	122	KRAZ	SPEEDOMETER	CP135 3802010	EA	1	BA				URK	1 Sep 93	
3	123	KRAZ	RELAY	RC401 3726010	EA	1	BA				URK	1 Sep 93	
3	124	KRAZ	RECIEVER	YK143 3807010 G4	EA	0 4	BA				URK	1 Sep 93	
3	125	KRAZ	SENSOR	BM146 3806600D	EA	0 4	BA				URK	1 Sep 93	
3	126	KRAZ	AMP METER	AP110 3811010	EA	0 8	BA				URK	1 Sep 93	
3	127	KRAZ	PRESSURE GAUGE	MD103 3816010	EA	0 4	BA				URK	1 Sep 93	
3	128	KRAZ	SENSOR	TM100 3808000 G	EA	1	BA				URK	1 Sep 93	
3	129	KRAZ	MIRRORS	256 8201012	EA	3	BA				URK	1 Sep 93	
3	130	KRAZ	EQUALIZER	220V 8702010A	EA	0 2	BA				URK	1 Sep 93	
3	131	KRAZ	TOTAL COST US DOLLARS				BA		$11 000		URK	1 Sep 93	
3	1	KRAZ	ENGINE	238M 1000186	EA	0 6	SG				URK	1 Sep 93	
3	2	KRAZ	SHIM	238 1000102 B2R1	EA	3 2	SG				URK	1 Sep 93	
3	3	KRAZ	SHIM	238 1000102 B2	EA	3 2	SG				URK	1 Sep 93	
3	4	KRAZ	SHIM	23831000104 V2	EA	3 2	SG				URK	1 Sep 93	
3	5	KRAZ	CLIPS	256-1001005 A1	EA	5	SG				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	6	KRAZ	ENG RING SETS	236-1000106-B2	EA	20	SG				URK	1 Sep 93	
3	7	KRAZ	ENG MOUNTS	236-1001008-01	EA	3	SG				URK	1 Sep 93	
3	8	KRAZ	SHAFT	2383 1000107 V2	EA	0 8	SG				URK	1 Sep 93	
3	9	KRAZ	BLOCK	238 1002012 B2	EA	0 4	SG				URK	1 Sep 93	
3	10	KRAZ	RING	236-100202 A	EA	5	SG				URK	1 Sep 93	
3	11	KRAZ	RING	236 1002040	EA	4	SG				URK	1 Sep 93	
3	12	KRAZ	OIL INS	236 1002272	EA	1	SG				URK	1 Sep 93	
3	13	KRAZ	PIPE	238 1003290 V	EA	1	SG				URK	1 Sep 93	
3	14	KRAZ	PIPE	238 1003291 V	EA	1	SG				URK	1 Sep 93	
3	15	KRAZ	CYL WIPER COLLAR	236 1002314 B	EA	4	SG				URK	1 Sep 93	
3	16	KRAZ	HEAD C76G	238 1003013 D	EA	1	SG				URK	1 Sep 93	
3	17	KRAZ	RING	237 1003114-V	EA	1	SG				URK	1 Sep 93	
3	18	KRAZ	PACKING	238 1003210 V2	EA	10	SG				URK	1 Sep 93	
3	19	KRAZ	PACKING	238 1003270	EA	10	SG				URK	1 Sep 93	
3	20	KRAZ	LINER CYLINDER	236 1004008	EA	16	SG				URK	1 Sep 93	
3	21	KRAZ	ROCKER ARM	236 1004045 V2	EA	4	SG				URK	1 Sep 93	
3	22	KRAZ	RING	400 1004030 80	EA	4	SG				URK	1 Sep 93	
3	23	KRAZ	SEAL	201 1005034 B3	EA	4	SG				URK	1 Sep 93	
3	24	KRAZ	GEAR	236 1005030 A	EA	4	SG				URK	1 Sep 93	
3	25	KRAZ	COLLAR	236 1005160 A2	EA	10	SG				URK	1 Sep 93	
3	26	KRAZ	SHAFT	238 1006015 G2	EA	0 2	SG				URK	1 Sep 93	
3	27	KRAZ	SPACERS	236-1006026-AR	EA	6	SG				URK	1 Sep 93	
3	28	KRAZ	SPACERS	236-1006037 AR	EA	4 8	SG				URK	1 Sep 93	
3	29	KRAZ	VALVE	236 1007010-V	EA	5	SG				URK	1 Sep 93	
3	30	KRAZ	VALVE	236-1007015 V4	EA	5	SG				URK	1 Sep 93	
3	31	KRAZ	ROD PUSH	236 1007176-A	EA	4 2	SG				URK	1 Sep 93	
3	32	KRAZ	PACKING	236-1008050	EA	5	SG				URK	1 Sep 93	
3	33	KRAZ	PACKING	238T 1009040	EA	5	SG				URK	1 Sep 93	
3	34	KRAZ	PUMP	236-1011014 V3	EA	1	SG				URK	1 Sep 93	
3	35	KRAZ	RADIATOR	157 1013010 A	EA	1	SG				URK	1 Sep 93	
3	36	KRAZ	EXHAUST PIPE	256B 1013408 B	EA	1 6	SG				URK	1 Sep 93	
3	37	KRAZ	ELEMENT FILTER	201T 1105540	EA	60	SG				URK	1 Sep 93	
3	38	KRAZ	PUMP	240-1106210	EA	1	SG				URK	1 Sep 93	
3	39	KRAZ	PUMP	236T1106288-A2	EA	1	SG				URK	1 Sep 93	
3	40	KRAZ	COLLAR	236-102940	EA	10	SG				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	41	KRAZ	1/2 HUB COUPLING	236-1029268-B	EA	0 5	SG				URK	1 Sep 93	
3	42	KRAZ	PIPE	236-1104308 V	EA	2	SG				URK	1 Sep 93	
3	43	KRAZ	PUMP	8006 1111005	EA	0 6	SG				URK	1 Sep 93	
3	44	KRAZ	PLUNGER RODS	60-1111074 01	EA	15	SG				URK	1 Sep 93	
3	45	KRAZ	INJECTOR	2606-1112010-02	EA	28	SG				URK	1 Sep 93	
3	46	KRAZ	SPRAYER	26 111211	EA	28	SG				URK	1 Sep 93	
3	47	KRAZ	FILTER	201T 1117038	EA	20	SG				URK	1 Sep 93	
3	48	KRAZ	COUPLING	09000 1121010 000	EA	0 2	SG				URK	1 Sep 93	
3	49	KRAZ	MUFFLER	256-1201010	EA	1	SG				URK	1 Sep 93	
3	50	KRAZ	PACKING	256B 1203002	EA	10	SG				URK	1 Sep 93	
3	51	KRAZ	SLEEVE	256 B1 1203096	EA	2 5	SG				URK	1 Sep 93	
3	52	KRAZ	PACKING	256B 1203039	EA	4	SG				URK	1 Sep 93	
3	53	KRAZ	RADIATOR	256B 1301008-10	EA	2	SG				URK	1 Sep 93	
3	54	KRAZ	ENG MOUNTS	256-1302025	EA	1	SG				URK	1 Sep 93	
3	55	KRAZ	ENG/ MOUNTS	256-1302139	EA	1	SG				URK	1 Sep 93	
3	56	KRAZ	RODS	214B 1303010	EA	3	SG				URK	1 Sep 93	
3	57	KRAZ	RODS	255 1303012	EA	2	SG				URK	1 Sep 93	
3	58	KRAZ	EXHAUST PIPE	256-1303016	EA	0 6	SG				URK	1 Sep 93	
3	59	KRAZ	PUMP	236 1307010-A3	EA	2 5	SG				URK	1 Sep 93	
3	60	KRAZ	SET	236-1307029 A	EA	5	SG				URK	1 Sep 93	
3	61	KRAZ	COLLAR	236-1307090	EA	8	SG				URK	1 Sep 93	
3	62	KRAZ	BELTS	25 6411 1404	EA	20	SG				URK	1 Sep 93	
3	63	KRAZ	BELTS	6421 1403	EA	20	SG				URK	1 Sep 93	
3	64	KRAZ	MOTOR	236-1308011 G2	EA	0 6	SG				URK	1 Sep 93	
3	65	KRAZ	DISCS	238 1601690-G	EA	1	SG				URK	1 Sep 93	
3	66	KRAZ	DISCS	238 1601094	EA	1	SG				URK	1 Sep 93	
3	67	KRAZ	DISCS	238-1601130 B	EA	1	SG				URK	1 Sep 93	
3	68	KRAZ	DISCS	238-1601131	EA	1 5	SG				URK	1 Sep 93	
3	69	KRAZ	BRAKE FRICTION PLATE	236 1601138 A3	EA	5	SG				URK	1 Sep 93	
3	70	KRAZ	COUPLING	236 1601180 B2	EA	1	SG				URK	1 Sep 93	
3	71	KRAZ	GEAR BOX	236NT 1700003	EA	0 8	SG				URK	1 Sep 93	
3	72	KRAZ	BOX	257 18000020-V2	EA	0 2	SG				URK	1 Sep 93	
3	73	KRAZ	BOX	256-1800020-V2	EA	0 2	SG				URK	1 Sep 93	
3	74	KRAZ	HEAD CROSS	131 2201025 A	EA	2	SG				URK	1 Sep 93	
3	75	KRAZ	SHAFT	527 2202010-16	EA	0 8	SG				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	76	KRAZ	DRIVE SHAFT	210G 2202045 04	EA	0 8	SG				URK	1 Sep 93	
3	77	KRAZ	SHAFT	210G 2204010-16	EA	0 8	SG				URK	1 Sep 93	
3	78	KRAZ	SUPPORT	210-2204060-B2	EA	1	SG				URK	1 Sep 93	
3	79	KRAZ	REAR DRIVE AXLE	255P 2400015 02	EA	1	SG				URK	1 Sep 93	
3	80	KRAZ	SET OF GEARS	256B 2402020	EA	0 2	SG				URK	1 Sep 93	
3	81	KRAZ	DIFFERENTIAL SEAL	210-2402052 A1	EA	6	SG				URK	1 Sep 93	
3	82	KRAZ	DIFFERENTIAL	200 2403010-A2	EA	0 4	SG				URK	1 Sep 93	
3	83	KRAZ	FLANGE	200-2403072 B1	EA	0 4	SG				URK	1 Sep 93	
3	84	KRAZ	AXLE	2550 2500015 02	EA	0 2	SG				URK	1 Sep 93	
3	85	KRAZ	SHOCK ABSORBER	256B1 2902012	EA	2	SG				URK	1 Sep 93	
3	86	KRAZ	1ST PLATE	255B 2902074 01	EA	2	SG				URK	1 Sep 93	
3	87	KRAZ	2ND PLATE	255B 2902076 01	EA	2	SG				URK	1 Sep 93	
3	88	KRAZ	SHOCK SPRINGS	500 2905006	EA	5	SG				URK	1 Sep 93	
3	89	KRAZ	SHOCK ABSORBER	256B 2912012 11	EA	2 6	SG				URK	1 Sep 93	
3	90	KRAZ	CONN BRACKETS	219 2912408	EA	6	SG				URK	1 Sep 93	
3	91	KRAZ	EQUALIZER	256B 2918005	EA	3	SG				URK	1 Sep 93	
3	92	KRAZ	SHAFT	256B 2918054	EA	0 4	SG				URK	1 Sep 93	
3	93	KRAZ	ROD	214 2919011 02	EA	5	SG				URK	1 Sep 93	
3	94	KRAZ	ROD	210 2919012 03	EA	5	SG				URK	1 Sep 93	
3	95	KRAZ	BUSHING	200 3001016	EA	4	SG				URK	1 Sep 93	
3	96	KRAZ	SEAL	200 3103035	EA	1 4	SG				URK	1 Sep 93	
3	97	KRAZ	SEAL	210 3104036	EA	1 4	SG				URK	1 Sep 93	
3	98	KRAZ	COTTER PINS	200-3104050 A	EA	50	SG				URK	1 Sep 93	
3	99	KRAZ	COTTER PINS	200 3104050 A	EA	50	SG				URK	1 Sep 93	
3	100	KRAZ	RELAYS	500 3401005 D	EA	0 5	SG				URK	1 Sep 93	
3	101	KRAZ	HYD BOOSTER BRAKES	256B 3405010 14	EA	1	SG				URK	1 Sep 93	
3	102	KRAZ	DISTRIBUTOR	255B 3405016	EA	1	SG				URK	1 Sep 93	
3	103	KRAZ	PUMP	256B 3407199	EA	1	SG				URK	1 Sep 93	
3	104	KRAZ	FRIC PLATES SHOE	200-3501105	EA	30	SG				URK	1 Sep 93	
3	105	KRAZ	LEVER	210 3501136 A2	EA	0 8	SG				URK	1 Sep 93	
3	106	KRAZ	FRIC PLATES SHOES	200-3502105 A	EA	30	SG				URK	1 Sep 93	
3	107	KRAZ	COMPRESSOR	130 3509009 11	EA	0 8	SG				URK	1 Sep 93	
3	108	KRAZ	GENERATOR	4573711587	EA	2	SG				URK	1 Sep 93	
3	109	KRAZ	REGULATOR	1112 3702	EA	2	SG				URK	1 Sep 93	
3	110	KRAZ	SWITCH	VK318T 3704000	EA	1	SG				URK	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	111	KRAZ	ELECTRO BRUSHES	2501 370805	EA	26	SG				URK	1 Sep 93	
3	112	KRAZ	SWITCH	P305 3709000	EA	1 5	SG				URK	1 Sep 93	
3	113	KRAZ	SWITCH	P39 371000-T	EA	1 5	SG				URK	1 Sep 93	
3	114	KRAZ	STARTER	45 7375 1471	EA	2 5	SG				URK	1 Sep 93	
3	115	KRAZ	RELAY	RC103-3708000	EA	1	SG				URK	1 Sep 93	
3	116	KRAZ	LAMPS	A 24 60 40	EA	40	SG				URK	1 Sep 93	
3	117	KRAZ	FILTERS	FG122 3711200 V	EA	3	SG				URK	1 Sep 93	
3	118	KRAZ	LAMPS	A24-324	EA	40	SG				URK	1 Sep 93	
3	119	KRAZ	LAMPS	A 24 2	EA	40	SG				URK	1 Sep 93	
3	120	KRAZ	LAMPS	A 24 5	EA	40	SG				URK	1 Sep 93	
3	121	KRAZ	LAMPS	A 24 21 2	EA	40	SG				URK	1 Sep 93	
3	122	KRAZ	SPEEDOMETER	CP135 3802010	EA	1	SG				URK	1 Sep 93	
3	123	KRAZ	RELAY	RC401 3726010	EA	1	SG				URK	1 Sep 93	
3	124	KRAZ	RECIEVER	YK143 3807010 G4	EA	0 4	SG				URK	1 Sep 93	
3	125	KRAZ	SENSOR	BM146 3806600D	EA	0 4	SG				URK	1 Sep 93	
3	126	KRAZ	AMP METER	AP110 3811010	EA	0 8	SG				URK	1 Sep 93	
3	127	KRAZ	PRESSURE GAUGE	MD103 3816010	EA	0 4	SG				URK	1 Sep 93	
3	128	KRAZ	SENSOR	TM100 3808000-G	EA	1	SG				URK	1 Sep 93	
3	129	KRAZ	MIRRORS	256 8201012	EA	3	SG				URK	1 Sep 93	
3	130	KRAZ	EQUALIZER	220V 8702010A	EA	0 2	SG				URK	1 Sep 93	
3	131	KRAZ	TOTAL COST US DOLLARS				SG		$11 000		URK	1 Sep 93	
1	50	EXPLOSIVES	AN BLASTING PRILL		TONNE	1 600	BA	$190 00	$304 000		SWD	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	53	EXPLOSIVES	ENULSION		KG	200 000	BA	$0 66	$132 000		SWD	1 Sep 93	
1	51	EXPLOSIVES	AN BLASTING PRILL		TONNE	1 000	SG	$190 00	$190 000		SWD	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	52	EXPLOSIVES	5 x30 (20KG) BAGGED EMULSION		KG	500 000	SG	$0 66	$330 000		SWD	1 Sep 93	
1	1	DUMPCAR	SIDE PANELS	634 01 000 0 cb	EA	8	BA				POL	1 Sep 93	
1	2	DUMPCAR	FRONT PANEL	634 04 000 3	EA	8	BA				POL	1 Sep 93	
1	3	DUMPCAR	PANEL LOCKS LEFT	634 01 010-2	EA	8	BA				POL	1 Sep 93	
1	4	DUMPCAR	PANEL LOCKS RIGHT	634 01 020-2	EA	8	BA				POL	1 Sep 93	
1	5	DUMPCAR	PANEL SUPPORTS	634 01 150 cb	EA	4	BA				POL	1 Sep 93	
1	6	DUMPCAR	SINGLE ACTION CYLINDER	640-45 010 cb	EA	6 4	BA				POL	1 Sep 93	
1	7	DUMPCAR	PISTON COLLARS	45 129	EA	200	BA				POL	1 Sep 93	
1	8	DUMPCAR	DOUBLE ACTION CYL	640-45 010-1	EA	8	BA				POL	1 Sep 93	
1	9	DUMPCAR	DOUBLE ACTION PISTON	640-45 105 2	EA	4	BA				POL	1 Sep 93	
1	10	DUMPCAR	DISTRIBUTION VALVES	372 000 1 9	EA	20	BA				POL	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	11	DUMPCAR	ROD EQUALIZER	522 00-003 0	EA	2	BA				POL	1 Sep 93	
1	12	DUMPCAR	BOGGEY CONNECTOR	522 00 010 1	EA	2	BA				POL	1 Sep 93	
1	13	DUMPCAR	SQ AXLE CAP ENDS	74 10 116	EA	4	BA				POL	1 Sep 93	
1	14	DUMPCAR	OUTSIDE SPRING	522 38 001 0	EA	16	BA				POL	1 Sep 93	
1	15	DUMPCAR	INSIDE SPRING	522 38 002 0	EA	16	BA				POL	1 Sep 93	
1	16	DUMPCAR	SET SH ABSORBERS	522 38 016 0	EA	4	BA				POL	1 Sep 93	
1	17	DUMPCAR	FRAME	4686 6061 40 016	EA	20	BA				POL	1 Sep 93	
1	18	DUMPCAR	SMALL BRAKE LOCKS	46 03 015	EA	20	BA				POL	1 Sep 93	
1	19	DUMPCAR	PUSH RDS BRAKE PDS	61 40-133	EA	8	BA				POL	1 Sep 93	
1	20	DUMPCAR	FRAME ENDS RIGHT	61 40 110	EA	3 2	BA				POL	1 Sep 93	
1	21	DUMPCAR	FRAME ENDS LEFT	61 40 120	EA	3 2	BA				POL	1 Sep 93	
1	22	DUMPCAR	BRK PADS COMP POLY	TY 38 114 79 72	EA	600	BA				POL	1 Sep 93	
1	23	DUMPCAR	WHEEL PAIRS	61 10 046	EA	4	BA				POL	1 Sep 93	
1	24	DUMPCAR	WHEEL PACKING COVER	TY 519 07	EA	4	BA				POL	1 Sep 93	
1	25	DUMPCAR	BOGGEY CONNECTORS	522 00 020 1	EA	2	BA				POL	1 Sep 93	
1	26	DUMPCAR	DISTRIBUTOR VALVE		EA	16	BA				POL	1 Sep 93	
1	27	DUMPCAR	AUTOMATIC COUPLING		EA	12	BA				POL	1 Sep 93	
1	28	DUMPCAR	AUTO COUPLING HEAD	106 00 00	EA	4	BA				POL	1 Sep 93	
1	29	DUMPCAR	COUPLING LOCK	106 01 002	EA	8	BA				POL	1 Sep 93	
1	30	DUMPCAR	LOCK HOLDER	106 01 003 0	EA	4	BA				POL	1 Sep 93	
1	31	DUMPCAR	COUPLING TRIPPER	106 01 006 0	EA	8	BA				POL	1 Sep 93	
1	32	DUMPCAR	COUPLING HINGE PINS	106 00 012 0	EA	12	BA				POL	1 Sep 93	
1	33	DUMPCAR	COUPLING SHOCK ABS	106 00 001	EA	8	BA				POL	1 Sep 93	
1	34	DUMPCAR	COUPLING SHOCK SLIDE	106-02 00 2	EA	4	BA				POL	1 Sep 93	
1	35	DUMPCAR	COUPLING SH AB LK	106 00 002 2	EA	16	BA				POL	1 Sep 93	
1	36	DUMPCAR	DOOR ACTLATOR ARMS	634 46 010	EA	16	BA				POL	1 Sep 93	
1	37	DUMPCAR	DOOR ACTUATOR ARMS	634 46 020 2	EA	16	BA				POL	1 Sep 93	
1	38	DUMPCAR	DOOR ACTUATOR ARMS	634 46 030	EA	8	BA				POL	1 Sep 93	
1	39	DUMPCAR	END VALVE		EA	20	BA				POL	1 Sep 93	
1	40	DUMPCAR	AIR SPEED REDUCERS		EA	16	BA				POL	1 Sep 93	
1	41	DUMPCAR	RING PACKING	38 72	EA	40	BA				POL	1 Sep 93	
1	42	DUMPCAR	AIR DISTRIBUTOR	482 000	EA	0	BA				POL	1 Sep 93	
1	43	DUMPCAR	PISTON COLLAR	270 397	EA	4	BA				POL	1 Sep 93	
1	44	DUMPCAR	PISTON SPRING	270 397	EA	8	BA				POL	1 Sep 93	
1	45	DUMPCAR	HOUSING ACC AIR	DR 483 00	EA	12	BA				POL	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	46	DUMPCAR	BRAKE CYL PARTS	VR 483 000	EA	12	BA				POL	1 Sep 93	
1	47	DUMPCAR	PIPES	VR 483-000	EA	12	BA				POL	1 Sep 93	
1	48	DUMPCAR	REGULATOR ARM	522 10 050-1	EA	12	BA				POL	1 Sep 93	
1	49	DUMPCAR	CAR CONNECTOR HOSE		EA	60	BA				POL	1 Sep 93	
1	50	DUMPCAR	TOTAL COST US DOLLARS				BA		$200 000		POL	1 Sep 93	
1	1	DUMPCAR	SIDE PANELS	634 01 000-0 cb	EA	12	SG				POL	1 Sep 93	
1	2	DUMPCAR	FRONT PANEL	634 04 000 3	EA	12	SG				POL	1 Sep 93	
1	3	DUMPCAR	PANEL LOCKS LEFT	634 01 010-2	EA	12	SG				POL	1 Sep 93	
1	4	DUMPCAR	PANEL LOCKS RIGHT	634 01 020-2	EA	12	SG				POL	1 Sep 93	
1	5	DUMPCAR	PANEL SUPPORTS	634 01 150 cb	EA	6	SG				POL	1 Sep 93	
1	6	DUMPCAR	SINGLE ACTION CYLINDER	640 45 010 cb	EA	9 6	SG				POL	1 Sep 93	
1	7	DUMPCAR	PISTON COLLARS	45 129	EA	300	SG				POL	1 Sep 93	
1	8	DUMPCAR	DOUBLE ACTION CYL	640 45 010 1	EA	12	SG				POL	1 Sep 93	
1	9	DUMPCAR	DOUBLE ACTION PISTON	640 45 105 2	EA	6	SG				POL	1 Sep 93	
1	10	DUMPCAR	DISTRIBUTION VALVES	372 000 1 9	EA	30	SG				POL	1 Sep 93	
1	11	DUMPCAR	ROD EQUALIZER	522 00 003 0	EA	3	SG				POL	1 Sep 93	
1	12	DUMPCAR	BOGGEY CONNECTOR	522 00 010 1	EA	3	SG				POL	1 Sep 93	
1	13	DUMPCAR	SQ AXLE CAP ENDS	74 10 116	EA	6	SG				POL	1 Sep 93	
1	14	DUMPCAR	OUTSIDE SPRING	522 38 001 0	EA	24	SG				POL	1 Sep 93	
1	15	DUMPCAR	INSIDE SPRING	522 38 002 0	EA	24	SG				POL	1 Sep 93	
1	16	DUMPCAR	SET SH ABSORBERS	522 38 016 0	EA	6	SG				POL	1 Sep 93	
1	17	DUMPCAR	FRAME	4686-6061 40-016	EA	30	SG				POL	1 Sep 93	
1	18	DUMPCAR	SMALL BRAKE LOCKS	46 03 015	EA	30	SG				POL	1 Sep 93	
1	19	DUMPCAR	PUSH RDS BRAKE PDS	61 40 133	EA	12	SG				POL	1 Sep 93	
1	20	DUMPCAR	FRAME ENDS RIGHT	61 40 110	EA	4 8	SG				POL	1 Sep 93	
1	21	DUMPCAR	FRAME ENDS LEFT	61 40 120	EA	4 8	SG				POL	1 Sep 93	
1	22	DUMPCAR	BRK PADS COMP POLY	TY 38 114 79 72	EA	900	SG				POL	1 Sep 93	
1	23	DUMPCAR	WHEEL PAIRS	61 10 046	EA	6	SG				POL	1 Sep 93	
1	24	DUMPCAR	WHEEL PACKING COVER	TY 519 07	EA	6	SG				POL	1 Sep 93	
1	25	DUMPCAR	BOGGEY CONNECTORS	522 00 020-1	EA	3	SG				POL	1 Sep 93	
1	26	DUMPCAR	DISTRIBUTOR VALVE		EA	24	SG				POL	1 Sep 93	
1	27	DUMPCAR	AUTOMATIC COUPLING		EA	18	SG				POL	1 Sep 93	
1	28	DUMPCAR	AUTO COUPLING HEAD	106 00 00	EA	6	SG				POL	1 Sep 93	
1	29	DUMPCAR	COUPLING LOCK	106 01 002	EA	12	SG				POL	1 Sep 93	
1	30	DUMPCAR	LOCK HOLDER	106 01 003 0	EA	6	SG				POL	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	31	DUMPCAR	COUPLING TRIPPER	106 01 006-0	EA	12	SG				POL	1 Sep 93	
1	32	DUMPCAR	COUPLING HINGE PINS	106 00-012 0	EA	18	SG				POL	1 Sep 93	
1	33	DUMPCAR	COUPLING SHOCK ABS	106-00-001	EA	12	SG				POL	1 Sep 93	
1	34	DUMPCAR	COUPLING SHOCK SLIDE	106-02 00-2	EA	6	SG				POL	1 Sep 93	
1	35	DUMPCAR	COUPLING SH AB LK	106-00 002 2	EA	24	SG				POL	1 Sep 93	
1	36	DUMPCAR	DOOR ACTLATOR ARMS	634 46-010	EA	24	SG				POL	1 Sep 93	
1	37	DUMPCAR	DOOR ACTUATOR ARMS	634 46 020-2	EA	24	SG				POL	1 Sep 93	
1	38	DUMPCAR	DOOR ACTUATOR ARMS	634 46 030	EA	12	SG				POL	1 Sep 93	
1	39	DUMPCAR	END VALVE		EA	30	SG				POL	1 Sep 93	
1	40	DUMPCAR	AIR SPEED REDUCERS		EA	24	SG				POL	1 Sep 93	
1	41	DUMPCAR	RING PACKING	38 72	EA	60	SG				POL	1 Sep 93	
1	42	DUMPCAR	AIR DISTRIBUTOR	482 000	EA	0	SG				POL	1 Sep 93	
1	43	DUMPCAR	PISTON COLLAR	270 397	EA	6	SG				POL	1 Sep 93	
1	44	DUMPCAR	PISTON SPRING	270 397	EA	12	SG				POL	1 Sep 93	
1	45	DUMPCAR	HOUSING ACC AIR	DR 483 00	EA	18	SG				POL	1 Sep 93	
1	46	DUMPCAR	BRAKE CYL PARTS	VR 483 000	EA	18	SG				POL	1 Sep 93	
1	47	DUMPCAR	PIPES	VR 483 000	EA	18	SG				POL	1 Sep 93	
1	48	DUMPCAR	REGULATOR ARM	522 10 050-1	EA	18	SG				POL	1 Sep 93	
1	49	DUMPCAR	CAR CONNECTOR HOSE		EA	90	SG				POL	1 Sep 93	
1	50	DUMPCAR	TOTAL COST US DOLLARS				SG		$300 000		POL	1 Sep 93	
1	1	COAL LOAD	PUMP STATION	CMJ V3A00 OCY 2	EA	1	BA				CIS	1 Sep 93	
1	2	COAL LOAD	PULLEY HOIST	3460 03 03600/3430 11 2	EA	4	BA				CIS	1 Sep 93	
1	3	COAL LOAD	PULLEY IDLER	3460 03 03600/3430 11 0	EA	20	BA				CIS	1 Sep 93	
1	4	COAL LOAD	BELTS		EA	20	BA				CIS	1 Sep 93	
1	5	COAL LOAD	FRONT PLATE	3460 00 005 02	EA	1	BA				CIS	1 Sep 93	
1	6	COAL LOAD	VIBRATOR SCREEN	7204 001	EA	2	BA				CIS	1 Sep 93	
1	7	COAL LOAD	SCREEN SPRINGS	1R0 72	EA	6	BA				CIS	1 Sep 93	
1	8	COAL LOAD	REDUCTION GEAR BOX	MY25 AM 01 03 160	EA	1	BA				CIS	1 Sep 93	
1	9	COAL LOAD	ROLLARS	200001 01 00 04	EA	1000	BA				CIS	1 Sep 93	
1	10	COAL LOAD	ROLLARS	200022 01 00 04	EA	1000	BA				CIS	1 Sep 93	
1	11	COAL LOAD	ROLLARS	1E4 952 306	EA	100	BA				CIS	1 Sep 93	
1	12	COAL LOAD	ROLLARS	1E4 992 11CB	EA	60	BA				CIS	1 Sep 93	
1	13	COAL LOAD	ROLLARS	1E4 954 3CB	EA	30	BA				CIS	1 Sep 93	
1	14	COAL LOAD	REDUCTION GEAR BOX	KS1 300	EA	1	BA				CIS	1 Sep 93	
1	15	COAL LOAD	CONVEYOR BELTS	B 1000	M	400	BA				CIS	1 Sep 93	
1	16	COAL LOAD	CONVEYOR BELTS	B-1400	M	300	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	17	COAL LOAD	CONVEYOR BELTS	B-1200	M	400	BA				CIS	1 Sep 93	
1	18	COAL LOAD	CONVEYOR DR MOTORS	4A3556Y3 160	EA	1	BA				CIS	1 Sep 93	
1	19	COAL LOAD	CONVEYOR DR MOTORS	4AM200M6Y3 22	EA	2	BA				CIS	1 Sep 93	
1	20	COAL LOAD	CONVEYOR DR MOTORS	AO102 12 6-6 4 24/37	EA	1	BA				CIS	1 Sep 93	
1	21	COAL LOAD	CONVEYOR DR MOTORS	AO102 12 B-3-4 24/35	EA	1	BA				CIS	1 Sep 93	
1	22	COAL LOAD	CRUSHER SPRING	5460 00 004 60	EA	4	BA				CIS	1 Sep 93	
1	23	COAL LOAD	CRUSHER COLLAR	8752 79	EA	4	BA				CIS	1 Sep 93	
1	24	COAL LOAD	CRUSHER COLLAR	8752 79	EA	4	BA				CIS	1 Sep 93	
1	25	COAL LOAD	CRUSHER SHIM	3450 01 011	EA	2	BA				CIS	1 Sep 93	
1	26	COAL LOAD	CRUSHER BEARING	GOST 5721 75	EA	2	BA				CIS	1 Sep 93	
1	27	COAL LOAD	TOTAL COST US DOLLARS				BA		$315 000		CIS	1 Sep 93	
1	1	COAL LOAD	BUSHING	3400 00 005 02	EA	4	SG				CIS	1 Sep 93	
1	2	COAL LOAD	FRONT PLATE	3430 04 200 7	EA	8	SG				CIS	1 Sep 93	
1	3	COAL LOAD	DISC	3430 11 200 00	EA	8	SG				CIS	1 Sep 93	
1	4	COAL LOAD	DISC	3430 11 007 00	EA	8	SG				CIS	1 Sep 93	
1	5	COAL LOAD	DRIVE UNIT LEFT SIDE	7415 53 050 00	EA	1	SG				CIS	1 Sep 93	
1	6	COAL LOAD	VIBRATOR LEFT	GUCL 72 00	EA	1	SG				CIS	1 Sep 93	
1	7	COAL LOAD	VIBRATOR RIGHT	GUCL 72 00	EA	1	SG				CIS	1 Sep 93	
1	8	COAL LOAD	TOTAL COST US DOLLARS				SG		$35 000		CIS	1 Sep 93	
1	1	D TRAIN	DISTRIBUTER	D50 17 101 cb 1	EA	500	SG				CIS	1 Sep 93	
1	2	D TRAIN	PUMP ELEMENT	D50 27 104 cb	EA	50	SG				CIS	1 Sep 93	
1	3	D TRAIN	SEAL	D50 27 204 cb 2	EA	100	SG				CIS	1 Sep 93	
1	4	D TRAIN	DIRECTIONAL VALVE	D50 27 209 cb 1	EA	10	SG				CIS	1 Sep 93	
1	5	D TRAIN	OIL PUMP	D50 12 3 01	EA	30	SG				CIS	1 Sep 93	
1	6	D TRAIN	WATER PUMP	D50 11 01	EA	30	SG				CIS	1 Sep 93	
1	7	D TRAIN	SHOCK	D50 10 111	EA	40	SG				CIS	1 Sep 93	
1	8	D TRAIN	SEAL	D50 34 114 01	EA	50	SG				CIS	1 Sep 93	
1	9	D TRAIN	REGULATOR	D50 27 200cb	EA	10	SG				CIS	1 Sep 93	
1	10	D TRAIN	OUTLET VALVE	KT6-06-001 cb 2	EA	50	SG				CIS	1 Sep 93	
1	11	D TRAIN	INLET VALVE	KT6 06 001 cb 2	EA	50	SG				CIS	1 Sep 93	
1	12	D TRAIN	SPRING VALVE	KT6 06-033 2	EA	2000	SG				CIS	1 Sep 93	
1	13	D TRAIN	INLET FILTER	KT6-06-021	EA	500	SG				CIS	1 Sep 93	
1	14	D TRAIN	DRIVE HUB	T33 55 6 cb	EA	100	SG				CIS	1 Sep 93	
1	15	D TRAIN	BELT	b 2240	EA	100	SG				CIS	1 Sep 93	
1	16	D TRAIN	BELT	b 1250	EA	100	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	17	D TRAIN	SHOCK ABSORBER SP	3 35 30 101	EA	40	SG				CIS	1 Sep 93	
1	18	D TRAIN	PRESS ELEC GAUGE		EA	15	SG				CIS	1 Sep 93	
1	19	D TRAIN	SWITCHES	TB1 2	EA	50	SG				CIS	1 Sep 93	
1	20	D TRAIN	SWITCHES	TB1 1	EA	50	SG				CIS	1 Sep 93	
1	21	D TRAIN	SWITCHES	TB1 4	EA	50	SG				CIS	1 Sep 93	
1	22	D TRAIN	COUPLES RAIL	GEM 70-85 000	EA	10	SG				CIS	1 Sep 93	
1	23	D TRAIN	BRAKE SHOES	GEM 2 4211	EA	1000	SG				CIS	1 Sep 93	
1	24	D TRAIN	AUTO COUPLINGS	CA 3	EA	40	SG				CIS	1 Sep 93	
1	25	D TRAIN	BATTERY	32TN 450	SET	6	SG				CIS	1 Sep 93	
1	26	D TRAIN	LAMP	PX50X50	EA	200	SG				CIS	1 Sep 93	
1	27	D TRAIN	LAMP	24 25	EA	100	SG				CIS	1 Sep 93	
1	28	D TRAIN	TOTAL COST US DOLLARS				SG				CIS	1 Sep 93	
1	1	DRILL PARTS	TRACK PADS	31 001 008 34	SET	30	BA				CIS	1 Sep 93	
1	2	DRILL PARTS	TRACK RAILS	31 001 008 000	EA	1	BA				CIS	1 Sep 93	
1	3	DRILL PARTS	LEVELING JACKS	B59 14 240	EA	3 5	BA				CIS	1 Sep 93	
1	4	DRILL PARTS	SPROCKET	31C 152 012 06	EA	2	BA				CIS	1 Sep 93	
1	5	DRILL PARTS	SPROCKET	B59 14 052	EA	2	BA				CIS	1 Sep 93	
1	6	DRILL PARTS	SHOCK ABSORBER	B122 22 11 015	EA	5	BA				CIS	1 Sep 93	
1	7	DRILL PARTS	SHOCK ABSORBER	B122 22 00 155	EA	3	BA				CIS	1 Sep 93	
1	8	DRILL PARTS	COMPRESSOR SUPP	B122 0017 000	EA	0 5	BA				CIS	1 Sep 93	
1	9	DRILL PARTS	CARTRIDGE	10 10 080	EA	2	BA				CIS	1 Sep 93	
1	10	DRILL PARTS	DRILL STEEL	722 22 11 00	EA	2	BA				CIS	1 Sep 93	
1	11	DRILL PARTS	BUSHING	31 001 008 037	EA	30	BA				CIS	1 Sep 93	
1	12	DRILL PARTS	BUSHING	31 001 008 102	EA	30	BA				CIS	1 Sep 93	
1	13	DRILL PARTS	HYD DISTRIBUTOR	R102 A4 A222 50	EA	5	BA				CIS	1 Sep 93	
1	14	DRILL PARTS	HYD PUMP	61 12 22	EA	3	BA				CIS	1 Sep 93	
1	15	DRILL PARTS	3 SPEED MOTOR		EA	2 5	BA				CIS	1 Sep 93	
1	16	DRILL PARTS	PULL DOWN CABLE	3X50+1X16	M	300	BA				CIS	1 Sep 93	
1	17	DRILL PARTS	HYD PUMP	N 403E TY2 653260 70	EA	2 5	BA				CIS	1 Sep 93	
1	18	DRILL PARTS	HYD PUMP	BG 12 22 MI TY2 05	EA	5	BA				CIS	1 Sep 93	
1	19	DRILL PARTS	TOTAL COST US DOLLARS				BA		$150 000		CIS	1 Sep 93	
1	37	ELEC EQUIP	SYNC MOTOR	CDE 2 15 34 642	EA	1	BA				CIS	1 Jan 94	
1	40	EXPLOSIVES	AMMONIT 20mm CARRIDGES		TONNE	20	OT	$650 00	$13 000		CIS	SPLIT	50% 1 SEPT 93 50% 1 JAN 94
1	1	HEAT PLT	CHAIN	9 08 000	M	125	BA				CIS	1 Sep 93	
1	2	HEAT PLT	HOLDER	T9 05 002	EA	100	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	3	HEAT PLT	HOLDER	T9 05 001	EA	100	BA				CIS	1 Sep 93	
1	4	HEAT PLT	HOLDER	6 30 2	EA	500	BA				CIS	1 Sep 93	
1	5	HEAT PLT	ROLLER	6 30 25	EA	300	BA				CIS	1 Sep 93	
1	6	HEAT PLT	FRONT PACKING	T197 01 001	EA	5	BA				CIS	1 Sep 93	
1	7	HEAT PLT	MIDDLE PACKING	T197 01 002	EA	5	BA				CIS	1 Sep 93	
1	8	HEAT PLT	END LEFT PACKING	T82 01 001	EA	5	BA				CIS	1 Sep 93	
1	9	HEAT PLT	RIGHT PACKING	T82 01 002	EA	5	BA				CIS	1 Sep 93	
1	10	HEAT PLT	MIDDLE PACKING	T82 01 003	EA	5	BA				CIS	1 Sep 93	
1	13	HEAT PLT	CONNECTING LINK	T82 00 018	EA	300	BA				CIS	1 Sep 93	
1	14	HEAT PLT	SHAFT	6 30 9	EA	300	BA				CIS	1 Sep 93	
1	15	HEAT PLT	WASHER	T82 03 005	EA	0 1	BA				CIS	1 Sep 93	
1	16	HEAT PLT	WASHER	12 10906 66	EA	0 1	BA				CIS	1 Sep 93	
1	17	HEAT PLT	WASHER	16-10906 66	EA	0 1	BA				CIS	1 Sep 93	
1	18	HEAT PLT	WASHER	20 11371 66	EA	0 1	BA				CIS	1 Sep 93	
1	19	HEAT PLT	COTTER PIN	5X25 397 66	EA	0 1	BA				CIS	1 Sep 93	
1	20	HEAT PLT	COTTER PIN	5X28 397 66	EA	0 25	BA				CIS	1 Sep 93	
1	21	HEAT PLT	COTTER PIN	9X50 2319 70	EA	0 25	BA				CIS	1 Sep 93	
1	22	HEAT PLT	CHAIN	9X27 2319 70	M	100	BA				CIS	1 Sep 93	
1	23	HEAT PLT	FT SHFT W/ HALF COUP	T82 03 000	EA	0 5	BA				CIS	1 Sep 93	
1	24	HEAT PLT	END SHAFT	T82 07 000	EA	0 5	BA				CIS	1 Sep 93	
1	25	HEAT PLT	SOCKSHING PAN	DN 17	EA	1	BA				CIS	1 Sep 93	
1	26	HEAT PLT	STEAM BOILER PARTS	1 08 06	SET	100	BA				CIS	1 Sep 93	
1	27	HEAT PLT	STEAM BOILER PARTS	1 08 05	EA	600	BA				CIS	1 Sep 93	
1	28	HEAT PLT	STEAM BOILER PARTS	3P 800	EA	2	BA				CIS	1 Sep 93	
1	29	HEAT PLT	BOILER CONVEC SEC	KVTC 20-150	EA	1	BA				CIS	1 Sep 93	
1	30	HEAT PLT	TOTAL COST US DOLLARS				BA		$300 000		CIS	1 Sep 93	
1	1	HEAT PLT	CHAIN	9 08 000	M	125	SG				CIS	1 Sep 93	
1	2	HEAT PLT	HOLDER	T9 05 002	EA	100	SG				CIS	1 Sep 93	
1	3	HEAT PLT	HOLDER	T9 05 001	EA	100	SG				CIS	1 Sep 93	
1	4	HEAT PLT	HOLDER	6 30 2	EA	500	SG				CIS	1 Sep 93	
1	5	HEAT PLT	ROLLER	6 30 25	EA	300	SG				CIS	1 Sep 93	
1	6	HEAT PLT	FRONT PACKING	T197 01 001	EA	5	SG				CIS	1 Sep 93	
1	7	HEAT PLT	MIDDLE PACKING	T197 01 002	EA	5	SG				CIS	1 Sep 93	
1	8	HEAT PLT	END LEFT PACKING	T82 01 001	EA	5	SG				CIS	1 Sep 93	
1	9	HEAT PLT	RIGHT PACKING	T82 01 002	EA	5	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	10	HEAT PLT	MIDDLE PACKING	T82 01 003	EA	5	SG				CIS	1 Sep 93	
1	13	HEAT PLT	CONNECTING LINK	T82 00 018	EA	300	SG				CIS	1 Sep 93	
1	14	HEAT PLT	SHAFT	6 30 9	EA	300	SG				CIS	1 Sep 93	
1	15	HEAT PLT	WASHER	T82 03 005	EA	0 1	SG				CIS	1 Sep 93	
1	16	HEAT PLT	WASHER	12 10906-66	EA	0 1	SG				CIS	1 Sep 93	
1	17	HEAT PLT	WASHER	16 10906 66	EA	0 1	SG				CIS	1 Sep 93	
1	18	HEAT PLT	WASHER	20 11371 66	EA	0 1	SG				CIS	1 Sep 93	
1	19	HEAT PLT	COTTER PIN	5X25 397 66	EA	0 1	SG				CIS	1 Sep 93	
1	20	HEAT PLT	COTTER PIN	5X28 397 66	EA	0 25	SG				CIS	1 Sep 93	
1	21	HEAT PLT	COTTER PIN	9X50 2319 70	EA	0 25	SG				CIS	1 Sep 93	
1	22	HEAT PLT	CHAIN	9X27 2319 70	M	100	SG				CIS	1 Sep 93	
1	23	HEAT PLT	FT SHFT W/ HALF COUP	T82 03 000	EA	0 5	SG				CIS	1 Sep 93	
1	24	HEAT PLT	END SHAFT	T82 07 000	EA	0 5	SG				CIS	1 Sep 93	
1	25	HEAT PLT	SOCKSHING PAN	DN 17	EA	1	SG				CIS	1 Sep 93	
1	26	HEAT PLT	STEAM BOILER PARTS	1 08 06	SET	100	SG				CIS	1 Sep 93	
1	27	HEAT PLT	STEAM BOILER PARTS	1 08 05	EA	600	SG				CIS	1 Sep 93	
1	28	HEAT PLT	STEAM BOILER PARTS	3P 800	EA	2	SG				CIS	1 Sep 93	
1	29	HEAT PLT	BOILER CONVEC SEC	KVTC 20 150	EA	1	SG				CIS	1 Sep 93	
1	30	HEAT PLT	TOTAL COST US DOLLARS				SG		$300 000		CIS	1 Sep 93	
1	1	RAIL MAT	RAIL TYPE P 50	7174 75	TONNE	450	BA				CIS	1 Sep 93	
1	2	RAIL MAT	RAIL TYPE P 65	7174 75	TONNE	300	BA				CIS	1 Sep 93	
1	3	RAIL MAT	BEDING PLATE P 50	12135 75	TONNE	36	BA				CIS	1 Sep 93	
1	4	RAIL MAT	BEDING PLATE P 65	12135 75	TONNE	36	BA				CIS	1 Sep 93	
1	5	RAIL MAT	CONN PLATE P 50	4133 54	TONNE	36	BA				CIS	1 Sep 93	
1	6	RAIL MAT	CONN PLATE P 65	4133 54	TONNE	36	BA				CIS	1 Sep 93	
1	7	RAIL MAT	RR SPAKE P 50		TONNE	36	BA				CIS	1 Sep 93	
1	8	RAIL MAT	RAIL PLANGE P 50	2953 51	TONNE	9	BA				CIS	1 Sep 93	
1	9	RAIL MAT	RAIL PLANGE P 65	2953 51	TONNE	9	BA				CIS	1 Sep 93	
1	10	RAIL MAT	BOLTS&NUTS P 50	11530-76	TONNE	9	BA				CIS	1 Sep 93	
1	11	RAIL MAT	BOLTS & NUTS P 65	11530-76	TONNE	4 5	BA				CIS	1 Sep 93	
1	12	RAIL MAT	LOCK WASHER P 50	19115 73	TONNE	3 6	BA				CIS	1 Sep 93	
1	13	RAIL MAT	TRACK SWITCH P50-RT		SET	3	BA				CIS	1 Sep 93	
1	14	RAIL MAT	TRACK SWITCH P65 LEFT		SET	3	BA				CIS	1 Sep 93	
1	15	RAIL MAT	Y RAIL P50-DIRECT LEFT		EA	1 5	BA				CIS	1 Sep 93	
1	16	RAIL MAT	Y RAIL P50-DIRECT RIGHT		EA	1 5	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	17	RAIL MAT	YRAIL P50-BENDED RIGHT		EA	1 5	BA				CIS	1 Sep 93	
1	18	RAIL MAT	RAIL INSOLATOR P50		SET	180	BA				CIS	1 Sep 93	
1	19	RAIL MAT	RAIL INSOLATOR P65		SET	165	BA				CIS	1 Sep 93	
1	20	RAIL MAT	CRESOTA SLEEPER		TONNE	3	BA				CIS	1 Sep 93	
1	21	RAIL MAT	TOTAL COST US DOLLARS				BA		$105 000		CIS	1 Sep 93	
1	1	RAIL MAT	RAIL TYPE P 50	7174 75	TONNE	1050	SG				CIS	1 Sep 93	
1	2	RAIL MAT	RAIL TYPE P 65	7174 75	TONNE	700	SG				CIS	1 Sep 93	
1	3	RAIL MAT	BEDING PLATE P 50	12135 75	TONNE	84	SG				CIS	1 Sep 93	
1	4	RAIL MAT	BEDING PLATE P 65	12135 75	TONNE	84	SG				CIS	1 Sep 93	
1	5	RAIL MAT	CONN PLATE P 50	4133 54	TONNE	84	SG				CIS	1 Sep 93	
1	6	RAIL MAT	CONN PLATE P 65	4133 54	TONNE	84	SG				CIS	1 Sep 93	
1	7	RAIL MAT	RR SPAKE P 50		TONNE	84	SG				CIS	1 Sep 93	
1	8	RAIL MAT	RAIL PLANGE P 50	2953 51	TONNE	21	SG				CIS	1 Sep 93	
1	9	RAIL MAT	RAIL PLANGE P 65	2953 51	TONNE	21	SG				CIS	1 Sep 93	
1	10	RAIL MAT	BOLTS&NUTS P 50	11530-76	TONNE	21	SG				CIS	1 Sep 93	
1	11	RAIL MAT	BOLTS & NUTS P 65	11530-76	TONNE	10 5	SG				CIS	1 Sep 93	
1	12	RAIL MAT	LOCK WASHER P 50	19115 73	TONNE	8 4	SG				CIS	1 Sep 93	
1	13	RAIL MAT	TRACK SWITCH P50 RT		SET	7	SG				CIS	1 Sep 93	
1	14	RAIL MAT	TRACK SWITCH P65 LEFT		SET	7	SG				CIS	1 Sep 93	
1	15	RAIL MAT	Y RAIL P50-DIRECT LEFT		EA	3 5	SG				CIS	1 Sep 93	
1	16	RAIL MAT	Y RAIL P50-DIRECT RIGHT		EA	3 5	SG				CIS	1 Sep 93	
1	17	RAIL MAT	YRAIL P50 BENDED RIGHT		EA	3 5	SG				CIS	1 Sep 93	
1	18	RAIL MAT	RAIL INSOLATOR P50		SET	420	SG				CIS	1 Sep 93	
1	19	RAIL MAT	RAIL INSOLATOR P65		SET	385	SG				CIS	1 Sep 93	
1	20	RAIL MAT	CRESOTA SLEEPER		TONNE	7	SG				CIS	1 Sep 93	
1	21	RAIL MAT	TOTAL COST US DOLLARS				SG		$245 000		CIS	1 Sep 93	
1	1	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	BA				CIS	1 Sep 93	
1	1	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	BA				CIS	1 Jan 94	
1	2	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	BA				CIS	1 Sep 93	
1	2	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	BA				CIS	1 Jan 94	
1	3	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	BA				CIS	1 Sep 93	
1	3	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	BA				CIS	1 Jan 94	
1	4	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	BA				CIS	1 Sep 93	
1	4	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	BA				CIS	1 Jan 94	
1	5	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	5	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	BA				CIS	1 Jan 94	
1	6	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	BA				CIS	1 Sep 93	
1	6	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	BA				CIS	1 Jan 94	
1	7	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1 5	BA				CIS	1 Sep 93	
1	7	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1 5	BA				CIS	1 Jan 94	
1	8	RR COMM	ROAD TRANSFORMER	NFT A	EA	15	BA				CIS	1 Sep 93	
1	8	RR COMM	ROAD TRANSFORMER	NFT A	EA	15	BA				CIS	1 Jan 94	
1	9	RR COMM	ROAD TRANSPORMER	NOVC 5A	EA	15	BA				CIS	1 Sep 93	
1	9	RR COMM	ROAD TRANSPORMER	NOVC 5A	EA	15	BA				CIS	1 Jan 94	
1	10	RR COMM	SIGNAL TRANSFORMER	ST 6	EA	25	BA				CIS	1 Sep 93	
1	10	RR COMM	SIGNAL TRANSFORMER	ST 6	EA	25	BA				CIS	1 Jan 94	
1	11	RR COMM	SWITCH RELAY	2162 00-V	EA	25	BA				CIS	1 Sep 93	
1	11	RR COMM	SWITCH RELAY	2162 00 V	EA	25	BA				CIS	1 Jan 94	
1	12	RR COMM	RECTIFIER	86 00 00V	EA	25	BA				CIS	1 Sep 93	
1	12	RR COMM	RECTIFIER	86 00 00V	EA	25	BA				CIS	1 Jan 94	
1	13	RR COMM	RESISTOR	7165	EA	25	BA				CIS	1 Sep 93	
1	13	RR COMM	RESISTOR	7165	EA	25	BA				CIS	1 Jan 94	
1	14	RR COMM	SWITCHING GEAR BOX		EA	5	BA				CIS	1 Sep 93	
1	14	RR COMM	SWITCHING GEAR BOX		EA	5	BA				CIS	1 Jan 94	
1	15	RR COMM	LAMPS FOR LINZ		EA	250	BA				CIS	1 Sep 93	
1	15	RR COMM	LAMPS FOR LINZ		EA	250	BA				CIS	1 Jan 94	
1	16	RR COMM	FRAMEWORK	19402 00-00	EA	5	BA				CIS	1 Sep 93	
1	16	RR COMM	FRAMEWORK	19402 00-00	EA	5	BA				CIS	1 Jan 94	
1	17	RR COMM	BONDING WIRE	21 00 00	EA	25	BA				CIS	1 Sep 93	
1	17	RR COMM	BONDING WIRE	21 00-00	EA	25	BA				CIS	1 Jan 94	
1	18	RR COMM	CONTROL WIRE		EA	50	BA				CIS	1 Sep 93	
1	18	RR COMM	CONTROL WIRE		EA	50	BA				CIS	1 Jan 94	
1	19	RR COMM	LAMPS FOR TERM BD		EA	500	BA				CIS	1 Sep 93	
1	19	RR COMM	LAMPS FOR TERM BD		EA	500	BA				CIS	1 Jan 94	
1	20	RR COMM	SWITCHING RELAY SET	144690000A	EA	5	BA				CIS	1 Sep 93	
1	20	RR COMM	SWITCHING RELAY SET	144690000A	EA	5	BA				CIS	1 Jan 94	
1	21	RR COMM	INST FOR ELEC MEAS		EA	5	BA				CIS	1 Sep 93	
1	21	RR COMM	INST FOR ELEC MEAS		EA	5	BA				CIS	1 Jan 94	
1	22	RR COMM	RR LINZ LTS RED	26116-00-00	EA	25	BA				CIS	1 Sep 93	
1	22	RR COMM	RR LINZ LTS RED	26116-00-00	EA	25	BA				CIS	1 Jan 94	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	23	RR COMM	RR LINZ LTS GREEN	26116-00-00	EA	25	BA				CIS	1 Sep 93	
1	23	RR COMM	RR LINZ LTS GREEN	26116-00 00	EA	25	BA				CIS	1 Jan 94	
1	24	RR COMM	RR LINZ LTS WHITE	26116-00-00	EA	20	BA				CIS	1 Sep 93	
1	24	RR COMM	RR LINZ LTS WHITE	26116-00 00	EA	20	BA				CIS	1 Jan 94	
1	25	RR COMM	ELECTROMOTOR		EA	10	BA				CIS	1 Sep 93	
1	25	RR COMM	ELECTROMOTOR		EA	10	BA				CIS	1 Jan 94	
1	26	RR COMM	SWITCHING ARM		EA	15	BA				CIS	1 Sep 93	
1	26	RR COMM	SWITCHING ARM		EA	15	BA				CIS	1 Jan 94	
1	27	RR COMM	TOTAL COST US DOLLARS				BA		$4 000		CIS	1 Sep 93	
1	27	RR COMM	TOTAL COST US DOLLARS				BA		$4 000		CIS	1 Jan 94	
1	1	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	SG				CIS	1 Sep 93	
1	2	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	SG				CIS	1 Sep 93	
1	3	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1	SG				CIS	1 Sep 93	
1	4	RR COMM	SIGNAL CABLE	GOST6436 75	KM	2	SG				CIS	1 Sep 93	
1	5	RR COMM	SIGNAL CABLE	GOST6436 75	KM	2	SG				CIS	1 Sep 93	
1	6	RR COMM	SIGNAL CABLE	GOST6436 75	KM	2	SG				CIS	1 Sep 93	
1	7	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1 5	SG				CIS	1 Sep 93	
1	8	RR COMM	ROAD TRANSFORMER	NFT A	EA	15	SG				CIS	1 Sep 93	
1	9	RR COMM	ROAD TRANSPORMER	NOVC 5A	EA	15	SG				CIS	1 Sep 93	
1	10	RR COMM	SIGNAL TRANSFORMER	ST 6	EA	25	SG				CIS	1 Sep 93	
1	11	RR COMM	SWITCH RELAY	2162 00-V	EA	25	SG				CIS	1 Sep 93	
1	12	RR COMM	RECTIFIER	86-00 00V	EA	25	SG				CIS	1 Sep 93	
1	13	RR COMM	RESISTOR	7165	EA	25	SG				CIS	1 Sep 93	
1	14	RR COMM	SWITCHING GEAR BOX		EA	5	SG				CIS	1 Sep 93	
1	15	RR COMM	LAMPS FOR LINZ		EA	250	SG				CIS	1 Sep 93	
1	16	RR COMM	FRAMEWORK	19402 00 00	EA	5	SG				CIS	1 Sep 93	
1	17	RR COMM	BONDING WIRE	21 00 00	EA	25	SG				CIS	1 Sep 93	
1	18	RR COMM	CONTROL WIRE		EA	50	SG				CIS	1 Sep 93	
1	19	RR COMM	LAMPS FOR TERM BD		EA	500	SG				CIS	1 Sep 93	
1	20	RR COMM	SWITCHING RELAY SET	144690000A	EA	5	SG				CIS	1 Sep 93	
1	21	RR COMM	INST FOR ELEC MEAS		EA	5	SG				CIS	1 Sep 93	
1	22	RR COMM	RR LINZ LTS RED	26116-00-00	EA	25	SG				CIS	1 Sep 93	
1	23	RR COMM	RR LINZ LTS GREEN	26116-00-00	EA	25	SG				CIS	1 Sep 93	
1	24	RR COMM	RR LINZ LTS WHITE	26116-00-00	EA	20	SG				CIS	1 Sep 93	
1	25	RR COMM	ELECTROMOTOR		EA	10	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	26	RR COMM	SWITCHING ARM		EA	15	SG				CIS	1 Sep 93	
1	27	RR COMM	TOTAL COST US DOLLARS				SG		$6 000		CIS	1 Sep 93	
1	1	SM ENG PTS	ENGINE	D160	SET	2 25	OT				CIS	1 Sep 93	
1	2	SM ENG PTS	COTTER PINS	1434	EA	36	OT				CIS	1 Sep 93	
1	3	SM ENG PTS	COTTER PINS	2971	EA	36	OT				CIS	1 Sep 93	
1	4	SM ENG PTS	BLOCK ENGINE	51 01 2 cb	EA	2 25	OT				CIS	1 Sep 93	
1	5	SM ENG PTS	PACKING	40201	EA	7 5	OT				CIS	1 Sep 93	
1	6	SM ENG PTS	RINGS	40210	EA	75	OT				CIS	1 Sep 93	
1	7	SM ENG PTS	PACKING SETS UPPER	A 230113160 cbn1	SET	15	OT				CIS	1 Sep 93	
1	8	SM ENG PTS	PACKINGSETS LOWER	A230110311	SET	15	OT				CIS	1 Sep 93	
1	9	SM ENG PTS	PACKING SETS	A23 0110312 AN2	SET	15	OT				CIS	1 Sep 93	
1	10	SM ENG PTS	PACKING	14 02 101 cb	EA	15	OT				CIS	1 Sep 93	
1	11	SM ENG PTS	ENGINE REBUILD KIT	1 02 10 cp	SET	3	OT				CIS	1 Sep 93	
1	12	SM ENG PTS	GUSHING	03325	EA	7 5	OT				CIS	1 Sep 93	
1	13	SM ENG PTS	PACKING UPPER	023 02 10002 AN1	SET	15	OT				CIS	1 Sep 93	
1	14	SM ENG PTS	PACKING LOWER	A23 0 10004 DN1	ET	15	OT				CIS	1 Sep 93	
1	15	SM ENG PTS	RING SETS	A27 00 011	SET	22 5	OT				CIS	1 Sep 93	
1	16	SM ENG PTS	RING SETS	027 00 024	SET	22 5	OT				CIS	1 Sep 93	
1	17	SM ENG PTS	RING SETS	A27 00 043	SET	22 5	OT				CIS	1 Sep 93	
1	18	SM ENG PTS	PISTON RING SETS	03694 1 cp	SET	3	OT				CIS	1 Sep 93	
1	19	SM ENG PTS	GENERATOR BELT	5X9X1090	EA	15	OT				CIS	1 Sep 93	
1	20	SM ENG PTS	FAN BELTS	16X11X1650	EA	15	OT				CIS	1 Sep 93	
1	21	SM ENG PTS	WATER PUMP	16 08 140 cp	EA	7 5	OT				CIS	1 Sep 93	
1	22	SM ENG PTS	OIL PUMP	29 09 124 cp	EA	6	OT				CIS	1 Sep 93	
1	23	SM ENG PTS	CYLINDER LINER	01466	EA	9	OT				CIS	1 Sep 93	
1	24	SM ENG PTS	RING SETS	51 03 115 cp	EA	75	OT				CIS	1 Sep 93	
1	25	SM ENG PTS	CRANKSHAFT	16 03 1120 cp	EA	3	OT				CIS	1 Sep 93	
1	26	SM ENG PTS	PISTON	51 03 103	SET	7 5	OT				CIS	1 Sep 93	
1	27	SM ENG PTS	PACKING	700 40-2886	EA	15	OT				CIS	1 Sep 93	
1	28	SM ENG PTS	FILTER	A41 20 000-1 cp	EA	30	OT				CIS	1 Sep 93	
1	29	SM ENG PTS	FILTER	A41 10 000 02	EA	30	OT				CIS	1 Sep 93	
1	30	SM ENG PTS	RING	40843	EA	75	OT				CIS	1 Sep 93	
1	31	SM ENG PTS	PACKING	40269	EA	7 5	OT				CIS	1 Sep 93	
1	32	SM ENG PTS	SPRAYER	14 69 107 1 cp	EA	75	OT				CIS	1 Sep 93	
1	33	SM ENG PTS	INJECTOR FITTINGS	14 69 117 1 cp	EA	75	OT				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	34	SM ENG PTS	CYLINDER HEAD	29 02 30 cp	EA	2 25	OT				CIS	1 Sep 93	
1	35	SM ENG PTS	STARTER	1723 cp	EA	2 25	OT				CIS	1 Sep 93	
1	36	SM ENG PTS	RADIATOR	1304130101 cp	EA	7 5	OT				CIS	1 Sep 93	
1	37	SM ENG PTS	MAGNETO	M 149A	EA	7 5	OT				CIS	1 Sep 93	
1	38	SM ENG PTS	CARBURATOR	113 110-70-11	EA	7 5	OT				CIS	1 Sep 93	
1	39	SM ENG PTS	GENERATOR	69 063701	EA	6	OT				CIS	1 Sep 93	
1	40	SM ENG PTS	STARTER	CT 230E	EA	6	OT				CIS	1 Sep 93	
1	41	SM ENG PTS	TRUBO COMPRESSOR	111 30 001 10	EA	4 5	OT				CIS	1 Sep 93	
1	42	SM ENG PTS	FUEL SYSTEM UPPER	16 67 1 cp	EA	4 5	OT				CIS	1 Sep 93	
1	43	SM ENG PTS	TOTAL COST US DOLLARS				OT		$90 000		CIS	1 Sep 93	
1	2	T250 DOZER	TRACK ASSEMBLEY	748 27 TOT CP	SET	2	AD				CIS	1 Sep 93	
1	1	WATER P	PUMP CENTRIFUGE	SNC 180 65	EA	0 6	SG				CIS	1 Sep 93	
1	2	WATER P	PUMP CENTRIFUGE	D 1250 65	EA	0 6	SG				CIS	1 Sep 93	
1	3	WATER P	PUMP CENTRIFUGE	D 200-95	EA	0 6	SG				CIS	1 Sep 93	
1	4	WATER P	PUMP CENTRIFUGE	NSC 3	EA	1 2	SG				CIS	1 Sep 93	
1	5	WATER P	IMPELLOR		EA	1 8	SG				CIS	1 Sep 93	
1	6	WATER P	IMPELLOR	5KE 224 176A	EA	12	SG				CIS	1 Sep 93	
1	7	WATER P	SHAFT	8KE 200 525 01A	EA	3	SG				CIS	1 Sep 93	
1	8	WATER P	SHAFT	EB 205 320	EA	3	SG				CIS	1 Sep 93	
1	9	WATER P	SHAFT	EB 205 320	EA	3	SG				CIS	1 Sep 93	
1	10	WATER P	COLLAR	1 35 58 2 GOCT 8752 70	EA	6	SG				CIS	1 Sep 93	
1	11	WATER P	SPARING	8KE 211 023	EA	3 6	SG				CIS	1 Sep 93	
1	12	WATER P	BEARING	5KS 253 013	EA	3 6	SG				CIS	1 Sep 93	
1	13	WATER P	IMPELLOR	5KE 224 014	EA	3 6	SG				CIS	1 Sep 93	
1	14	WATER P	SPARING	8KS 210 095	EA	3 6	SG				CIS	1 Sep 93	
1	15	WATER P	COUPLING	8KS 255 000	EA	1 8	SG				CIS	1 Sep 93	
1	16	WATER P	PUMP	VKC 1/16	EA	1 2	SG				CIS	1 Sep 93	
1	17	WATER P	PUMP PART	0G 81/18	EA	0 6	SG				CIS	1 Sep 93	
1	18	WATER P	PUMP CENTRIFUGE	D 320-50	EA	0 6	SG				CIS	1 Sep 93	
1	19	WATER P	PUMP CENTRIFUGE	D 1250 65	EA	1 2	SG				CIS	1 Sep 93	
1	20	WATER P	PUMP PART	GNOM 10 10	EA	2 4	SG				CIS	1 Sep 93	
1	21	WATER P	PUMP PART	NSC 3	EA	0 6	SG				CIS	1 Sep 93	
1	22	WATER P	PUMP PART	FG 144/46	EA	1 2	SG				CIS	1 Sep 93	
1	23	WATER P	PUMP CENTRIFUGE	SHCGA 38 220	EA	1 2	SG				CIS	1 Sep 93	
1	24	WATER P	PUMP CENTRIFUGE	K 20-30	EA	4 8	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	25	WATER P	PUMP CENTRIFUGE	K 45/55	EA	2 4	SG				CIS	1 Sep 93	
1	26	WATER P	PUMP CENTRIFUGE	SNC 400-105	EA	0 6	SG				CIS	1 Sep-93	
1	27	WATER P	PUMP CENTRIFUGE	SNC 240-300	EA	0 6	SG				CIS	1 Sep 93	
1	28	WATER P	PUMP PART	ESB-6-16-75	EA	0 6	SG				CIS	1 Sep 93	
1	29	WATER P	PUMP PART	ESB 8-40-165	EA	1 2	SG				CIS	1 Sep 93	
1	30	WATER P	PUMP PART	ESB-10-120 60	EA	1 2	SG				CIS	1 Sep 93	
1	31	WATER P	PUMP PART	ESB-10 120 60	EA	3	SG				CIS	1 Sep 93	
1	32	WATER P	TOTAL COST US DOLLARS				SG		$150 000		CIS	1 Sep 93	
1	1	WATER P	PUMP CENTRIFUGE	SNC 180 65	EA	0 4	SO				CIS	1 Sep 93	
1	2	WATER P	PUMP CENTRIFUGE	D 1250 65	EA	0 4	SO				CIS	1 Sep 93	
1	3	WATER P	PUMP CENTRIFUGE	D 200-95	EA	0 4	SO				CIS	1 Sep 93	
1	4	WATER P	PUMP CENTRIFUGE	NSC 3	EA	0 8	SO				CIS	1 Sep 93	
1	5	WATER P	IMPELLOR		EA	1 2	SO				CIS	1 Sep 93	
1	6	WATER P	IMPELLOR	5KE 224 176A	EA	8	SO				CIS	1 Sep 93	
1	7	WATER P	SHAFT	8KE 200 525 01A	EA	2	SO				CIS	1 Sep 93	
1	8	WATER P	SHAFT	EB 205 320	EA	2	SO				CIS	1 Sep 93	
1	9	WATER P	SHAFT	EB 205 320	EA	2	SO				CIS	1 Sep 93	
1	10	WATER P	COLLAR	1 35 58 2 GOCT 6752 70	EA	4	SO				CIS	1 Sep 93	
1	11	WATER P	SPARING	8KE 211 023	EA	2 4	SO				CIS	1 Sep 93	
1	12	WATER P	BEARING	5KS 253 013	EA	2 4	SO				CIS	1 Sep 93	
1	13	WATER P	IMPELLOR	5KE 224 014	EA	2 4	SO				CIS	1 Sep 93	
1	14	WATER P	SPARING	8KS 210 095	EA	2 4	SO				CIS	1 Sep 93	
1	15	WATER P	COUPLING	8KS 255 000	EA	1 2	SO				CIS	1 Sep 93	
1	16	WATER P	PUMP	VKC 1/16	EA	0 8	SO				CIS	1 Sep 93	
1	17	WATER P	PUMP PART	0G 81/18	EA	0 4	SO				CIS	1 Sep 93	
1	18	WATER P	PUMP CENTRIFUGE	D 320-50	EA	0 4	SO				CIS	1 Sep 93	
1	19	WATER P	PUMP CENTRIFUGE	D 1250 65	EA	0 8	SO				CIS	1 Sep 93	
1	20	WATER P	PUMP PART	GNOM 10-10	EA	1 6	SO				CIS	1 Sep 93	
1	21	WATER P	PUMP PART	NSC 3	EA	0 4	SO				CIS	1 Sep 93	
1	22	WATER P	PUMP PART	FG 144/46	EA	0 8	SO				CIS	1 Sep 93	
1	23	WATER P	PUMP CENTRIFUGE	SHCGA 38 220	EA	0 8	SO				CIS	1 Sep 93	
1	24	WATER P	PUMP CENTRIFUGE	K 20-30	EA	3 2	SO				CIS	1 Sep 93	
1	25	WATER P	PUMP CENTRIFUGE	K 45/55	EA	1 6	SO				CIS	1 Sep 93	
1	26	WATER P	PUMP CENTRIFUGE	SNC 400-105	EA	0 4	SO				CIS	1 Sep 93	
1	27	WATER P	PUMP CENTRIFUGE	SNC 240-300	EA	0 4	SO				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
1	28	WATER P	PUMP PART	ESB-6-16-75	EA	0 4	SO				CIS	1 Sep 93	
1	29	WATER P	PUMP PART	ESB-8-40-165	EA	0 8	SO				CIS	1 Sep 93	
1	30	WATER P	PUMP PART	ESB 10-120-60	EA	0 8	SO				CIS	1 Sep 93	
1	31	WATER P	PUMP PART	ESB 10-120-60	EA	2	SO				CIS	1 Sep 93	
1	32	WATER P	TOTAL COST US DOLLARS				SO		$100 000		CIS	1 Sep 93	
2	1	DRILL PARTS	TRACK PADS	31 001 008 34	SET	30	SG				CIS	1 Sep 93	
2	2	DRILL PARTS	TRACK RAILS	31 001 008 000	EA	1	SG				CIS	1 Sep 93	
2	3	DRILL PARTS	LEVELING JACKS	B59 14 240	EA	3 5	SG				CIS	1 Sep 93	
2	4	DRILL PARTS	SPROCKET	31C 152 012 06	EA	2	SG				CIS	1 Sep 93	
2	5	DRILL PARTS	SPROCKET	B59 14 052	EA	2	SG				CIS	1 Sep 93	
2	6	DRILL PARTS	SHOCK ABSORBER	B122 22 11 015	EA	5	SG				CIS	1 Sep 93	
2	7	DRILL PARTS	SHOCK ABSORBER	B122 22 00 155	EA	3	SG				CIS	1 Sep 93	
2	8	DRILL PARTS	COMPRESSOR SUPP	B122 0017 000	EA	0 5	SG				CIS	1 Sep 93	
2	9	DRILL PARTS	CARTRIDGE	10 10 080	EA	2	SG				CIS	1 Sep 93	
2	10	DRILL PARTS	DRILL STEEL	722 22 11 00	EA	2	SG				CIS	1 Sep 93	
2	11	DRILL PARTS	BUSHING	31 001 008 037	EA	30	SG				CIS	1 Sep 93	
2	12	DRILL PARTS	BUSHING	31 001 008 102	EA	30	SG				CIS	1 Sep 93	
2	13	DRILL PARTS	HYD DISTRIBUTOR	R102 A4 A222 50	EA	5	SG				CIS	1 Sep 93	
2	14	DRILL PARTS	HYD PUMP	61 12 22	EA	3	SG				CIS	1 Sep 93	
2	15	DRILL PARTS	3 SPEED MOTOR		EA	2 5	SG				CIS	1 Sep 93	
2	16	DRILL PARTS	PULL DOWN CABLE	3X50+1X16	M	300	SG				CIS	1 Sep 93	
2	17	DRILL PARTS	HYD PUMP	N 403E TY2 653260 70	EA	2 5	SG				CIS	1 Sep 93	
2	18	DRILL PARTS	HYD PUMP	BG 12 22 MI TY2 05	EA	5	SG				CIS	1 Sep 93	
2	19	DRILL PARTS	TOTAL COST US DOLLARS				SG		$150 000		CIS	1 Sep 93	
2	1	ELE MOTOR	20/90 DRAGLINE	AO2 72 4Y2 30 KVT	EA	2	BA				CIS	1 Jan 94	
2	2	ELE MOTOR	20/90 DRAGLINE	AO2 72 4Y2 22 KVT	EA	2	BA				CIS	1 Jan 94	
2	3	ELE MOTOR	20/90 DRAGLINE	MPE 1000-630 YXLE	EA	2	BA				CIS	1 Jan 94	
2	4	ELE MOTOR	20/90 DRAGLINE	HOISE GENERATOR	EA	5	BA				CIS	1 Jan 94	
2	5	ELE MOTOR	10/70-13/50 DRAGLINE	GENERATOR	EA	3	BA				CIS	1 Jan 94	
2	6	ELE MOTOR	10/70 13/50 DRAGLINE	SYNC MOTOR	EA	10	BA				CIS	1 Sep 93	
2	7	ELE MOTOR	10/70-13/50 DRAGLINE	EXCITER MOTOR	EA	8	BA				CIS	1 Jan 94	
2	8	ELE MOTOR	10/70-13/50 DRAGLINE	EXCITER MOTOR	EA	4	BA				CIS	1 Jan 94	
2	9	ELE MOTOR	10/70-13/50 DRAGLINE	GENERATOR	EA	2	BA				CIS	1 Jan 94	
2	15	ELE MOTOR	MISC ELEC MOTORS	BAO 61 4 13KVT	EA	1	BA				CIS	1 Jan 94	
2	16	ELE MOTOR	MISC ELEC MOTORS	BAO 62 4 17KVT	EA	1	BA				CIS	1 Jan 94	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	17	ELE MOTOR	MISC ELEC MOTORS	BAO 71 4 22KVT	EA	1	BA				CIS	1 Jan 94	
2	18	ELE MOTOR	MISC ELEC MOTORS	BAO 72 4 30KVT	EA	1	BA				CIS	1 Jan 94	
2	19	ELE MOTOR	MISC ELEC MOTORS	BAO 82 4 55KVT	EA	1	BA				CIS	1 Jan 94	
2	20	ELE MOTOR	MISC ELEC MOTORS	BAO 180M4 30KVT	EA	2	BA				CIS	1 Jan 94	
2	21	ELE MOTOR	MISC ELEC MOTORS	BAO 62 6 13KVT	EA	1	BA				CIS	1 Jan 94	
2	22	ELE MOTOR	MISC ELEC MOTORS	BAO 72 6 22KVT	EA	2	BA				CIS	1 Jan 94	
2	31	ELE MOTOR	ELEC MOTORS	MTKE 4AC18054	EA	1	BA				CIS	1 Jan 94	
2	32	ELE MOTOR	ELEC MOTORS	MTKE 4A10024YE	EA	1	BA				CIS	1 Jan 94	
2	33	ELE MOTOR	ELEC MOTORS	MTKE 4A71A2YE	EA	1	BA				CIS	1 Jan 94	
2	10	ELE MOTOR	EKG 8i & 4U SHOVEL	HOIST MOTOR	EA	10	SG				CIS	1 Jan 94	
2	11	ELE MOTOR	EKG 8i & 4U SHOVEL	VEN FAN MOTOR	EA	8	SG				CIS	1 Jan 94	
2	12	ELE MOTOR	EKG 8i & 4U SHOVEL	SW OIL PUMP MOT	EA	4	SG				CIS	1 Jan 94	
2	13	ELE MOTOR	EKG 8i & 4U SHOVEL	FAN M FOR GEN	EA	4	SG				CIS	1 Jan 94	
2	14	ELE MOTOR	EKG 8i & 4U SHOVEL	AIR COMP ELEC MO	EA	2	SG				CIS	1 Jan 94	
2	23	ELE MOTOR	MISC ELEC MOTORS	BAO 81 6 30KVT	EA	1	SG				CIS	1 Jan 94	
2	24	ELE MOTOR	MISC ELEC MOTORS	BAO 82 6 40KVT	EA	1	SG				CIS	1 Jan 94	
2	25	ELE MOTOR	MISC ELEC MOTORS	BAP 160M6 15KVT	EA	1	SG				CIS	1 Jan 94	
2	26	ELE MOTOR	MISC ELEC MOTORS	BAO 81 8Y2 22KVT	EA	1	SG				CIS	1 Jan 94	
2	27	ELE MOTOR	MISC ELEC MOTORS	WOUND MOTOR	EA	1	SG				CIS	1 Jan 94	
2	28	ELE MOTOR	MISC ELEC MOTORS	HOIST	EA	1	SG				CIS	1 Jan 94	
2	29	ELE MOTOR	MISC ELEC MOTORS	A/C ELECT MOTOR	EA	5	SG				CIS	1 Jan 94	
2	30	ELE MOTOR	MISC ELEC MOTORS	A/C ELECT MOTOR	EA	1	SG				CIS	1 Jan 94	
2	34	ELE MOTOR	ELEC MOTORS	MTKE 4A33556YE	EA	1	SG				CIS	1 Jan 94	
2	35	ELE MOTOR	ELEC MOTORS	MTKE 4AM200M6YE	EA	2	SG				CIS	1 Jan 94	
2	36	ELE MOTOR	ELEC MOTORS	MTKE AO2 12/8/6/4	EA	1	SG				CIS	1 Jan 94	
2	38	ELEC EQUIP	SINGLE SHAFT EL MO	DE 816Y2	EA	2	BA				CIS	1 Jan 94	
2	39	ELEC EQUIP	HORIZ MOTOR	DEB 12	EA	2	BA				CIS	1 Jan 94	
2	44	ELEC EQUIP	GEN 30KW 115V 261 A	MIXED BOOSTER	EA	2	BA				CIS	1 Sep 93	
2	40	ELEC EQUIP	TWO SHAFT MOTOR	DPE 52 60	EA	3	SG				CIS	1 Jan 94	
2	41	ELEC EQUIP	DC GENERATOR	VP 250M94	EA	1	SG				CIS	1 Jan 94	
2	42	ELEC EQUIP	HI VOLT/VACUM BREK	2KVE 6-630	EA	1	SG				CIS	1 Jan 94	
2	43	ELEC EQUIP	RING TYPE CURR REC	TK3 12 492	EA	2	SG				CIS	1 Jan 94	
2	45	ELEC EQUIP	GEN 30KW 115V 261 A	INDEP BOOSTER	EA	1	SG				CIS	1 Sep 93	
2	1	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	SG				CIS	1 Jan 94	
2	2	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	SG				CIS	1 Jan 94	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	3	RR COMM	SIGNAL CABLE	GOST6436-75	KM	1	SG				CIS	1 Jan 94	
2	4	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	SG				CIS	1 Jan 94	
2	5	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	SG				CIS	1 Jan 94	
2	6	RR COMM	SIGNAL CABLE	GOST6436-75	KM	2	SG				CIS	1 Jan 94	
2	7	RR COMM	SIGNAL CABLE	GOST6436 75	KM	1 5	SG				CIS	1 Jan 94	
2	8	RR COMM	ROAD TRANSFORMER	NFT A	EA	15	SG				CIS	1 Jan 94	
2	9	RR COMM	ROAD TRANSPORMER	NOVC 5A	EA	15	SG				CIS	1 Jan 94	
2	10	RR COMM	SIGNAL TRANSFORMER	ST 6	EA	25	SG				CIS	1 Jan 94	
2	11	RR COMM	SWITCH RELAY	2162 00-V	EA	25	SG				CIS	1 Jan 94	
2	12	RR COMM	RECTIFIER	86-00 00V	EA	25	SG				CIS	1 Jan 94	
2	13	RR COMM	RESISTOR	7165	EA	25	SG				CIS	1 Jan 94	
2	14	RR COMM	SWITCHING GEAR BOX		EA	5	SG				CIS	1 Jan 94	
2	15	RR COMM	LAMPS FOR LINZ		EA	250	SG				CIS	1 Jan 94	
2	16	RR COMM	FRAMEWORK	19402 00-00	EA	5	SG				CIS	1 Jan 94	
2	17	RR COMM	BONDING WIRE	21 00 00	EA	25	SG				CIS	1 Jan 94	
2	18	RR COMM	CONTROL WIRE		EA	50	SG				CIS	1 Jan 94	
2	19	RR COMM	LAMPS FOR TERM BD		EA	500	SG				CIS	1 Jan 94	
2	20	RR COMM	SWITCHING RELAY SET	144690000A	EA	5	SG				CIS	1 Jan 94	
2	21	RR COMM	INST FOR ELEC MEAS		EA	5	SG				CIS	1 Jan 94	
2	22	RR COMM	RR LINZ LTS RED	26116 00 00	EA	25	SG				CIS	1 Jan 94	
2	23	RR COMM	RR LINZ LTS GREEN	26116-00-00	EA	25	SG				CIS	1 Jan 94	
2	24	RR COMM	RR LINZ LTS WHITE	26116-00 00	EA	20	SG				CIS	1 Jan 94	
2	25	RR COMM	ELECTROMOTOR		EA	10	SG				CIS	1 Jan 94	
2	26	RR COMM	SWITCHING ARM		EA	15	SG				CIS	1 Jan 94	
2	27	RR COMM	TOTAL COST US DOLLARS				SG		$6 000		CIS	1 Jan 94	
2	1	SM ENG PTS	ENGINE	D160	SET	0 75	SO				CIS	1 Sep 93	
2	2	SM ENG PTS	COTTER PINS	1434	EA	12	SO				CIS	1 Sep 93	
2	3	SM ENG PTS	COTTER PINS	2971	EA	12	SO				CIS	1 Sep 93	
2	4	SM ENG PTS	BLOCK ENGINE	51 01 2 cb	EA	0 75	SO				CIS	1 Sep 93	
2	5	SM ENG PTS	PACKING	40201	EA	2 5	SO				CIS	1 Sep 93	
2	6	SM ENG PTS	RINGS	40210	EA	25	SO				CIS	1 Sep 93	
2	7	SM ENG PTS	PACKING SETS UPPER	A 230113160 cbn1	SET	5	SO				CIS	1 Sep 93	
2	8	SM ENG PTS	PACKINGSETS LOWER	A230110311	SET	5	SO				CIS	1 Sep 93	
2	9	SM ENG PTS	PACKING SETS	A23 0110312 AN2	SET	5	SO				CIS	1 Sep 93	
2	10	SM ENG PTS	PACKING	14 02 101 cb	EA	5	SO				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	11	SM ENG PTS	ENGINE REBUILD KIT	1 02 10 cp	SET	1	SO				CIS	1 Sep 93	
2	12	SM ENG PTS	GUSHING	03325	EA	2 5	SO				CIS	1 Sep 93	
2	13	SM ENG PTS	PACKING UPPER	023 02 10002 AN1	SET	5	SO				CIS	1 Sep 93	
2	14	SM ENG PTS	PACKING LOWER	A23 0 10004 DN1	ET	5	SO				CIS	1 Sep 93	
2	15	SM ENG PTS	RING SETS	A27 00 011	SET	7 5	SO				CIS	1 Sep 93	
2	16	SM ENG PTS	RING SETS	027 00 024	SET	7 5	SO				CIS	1 Sep 93	
2	17	SM ENG PTS	RING SETS	A27 00 043	SET	7 5	SO				CIS	1 Sep 93	
2	18	SM ENG PTS	PISTON RING SETS	03694 1 cp	SET	1	SO				CIS	1 Sep 93	
2	19	SM ENG PTS	GENERATOR BELT	5X9X1090	EA	5	SO				CIS	1 Sep 93	
2	20	SM ENG PTS	FAN BELTS	16X11X1650	EA	5	SO				CIS	1 Sep 93	
2	21	SM ENG PTS	WATER PUMP	16 08 140 cp	EA	2 5	SO				CIS	1 Sep 93	
2	22	SM ENG PTS	OIL PUMP	29 09 124 cp	EA	2	SO				CIS	1 Sep 93	
2	23	SM ENG PTS	CYLINDER LINER	01466	EA	3	SO				CIS	1 Sep 93	
2	24	SM ENG PTS	RING SETS	51 03 115 cp	EA	25	SO				CIS	1 Sep 93	
2	25	SM ENG PTS	CRANKSHAFT	16 03-1120 cp	EA	1	SO				CIS	1 Sep 93	
2	26	SM ENG PTS	PISTON	51 03 103	SET	2 5	SO				CIS	1 Sep 93	
2	27	SM ENG PTS	PACKING	700 40 2886	EA	5	SO				CIS	1 Sep 93	
2	28	SM ENG PTS	FILTER	A41 20 000-1 cp	EA	10	SO				CIS	1 Sep 93	
2	29	SM ENG PTS	FILTER	A41 10 000 02	EA	10	SO				CIS	1 Sep 93	
2	30	SM ENG PTS	RING	40843	EA	25	SO				CIS	1 Sep 93	
2	31	SM ENG PTS	PACKING	40269	EA	2 5	SO				CIS	1 Sep 93	
2	32	SM ENG PTS	SPRAYER	14 69 107 1 cp	EA	25	SO				CIS	1 Sep 93	
2	33	SM ENG PTS	INJECTOR FITTINGS	14 69 117 1 cp	EA	25	SO				CIS	1 Sep 93	
2	34	SM ENG PTS	CYLINDER HEAD	29 02 30 cp	EA	0 75	SO				CIS	1 Sep 93	
2	35	SM ENG PTS	STARTER	1723 cp	EA	0 75	SO				CIS	1 Sep 93	
2	36	SM ENG PTS	RADIATOR	1304130101 cp	EA	2 5	SO				CIS	1 Sep 93	
2	37	SM ENG PTS	MAGNETO	M 149A	EA	2 5	SO				CIS	1 Sep 93	
2	38	SM ENG PTS	CARBURATOR	113 110-70-11	EA	2 5	SO				CIS	1 Sep 93	
2	39	SM ENG PTS	GENERATOR	69 063701	EA	2	SO				CIS	1 Sep 93	
2	40	SM ENG PTS	STARTER	CT 230E	EA	2	SO				CIS	1 Sep 93	
2	41	SM ENG PTS	TRUBO COMPRESSOR	111 30 001 10	EA	1 5	SO				CIS	1 Sep 93	
2	42	SM ENG PTS	FUEL SYSTEM UPPER	16 67 1 cp	EA	1 5	SO				CIS	1 Sep 93	
2	43	SM ENG PTS	TOTAL COST US DOLLARS				SO		$30 000		CIS	1 Sep 93	
2	1	T250 DOZER	HOSE	700-40-3505	EA	2	AD				CIS	1 Sep 93	
2	3	T250 DOZER	PINS TRACK	748-22 6	EA	10	AD				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	4	T250 DOZER	REGULATOR RELAY		EA	2	AD				CIS	1 Sep 93	
2	5	T250 DOZER	ELEMENT	CB-3329 00-6G	EA	48	AD				CIS	1 Sep 93	
2	6	T250 DOZER	PUMP	933 02 06	EA	1	AD				CIS	1 Sep 93	
2	7	T250 DOZER	FILTER HOUSING	748 05 T20 CP	EA	2	AD				CIS	1 Sep 93	
2	8	T250 DOZER	FILTER HOUSING	748 65 272 CP	EA	2	AD				CIS	1 Sep 93	
2	9	T250 DOZER	ELEMENT	54 57 020A	EA	10	AD				CIS	1 Sep 93	
2	10	T250 DOZER	PUMP	BNK 12	EA	2	AD				CIS	1 Sep 93	
2	11	T250 DOZER	TOTAL COST US DOLLARS				AD		$45 000		CIS	1 Sep 93	
2	1	YM2 PARTS	CYLINDER	240H 1004008 D	EA	132	BA				CIS	1 Sep 93	
2	2	YM2 PARTS	CRANK SHAFT	240 1000107 B6	EA	4	BA				CIS	1 Sep 93	
2	3	YM2 PARTS	RINGS	236-1000106-B4	EA	132	BA				CIS	1 Sep 93	
2	4	YM2 PARTS	PACKING	240 1000104 B2	EA	10	BA				CIS	1 Sep 93	
2	5	YM2 PARTS	PACKING	240 1000104 P2	EA	5	BA				CIS	1 Sep 93	
2	6	YM2 PARTS	PACKING	240-1000104 P1	EA	5	BA				CIS	1 Sep 93	
2	7	YM2 PARTS	SEAL	240-1003213 A3	EA	100	BA				CIS	1 Sep 93	
2	8	YM2 PARTS	PUMP	240-1011014	EA	3	BA				CIS	1 Sep 93	
2	9	YM2 PARTS	ELEMENT	240 1017038	EA	500	BA				CIS	1 Sep 93	
2	10	YM2 PARTS	ELEMENT	238H 1109080	EA	50	BA				CIS	1 Sep 93	
2	11	YM2 PARTS	TURBOCOMPRESSOR	240H 1118010 B	EA	4	BA				CIS	1 Sep 93	
2	12	YM2 PARTS	TURBOCOMPRESSOR	240H 1118011B	EA	4	BA				CIS	1 Sep 93	
2	13	YM2 PARTS	BLOCK CYLINDER	240H 1002012H	EA	1	BA				CIS	1 Sep 93	
2	14	YM2 PARTS	PUMP	9016111008 02	EA	1	BA				CIS	1 Sep 93	
2	15	YM2 PARTS	SPRAY INJECTOR	26161112110	EA	60	BA				CIS	1 Sep 93	
2	16	YM2 PARTS	RING	236 1002024A	EA	100	BA				CIS	1 Sep 93	
2	17	YM2 PARTS	RING	236 1002040	EA	50	BA				CIS	1 Sep 93	
2	18	YM2 PARTS	ELEMENT FILTER	240T 1017040 A3	EA	100	BA				CIS	1 Sep 93	
2	19	YM2 PARTS	ELEMENT	201T 1105540	EA	100	BA				CIS	1 Sep 93	
2	20	YM2 PARTS	RINGS	236 1004002 A3	EA	48	BA				CIS	1 Sep 93	
2	21	YM2 PARTS	PACKING SEALS	240 1008098	EA	5	BA				CIS	1 Sep 93	
2	22	YM2 PARTS	PACKING SEALS	240T 1009040 A2	EA	5	BA				CIS	1 Sep 93	
2	23	YM2 PARTS	FUEL PUMP	1111008 20	EA	1	BA				CIS	1 Sep 93	
2	24	YM2 PARTS	ELEMENT	201 1117038 A2	EA	250	BA				CIS	1 Sep 93	
2	25	YM2 PARTS	PUMP	240 1307010-A	EA	2 5	BA				CIS	1 Sep 93	
2	26	YM2 PARTS	GENERATOR	45 7371 0209	EA	1 5	BA				CIS	1 Sep 93	
2	27	YM2 PARTS	STARTER	45 7375 1471	EA	1 5	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	28	YM2 PARTS	TOTAL COST US DOLLARS				BA		$12 500		CIS	1 Sep 93	
3	1	T130 DOZER	PACKING	2301103160 CBN 1	EA	3	BA				CIS	1 Sep 93	
3	2	T130 DOZER	THIMBLE ?	01466-2	EA	10	BA				CIS	1 Sep 93	
3	3	T130 DOZER	RINGS	51 03-115 CP	EA	10	BA				CIS	1 Sep 93	
3	4	T130 DOZER	CRANKSHAFT	16-03 126 CP	EA	0 6	BA				CIS	1 Sep 93	
3	5	T130 DOZER	CYLINDER	51 03 23	EA	10	BA				CIS	1 Sep 93	
3	6	T130 DOZER	HYDRALIC SEAL	700 40-2889	EA	4 8	BA				CIS	1 Sep 93	
3	7	T130 DOZER	FILTER	F A41 20 000 01 CP	EA	10	BA				CIS	1 Sep 93	
3	8	T130 DOZER	FILTER	A41 10 000 02 CP	EA	10	BA				CIS	1 Sep 93	
3	9	T130 DOZER	RING	40843	EA	10	BA				CIS	1 Sep 93	
3	10	T130 DOZER	PACKING	40269	EA	3	BA				CIS	1 Sep 93	
3	11	T130 DOZER	GEAR PINION	74116	EA	0 3	BA				CIS	1 Sep 93	
3	12	T130 DOZER	REDUCTION GEAR	17 76 8 CP	EA	0 1	BA				CIS	1 Sep 93	
3	13	T130 DOZER	FUEL INJECTORS	17 69 107 1 CP	EA	10	BA				CIS	1 Sep 93	
3	14	T130 DOZER	SPRAYER	14 69 117 1 CP	EA	10	BA				CIS	1 Sep 93	
3	15	T130 DOZER	PUMP	51 67 11 CP	EA	0 3	BA				CIS	1 Sep 93	
3	16	T130 DOZER	COMPRESSOR PIPING	92 000-06	EA	1	BA				CIS	1 Sep 93	
3	17	T130 DOZER	AIR INLET	N036 85 770	EA	0 9	BA				CIS	1 Sep 93	
3	18	T130 DOZER	WATER PUMP	16 8 140-CP	EA	1	BA				CIS	1 Sep 93	
3	19	T130 DOZER	OIL PUMP	29 09 124 CP	EA	1	BA				CIS	1 Sep 93	
3	20	T130 DOZER	HYDRALIC PUMP	NS 100A 3 P	EA	0 6	BA				CIS	1 Sep 93	
3	21	T130 DOZER	PUMP	NS 32 Y WP	EA	0 2	BA				CIS	1 Sep 93	
3	22	T130 DOZER	GEAR BOX	24 12 1 CP	EA	0 2	BA				CIS	1 Sep 93	
3	23	T130 DOZER	FILTER	A23 30 000 01	EA	5	BA				CIS	1 Sep 93	
3	24	T130 DOZER	PACKING SEALS	700 40-2049	EA	3	BA				CIS	1 Sep 93	
3	25	T130 DOZER	CARBURATOR	113 1107011	EA	1 2	BA				CIS	1 Sep 93	
3	26	T130 DOZER	SUPPORT BRACKET	51 07 102 CP	EA	0 4	BA				CIS	1 Sep 93	
3	27	T130 DOZER	ENGINE HEAD	07146 1 CP	EA	0 6	BA				CIS	1 Sep 93	
3	28	T130 DOZER	FUEL SYS CENTRIFUGE	95000	EA	0 5	BA				CIS	1 Sep 93	
3	29	T130 DOZER	FAN BLADES	51 08-113 CP	EA	0 4	BA				CIS	1 Sep 93	
3	30	T130 DOZER	RADIATOR	130Y 13 010-1	EA	1	BA				CIS	1 Sep 93	
3	31	T130 DOZER	BRAKE DISC	736 4 CP	EA	1 5	BA				CIS	1 Sep 93	
3	32	T130 DOZER	MAGNET SOLENOID	M149 A3	EA	1 4	BA				CIS	1 Sep 93	
3	33	T130 DOZER	STARTER	ST 230M	EA	1 4	BA				CIS	1 Sep 93	
3	34	T130 DOZER	GENERATOR	70-3701	EA	0 5	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	35	T130 DOZER	RELAY STARTER	RR 0362B1	EA	1 5	BA				CIS	1 Sep 93	
3	36	T130 DOZER	DISTRIBUTOR	R 150-A3T001	EA	0 3	BA				CIS	1 Sep 93	
3	37	T130 DOZER	DRIVE SHAFT	50-14 113	EA	0 2	BA				CIS	1 Sep 93	
3	38	T130 DOZER	CYLINDER POWER	18-26-270 CP	EA	0 5	BA				CIS	1 Sep 93	
3	39	T130 DOZER	CYLINDER	DP 26-C 06-140	EA	0 2	BA				CIS	1 Sep 93	
3	40	T130 DOZER	ELEMENT FILTER	EF 01 00 CP	EA	14	BA				CIS	1 Sep 93	
3	41	T130 DOZER	PUMP BRAKE	14 71 3 CP	EA	0 3	BA				CIS	1 Sep 93	
3	42	T130 DOZER	MECH	17 74 8 CP	EA	0 2	BA				CIS	1 Sep 93	
3	43	T130 DOZER	SUPPORT	17 74 284	EA	0 4	BA				CIS	1 Sep 93	
3	44	T130 DOZER	SHAFT	16-74 10 CP	EA	0 3	BA				CIS	1 Sep 93	
3	45	T130 DOZER	GEAR	17 01 22	EA	0 3	BA				CIS	1 Sep 93	
3	46	T130 DOZER	FRICTION CLUTCH PADS	24 16 101 CP	EA	0 6	BA				CIS	1 Sep 93	
3	47	T130 DOZER	SERVICE MECH	21 17 4 CP	EA	0 5	BA				CIS	1 Sep 93	
3	48	T130 DOZER	FAN BELT	18360 01 CP	EA	1 2	BA				CIS	1 Sep 93	
3	49	T130 DOZER	PULLEY WHEEL	24 21 146 CP	EA	0 4	BA				CIS	1 Sep 93	
3	50	T130 DOZER	DRIVE PULLEY	24 21 169 CP	EA	1 6	BA				CIS	1 Sep 93	
3	51	T130 DOZER	DOUBLE PULLEY	24 21 170 CP	EA	1 6	BA				CIS	1 Sep 93	
3	52	T130 DOZER	FILTER	A 410000-2	EA	1	BA				CIS	1 Sep 93	
3	53	T130 DOZER	IDLER PULLEY	24 21 171 CP	EA	1 6	BA				CIS	1 Sep 93	
3	54	T130 DOZER	FILTER	A 410000-A CP	EA	6	BA				CIS	1 Sep 93	
3	55	T130 DOZER	MIDDLE CUTTING EDGE	D3 110AXP 02 001 0	EA	0 3	BA				CIS	1 Sep 93	
3	56	T130 DOZER	END CUTTING EDGE RT	D661 02001 02	EA	0 3	BA				CIS	1 Sep 93	
3	57	T130 DOZER	END CUTTING EDGE LEFT	D661 02 002 02	EA	0 3	BA				CIS	1 Sep 93	
3	58	T130 DOZER	TRACK ASSEMBLY	24 22 1	SET	0 3	BA				CIS	1 Sep 93	
3	59	T130 DOZER	DEFLECTOR RK GUARD	2204	EA	20	BA				CIS	1 Sep 93	
3	60	T130 DOZER	DEFLECTOR RK GUARD	2205	EA	20	BA				CIS	1 Sep 93	
3	61	T130 DOZER	PACKING TRACKS ADJ	40201	EA	8	BA				CIS	1 Sep 93	
3	62	T130 DOZER	RING	40210	EA	2	BA				CIS	1 Sep 93	
3	63	T130 DOZER	CYLINDER PACKING	40944 CP	EA	5	BA				CIS	1 Sep 93	
3	64	T130 DOZER	CYLINDER	14 02 101 CP	EA	5	BA				CIS	1 Sep 93	
3	65	T130 DOZER	HEAD CYLINDER	16-02 106 CP	EA	2	BA				CIS	1 Sep 93	
3	66	T130 DOZER	VALVE	14 02 32	EA	1	BA				CIS	1 Sep 93	
3	67	T130 DOZER	VALVE	14 02 33 V	EA	1	BA				CIS	1 Sep 93	
3	68	T130 DOZER	PIPE	10663-1	EA	1	BA				CIS	1 Sep 93	
3	69	T130 DOZER	PIPE	10664 1	EA	1	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	70	T130 DOZER	GEARBOX	50-12 12 CP	EA	0 2	BA				CIS	1 Sep 93	
3	71	T130 DOZER	COUPLING	18 14 133 CP	EA	0 3	BA				CIS	1 Sep 93	
3	72	T130 DOZER	DISC	18-14 135 CP	EA	0 4	BA				CIS	1 Sep 93	
3	73	T130 DOZER	COUPLING	18 14 78	EA	0 3	BA				CIS	1 Sep 93	
3	74	T130 DOZER	COLLAR	3 48X28-6	EA	0 4	BA				CIS	1 Sep 93	
3	75	T130 DOZER	RING	N1 35X28-2	EA	0 6	BA				CIS	1 Sep 93	
3	76	T130 DOZER	DISC	24 16-103 CP	EA	1	BA				CIS	1 Sep 93	
3	77	T130 DOZER	PUMP	51 67 10 CP	EA	0 2	BA				CIS	1 Sep 93	
3	78	T130 DOZER	PISTON PUMP	16 67 102 CP	EA	3 6	BA				CIS	1 Sep 93	
3	79	T130 DOZER	PUMP PISTON	16-67 108 CP	EA	3 6	BA				CIS	1 Sep 93	
3	80	T130 DOZER	DISC	738 4 CP	EA	1	BA				CIS	1 Sep 93	
3	81	T130 DOZER	COUPLING	72118 CP	EA	0 5	BA				CIS	1 Sep 93	
3	82	T130 DOZER	RING	111 30 123 00	EA	2	BA				CIS	1 Sep 93	
3	83	T130 DOZER	ROTOR	92 55	EA	0 2	BA				CIS	1 Sep 93	
3	84	T130 DOZER	RADIATOR	21 09 1	EA	0 2	BA				CIS	1 Sep 93	
3	85	T130 DOZER	PUMP	51 67 11 CP	EA	0 2	BA				CIS	1 Sep 93	
3	86	T130 DOZER	TOTAL COST US DOLLARS				BA		$18 000		CIS	1 Sep 93	
3	1	T130 DOZER	PACKING	2301103160 CBN 1	EA	23	OT				CIS	1 Sep 93	
3	2	T130 DOZER	THIMBLE ?	01466 2	EA	75	OT				CIS	1 Sep 93	
3	3	T130 DOZER	RINGS	51 03 115 CP	EA	75	OT				CIS	1 Sep 93	
3	4	T130 DOZER	CRANKSHAFT	16 03 126 CP	EA	5	OT				CIS	1 Sep 93	
3	5	T130 DOZER	CYLINDER	51 03-23	EA	75	OT				CIS	1 Sep 93	
3	6	T130 DOZER	HYDRALIC SEAL	700 40-2869	EA	36	OT				CIS	1 Sep 93	
3	7	T130 DOZER	FILTER	F A41 20 000 01 CP	EA	75	OT				CIS	1 Sep 93	
3	8	T130 DOZER	FILTER	A41 10 000 02 CP	EA	75	OT				CIS	1 Sep 93	
3	9	T130 DOZER	RING	40843	EA	75	OT				CIS	1 Sep 93	
3	10	T130 DOZER	PACKING	40269	EA	23	OT				CIS	1 Sep 93	
3	11	T130 DOZER	GEAR PINION	74116	EA	2	OT				CIS	1 Sep 93	
3	12	T130 DOZER	REDUCTION GEAR	17 76-8 CP	EA	1	OT				CIS	1 Sep 93	
3	13	T130 DOZER	FUEL INJECTORS	17 69 107 1 CP	EA	75	OT				CIS	1 Sep 93	
3	14	T130 DOZER	SPRAYER	14 69 117 1 CP	EA	75	OT				CIS	1 Sep 93	
3	15	T130 DOZER	PUMP	51 67 11 CP	EA	2	OT				CIS	1 Sep 93	
3	16	T130 DOZER	COMPRESSOR PIPING	92 000-06	EA	8	OT				CIS	1 Sep 93	
3	17	T130 DOZER	AIR INLET	N036-85 770	EA	7	OT				CIS	1 Sep 93	
3	18	T130 DOZER	WATER PUMP	16-8-140-CP	EA	8	OT				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMB R	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	19	T130 DOZER	OIL PUMP	29 09 124 CP	EA	8	OT				CIS	1 Sep 93	
3	20	T130 DOZER	HYDRALIC PUMP	NS 100A 3 P	EA	5	OT				CIS	1 Sep 93	
3	21	T130 DOZER	PUMP	NS 32 Y WP	EA	2	OT				CIS	1 Sep 93	
3	22	T130 DOZER	GEAR BOX	24 12 1 CP	EA	2	OT				CIS	1 Sep 93	
3	23	T130 DOZER	FILTER	A23 30 000 01	EA	38	OT				CIS	1 Sep 93	
3	24	T130 DOZER	PACKING SEALS	700-40-2049	EA	23	OT				CIS	1 Sep 93	
3	25	T130 DOZER	CARBURATOR	113 1107011	EA	9	OT				CIS	1 Sep 93	
3	26	T130 DOZER	SUPPORT BRACKET	51 07 102 CP	EA	3	OT				CIS	1 Sep 93	
3	27	T130 DOZER	ENGINE HEAD	07146-1 CP	EA	5	OT				CIS	1 Sep 93	
3	28	T130 DOZER	FUEL SYS CENTRIFUGE	95000	EA	4	OT				CIS	1 Sep 93	
3	29	T130 DOZER	FAN BLADES	51 08-113 CP	EA	3	OT				CIS	1 Sep 93	
3	30	T130 DOZER	RADIATOR	130Y 13 010 1	EA	8	OT				CIS	1 Sep 93	
3	31	T130 DOZER	BRAKE DISC	738 4 CP	EA	11	OT				CIS	1 Sep 93	
3	32	T130 DOZER	MAGNET SOLENOID	M149 A3	EA	11	OT				CIS	1 Sep 93	
3	33	T130 DOZER	STARTER	ST 230M	EA	11	OT				CIS	1 Sep 93	
3	34	T130 DOZER	GENERATOR	70-3701	EA	4	OT				CIS	1 Sep 93	
3	35	T130 DOZER	RELAY STARTER	RR 0362B1	EA	11	OT				CIS	1 Sep 93	
3	36	T130 DOZER	DISTRIBUTOR	R 150-A3T001	EA	2	OT				CIS	1 Sep 93	
3	37	T130 DOZER	DRIVE SHAFT	50-14 113	EA	2	OT				CIS	1 Sep 93	
3	38	T130 DOZER	CYLINDER POWER	18 26-270 CP	EA	4	OT				CIS	1 Sep 93	
3	39	T130 DOZER	CYLINDER	DP 26 C 06-140	EA	2	OT				CIS	1 Sep 93	
3	40	T130 DOZER	ELEMENT FILTER	EF 01 00 CP	EA	105	OT				CIS	1 Sep 93	
3	41	T130 DOZER	PUMP BRAKE	14 71 3 CP	EA	2	OT				CIS	1 Sep 93	
3	42	T130 DOZER	MECH	17 74 8 CP	EA	2	OT				CIS	1 Sep 93	
3	43	T130 DOZER	SUPPORT	17 74 284	EA	3	OT				CIS	1 Sep 93	
3	44	T130 DOZER	SHAFT	16 74 10 CP	EA	2	OT				CIS	1 Sep 93	
3	45	T130 DOZER	GEAR	17 01 22	EA	2	OT				CIS	1 Sep 93	
3	46	T130 DOZER	FRICTION CLUTCH PADS	24 16 101 CP	EA	5	OT				CIS	1 Sep 93	
3	47	T130 DOZER	SERVICE MECH	21 17 4 CP	EA	4	OT				CIS	1 Sep 93	
3	48	T130 DOZER	FAN BELT	18360-01 CP	EA	9	OT				CIS	1 Sep 93	
3	49	T130 DOZER	PULLEY WHEEL	24 21 146 CP	EA	3	OT				CIS	1 Sep 93	
3	50	T130 DOZER	DRIVE PULLEY	24 21 169 CP	EA	12	OT				CIS	1 Sep 93	
3	51	T130 DOZER	DOUBLE PULLEY	24 21 170 CP	EA	12	OT				CIS	1 Sep 93	
3	52	T130 DOZER	FILTER	A 410000 2	EA	8	OT				CIS	1 Sep 93	
3	53	T130 DOZER	IDLER PULLEY	24 21 171 CP	EA	12	OT				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	54	T130 DOZER	FILTER	A 410000-A CP	EA	45	OT				CIS	1 Sep 93	
3	55	T130 DOZER	MIDDLE CUTTING EDGE	D3 110AXP 02 001 0	EA	2	OT				CIS	1 Sep 93	
3	56	T130 DOZER	END CUTTING EDGE RT	D661 02001 02	EA	2	OT				CIS	1 Sep 93	
3	57	T130 DOZER	END CUTTING EDGE LEFT	D661 02 002 02	EA	2	OT				CIS	1 Sep 93	
3	58	T130 DOZER	TRACK ASSEMBLY	24 22 1	SET	2	OT				CIS	1 Sep 93	
3	59	T130 DOZER	DEFLECTOR RK GUARD	2204	EA	150	OT				CIS	1 Sep 93	
3	60	T130 DOZER	DEFLECTOR RK GUARD	2205	EA	150	OT				CIS	1 Sep 93	
3	61	T130 DOZER	PACKING TRACKS ADJ	40201	EA	60	OT				CIS	1 Sep 93	
3	62	T130 DOZER	RING	40210	EA	15	OT				CIS	1 Sep 93	
3	63	T130 DOZER	CYLINDER PACKING	40944 CP	EA	38	OT				CIS	1 Sep 93	
3	64	T130 DOZER	CYLINDER	14 02 101 CP	EA	38	OT				CIS	1 Sep 93	
3	65	T130 DOZER	HEAD CYLINDER	16 02 106 CP	EA	15	OT				CIS	1 Sep 93	
3	66	T130 DOZER	VALVE	14 02 32	EA	8	OT				CIS	1 Sep 93	
3	67	T130 DOZER	VALVE	14 02 33 V	EA	8	OT				CIS	1 Sep 93	
3	68	T130 DOZER	PIPE	10663 1	EA	8	OT				CIS	1 Sep 93	
3	69	T130 DOZER	PIPE	10664 1	EA	8	OT				CIS	1 Sep 93	
3	70	T130 DOZER	GEARBOX	50 12 12 CP	EA	2	OT				CIS	1 Sep 93	
3	71	T130 DOZER	COUPLING	18 14 133 CP	EA	2	OT				CIS	1 Sep 93	
3	72	T130 DOZER	DISC	18 14 135 CP	EA	3	OT				CIS	1 Sep 93	
3	73	T130 DOZER	COUPLING	18 14 78	EA	2	OT				CIS	1 Sep 93	
3	74	T130 DOZER	COLLAR	3 48X28 6	EA	3	OT				CIS	1 Sep 93	
3	75	T130 DOZER	RING	N1 35X28 2	EA	5	OT				CIS	1 Sep 93	
3	76	T130 DOZER	DISC	24 16 103 CP	EA	8	OT				CIS	1 Sep 93	
3	77	T130 DOZER	PUMP	51 67 10 CP	EA	2	OT				CIS	1 Sep 93	
3	78	T130 DOZER	PISTON PUMP	16 67 102 CP	EA	27	OT				CIS	1 Sep 93	
3	79	T130 DOZER	PUMP PISTON	16 67 108 CP	EA	27	OT				CIS	1 Sep 93	
3	80	T130 DOZER	DISC	738 4 CP	EA	8	OT				CIS	1 Sep 93	
3	81	T130 DOZER	COUPLING	72118 CP	EA	4	OT				CIS	1 Sep 93	
3	82	T130 DOZER	RING	111 30 123 00	EA	15	OT				CIS	1 Sep 93	
3	83	T130 DOZER	ROTOR	92 55	EA	2	OT				CIS	1 Sep 93	
3	84	T130 DOZER	RADIATOR	21 09 1	EA	2	OT				CIS	1 Sep 93	
3	85	T130 DOZER	PUMP	51 67 11 CP	EA	2	OT				CIS	1 Sep 93	
3	86	T130 DOZER	TOTAL COST US DOLLARS				OT		$135 000		CIS	1 Sep 93	
3	1	T130 DOZER	PACKING	2301103160 CBN 1	EA	5	SG				CIS	1 Sep 93	
3	2	T130 DOZER	THIMBLE ?	01466-2	EA	15	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	3	T130 DOZER	RINGS	51 03-115 CP	EA	15	SG				CIS	1 Sep 93	
3	4	T130 DOZER	CRANKSHAFT	16-03 126 CP	EA	1	SG				CIS	1 Sep 93	
3	5	T130 DOZER	CYLINDER	51 03-23	EA	15	SG				CIS	1 Sep 93	
3	6	T130 DOZER	HYDRALIC SEAL	700-40-2889	EA	7	SG				CIS	1 Sep 93	
3	7	T130 DOZER	FILTER	F A41 20 000 01 CP	EA	15	SG				CIS	1 Sep 93	
3	8	T130 DOZER	FILTER	A41 10 000 02 CP	EA	15	SG				CIS	1 Sep 93	
3	9	T130 DOZER	RING	40843	EA	15	SG				CIS	1 Sep 93	
3	10	T130 DOZER	PACKING	40269	EA	5	SG				CIS	1 Sep 93	
3	11	T130 DOZER	GEAR PINION	74116	EA	0	SG				CIS	1 Sep 93	
3	12	T130 DOZER	REDUCTION GEAR	17 76-8 CP	EA	0	SG				CIS	1 Sep 93	
3	13	T130 DOZER	FUEL INJECTORS	17 69 107 1 CP	EA	15	SG				CIS	1 Sep 93	
3	14	T130 DOZER	SPRAYER	14 69 117 1 CP	EA	15	SG				CIS	1 Sep 93	
3	15	T130 DOZER	PUMP	51 67 11 CP	EA	0	SG				CIS	1 Sep 93	
3	16	T130 DOZER	COMPRESSOR PIPING	92 000 06	EA	2	SG				CIS	1 Sep 93	
3	17	T130 DOZER	AIR INLET	N036-85 770	EA	1	SG				CIS	1 Sep 93	
3	18	T130 DOZER	WATER PUMP	16 8 140 CP	EA	2	SG				CIS	1 Sep 93	
3	19	T130 DOZER	OIL PUMP	29 09 124 CP	EA	2	SG				CIS	1 Sep 93	
3	20	T130 DOZER	HYDRALIC PUMP	NS 100A 3 P	EA	1	SG				CIS	1 Sep 93	
3	21	T130 DOZER	PUMP	NS 32 Y WP	EA	0	SG				CIS	1 Sep 93	
3	22	T130 DOZER	GEAR BOX	24 12 1 CP	EA	0	SG				CIS	1 Sep 93	
3	23	T130 DOZER	FILTER	A23 30 000 01	EA	8	SG				CIS	1 Sep 93	
3	24	T130 DOZER	PACKING SEALS	700 40-2049	EA	5	SG				CIS	1 Sep 93	
3	25	T130 DOZER	CARBURATOR	113 1107011	EA	2	SG				CIS	1 Sep 93	
3	26	T130 DOZER	SUPPORT BRACKET	51 07 102 CP	EA	1	SG				CIS	1 Sep 93	
3	27	T130 DOZER	ENGINE HEAD	07146-1 CP	EA	1	SG				CIS	1 Sep 93	
3	28	T130 DOZER	FUEL SYS CENTRIFUGE	95000	EA	1	SG				CIS	1 Sep 93	
3	29	T130 DOZER	FAN BLADES	51 08 113 CP	EA	1	SG				CIS	1 Sep 93	
3	30	T130 DOZER	RADIATOR	130Y 13 010 1	EA	2	SG				CIS	1 Sep 93	
3	31	T130 DOZER	BRAKE DISC	738 4 CP	EA	2	SG				CIS	1 Sep 93	
3	32	T130 DOZER	MAGNET SOLENOID	M149 A3	EA	2	SG				CIS	1 Sep 93	
3	33	T130 DOZER	STARTER	ST 230M	EA	2	SG				CIS	1 Sep 93	
3	34	T130 DOZER	GENERATOR	70 3701	EA	1	SG				CIS	1 Sep 93	
3	35	T130 DOZER	RELAY STARTER	RR 0362B1	EA	2	SG				CIS	1 Sep 93	
3	36	T130 DOZER	DISTRIBUTOR	R 150 A3T001	EA	0	SG				CIS	1 Sep 93	
3	37	T130 DOZER	DRIVE SHAFT	50-14 113	EA	0	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	38	T130 DOZER	CYLINDER POWER	18-26-270 CP	EA	1	SG				CIS	1 Sep 93	
3	39	T130 DOZER	CYLINDER	DP 26-C 06-140	EA	0	SG				CIS	1 Sep 93	
3	40	T130 DOZER	ELEMENT FILTER	EF 01 00 CP	EA	21	SG				CIS	1 Sep 93	
3	41	T130 DOZER	PUMP BRAKE	14 71 3 CP	EA	0	SG				CIS	1 Sep 93	
3	42	T130 DOZER	MECH	17 74 8 CP	EA	0	SG				CIS	1 Sep 93	
3	43	T130 DOZER	SUPPORT	17 74 284	EA	1	SG				CIS	1 Sep 93	
3	44	T130 DOZER	SHAFT	16-74 10 CP	EA	0	SG				CIS	1 Sep 93	
3	45	T130 DOZER	GEAR	17 01 22	EA	0	SG				CIS	1 Sep 93	
3	46	T130 DOZER	FRICTION CLUTCH PADS	24 16-101 CP	EA	1	SG				CIS	1 Sep 93	
3	47	T130 DOZER	SERVICE MECH	21 17 4 CP	EA	1	SG				CIS	1 Sep 93	
3	48	T130 DOZER	FAN BELT	18360 01 CP	EA	2	SG				CIS	1 Sep 93	
3	49	T130 DOZER	PULLEY WHEEL	24 21 146 CP	EA	1	SG				CIS	1 Sep 93	
3	50	T130 DOZER	DRIVE PULLEY	24 21 169 CP	EA	2	SG				CIS	1 Sep 93	
3	51	T130 DOZER	DOUBLE PULLEY	24 21 170 CP	EA	2	SG				CIS	1 Sep 93	
3	52	T130 DOZER	FILTER	A 410000 2	EA	2	SG				CIS	1 Sep 93	
3	53	T130 DOZER	IDLER PULLEY	24 21 171 CP	EA	2	SG				CIS	1 Sep 93	
3	54	T130 DOZER	FILTER	A 410000 A CP	EA	9	SG				CIS	1 Sep 93	
3	55	T130 DOZER	MIDDLE CUTTING EDGE	D3 110AXP 02 001 0	EA	0	SG				CIS	1 Sep 93	
3	56	T130 DOZER	END CUTTING EDGE RT	D661 02001 02	EA	0	SG				CIS	1 Sep 93	
3	57	T130 DOZER	END CUTTING EDGE LEFT	D661 02 002 02	EA	0	SG				CIS	1 Sep 93	
3	58	T130 DOZER	TRACK ASSEMBLY	24 22 1	SET	0	SG				CIS	1 Sep 93	
3	59	T130 DOZER	DEFLECTOR RK GUARD	2204	EA	30	SG				CIS	1 Sep 93	
3	60	T130 DOZER	DEFLECTOR RK GUARD	2205	EA	30	SG				CIS	1 Sep 93	
3	61	T130 DOZER	PACKING TRACKS ADJ	40201	EA	12	SG				CIS	1 Sep 93	
3	62	T130 DOZER	RING	40210	EA	3	SG				CIS	1 Sep 93	
3	63	T130 DOZER	CYLINDER PACKING	40944 CP	EA	8	SG				CIS	1 Sep 93	
3	64	T130 DOZER	CYLINDER	14 02 101 CP	EA	8	SG				CIS	1 Sep 93	
3	65	T130 DOZER	HEAD CYLINDER	16 02 106 CP	EA	3	SG				CIS	1 Sep 93	
3	66	T130 DOZER	VALVE	14 02 32	EA	2	SG				CIS	1 Sep 93	
3	67	T130 DOZER	VALVE	14 02 33 V	EA	2	SG				CIS	1 Sep 93	
3	68	T130 DOZER	PIPE	10663-1	EA	2	SG				CIS	1 Sep 93	
3	69	T130 DOZER	PIPE	10664 1	EA	2	SG				CIS	1 Sep 93	
3	70	T130 DOZER	GEARBOX	50-12 12 CP	EA	0	SG				CIS	1 Sep 93	
3	71	T130 DOZER	COUPLING	18-14 133 CP	EA	0	SG				CIS	1 Sep 93	
3	72	T130 DOZER	DISC	18-14 135 CP	EA	1	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	73	T130 DOZER	COUPLING	18-14-78	EA	0	SG				CIS	1 Sep 93	
3	74	T130 DOZER	COLLAR	3 48X28-6	EA	1	SG				CIS	1 Sep 93	
3	75	T130 DOZER	RING	N1 35X28 2	EA	1	SG				CIS	1 Sep 93	
3	76	T130 DOZER	DISC	24 16-103 CP	EA	2	SG				CIS	1 Sep 93	
3	77	T130 DOZER	PUMP	51 67 10 CP	EA	0	SG				CIS	1 Sep 93	
3	78	T130 DOZER	PISTON PUMP	16-67 102 CP	EA	5	SG				CIS	1 Sep 93	
3	79	T130 DOZER	PUMP PISTON	16 67 108 CP	EA	5	SG				CIS	1 Sep 93	
3	80	T130 DOZER	DISC	738-4 CP	EA	2	SG				CIS	1 Sep 93	
3	81	T130 DOZER	COUPLING	72118 CP	EA	1	SG				CIS	1 Sep 93	
3	82	T130 DOZER	RING	111 30 123 00	EA	3	SG				CIS	1 Sep 93	
3	83	T130 DOZER	ROTOR	92 55	EA	0	SG				CIS	1 Sep 93	
3	84	T130 DOZER	RADIATOR	21 09 1	EA	0	SG				CIS	1 Sep 93	
3	85	T130 DOZER	PUMP	51 67 11 CP	EA	0	SG				CIS	1 Sep 93	
3	86	T130 DOZER	TOTAL COST US DOLLARS				SG		$27 000		CIS	1 Sep 93	
3	1	T250 DOZER	ENGINE	B 31M 748 01 4 cb	EA	2	BA				CIS	1 Sep 93	
3	2	T250 DOZER	HOUSING	748 05 120 CP	EA	20	BA				CIS	1 Sep 93	
3	3	T250 DOZER	HOUSING	748 05 271 CP	EA	20	BA				CIS	1 Sep 93	
3	4	T250 DOZER	REFLECTOR LIGHTS	748 07 182 CP	EA	1	BA				CIS	1 Sep 93	
3	5	T250 DOZER	REFLECTOR LIGHTS	748 07 212 CP	EA	1	BA				CIS	1 Sep 93	
3	6	T250 DOZER	REGULATOR	P5M	EA	10	BA				CIS	1 Sep 93	
3	7	T250 DOZER	LIGHT SET	FG 122B	EA	20	BA				CIS	1 Sep 93	
3	8	T250 DOZER	LAMP	A 24 75X60	EA	1000	BA				CIS	1 Sep 93	
3	9	T250 DOZER	PLANETARY MECH	748 16-141 cb	EA	1	BA				CIS	1 Sep 93	
3	10	T250 DOZER	RINGS	748 16-86	EA	4	BA				CIS	1 Sep 93	
3	11	T250 DOZER	RINGS	748 58 2059	EA	4	BA				CIS	1 Sep 93	
3	12	T250 DOZER	SHIMS	748-18-226 232	EA	160	BA				CIS	1 Sep 93	
3	13	T250 DOZER	CLIPS	3629	EA	10000	BA				CIS	1 Sep 93	
3	14	T250 DOZER	GEAR BOX	748-19	EA	2	BA				CIS	1 Sep 93	
3	15	T250 DOZER	SHIFTING FORK	748-19 1	EA	30	BA				CIS	1 Sep 93	
3	16	T250 DOZER	IDLER	748 21 112 CP	EA	48	BA				CIS	1 Sep 93	
3	17	T250 DOZER	IDLER	748 21 130 CP	EA	48	BA				CIS	1 Sep 93	
3	18	T250 DOZER	SETS TRACK	748-22 101 CP	SET	4	BA				CIS	1 Sep 93	
3	19	T250 DOZER	GROUSERS	748-22 132 CP	EA	20	BA				CIS	1 Sep 93	
3	20	T250 DOZER	TRACK BOLTS	700-28 232	EA	1000	BA				CIS	1 Sep 93	
3	21	T250 DOZER	TRACK BUSHINGS	748-22 3	EA	100	BA				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	22	T250 DOZER	TRACK LINKS	748-22 1	EA	40	BA				CIS	1 Sep 93	
3	23	T250 DOZER	TRACK LINKS	748-22 2	EA	40	BA				CIS	1 Sep 93	
3	24	T250 DOZER	TRACK PINS	748-22 6	EA	100	BA				CIS	1 Sep 93	
3	25	T250 DOZER	CONE ?	748-22 71	EA	200	BA				CIS	1 Sep 93	
3	26	T250 DOZER	WASHERS	748-22 50	EA	1000	BA				CIS	1 Sep 93	
3	27	T250 DOZER	BLOWER	748 27 208 CP	EA	2	BA				CIS	1 Sep 93	
3	28	T250 DOZER	PACKING	748-31 11	EA	10	BA				CIS	1 Sep 93	
3	29	T250 DOZER	PACKING	748-31 138	EA	10	BA				CIS	1 Sep 93	
3	30	T250 DOZER	COUPLING	748-13 75	EA	2	BA				CIS	1 Sep 93	
3	31	T250 DOZER	AXLE	748-50 206	EA	2	BA				CIS	1 Sep 93	
3	32	T250 DOZER	COUPLING	748 50 171 CP	EA	2	BA				CIS	1 Sep 93	
3	33	T250 DOZER	DISC	748-50-302 CP	EA	4	BA				CIS	1 Sep 93	
3	34	T250 DOZER	DISC	748 50 152 CP	EA	4	BA				CIS	1 Sep 93	
3	35	T250 DOZER	PUMP	748 50-232 cb	EA	5	BA				CIS	1 Sep 93	
3	36	T250 DOZER	CONTACTOR	TKC 611D0D	EA	8	BA				CIS	1 Sep 93	
3	37	T250 DOZER	CONTROLLER	KB30G 748 82 371	EA	2	BA				CIS	1 Sep 93	
3	38	T250 DOZER	ELECT BRUSH	UG 2A 2/12 5X40X60	EA	300	BA				CIS	1 Sep 93	
3	39	T250 DOZER	ELECT BRUSH	UG 2A /16X32X40/	EA	500	BA				CIS	1 Sep 93	
3	40	T250 DOZER	INITIATOR	DK 913A	EA	2	BA				CIS	1 Sep 93	
3	41	T250 DOZER	HYDRO PUMP	748 99 230 cb	EA	2	BA				CIS	1 Sep 93	
3	42	T250 DOZER	WASHER	748 99 993	EA	20	BA				CIS	1 Sep 93	
3	43	T250 DOZER	RINGS	748 99 446	EA	20	BA				CIS	1 Sep 93	
3	44	T250 DOZER	DISTRIBUTOR	748 99 465 cb	EA	2	BA				CIS	1 Sep 93	
3	45	T250 DOZER	POWER CYLINDER	748 99 10 cb	EA	6	BA				CIS	1 Sep 93	
3	46	T250 DOZER	SHOCK ABSORBER	402 50 7	EA	24	BA				CIS	1 Sep 93	
3	47	T250 DOZER	PACKING	3303 08 1	EA	4	BA				CIS	1 Sep 93	
3	48	T250 DOZER	RING	303 10-2	EA	72	BA				CIS	1 Sep 93	
3	49	T250 DOZER	PIPE	303 18 1A	EA	72	BA				CIS	1 Sep 93	
3	50	T250 DOZER	GENERATOR	CBV 30940-3	EA	4	BA				CIS	1 Sep 93	
3	51	T250 DOZER	BUSHING	3308-233 2	EA	2	BA				CIS	1 Sep 93	
3	52	T250 DOZER	PUMP	CB 3311 00-4	EA	1	BA				CIS	1 Sep 93	
3	53	T250 DOZER	SHAFT	CB411 22 16	EA	2	BA				CIS	1 Sep 93	
3	54	T250 DOZER	PUMP	CB412 00-5	EA	2	BA				CIS	1 Sep 93	
3	55	T250 DOZER	TOTAL COST US DOLLARS				BA		$45 000		CIS	1 Sep 93	
3	1	T250 DOZER	LINK	748-22 132 CP	EA	20	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	2	T250 DOZER	LINK	748-22 133 CP	EA	20	SG				CIS	1 Sep 93	
3	3	T250 DOZER	LINK	748-22 134 CP	EA	20	SG				CIS	1 Sep 93	
3	4	T250 DOZER	END PIN	748-22 6	EA	200	SG				CIS	1 Sep 93	
3	5	T250 DOZER	HEAD LAMP SET	748-10-318 CP	EA	18	SG				CIS	1 Sep 93	
3	6	T250 DOZER	PACKING	748-18-234	EA	40	SG				CIS	1 Sep 93	
3	7	T250 DOZER	PACKING	748 18 229	EA	40	SG				CIS	1 Sep 93	
3	8	T250 DOZER	PACKING	748-18 229	EA	40	SG				CIS	1 Sep 93	
3	9	T250 DOZER	CROWN ?	748-19 1	EA	8	SG				CIS	1 Sep 93	
3	10	T250 DOZER	COUPLING	748 19 5	EA	4	SG				CIS	1 Sep 93	
3	11	T250 DOZER	GENERATOR	GNA 222 748-82 349 CP	EA	2	SG				CIS	1 Sep 93	
3	12	T250 DOZER	OIL PUMP	748 60 276-CP	EA	10	SG				CIS	1 Sep 93	
3	13	T250 DOZER	BRUSH	UG2A KG3 16X32X40	EA	72	SG				CIS	1 Sep 93	
3	14	T250 DOZER	BRUSH	UG2A K12 8 2X12 5X40X5	EA	36	SG				CIS	1 Sep 93	
3	15	T250 DOZER	DISTRIBUTOR	748 99 465 CP	EA	1	SG				CIS	1 Sep 93	
3	16	T250 DOZER	HYDROPUMP	933 02 06	EA	1	SG				CIS	1 Sep 93	
3	17	T250 DOZER	TOTAL COST US DOLLARS				SG		$45 000		CIS	1 Sep 93	
3	1	T250 DOZER	CUTTING EDGES	D3 132 T 0200T	EA	4	SO				CIS	1 Sep 93	
3	2	T250 DOZER	CUTTING EDGES	D3 132 1 02002	EA	4	SO				CIS	1 Sep 93	
3	3	T250 DOZER	CUTTING EDGES	D3 59XL 0T00030	EA	2	SO				CIS	1 Sep 93	
3	4	T250 DOZER	CUTTING EDGES	D3 TT8 TO 00T	EA	2	SO				CIS	1 Sep 93	
3	5	T250 DOZER	TOTAL COST US DOLLARS				SO		$45 000		CIS	1 Sep 93	
3	1	YM2 PARTS	CYLINDER	240H 1004008-D	EA	132	SG				CIS	1 Sep 93	
3	2	YM2 PARTS	CRANK SHAFT	240-1000107 B6	EA	4	SG				CIS	1 Sep 93	
3	3	YM2 PARTS	RINGS	236 1000106-B4	EA	132	SG				CIS	1 Sep 93	
3	4	YM2 PARTS	PACKING	240-1000104 B2	EA	10	SG				CIS	1 Sep 93	
3	5	YM2 PARTS	PACKING	240-1000104 P2	EA	5	SG				CIS	1 Sep 93	
3	6	YM2 PARTS	PACKING	240-1000104 P1	EA	5	SG				CIS	1 Sep 93	
3	7	YM2 PARTS	SEAL	240-1003213 A3	EA	100	SG				CIS	1 Sep 93	
3	8	YM2 PARTS	PUMP	240-1011014	EA	3	SG				CIS	1 Sep 93	
3	9	YM2 PARTS	ELEMENT	240-1017038	EA	500	SG				CIS	1 Sep 93	
3	10	YM2 PARTS	ELEMENT	238H 1109080	EA	50	SG				CIS	1 Sep 93	
3	11	YM2 PARTS	TURBOCOMPRESSOR	240H 1118010 B	EA	4	SG				CIS	1 Sep 93	
3	12	YM2 PARTS	TURBOCOMPRESSOR	240H 1118011B	EA	4	SG				CIS	1 Sep 93	
3	13	YM2 PARTS	BLOCK CYLINDER	240H 1002012H	EA	1	SG				CIS	1 Sep 93	
3	14	YM2 PARTS	PUMP	9016111008 02	EA	1	SG				CIS	1 Sep 93	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
3	15	YM2 PARTS	SPRAY INJECTOR	26161112110	EA	60	SG				CIS	1 Sep 93	
3	16	YM2 PARTS	RING	236-1002024A	EA	100	SG				CIS	1 Sep 93	
3	17	YM2 PARTS	RING	236-1002040	EA	50	SG				CIS	1 Sep 93	
3	18	YM2 PARTS	ELEMENT FILTER	240T 1017040 A3	EA	100	SG				CIS	1 Sep 93	
3	19	YM2 PARTS	ELEMENT	201T 1105540	EA	100	SG				CIS	1 Sep 93	
3	20	YM2 PARTS	RINGS	236-1004002 A3	EA	48	SG				CIS	1 Sep 93	
3	21	YM2 PARTS	PACKING SEALS	240-1008098	EA	5	SG				CIS	1 Sep 93	
3	22	YM2 PARTS	PACKING SEALS	240T 1009040 A2	EA	5	SG				CIS	1 Sep 93	
3	23	YM2 PARTS	FUEL PUMP	1111008 20	EA	1	SG				CIS	1 Sep 93	
3	24	YM2 PARTS	ELEMENT	201 1117038 A2	EA	250	SG				CIS	1 Sep 93	
3	25	YM2 PARTS	PUMP	240 1307010-A	EA	2 5	SG				CIS	1 Sep 93	
3	26	YM2 PARTS	GENERATOR	45 7371 0209	EA	1 5	SG				CIS	1 Sep 93	
3	27	YM2 PARTS	STARTER	45 7375 1471	EA	1 5	SG				CIS	1 Sep 93	
3	28	YM2 PARTS	TOTAL COST US DOLLARS				SG		$12 500		CIS	1 Sep 93	
2	1	BELAZ	ENGINE	240N 1000187	SET	4	BA				Bel	1 Jan 94	
2	2	BELAZ	CYLINDER LINER SETS	240N 1004006D	SET	144	BA				Bel	1 Jan 94	
2	3	BELAZ	PACKING	240 1003213	EA	300	BA				Bel	1 Jan 94	
2	4	BELAZ	RING SETS	236-100106 B3	EA	200	BA				Bel	1 Jan 94	
2	5	BELAZ	CLUTCH SHIMS	240-1000104	EA	16	BA				Bel	1 Jan 94	
2	6	BELAZ	SHIMS	240-1000104 BR	EA	10	BA				Bel	1 Jan 94	
2	7	BELAZ	PACKING	240 1009040A2	EA	30	BA				Bel	1 Jan 94	
2	8	BELAZ	FILTER	240 1017040A2	EA	2000	BA				Bel	1 Jan 94	
2	9	BELAZ	FILTER	201 1105538	EA	1500	BA				Bel	1 Jan 94	
2	10	BELAZ	INJECTOR	236-1112110B2	EA	240	BA				Bel	1 Jan 94	
2	11	BELAZ	TURBOCHARGER	240N 118010B	EA	10	BA				Bel	1 Jan 94	
2	12	BELAZ	TURBOCHARGER	240N 1118011B	EA	10	BA				Bel	1 Jan 94	
2	13	BELAZ	FILTER	201 1117040 A	EA	1000	BA				Bel	1 Jan 94	
2	14	BELAZ	FILTER	238 1109080	EA	500	BA				Bel	1 Jan 94	
2	15	BELAZ	FILTER COVER	240-1002264	EA	5	BA				Bel	1 Jan 94	
2	16	BELAZ	PACKING	240-1002314	EA	20	BA				Bel	1 Jan 94	
2	17	BELAZ	HARMONIC BALANCER	240 1002310	EA	5	BA				Bel	1 Jan 94	
2	18	BELAZ	CRANK SHAFT	240-1005008G4	EA	5	BA				Bel	1 Jan 94	
2	19	BELAZ	PUSH RODS	236-1007180	EA	24	BA				Bel	1 Jan 94	
2	20	BELAZ	PACKING	240-1008098	EA	30	BA				Bel	1 Jan 94	
2	21	BELAZ	PUMP	240-1011014 B	EA	5	BA				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	22	BELAZ	PIPE HOSE	240-1104308 G	EA	24	BA				Bel	1 Jan 94	
2	23	BELAZ	PIPE	240-1104300-B	EA	13	BA				Bel	1 Jan 94	
2	24	BELAZ	PIPE	240-1104390A	EA	6	BA				Bel	1 Jan 94	
2	25	BELAZ	PIPE	240-1104346A	EA	8	BA				Bel	1 Jan 94	
2	26	BELAZ	PUMP	240-1106210	EA	5	BA				Bel	1 Jan 94	
2	27	BELAZ	PISTON PLUNGER	60 1111074	EA	24	BA				Bel	1 Jan 94	
2	28	BELAZ	VALVE	33 1111102	EA	38	BA				Bel	1 Jan 94	
2	29	BELAZ	INJECTORS	262 111201	EA	24	BA				Bel	1 Jan 94	
2	30	BELAZ	ROTORS	240N 1118080B	EA	20	BA				Bel	1 Jan 94	
2	31	BELAZ	COVER	240N 1118280B	EA	30	BA				Bel	1 Jan 94	
2	32	BELAZ	RING	240N 1118240	EA	40	BA				Bel	1 Jan 94	
2	33	BELAZ	PUMP	240N 1307010A	EA	3	BA				Bel	1 Jan 94	
2	34	BELAZ	SET	240-1307029	EA	20	BA				Bel	1 Jan 94	
2	35	BELAZ	STARTER	25 3708	EA	5	BA				Bel	1 Jan 94	
2	36	BELAZ	GENERATOR	G263	EA	5	BA				Bel	1 Jan 94	
2	37	BELAZ	REGULATOR RELAY	RR 363 3702000	EA	5	BA				Bel	1 Jan 94	
2	38	BELAZ	COMPRESSOR	540 3509015	EA	10	BA				Bel	1 Jan 94	
2	39	BELAZ	WASHER	540A 3509130	EA	5	BA				Bel	1 Jan 94	
2	40	BELAZ	SHIMS	130 3509092	EA	5	BA				Bel	1 Jan 94	
2	41	BELAZ	PISTON	130-350909160	EA	10	BA				Bel	1 Jan 94	
2	42	BELAZ	RING	130-3509164	EA	20	BA				Bel	1 Jan 94	
2	43	BELAZ	RING	130-350 9166	EA	20	BA				Bel	1 Jan 94	
2	44	BELAZ	RING	130-3509167	EA	20	BA				Bel	1 Jan 94	
2	45	BELAZ	FILTER	740-1109560	EA	100	BA				Bel	1 Jan 94	
2	46	BELAZ	ROLLER	540-1308110-01	EA	5	BA				Bel	1 Jan 94	
2	47	BELAZ	ROLLER	540 1308111 01	EA	5	BA				Bel	1 Jan 94	
2	48	BELAZ	BELT	P21X14X1950	EA	100	BA				Bel	1 Jan 94	
2	49	BELAZ	BELT	P21X14X1735	EA	100	BA				Bel	1 Jan 94	
2	50	BELAZ	HYDRAULIC BOOSTER	548A 1700004 10	EA	4	BA				Bel	1 Jan 94	
2	51	BELAZ	FRICTION PLATES BRAKE	540 1701330 01	EA	12	BA				Bel	1 Jan 94	
2	52	BELAZ	DISC	540 1701352 11	EA	120	BA				Bel	1 Jan 94	
2	53	BELAZ	DISC	540-1701344	EA	140	BA				Bel	1 Jan 94	
2	54	BELAZ	BRAKE DRUM	540-1701312 10	EA	12	BA				Bel	1 Jan 94	
2	55	BELAZ	PACKING RING	540-1701326B	EA	50	BA				Bel	1 Jan 94	
2	56	BELAZ	ELECTRIC MAGNETO	RC330-1705000	EA	20	BA				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	57	BELAZ	RADIATOR	548A 1301010	EA	5	BA				Bel	1 Jan 94	
2	58	BELAZ	DRIVE SHAFT	548A 2201010-02	EA	5	BA				Bel	1 Jan 94	
2	59	BELAZ	DRIVE SHAFT	548A 2208010	EA	5	BA				Bel	1 Jan 94	
2	60	BELAZ	TRANSMISSION GEAR	548P 2402010 10	EA	2	BA				Bel	1 Jan 94	
2	61	BELAZ	CYLINDER	548-2917020 11	EA	6	BA				Bel	1 Jan 94	
2	62	BELAZ	COLLAR	540 2917062	EA	200	BA				Bel	1 Jan 94	
2	63	BELAZ	CYLINDER	540-2917080-01	EA	100	BA				Bel	1 Jan 94	
2	64	BELAZ	RINGS	540 2917064	EA	400	BA				Bel	1 Jan 94	
2	65	BELAZ	SHIFTING FORK	7540 2919412	EA	3	BA				Bel	1 Jan 94	
2	66	BELAZ	LEVER	548 3001031	EA	5	BA				Bel	1 Jan 94	
2	67	BELAZ	PULLEY	540 3003052 02	EA	3	BA				Bel	1 Jan 94	
2	68	BELAZ	HYDRALIC BOOSTER	525 3405010 06	EA	5	BA				Bel	1 Jan 94	
2	69	BELAZ	RINGS	016 020 25 2 2	EA	50	BA				Bel	1 Jan 94	
2	70	BELAZ	RINGS	080 090 58 2 2	EA	20	BA				Bel	1 Jan 94	
2	71	BELAZ	PISTON	130 3509160 02	EA	40	BA				Bel	1 Jan 94	
2	72	BELAZ	RINGS	130 3509167	EA	40	BA				Bel	1 Jan 94	
2	73	BELAZ	SPRAYER DEFLECTORS	FG 140 371200	EA	100	BA				Bel	1 Jan 94	
2	74	BELAZ	LAMPS	A2M 55 50	EA	300	BA				Bel	1 Jan 94	
2	75	BELAZ	LAMPS	A24 5	EA	300	BA				Bel	1 Jan 94	
2	76	BELAZ	LAMPS	A24 21 2	EA	200	BA				Bel	1 Jan 94	
2	77	BELAZ	LAMPS	A24 60 40	EA	100	BA				Bel	1 Jan 94	
2	78	BELAZ	SPRAYERS DEFLECTORS	FP 130 3716200 B	EA	50	BA				Bel	1 Jan 94	
2	79	BELAZ	LOCK	VK 856-3708000	EA	10	BA				Bel	1 Jan 94	
2	80	BELAZ	TOTAL COST US DOLLLARS				BA		$565 000		Bel	1 Jan 94	
2	1	BELAZ	ENGINE	YM3 240N1000411B	SET	2	SG				Bel	1 Jan 94	
2	2	BELAZ	TRANSMISSION	GMP 548T 1700004	SET	3	SG				Bel	1 Jan 94	
2	3	BELAZ	CABIN	548T 5000012 50	SET	3	SG				Bel	1 Jan 94	
2	4	BELAZ	LAMPS	A 24 5 1	EA	1000	SG				Bel	1 Jan 94	
2	5	BELAZ	LAMPS	A 24 55X50	EA	500	SG				Bel	1 Jan 94	
2	6	BELAZ	LAMPS	A 24 60X40	EA	200	SG				Bel	1 Jan 94	
2	7	BELAZ	BELT	1950/00368/	EA	60	SG				Bel	1 Jan 94	
2	8	BELAZ	PUMP	NS 50Y 3 T	EA	30	SG				Bel	1 Jan 94	
2	9	BELAZ	PUMP	NS 50Y 2 1	EA	30	SG				Bel	1 Jan 94	
2	10	BELAZ	SHIMMS	240-1000104B2	EA	15	SG				Bel	1 Jan 94	
2	11	BELAZ	SHIMMS	240-1000104B2R1	EA	15	SG				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	12	BELAZ	SHIMMS	240-100010452R2	EA	10	SG				Bel	1 Jan 94	
2	13	BELAZ	RING SET	236-10000106-B4	EA	240	SG				Bel	1 Jan 94	
2	14	BELAZ	CRANK SHAFT	240-1000107B6	EA	10	SG				Bel	1 Jan 94	
2	15	BELAZ	PACKING	240-1002265	EA	40	SG				Bel	1 Jan 94	
2	16	BELAZ	CRANKCASE (OIL PAN)	240-1002310	EA	4	SG				Bel	1 Jan 94	
2	17	BELAZ	PACKING	240-1003240A3	EA	60	SG				Bel	1 Jan 94	
2	18	BELAZ	PACKING	240-1003213	EA	200	SG				Bel	1 Jan 94	
2	19	BELAZ	PACKING	240-1003270 B	EA	120	SG				Bel	1 Jan 94	
2	20	BELAZ	SET	240N 1004008 B	EA	120	SG				Bel	1 Jan 94	
2	21	BELAZ	LINER	240N 1004008	EA	60	SG				Bel	1 Jan 94	
2	22	BELAZ	COLLAR	236 1005160 A2	EA	30	SG				Bel	1 Jan 94	
2	23	BELAZ	RING	240-1005576	EA	80	SG				Bel	1 Jan 94	
2	24	BELAZ	RING	240 1005582B	EA	80	SG				Bel	1 Jan 94	
2	25	BELAZ	PACKING	240N 1008027	EA	100	SG				Bel	1 Jan 94	
2	26	BELAZ	PACKING	240T 1009040	EA	80	SG				Bel	1 Jan 94	
2	27	BELAZ	PUMP	240-1011014B	EA	15	SG				Bel	1 Jan 94	
2	28	BELAZ	ELEMENT	201T 1017038A	EA	1000	SG				Bel	1 Jan 94	
2	29	BELAZ	OIL CLEANER	236-1029240	EA	6	SG				Bel	1 Jan 94	
2	30	BELAZ	COLLAR	236-1029240	EA	20	SG				Bel	1 Jan 94	
2	31	BELAZ	SHAFT	240 1029336	EA	10	SG				Bel	1 Jan 94	
2	32	BELAZ	ELEMENT	201 1105538	EA	1000	SG				Bel	1 Jan 94	
2	33	BELAZ	ELEMENT	238N 1109080	EA	200	SG				Bel	1 Jan 94	
2	34	BELAZ	PUMP	9016-11110082	EA	4	SG				Bel	1 Jan 94	
2	35	BELAZ	PLUNGER	PARA 60-1111073	EA	60	SG				Bel	1 Jan 94	
2	36	BELAZ	SPRAYER	261 1112110	EA	120	SG				Bel	1 Jan 94	
2	37	BELAZ	ELEMENT	201 1117038 A2	EA	1000	SG				Bel	1 Jan 94	
2	38	BELAZ	TURBOCOMPRESSOR	240N 1118010B	EA	10	SG				Bel	1 Jan 94	
2	39	BELAZ	TURBOCOMPRESSOR	240N 1118011B	EA	10	SG				Bel	1 Jan 94	
2	40	BELAZ	RING	240N 1118106	EA	120	SG				Bel	1 Jan 94	
2	41	BELAZ	FLANGE	240N 1118272	EA	20	SG				Bel	1 Jan 94	
2	42	BELAZ	COVER	240N 1118280 B	EA	20	SG				Bel	1 Jan 94	
2	43	BELAZ	BELT	1735/256421 1413	EA	60	SG				Bel	1 Jan 94	
2	44	BELAZ	RADIATOR	548A 1301010	EA	10	SG				Bel	1 Jan 94	
2	45	BELAZ	PIPE	240-1303100-V2	EA	6	SG				Bel	1 Jan 94	
2	46	BELAZ	PIPE	240-1303101 V2	EA	6	SG				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY

EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	47	BELAZ	GEARS	7523 1731002	EA	4	SG				Bel	1 Jan 94	
2	48	BELAZ	AXLE	540-1731030-20	EA	10	SG				Bel	1 Jan 94	
2	49	BELAZ	AXLE	548A 1731101 01	EA	6	SG				Bel	1 Jan 94	
2	50	BELAZ	CROSSET	540-2201025 02	EA	20	SG				Bel	1 Jan 94	
2	51	BELAZ	SHAFT	548T 2208010	EA	4	SG				Bel	1 Jan 94	
2	52	BELAZ	SHAFT	7523 2201010	EA	6	SG				Bel	1 Jan 94	
2	53	BELAZ	SHAFT	540T 2208117	EA	40	SG				Bel	1 Jan 94	
2	54	BELAZ	TRANSMISSION	548 2402010-11	EA	2	SG				Bel	1 Jan 94	
2	55	BELAZ	BUMPER	7523 2803010	EA	4	SG				Bel	1 Jan 94	
2	56	BELAZ	CYLINDER	540-2917056 31	EA	20	SG				Bel	1 Jan 94	
2	57	BELAZ	CYLINDER	548 2917020 11	EA	6	SG				Bel	1 Jan 94	
2	58	BELAZ	SHIFTING FORK	540 2919412 23	EA	6	SG				Bel	1 Jan 94	
2	59	BELAZ	PIN	540M 2919426	EA	10	SG				Bel	1 Jan 94	
2	60	BELAZ	ROD	540 2919429 30	EA	6	SG				Bel	1 Jan 94	
2	61	BELAZ	SEAL	540 2919440 B1	EA	60	SG				Bel	1 Jan 94	
2	62	BELAZ	RING	7540 2919442	EA	40	SG				Bel	1 Jan 94	
2	63	BELAZ	ROD	7548 2919016-01	EA	10	SG				Bel	1 Jan 94	
2	64	BELAZ	SPACERS	548 3001016	EA	30	SG				Bel	1 Jan 94	
2	65	BELAZ	SPACERS	548 3001017	EA	30	SG				Bel	1 Jan 94	
2	66	BELAZ	SPACERS	548 3001026	EA	30	SG				Bel	1 Jan 94	
2	67	BELAZ	PULLEY	540 3003052	EA	6	SG				Bel	1 Jan 94	
2	68	BELAZ	BOOSTER	525 3405010 06	EA	6	SG				Bel	1 Jan 94	
2	69	BELAZ	SET	7522 3405155	EA	10	SG				Bel	1 Jan 94	
2	70	BELAZ	PACKING	548 3501105	EA	240	SG				Bel	1 Jan 94	
2	71	BELAZ	PIPE	540T 3506060 01	EA	20	SG				Bel	1 Jan 94	
2	72	BELAZ	BRAKE PLATE	549A 3507015	EA	60	SG				Bel	1 Jan 94	
2	73	BELAZ	COMPRESSOR	540T 3509015	EA	10	SG				Bel	1 Jan 94	
2	74	BELAZ	RING	130-35L 167	EA	40	SG				Bel	1 Jan 94	
2	75	BELAZ	REGULATOR	11 3512010	EA	8	SG				Bel	1 Jan 94	
2	76	BELAZ	COLLAR	540-3519137 B	EA	40	SG				Bel	1 Jan 94	
2	77	BELAZ	CYLINDER	540M 3519310	EA	10	SG				Bel	1 Jan 94	
2	78	BELAZ	BRUSHHOLDER	G263A 3701010	EA	20	SG				Bel	1 Jan 94	
2	79	BELAZ	LOCK	856 3708000	EA	20	SG				Bel	1 Jan 94	
2	80	BELAZ	RELE STARTER	RC103 37078000	EA	10	SG				Bel	1 Jan 94	
2	81	BELAZ	STARTER	45 7375 1451	EA	6	SG				Bel	1 Jan 94	

MORRSION KNUDSEN COMPANY EMERGENCY HEAT and POWER PROJ NO 1 MATERIALS AND SPARE PARTS LIST

PRIORITY NUMBER	NUM	UNIT NAME	DESCRIPTION	PART NUMBER	UNITS	QNT	LOC	UNIT COST$	TOTAL COST$	SEA/RR TOTAL $	SOURCE CNTRY	NEED DATE	COMMENTS
2	82	BELAZ	VOLTAGE REGULATOR	21 3702	EA	20	SG				Bel	1 Jan 94	
2	83	BELAZ	SOLENOID	CT103-3708120-150	EA	20	SG				Bel	1 Jan 94	
2	84	BELAZ	ROTOR	25 3708200	EA	10	SG				Bel	1 Jan 94	
2	85	BELAZ	EQUALIZER BAR	25 3708320	EA	12	SG				Bel	1 Jan 94	
2	86	BELAZ	SWITCH	P602 3709210	EA	10	SG				Bel	1 Jan 94	
2	87	BELAZ	LIGHT SET	122 3711010-BV	EA	30	SG				Bel	1 Jan 94	
2	88	BELAZ	LIGHT SET	6 3711000KT	EA	30	SG				Bel	1 Jan 94	
2	89	BELAZ	FILTER ELEMENT	140-37112000-01	EA	30	SG				Bel	1 Jan 94	
2	90	BELAZ	INST LIGHTS	130 3712010-B	EA	20	SG				Bel	1 Jan 94	
2	91	BELAZ	INST LIGHTS	130 3716010 V	EA	15	SG				Bel	1 Jan 94	
2	92	BELAZ	INST LIGHTS	130 3716010 G	EA	15	SG				Bel	1 Jan 94	
2	93	BELAZ	REFLECTOR	FN 130-3716210	EA	20	SG				Bel	1 Jan 94	
2	94	BELAZ	REFLECTOR	FN 130 3716210B	EA	20	SG				Bel	1 Jan 94	
2	95	BELAZ	SIGNAL	C40 3721000	EA	12	SG				Bel	1 Jan 94	
2	96	BELAZ	ENGINE DIP STICKS	YP101 3726000-V1T	EA	30	SG				Bel	1 Jan 94	
2	97	BELAZ	SWITCH	P145 3726000T	EA	20	SG				Bel	1 Jan 94	
2	98	BELAZ	RELAY	RC 951A 3726010 70	EA	12	SG				Bel	1 Jan 94	
2	99	BELAZ	SENSOR	MM355 3829010	EA	20	SG				Bel	1 Jan 94	
2	100	BELAZ	HYDRALICK JACK	11107 39103010	EA	10	SG				Bel	1 Jan 94	
2	101	BELAZ	GLASS	540 5206010-10	EA	20	SG				Bel	1 Jan 94	
2	102	BELAZ	WINDOW HANDLES	81 6104013 B	EA	10	SG				Bel	1 Jan 94	
2	103	BELAZ	MIRROR	5040-8201015 01	EA	30	SG				Bel	1 Jan 94	
2	104	BELAZ	HOOD	7523 8402012	EA	6	SG				Bel	1 Jan 94	
2	105	BELAZ	HOOD	548A 8402411	EA	4	SG				Bel	1 Jan 94	
2	106	BELAZ	FENDERS	548A 840 3010	EA	4	SG				Bel	1 Jan 94	
2	107	BELAZ	GENERATOR	G263A 457371 1487	EA	6	SG				Bel	1 Jan 94	
2	108	BELAZ	STARTER	G263A	EA	10	SG				Bel	1 Jan 94	
2	109	BELAZ	ELECTROMOTOR	MN 1	EA	10	SG				Bel	1 Jan 94	
2	110	BELAZ	LAMPA	A24 1	EA	1000	SG				Bel	1 Jan 94	
2	111	BELAZ	LAMPA	A24 21 5	EA	1000	SG				Bel	1 Jan 94	

TOTAL COST US DOLLARS $23 283 254

SECTION 2
OPERATIONS & MAINTENANCE (O&M) TRAINING

The following section provides an outline for O&M training programs that should, if employed, make a long-term meaningful contribution to production and cost in coal mines of Mongolia

2 1 OBJECTIVES AND SCOPE

To define "basic" training programs which would enhance the knowledge, capabilities and experience of the mine and support staffs Areas to be focused on include

- Operations
- Engineering
- Accounting
- Purchasing and Procurement

It is the goal that through these training programs the Mongolian Coal Industry would begin to apply practical knowledge gained to improve the overall mine efficiency and production, while obtaining an important lesson in free market procedures and enterprising

A majority of these programs will concentrate on classroom type training sessions with the remainder being focused toward hands-on training In specific areas key individuals should be assigned (herein identified) to similar operations in the U S where they will witness in actual operation the practices they have learned

2 2 MINE OPERATIONS

Mine operations training should stress day to day activity and supervision of mining tasks including drilling and blasting, draglines, shovels, loaders, trucks, dozers and graders

Particular emphasis will be placed on preventative maintenance programs, manpowe scheduling and cost effective decision making The development of management tool such as monitoring and performance reports must be an integral part of the training Basic principals of economics, such as cost control, capital and return should also be provided

The following outline defines the content and nature of the training program for Mine Operations

MINE OPERATIONS (MO)

1 DRILLING & BLASTING

- Drilling techniques & procedures
- Effective use of drills
- How to size drills
- Blasting agents & alternatives
- Blasting technique & procedures
- Blasting applications

2 OVERBURDEN REMOVAL

- Alternatives and application
- Prestrip techniques
- Dragline utilization & application
- Shovel/Loader utilization/application
- Trucks & scrapers utilization/application
- Highwall stability & safety

3 COAL REMOVAL

- Maximize recovery
- Minimize dilution
- Alternatives and application

4. HAUL ROADS

- Tires
- Mechanical
- Productivity

5 RECLAMATION AND ENVIRONMENTAL IMPACTS

- Surface water
- Ground water
- Toxic and hazardous substances
- Grading and revegetation

6 MANAGEMENT REPORTS

- Job cost statement
- Performance and production reporting
- Equipment status report
- Budget vs actual

7 COAL PREPARATION

- Cleaning and loading
- Crushing and screening
- Blending

8 PREVENTATIVE MAINTENANCE

- Lubrication
- Vibration and noise
- Thermal monitoring
- Crack detection techniques
- Failure statistic analysis
- General maintenance procedures
- Spare parts control

- Welding and cutting procedures
- Bucket maintenance
- Tire maintenance
- Electrical maintenance
- Crusher and belt maintenance
- Dragline and shovel maintenance
- Truck, loader, dozer and grader maintenance
- Oil sampling and analysis
- Problem solving
- Safety
- Planning and scheduling
- Shops and facilities

9 ADMINISTRATIVE & FINANCIAL

- Operating cost
- Capital cost
- Fixed versus variable cost
- Cost statement
- Profit & loss statement
- Margin and rate of return
- Cost effective decision making
- Management by objectives

2 3 MINE ENGINEERING

Mining engineering training should focus on technologies that are applicable to Sharyn Gol and Baga Nuur mines Engineers who will become future managers should be exposed to virtually all the mine operations curriculum as well as some of the procurement, and accounting sessions Specifically for the engineer, emphasis of the program should be placed on short and long-term planning, proper equipment selection, mine plan criteria

and production monitoring A one week course in computer mine planning and applications will also be important

MINE ENGINEERING (ME)

1 MINE CONTROL AND VOLUMETRIC SURVEY

- Aerial
- Geodetic
- Slope stability monitoring

2 MINE PLANNING

- Short term
- Long term
- Equipment selection
- Computer application
- Mine design criteria

3 EQUIPMENT OPTIMIZATION

- Evaluation of current equipment utilization
- Evaluate requirements
- Reevaluate equipment selection

4. MANAGEMENT INFORMATION SYSTEMS

- Budget and cost monitoring
- Production reporting
- Mine data compilation system
- Mine data analysis system
- Cost recording system
- Information presentation
- Cost estimating

2 4 MINE ACCOUNTING

The mine accounting program should concentrate on cost reporting, financial analysis, budget preparation, material management and control, with emphasis on tracking, data collection systems and reporting systems

MINE ACCOUNTING (MA)

1. PROJECT PLANNING

- Chart of accounts
- Cost consideration
- Cost estimates
- Financial evaluations
- Capital vs expense decisions

2. FINANCIAL PLANNING

- Tools of financial planning
- Capital structure
- Long term financing
- Sources and use of funds

3 BUDGET PREPARATION AND CONTROL

- Capital, operating expenses and cash
- Method of allocating production cost and deferred expenses

4. MATERIAL MANAGEMENT

- Material management information system
- Procurement of equipment and spare parts
- Tracking, inventory control, and ordering

5 COSTING SYSTEM

- Cost system concept and objective
- Coding structure
- Interface with other system
- Prorated cost
- Direct cost
- Work order system
- Time card
- Issue card
- Information and means to develop cost management system

2 5 MINE PURCHASING AND PROCUREMENT

Training in purchasing and procurement will consist of procedures in expediting, management controls, contracts, negotiating and competitive bidding process Particular emphasis will be put on dealing with suppliers, terms and conditions of a P O , and utilization of shipper and forwarders Additionally, of primary importance, will be to present and instruct the participant in an inventory control system including requisitions, P O s, tracking and issue procedures The following outline identifies the scope of the training for this area

MINE PURCHASING AND PROCUREMENT (MP)

1 GENERAL SCOPE

- Procurement price and procedure
- Effective procurement planning and control
- Competitive bid process
- Evaluation technique
- Purchase requisitions

- Purchase order & processing
- Shippers and forwarders
- Contract administration
- Warranty
- Vendor performance
- Negotiating

2 INVENTORY CONTROL

- Cataloging
- Inventory classification
- Forecasting needs
- Reorder logic
- Inventory control techniques
- Transportation/Expediting

3 WAREHOUSE OPERATION

- Set up stock codes
- Warehouse layout
- Material handling equipment
- Receiving process
- Issuing process
- Equipment and tool control

4. ANALYSIS

- Active, inactive dead stock
- Service level, turnover, investment
- Lead time analysis
- Reporting

2 6 SCHEDULE AND ATTENDANCE OF TRAINING SEMINARS

The key people in the Mongolian industry must be exposed to this training Only if they understand and support the changes will they be initiated Since so many key managers will be scheduled to attend the training seminars from diverse locations it is best that the seminar be presented in Ulaanbaatar Holding the meetings in Ulaanbaatar provides a central location and adequate facilities for such training Working through the Ministry of Fuel and Energy, individuals will be scheduled during appropriate times Expense of travel, meal and lodging for the Mongolians would be covered by the Ministry Table 2 6-1 provides a list of training groups and their office locations

Table 2 6-2 provides a list of training sessions, attendees, instructors and the duration of each session To effectively utilize the time of the numerous instructors, consideration in scheduling must recognize their proper utilization Therefore, it is anticipated that the instructors shown on Table 2 6-2 will be required to teach the respective courses with the duration and desired attendees as shown

To schedule 7 different instructors teaching 22 sessions to 10 groups coming from over 3 locations will take some organization Recognizing some sessions may overlap the following matrix (Table 2 6-3) illustrates a possible schedule to effectively accommodate the diversity

Additionally, each instructor should make a mine visit to Sharyn Gol and Baga Nuur This visit should coincide with his training sessions Ideally he could visit one mine before his presentation and one after Thus he could appreciate the unique problems the Mongolians have and focus on them in his session The visit after his training would be utilized to follow up with staff and address questions in a less formal atmosphere

As an option and to culminate the training course a select group of individuals should visit coal mine operations in the United States that represent conditions similar to those

TABLE 2 6-1

TRAINING GROUP DEFINITIONS

TRAINING GROUP	DESIGNATION	OFFICE LOCATION
Senior Ministry Representatives	SMR	Ulaanbaatar
Senior Mine Management	SM	Sharyn Gol, Baga Nuur *
Production Superintendents	PS	Sharyn Gol, Baga Nuur *
Maintenance Superintendents	MS	Sharyn Gol, Baga Nuur *
Mine Engineering	ME	Sharyn Gol, Baga Nuur *
Engineering Ministry & Technical Institute	EMT	Ulaanbaatar
Mine Accounting	MA	Sharyn Gol, Baga Nuur *
Accounting Ministry	AMT	Ulaanbaatar
Mine Purchasing & Procurement	MP	Sharyn Gol, Baga Nuur *
Nuur Company Representatives	NC	Ulaanbaatar

* Also representatives from other mines in Mongolia such as Nalaikh, and Shivee Ovoo

TABLE 2 6-2

TRAINING SEMINAR SESSIONS

INSTRUCTOR	TRAINING SESSION	TRAINING GROUP	DURATION (DAYS)
Mine Operation - A	Drilling & Blasting	SM, PS, ME, EMT, MC	10
Mine Operation - A	Overburden Removal	SM, PS, ME, EMT	10
Mine Operation - A	Coal Removal	SM, PS, ME, EMT	05
Mine Operation - A	Haul Roads	SM, PS, ME, EMT	05
Mine Operation - A	Coal Preparation	SM, PS, ME, EMT	05
Mine Operation - B	Reclamation & Environmental Impacts	SM, PS, ME, EMT, SMR	05
Mine Operation - C	Management Reports	SM, ME, EMT, SMR, MA, AMT	10
Mine Operation - C	Administrative & Financial	SM, ME, EMT, SMR, MA, AMT	20
Mine Operation - D	Preventative Maintenance	SM, MS, ME, EMT	50
Mining Engineering - E	Mine Control & Volume Survey	ME, EMT	05
Mining Engineering - E	Mine Planning	ME, EMT	35
Mining Engineering - E	Equipment Optimization	ME, EMT	20
Mining Engineering - C	Management Information Systems	ME, EMT, MA, AMT	40
Mining Accounting - F	Project Planning	SMR, SM, MA, AMT, MP, NC, ME, EMT	20
Mining Accounting - F	Financial Planning	SMR, SM, MA, AMT	10
Mining Accounting - F	Budget Preparation & Control	SMR, SM, MA, AMT, MP, NC, ME, EMT	20
Mining Accounting - F	Materials Management	MA, AMT, MP, NC	10
Mining Accounting - F	Costing Systems	MA, AMT	40
Mine Purchasing & Procurement - G	General Scope Purchasing & Procurement	MP, NC	40
Mine Purchasing & Procurement - G	Inventory Control	MP, NC	40
Mine Purchasing & Procurement - G	Warehouse Operation	MP, NC	20
Mine Purchasing & Procurement - G	Analysis	MP, NC, SMR, SM	20
TOTAL			
7 Instructors	22 Sessions	10 Groups	44 Days

Table 2 6 - 3
Training Seminar Schedule

Training Session	Duration (days)	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Topic								
Drilling & Blasting	10							
Overburden Removal	10							
Coal Removal	05							
Haul Roads	05							
Coal Preparation	05							
Reclamation & Environ Impact	05							
Preventive Maintenance	50							
Administration & Finance	20							
Management Reporting	10							
Mine Control & Volume Survey	05							
Mine Planning	35							
Equipment Optimization	20							
Management Information Sys	40							
Project Planning	20							
Financial Planning	10							
Budget Preparation & Control	20							
Material Management	10							
Costing System	40							
Purchasing & Procurement	40							
Inventory Control	20							
Warehouse Operations	20							
Analysis	20							
USA Mine Visitation	150							
Groups								
Senior Ministry Representatives	105							
Senior Mine Managers	190							
Production Superintendents	40							
Maintenance Superintendents	50							
Mine Engineers	240							
Mine Engineering Technicians	240							
Mine Accountants	140							
Ministry Accountants	140							
Purchasing & Procurement	130							
Nuurs Company Representative	140							
Instructors								
Min Op A	35		B N B N S G S G S G					
Min Op B	05		B N B N S G S G S G					
Min Op C	70		S G S G	B N B N				
Min Op D	50		S G S G S G	B N B N				
Min Eng E	60		S G S G S G		B N B N			
Min Acc, F	80		S G S G S G		B N B N			
Min Purch & Proc G	100			S G S G S G	B N B N			

Key	
Full Day Session	
Half Day Session	
Sharyn Gol Mine (instructor visit)	SG
Baga Nuur Mine (instructor visit)	BN

experienced in Mongolia This should be done after completing the sessions in Mongolia, so that what they were exposed to in class can be reinforced with seeing the practices employed and the results

The individuals to make the trip to the United States can be broken into four groups These groups and the anticipated participants include

Ministry and Senior Mine Management

Deputy Coal Minister
Assistant Deputy Coal Minister
General Director Baga Nuur
General Director Sharyn Gol

Engineering

General Director Technical Institute
Director Technical Institute
Chief Engineer Sharyn Gol
Chief Engineer Baga Nuur

Production & Maintenance Superintendents

Production Superintendent Sharyn Gol
Production Superintendent Baga Nuur
Maintenance Superintendent Sharyn Gol
Maintenance Superintendent Baga Nuur

Purchasing Procurement & Accounting

Director Nuurs
General Manager Nuurs
Accountant Baga Nuur
Accountant Sharyn Gol

Purchasing Agent Baga Nuur
Purchasing Agent Sharyn Gol

These groups should anticipate spending approximately 2 weeks in the United States They should visit 2 and possibly 3 different operations In addition to actual operating mines they should also visit the home office or headquarters of a major mining company to observe the overall management processes of an American company

2 7 MATERIAL AND TRAINING NEEDS

Although audio and video systems do exist in Mongolia, at the most inopportune time they either disappear, do not work, or are incomplete Since training sessions are organized simultaneously, at a minimum, it is recommended that one complete set of training aids be retained and the remainder will be acquired in-country The needs would include

- VCR Camcorder
- VCR - Recorder/Player
- TV Monitor
- Accessories
- Slide Projector
- Screen
- Tapes
- Overhead Projector
- Freight from U S

2 8 LANGUAGE BARRIER

A significant obstacle to effective training will be to overcome the language difficulties, particularly in such diverse and technical fields At any one time while in Mongolia the greatest demand for interpreters will be three Two interpreters will be required for sessions going on simultaneously and one for mine visitations (possibly two) It is preferred that the technical talents of the interpreters include Mechanical Engineering, Mining or Geological, and Administrative skills These personnel are available in Mongolia with

varying capabilities It will be crucial to the success of the effort that good interpreters are acquired

2 9 ESTIMATED COST OF TRAINING

The following estimate is provided to perform the efforts herein defined, plus that of a Training Coordinator to maintain continuity and organization of the entire program

In-Country Training Program

1)	Material Preparation for Training Program	$ 48,000
2)	Coordination of Training, Site Presentation, Travel Time	198,000
3)	Travel Cost	36,000
4)	Per Diem	29,000
5)	Final Report	5,000
6)	Training Aides	9,000
	TOTAL	$ 325,000

Optional United States Training Program

1)	Travel to and from U S (Mongolian Delegation)	$ 72,000
2)	Inter-U S travel (Mongolian Delegation)	54,000
3)	Travel & U S Expense (meals & lodging, Mongolian Delegation)	36,000
4)	Coordination & Presentations in U S	49,000
	TOTAL	$ 211,000

2 10 EVALUATION CRITERIA

It is always difficult to quantitatively identify the rewards of a training program However, we believe that the benefits of the training to the Mongolians will be readily noticeable although it may take several months or years to become apparent The best way to

L 90

evaluate the merit of training will be to monitor the performance after implementation of the programs, in comparison to historical performances Statistics to follow at each mine would include

1) Overburden production per manday
2) Coal production per manday
3) Fuel consumption per total volume moved
4) Availability of draglines
5) Availability of shovels
6) Availability of trucks
7) Total annual production of dragline shovels and trucks

Unfortunately previous records are non-existent or confusing and contradictory at best As you have noticed major emphasis has been applied to tracking, monitoring and record keeping in the training session identified The primary purpose of this is to identify problem areas to focus one's attention to and to judge the success of one's corrective measures If incorporated, the means to measure the success of the programs will be established

To value future performance in comparison to what would have happened without the training requires visionary capabilities, thus a comparison to past performance is desired In light of the lack of data we would not measure the micro-performance but more global performance statistics such as BCY moved per year per machine for which records can be obtained or back calculated

The unfortunate part of this evaluation procedure is that we must live the future before we can quantify the success of the training programs Therefore, one must incur the cost of training before you can measure it's benefit We expect the benefits will only be noticeable after several months, but the rewards will be realized for years to come

Projections with which we feel comfortable now, based on our current activity and knowledge, would indicate that the following improvements could be attributed to training and use of American technologies

- Blasting supplies cut 15%

- Enhance dragline productivity and availability (10%) due to improved dragline bucket maintenance which should improve production at Baga Nuur by 5% or 175,000 tonnes of coal per year

- Change in management and operating procedures particularly manpower scheduling and equipment utilization and the introduction of utility support equipment should improve production per man day by 5% throughout the industry or an additional 300,000 tonnes of coal per year

These are reasonable expectations and goals we feel could be achieved and attributed to a thorough training program

SECTION 3
MAINTENANCE, ORDER, ENTRY, AND TRACKING SYSTEM

In the eyes of Western practitioners, the system for ordering, paying, transporting, tracking, and issuing materials in Mongolia has been, and continues to be, a very perplexing system The following narrative defines the procedures typically utilized by the mining industry today, the basis of which is the planned economy inherited from the Russians

3 1 TRADITIONAL PROCEDURES

Until 1991, Mongolian procurement followed the format of the planned economy Projections for five-year plans were developed with primary emphasis on new equipment needs These requests were confirmed within two years of delivery Once this contract was made, delivery had to be accepted regardless of need Also, the life of equipment was fixed For example, 40-tonne trucks were replaced every 250,000 km and dozers every 8-10,000 hours (approximately every 3 to 4 years) Forecasting with such advanced notice gave Russian factories secure orders around which to schedule production

Such an arrangement led to many abuses Having to anticipate so far in advance often required ordering much more than was necessary Inevitably, not every component was identified and, because ordering out of phase with the 2-year plan was extremely difficult, equipment would sit for weeks and months waiting for parts Useless inventories of inactive stock would grow in the meantime Knowing that equipment would be replaced on a scheduled basis led to little maintenance in the later life of the equipment Essentially, equipment was run to destruction, parked after the arrival of the new fleet, and then cannibalized for spare parts when needed

Primarily, purchases were made in rubles and the tugrik had established or negotiated exchange rates, so there was little difficulty in making payment Yet at times, the Mongolians would be given equipment they never asked for (excess or phased out Russian

models for which parts were no longer manufactured) which caused most payment problems Another difficulty was (and still is) getting selected pieces or spare parts The Russians would want to supply the entire unit rather than be bothered with individual parts For example, if a truck needed an engine, rather than supply one, they would prefer to sell the entire truck They made acquiring individual components and parts difficult as an incentive to purchase completely new ones in the next ordering cycle These basic principles and mentality are prevalent in today's Mongolian purchasing and procurement procedures

3 2 EXISTING PURCHASING AND PROCUREMENT PROCEDURES

In October of each year, all mines, including the small local mines, must prepare a list of needs for the next year and submit this list to the Ministry for approval Inevitably, this list is much more extensive than necessary since, traditionally, major cuts are always incorporated The list of needs is evaluated, summarized, and consolidated by the Nuurs Company (Nuurs is a trading company, and it is not private but a wholly controlled arm of the Ministry of Fuel and Energy) and presented to the Ministry by the end of October The Ministry makes its review and subsequent cuts, but it puts the majority of its emphasis on capital items such as new equipment, leaving the details of small parts and supplies mostly to the discretion of Nuurs In November, the list approved by the Ministry is submitted to the Ministry of Trade and Industry (MTI) and the Ministry of Finance (MF) Traditionally, both agencies make further cuts until a list, valued in U S dollars, is approved by these ministries Virtually nothing is manufactured in Mongolia

Upon identifying the value of the budget, which includes 20% for unforeseen emergency needs, MTI determines what portion of the budget can be acquired through barter and what portion must be financed by hard currency to be supplied by the Minister of Finance A survey is conducted by MTI to determine the value of the commodities to be traded as well as the quantity available for commitment The primary commodities used for trade are copper and fluoride concentrates, meat, leather, sheepskin coats, and cashmere A dollar

value is put on each item for which it is expected to be exchanged for an equal dollar value in equipment and parts The remaining funding is supplied by the MF As an example, in 1992, in addition to American and Japanese grants, 12 million dollars of materials were purchased of which 2 million dollars were bartered and 10 million dollars were purchased (It appears that some of the hard currency was supplied by World Bank funding, confirmation of this should be made, however) The dollars were supplied by the Mongolian State Bank International at no interest

At this point (December), the Nuurs Company is notified of the approved funding for the subsequent year and is given the authority to acquire the needed supplies The supplies exclude petroleum products which is the responsibility of the Petroleum Importing Company, it is not a private company, but part of the Ministry of Transportation and Communications Nuurs' representatives then go to their suppliers in Russia and negotiate contracts for the materials and equipment They are allowed to negotiate the bartered materials up to the value approved but are expected to do better To do otherwise requires the approval of MTI Items are ordered and scheduled for delivery on a quarterly basis Generally, a partial payment of 15-20% is made upon notification of shipment, and the balance is paid upon receipt Penalties generally established for late orders are to be paid in dollars, and cannot be credited to future purchases

Nuurs is responsible for tracking the shipment They are notified by telex that the shipment has left and are given the railcar billing and car number If the shipment is destined for the Baga Nuur Mine, it will be delivered to Baga Nuur where it will clear customs Nuurs' representatives will be contacted and will physically go to Baga Nuur to inspect the shipment for completeness and damage and clear it from customs They will prepare damage reports for insurance, if appropriate, and back order missing components If a shipment contains a variety of parts for Baga Nuur, Sharyn Gol, Shivee Ovoo, local mines, etc , the shipment is brought to Ulaanbataar where it is checked and cleared by Nuurs and stored in warehouses for future delivery Materials for Sharyn Gol are handled under the same procedure as Baga Nuur deliveries

An additional observation is that Nuurs purchases equipment and parts with dollars and commodities on an equal dollar value basis However, the mines are then charged in tugriks at the exchange rate of 40 tugriks to $1 00 when the street rate is over 350 to 1 In February, the charge rate was changed to 150 to 1 Irregardless, any cost data collected from the mine is significantly under estimated and misleading

3 3 CURRENT-1993 PURCHASING PROCEDURE

Our investigation has determined that the noted procedures for 1993 have been followed However, in December of last year, Nuurs did not contract out any of the materials and equipment required for this year which they have traditionally done Instead, they will order only on an as-needed basis We believe that this is a better approach but not for the reasons noted by the Mongolians which are as follows

1) Last year, Nuurs found themselves in a situation where they had ordered parts prior to AID's involvement for which AID funding was not available (in accordance with established AID guidelines) Therefore, they want to postpone any purchases until AID funding is available This can put the operations in a very serious predicament depending on how supportive Nuurs is in acquiring parts that need immediate replacement

2) Source of barter commodities are becoming difficult to acquire and values difficult to determine

   - Guarantee of production (i e copper concentrates) and availability uncertain

   - Private enterprises undercut government price of commodities Although the barter commodities used for trade come from government-established organizations, they have all established associated companies (Nuurs is an

example) These companies, although still controlled by various government ministries, are encouraged to act as private enterprises operating in a free market society Thus, they are allowed to sell their goods in the open market at a much higher price than what the government will pay them (production costs only) to use the goods as barter commodities Although public sales are more than what the government will pay, the subsequent resale value of the commodity by individuals is less than the barter value the government has placed on the product to exchange for Russian materials This leads to two problems 1) commodities are not available because the manufacturer is able to sell them at a higher price elsewhere and, 2) the arrangement undercuts the value the government applied to the commodities for trade

3 4 INVENTORY AND ISSUING CONTROL

Inventory is counted at the mine at least once a year The mine management is responsible for making and reporting the results although there is a Department of Inspection and Control within the Ministry of Fuel and Energy (MFE) which supposedly oversees this effort Although the MFE has asked Nuurs to involve themselves with such activity, Nuurs feels it is not their responsibility and have also found it difficult to work with the mine management on such an issue Nuurs has an interest (correctly so) in knowing what current inventories are to properly approve purchase requests When they ask to check or see inventory, they find the mine management uncooperative

There does not appear to be any minimum reorder system in place As an example, a review of Sharyn Gol's request list for 1993 was identical to the 1992 listing with only the date of submittal changed

Issuing parts, particularly larger components such as tires, is monitored by hand However, on such components, either the kilometers traveled or the hours worked are monitored to see if failure fell within established limits Approval for issuing such a major part includes

a lengthy process The individual operating the machine at the time of failure requests the superintendent for a new part The superintendent contacts the Chief Engineer who investigates the life of the component in question If acceptable, the warehouse is notified to release the replacement component If not, there is an inquiry into possible abuse or malfunction Although this procedure has merit, the equipment should be fixed first, and then administrative and investigative procedures should follow This would be a much more effective use of time

An incentive program has been established for operators Various bonuses are offered for various achievements For example, the number of tonnes hauled in a certain period, or if a truck operates over 250,000 kilometers or a dozer operates over 10,000 hours before it needs to be replaced, the operator would receive a bonus Coincidentally, these were the levels, in previous years under the planned economy, that the equipment was replaced irregardless of its condition

3 5 SHORT-TERM RECOMMENDATIONS

The following identifies recommendations for immediate and short-term efforts to be performed in purchasing, procurement, and inventory control

- A thorough inventory taken by someone outside the immediate mine management Make an inventory check of all parts in inventory at Baga Nuur, Sharyn Gol, Shivee Ovoo, and Nuurs' warehouse in Ulaanbaatar A candidate for this would be Nuurs with outside assistance from someone familiar with western inventory control systems

- Identify the rate of consumption for all major parts whether in inventory or not The purchasing or engineering departments should be responsible for this

- Identify the length of time current inventory will last under the current consumption rate

- A western specialist should investigate life, or production expected of components, to see if they achieve acceptable levels of performance This should allow one to focus on material or maintenance problems
- Nuurs should be aware of inventories at each mine such that duplication of inventories could be minimized and parts required at one mine may be found at another rather than ordered and waiting months for replacements

3 6 LONG-TERM RECOMMENDATIONS

To effectively manage the efforts of purchasing, procurement, and inventory in Mongolia, major changes and extensive training will be required The following outlines the needs

- A formal requisition and purchase order system

- A computerized inventory control system including parts issuing and reordering

- A parts and equipment tracking and monitoring system

- A preventative maintenance program

- Establish valid budgeting and monitoring procedures to be substantiated by supporting documentation and a formal management review process

3 7 COST AND SCHEDULE FOR IMPLEMENTATION

Actual implementation of such a system is made up of several stages Table 3 7-1 recognizes an investigative stage, a development stage, a training stage, and an

implementation stage Additionally, it is highly recommended that the effort include a visitation of Mongolian personnel to the United States to observe proper procedures first hand The cost, in U S dollars, for each stage is also shown in the table

700

TABLE 3 7-1
COST AND IMPLEMENTATION SCHEDULE
"MAINTENANCE, ORDER, ENTRY, AND TRACKING SYSTEMS"

Stage	Time Frame (Months)												US $
	1	2	3	4	5	6	7	8	9	10	11	12	
Investigation													65,000
Development													111,000
Training													95,000
Implementation													180,000
US Visitation													75,000
Total													526,000

SECTION 4
SHIVEE OVOO - MANAGEMENT OVERVIEW

The Shivee Ovoo deposit presents not only a unique opportunity to mitigate the coal supply problems in Mongolia but to establish American technologies, management, and operating procedure as a model for the rest of Mongolia This is a relatively new mine which began operations in December of 1991 with the first coal production in the spring of 1992 This offers Shivee Ovoo one of the greatest advantages it is not mature enough to have developed ingrained traditions and practices which make the other operations in Mongolia so inefficient. Additionally, it offers an opportunity to focus resources, technology and funding in one place where the results would not only be representative of American mining capability but also an example to all of Mongolia of how a free market enterprise manages its business

The greatest obstacle to the realization of Shivee Ovoo is its inherent quality With an average heat value of 2800-3200 kcal/Kg, it is significantly below the calorific value specification of Power Plant 4 in Ulaanbaatar of 3550 kcal/kg--the most lenient plant in the system This disparity must be overcome either through blending, beneficiation or plant modification before Shivee Ovoo will ever become a major contributor

4 1 INVESTIGATION

The Shivee Ovoo deposit lies approximately 240 km southeast of Ulaanbaatar in close proximity to the main line rail system connecting Ulaanbaatar with China The deposit was discovered in 1957 Over 450 core holes have been drilled in the deposit Approximately 663 5 million tonnes have been designated as proven reserves with 271 holes drilled on approximately 350 meter centers The remaining geological resource of approximately 2 2 billion tonnes in 5 defined coal strata can be designated as inferred Contrary to previous reports, our investigation has only been able to support the potential of 2 3 billion vs 6 0 billion tons of reserves reported in other documents (still a world-class deposit) Of greater

concern, is that we have determined the stripping ratio of the proven reserve of 663 5 million tonnes to be 78 3 1, as opposed to the previously reported 1 3 1 However, in evaluating the deposit and preparing the mine plan for this effort, we have identified a minable resource of 51 3 million tonnes, sufficient enough to produce approximately 36% of Mongolia's annual coal production for nearly 20 years at an in-place ratio of 1 69 1 (m^3/ tonne)

The overburden is unconsolidated and has no permafrost Therefore, at this time, other than the coal, there is no blasting required However, an investigation of the drill logs and lithology indicates that silicification of the sand clays with depth will dictate that blasting will be necessary in the future

There is a dewatering and depressurization system required At this time, there is one operating, yet drawdown rates would indicate that it should be expanded Greater scrutiny of the hydrological consequence through previously-collected data should be investigated If necessary, conventional pump tests should be performed to determine the ground water hydrology The current pumping rate is 4200 m^3/day, or approximately 1 5 million gallons per day There is no indication this problem is not manageable

There are five major coal bearing strata separated by numerous interburdens up to 60 meters and partings up to over 5 meters thick in places The five strata have the average following quality

	kcal/kg(BTU)	% Moisture	% Ash	% Sulfur
Seam 1	3050 (5485)	10 68	13 97	0 67
Seam 2	3065 (5510)	9 02	14 24	0 76
Seam 3	2900 (5200)	7 62	20 43	0 92
Seam 4	3020 (5440)	9 19	29 30	0 83
Seam 5	3056 (5500)	7 63	20 76	0 89

In the mine plan developed herein, coal is recovered primarily out of Strata 1, 2 and 5 It is also important to report the procedures of how the partings (virtually no calorific value and nearly 100% ash) were recognized in the calculation of the seam quality Since the selectivity of the Russian mining equipment is very poor, any parting of less than 1 meter is considered part of the coal and is, therefore, included in the sample analyzed Western technology would remove partings greater than 15 cm (6 inches) Recognizing the critically low quality being reported and the significant impact 1 meter of parting would have on the quality, we assumed removing all partings down to 15 cm, thus improving the as-mined calorific value approximately 5% to 2950 to 3360 kcal/kg The ash values recorded should improve as well but have not been corrected for the selective mining techniques proposed

Currently, there are no coal crushing or loading facilities at the site The coal is loaded directly from the mine (run-of-mine) into rail cars with 2-cubic-meter diesel shovels Loading run-of-mine coal (chunks of 1 meter) creates significant problems with pulverizers at the power plant

In addition to the juxtaposition to the main line railroad, Shivee Ovoo offers several other favorable infrastructure aspects, the lack of which makes development of most projects in Mongolia uneconomical For example, high-voltage transmission lines are available on site, and an abandoned Russian military town, which had apartments to house 10,000 people with supporting infrastructure, exists within a few kilometers

4 2 GEOLOGY

The coal is of cretaceous period age or approximately 95-100 million years old The coal is commonly referred to as brown coal or lignite The overburden is characteristically sandstone, sandy clay, mudstone, aleurolite, argelite and gravel in descending order of proportion The seams dip at approximately 5-12 degrees The original volumetrics and quality calculations assumed that coal seams of less than 1 meter were not considered recoverable and partings 1 meter or less between seams of coal greater than 1 meter thick

are considered recoverable Figure 1 indicates the projected footprint of the various outcrops in the proven reserve area Figure 2 represents the top of the seam outcrops and designates cross sections 1 through 8 (attached) Figures 3 through 10 represent the cross sections themselves These cross sections depict the mining technique employed at various locations as well

4 3 MINE PLAN

From the geological information, in-place and as-mined volumetrics were developed, and are presented in Table 4 3-1

The rehandle and minable ratios were determined by dragline range diagrams which sized the draglines and identified the rehandle requirements Figures 4 3-1, 4 3-2 and 4 3-3 show dragline range diagrams for various overburden depths

Range diagrams for overburden depths of 20, 30, 40, 50 and 60 meters, with two 10-meter seams of coal and five meters of partings have been designed to represent the typical conditions to be experienced at Shivee Ovoo

This design effort dictates that a 42 m^3 (55 yd^3) dragline with a 121 meter (400 foot) boom at a 35 degree angle and a 108 meter (356 foot) reach will be necessary to handle the thick overburden and interburden (up to 60 mm) and to compensate for the relatively thick coal seams Even with such a machine, rehandle at the 60 meter depth is 94%

The mine plan recognizes four distinctly different mine procedures which are designated in Figure 12

1) Loader truck - exclusively - red
2) Dragline - no rehandle - green
3) Dragline - with rehandle - green/purple

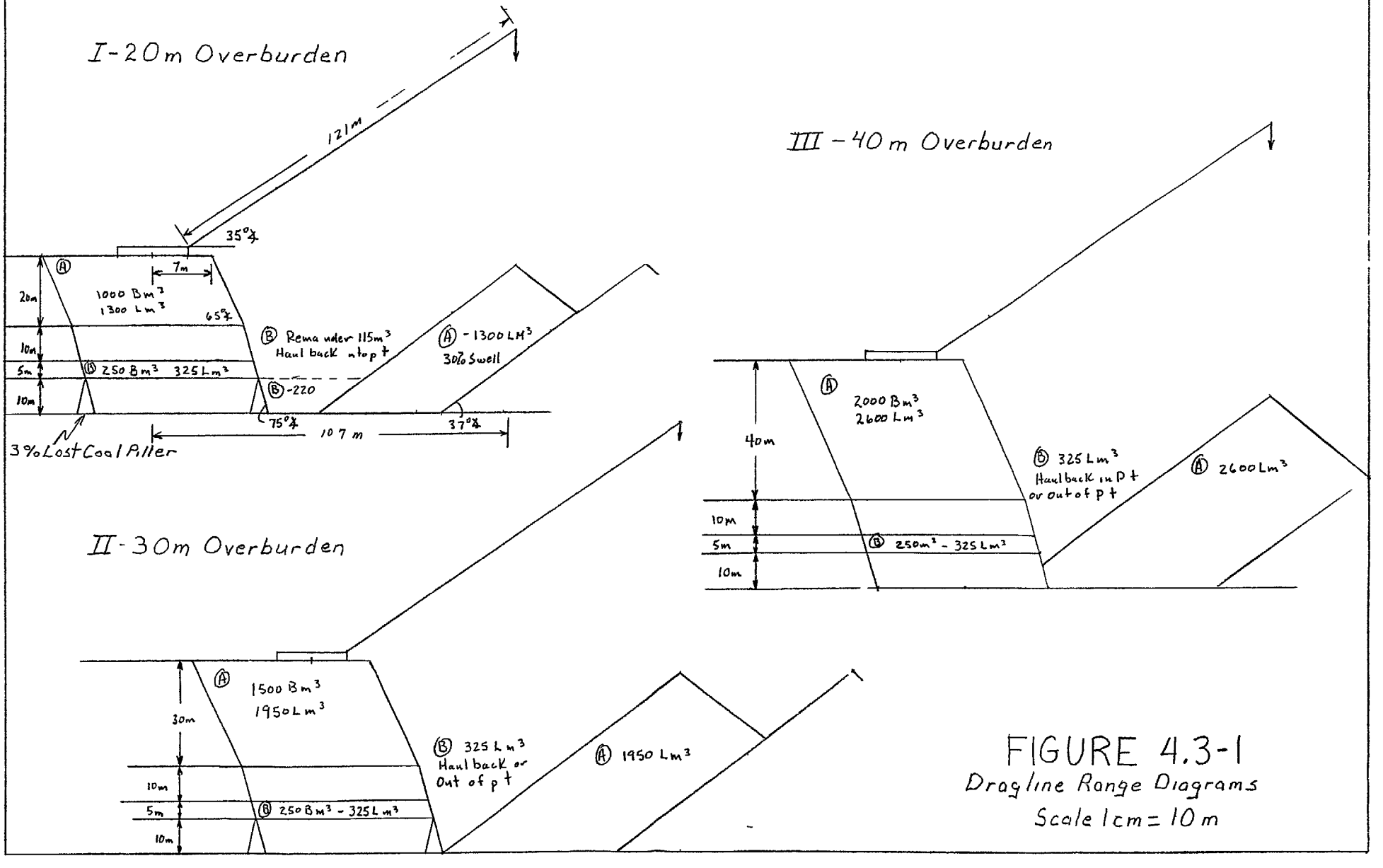

FIGURE 4.3-1
Dragline Range Diagrams
Scale 1cm = 10m

IV -50m Overburden
650 Lm³ (20%) Dozer or Truck
650 Lm³ (20%) Dragline Chop
2070 Lm³ (58%) Rehandle

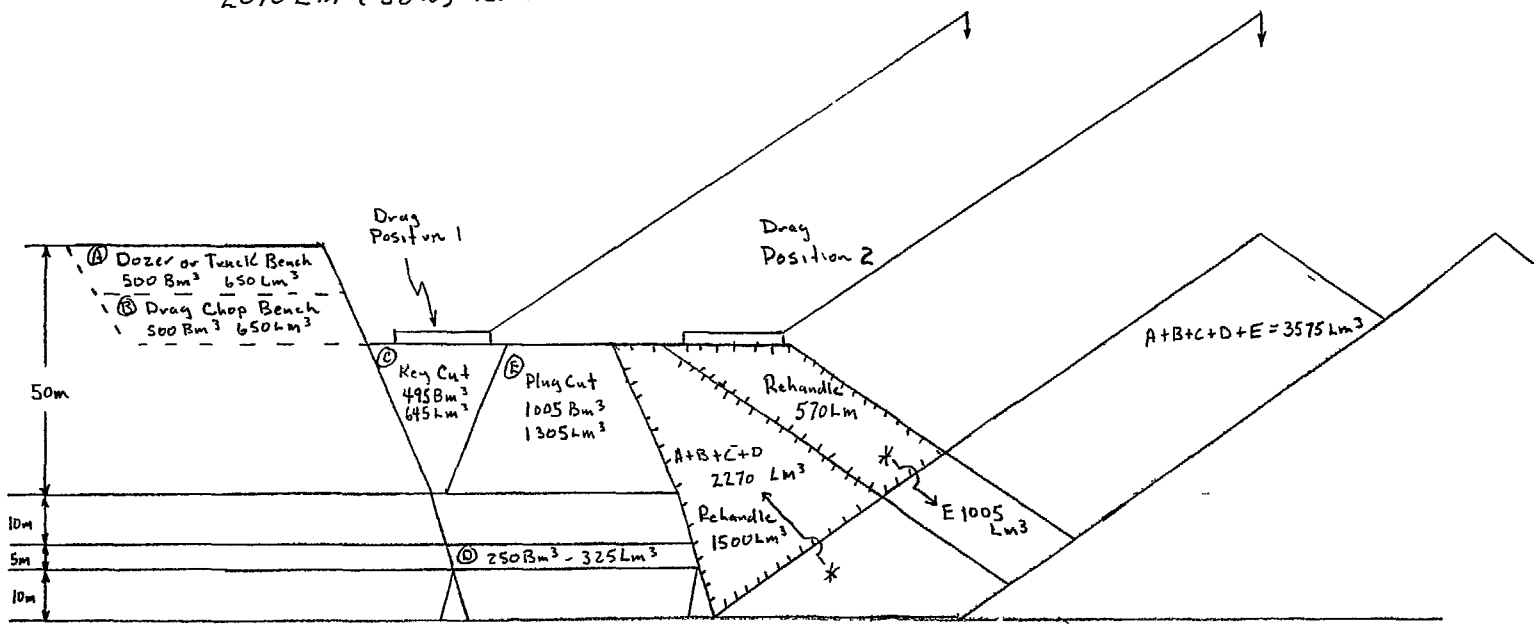

FIGURE 43-2
Dragline Range Diagrams
Scale 1cm = 10 m

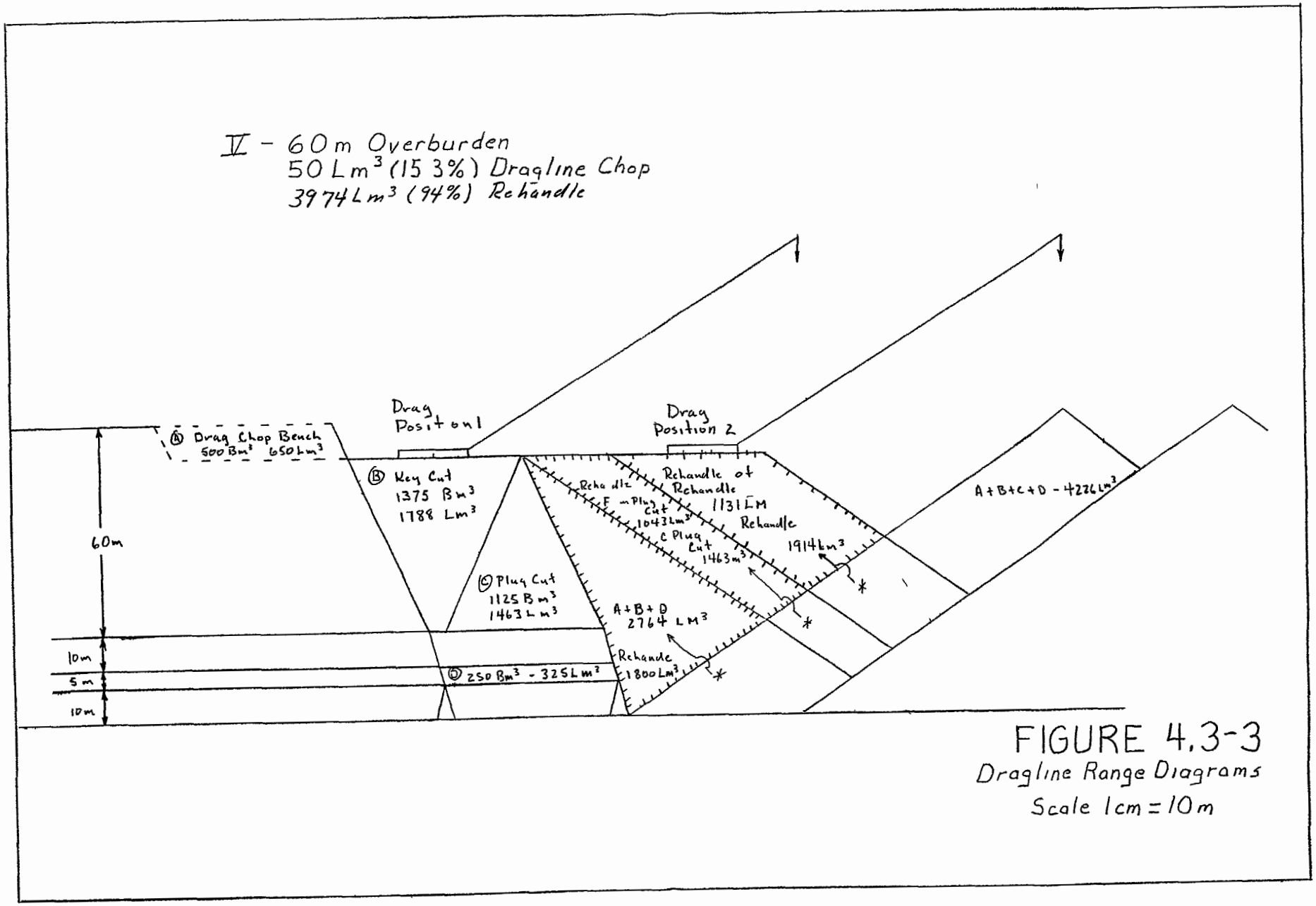

FIGURE 4.3-3
Dragline Range Diagrams
Scale 1cm = 10m

TABLE 4 3-1

VOLUMETRICS

LOCATION	AREA (SQ METERS)	AVERAGE OVERBURDEN THICKNESS (METERS)	OVERBURDEN VOLUME (CU METERS)	AVERAGE INT BURDEN THICKNESS (METERS)	INT'BURDEN VOLUME (CU METERS)	AVERAGE PARTING THICKNESS (METERS)	PARTING VOLUME (CU METERS)	10% REHANDLE VOLUME (CU METERS)	CALCULATED REHANDLE (%)	CALCULATED REHANDLE (CU METERS)
AREA 1	79,000	10 21	806,590	0 00	0	0 27	21,330	82,792	0%	0
AREA 2	200,000	15 64	3,128,000	0 00	0	0 45	90,000	321,800	0%	0
AREA 3	195,000	26 71	5,208,450	0 00	0	2 04	397,800	560,625	0%	0
AREA 4	244,000	49 97	12,192,680	0 00	0	2 36	575,840	1,276,852	58%	7,405,742
AREA 5	516,000	46 71	24,102,360	3 90	2,012,400	4 73	2,440,680	2,855,544	53%	15,134,383
AREA 6	399,000	28 71	11,455,290	59 46	23,724,540	5 20	2,074,800	3,725,463	94%	35,019,352
TOTAL	1,633,000	34 84	56,893,370	15 76	25,736,940	3 43	5,600,450	8,823,076	205%	57,559,477

LOCATION	AREA (SQ METERS)	COAL THICKNESS (METERS)	COAL VOLUME (CU METERS)	IN-PLACE COAL @ 1 3 S G (TONNES)	TOTAL IN-PLACE BURDEN (CU METERS)	IN-PLACE RATIO CU M /TONNE	RECOVERED COAL @ 85 % (TONNES)	COAL WASTE @ 15 % (CU METERS)	TOTAL * BURDEN HANDLED (CU METERS)	MINEABLE RATIO CU M /TONNE
AREA 1	79,000	14 5	1,145,500	1,489,150	827,920	0 56	1,265,778	171,825	1,082,537	0 86
AREA 2	200,000	13 7	2,740,000	3,562,000	3,218,000	0 90	3,027,700	411,000	3,950,800	1 30
AREA 3	195,000	18 4	3,588,000	4,664,400	5,606,250	1 20	3,964,740	538,200	6,705,075	1 69
AREA 4	244,000	21 4	5,221,600	6,788,080	12,768,520	1 88	5,769,868	783,240	22,234,354	3 85
AREA 5	516,000	29 6	15,273,600	19,855,680	28,555,440	1 44	16,877,328	2,291,040	48,836,407	2 89
AREA 6	399,000	28 7	11,451,300	14,886,690	37,254,630	2 50	12,653,687	1,717,695	77,717,140	6 14
TOTAL	1,633,000	24 1	39,420,000	51,246,000	88,230,760	1 72	43,559,100	5,913,000	160,526,313	3 69

* INCLUDES COAL WASTE

4) Dragline and loader truck - green/purple/red

Waste volume and ratios for the first three years are so small that a dragline operation is not advisable Therefore, a loader truck fleet is identified Beginning in year 4, a dragline will be introduced to accommodate the higher ratios Table 4 3-2 depicts the annual excavation quantities by equipment type

During the first three years of the operation (Figure 11), areas I, II, and III (Figure 12) will be mined This area has extremely low ratio coal and a dragline is unnecessary Therefore, shovel/loader and trucks will remove all overburden and coal during this period These areas are colored in red on all the cross sections (Figures 2 through10) and the mine plan drawing (Figure 12)

During years 4, 5 and part of 6, the mine plan is in an ideal dragline situation The overburden is 40 meters or less (see range diagrams) with only miscellaneous rehandle to be recognized This area is shaded green in the mine plan of Figure 12 and the cross section Figures 2 through 10

Years 6 through part of 12 recognize overburden depths of from 40 to 60 meters This is very demanding for the dragline and requires significant manipulation of the machine and rehandle Range diagrams for the 50 meter and 60 meter levels have been prepared two ways The 50 meter cover depicts a supplemental prestrip with dozers or truck/loader-shovels At the 60 meter depth, the dragline is shown doing the work exclusively In developing the volumetrics and the production requirements, we have assumed the dragline would handle all the overburden in both levels and, therefore, no prestrip volume was attributed to the shovel/loader-truck fleet The cost of truck material can exceed dragline dirt by over 400% and, since the dragline is physically capable of moving the material (see range diagrams) and has been herein sized sufficiently to move the volume, we have determined it has to be designated to move all of the material during this period

TABLE 4 3-2

PRODUCTION REQUIREMENTS

(IN MILLIONS)

YEAR	TRUCK & LOADER OVERBURDEN (CU METERS)	TRUCK & LOADER PARTING (CU METERS)	TRUCK & LOADER COAL (TONNES)	DRAGLINE & DOZER OVERBURDEN (CU METERS)
1	2 60	0 06	2 50	--
2	3 60	0 10	2 50	--
3	4 00	0 27	2 50	--
4	--	0 20	2 50	7 00
5	--	0 35	2 50	8 50
6	--	0 30	2 50	7 30
7	--	0 30	2 50	6 40
8	--	0 30	2 50	6.10
9	--	0 30	2 50	6 10
10	--	0 30	2 50	6 50
11	--	0 30	2 50	8 50
12	--	0 30	2 50	10 00
13	1 00	0 40	2 50	11 50
14	1 25	0 40	2 50	12 50
15	1 50	0 40	2.50	12 90
16	1 75	0 40	2 50	13 20
17	2 00	0 40	2 50	12 90
TOTAL	17 70	5 08	42 50	129 40

Years 12 through 17 are shaded red, purple and green in Figure 12 and on the cross sections This represents truck removal of the overburden above the fifth seam (strata) and the dragline working exclusively in the interburden which averages 59 5 meters thick

Partings have been assumed to be moved with a shovel/loader-truck fleet

Coal removal is to be removed by Huron Easi-miners This technique removes the coal in a horizontal plane in lifts up to 60 centimeters thick and with the selectivity of removing partings over 15 cm (6 in) thick Utilization of this machine will eliminate contamination of the coal (improve its quality approximately 5%), since current quality projections assume partings of 1 meter thick are part of the coal The Easi-miner cuts the coal, elimintng blasting The Easti-miner will minimize, possibly eliminate crushing since the discharge size of the coal is a maximum of 25 cm (6 in)

The truck fleet should be 109 tonne (120 ton) rear dumps capable of hauling coal, parting, and overburden They should all be the same for continuity

Dozers will be used for reclamation, cleaning coal, ripping frost, preparing dragline bench and possible parting removal

4 4 EQUIPMENT REQUIREMENTS

To accommodate the mine plan and its volumetric demands, the annual equipment requirements shown on Table 4 4-1 have been determined They have been developed by year to indicate additional unit requirements based on production demands Supplementary equipment and facilities are listed separately since they are common throughout the life of the job Table 4 4-2 represents the availability utilized and anticipated for each machine Table 4 4-3 represents the shift schedule required for each task to achieve the desired production

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TABLE 4.4-1
EQUIPMENT REQUIREMENTS

ITEM YEAR >	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
DRAGLINE 43 M3 - 56 YD			1	------	------	------	------	------	------	------	------	------	------	------	------	------	------>
DOZER (TRACK)	2	------>	3	------	------	------	------	------	------	------	------	------	------	------	------	------	------>
DOZER (RUBBER TIRE)	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------>
LOADER (RUBBER TIRE)	2	------>	3	------	------	------	------	------	------	------	------	------	------	------	------	------	------>
EASIMINER	2	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------>
TRUCKS 110 TONNE	6	7	9	9	9	6	6	6	6	6	6	6	7	7	8	8	8
DRILL	1	------>	2	------	------	------	------	------	------	------	------	------	------	------	------	------	------>
GRADER	2	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------>
WATER TRUCK	2	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------>
SERVICE TRUCK	2	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------>
MAN TRIP	2	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------>
PICKUP TRUCK	10	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------>
FLATBED TRUCK	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------>
CRANE	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------>

TABLE 4.4-2
AVAILABILITY

DRAGLINE	75%		TRUCKS	80%
DOZERS	75%		DRILLS	70%
LOADERS	70%		GRADERS	80%
EASIMINER	65%		WATER TRUCKS	70%

TABLE 4.4-3
SHIFT SCHEDULE

TASK / YEAR >	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
DRAGLINE				6DAY 2 SH	5DAY 3 SH	6DAY 2 SH	5DAY				3 SH	6DAY		7DAY			
COAL LOADING	5DAY 2 SH																
TRUCK BURDEN	5DAY 3 SH	6DAY		7DAY		5DAY											
RECLAMATION	5DAY 2 SH																
MAINTENANCE	6DAY 3 SH			7DAY		6DAY											

The dragline has been sized based on the range diagrams and production demands It will require 121 m (400 ft) boom, at 35 degrees to achieve a swing radius of 108 meters (356 ft) During the most demanding production period, the dragline must produce 13 0 million cubic meters per year This will require a 43 m^3 bucket (45 yd^3) The calculation supporting this maximum production is

$$\text{\# Swings} = \frac{350\ dy/yr \times 24\ hr/dy \times 60\ min/hr \times 60\ sec/min \times 75\%\ availability}{75\ sec\ per\ swing}$$

Swings = 302,400

Therefore 302,400 swings x 43 m^3/swing = 13 0 million cubic meters

The dozers should include 2 - 500 HP units with rippers, one for reclamation and one for coal cleaning and dragline ground work Additionally, 1 - 750 HP unit for ripping frost, benching for dragline and parting removal should be included

1 - 350 HP rubber-tired dozer for miscellaneous support should be also be required 2 - 10 m^3 (13 yd^3) rubber-tired loaders should be included for overburden removal, supplemental coal loading, and railroad car loading if necessary In year 3, another should be added as a backup machine

Two Huron Easi-miner are required although one is almost sufficient A second is required because of parts availability in Mongolia

By year 3, nine 110 tonne rear-dump trucks will be necessary Although bottom-dump trucks are more effective for coal hauling, these units must remove parting and overburden and, for continuity and inventory purposes, they should all be the same

Two 6 inch rotary blast hole drills are required Also 2 - 275 HP graders, 2 - 37,000 liter water trucks and miscellaneous support equipment is needed

4 5 FACILITY REQUIREMENTS

The maintenance facility should consist of 4 drive-through bays with sufficient depth to allow 2 trucks to park end to end One additional bay should be added and set up exclusively for servicing The height of the bay should be sufficient to handle a 120-ton truck with its bed up and sufficient clearance for a 30-ton overhead crane 2 of the bays should have rails in the floor for track dozers One side of the building should have a 30-ton crane and the other a 20-ton crane There should be a separate bay for a welding shop and one for an electrical shop

Remote from the maintenance building there should be a bucket repair building

Administrative and engineering can either be attached to the maintenance building or be independently located

The warehouse and secured outside storage should be adjacent to the maintenance bays with the ability of the overhead crane to move readily from the equipment bays in and out of the warehouse

An outside equipment line should be included provided with electrical outlets for keeping equipment warm when parked in the winter

A fuel farm, lube and acetylene storage should be located remotely from the maintenance facilities

A truck dump hopper with slot feeding capabilities should be provided at the crushers Only two stages of crushing will be required (conceivably none if a Huron East-miner is utilized and 15 cm material is acceptable) The first stage should be a rotary feeder breaker (autogenous mill) Since there are numerous small partings, this rotary breaker will tend to segregate out the rock material A Stamler feeder breaker or double drum

crusher will be sufficient to complete the crushing needs The system should be capable of operating at 1500 tonnes per hour Crushed coal should be stored in a drive-under coal silo for surge loading railroad cars An alternative to this could be direct loading of the rail cars from the prep plant which would require its operation whenever a train showed up or to have a conical outside stockpile which would feed the train through the use of an underground feeder and conveyor system The active capacity of the silo or the conical pile should be a minimum of 2 days of coal or 20,000 tonnes

Run-of-mine storage capacity in front of the hopper should be sufficient for 10 days or 100,000 tonnes

4 6 CRAFT MAN POWER REQUIREMENTS

The craft manpower is directly related to the equipment shift schedules depicted in Section 4 4 Therefore, the labor requirements shown on Table 4 6-1 will parallel Table 4 4-3 Shift Schedule

Man power requirements are based on an 8 hour work day If a task such as the dragline operations in later years is required to work seven days a week, 3 shifts per day, a fourth crew is included

Welders, mechanics and servicers are included in the maintenance personnel

4 7 MANAGEMENT ENGINEERING AND ADMINISTRATION

The organization chart shown on Table 4 7-1 represents the number of personnel required to manage the Shivee Ovoo operation as we have defined it herein

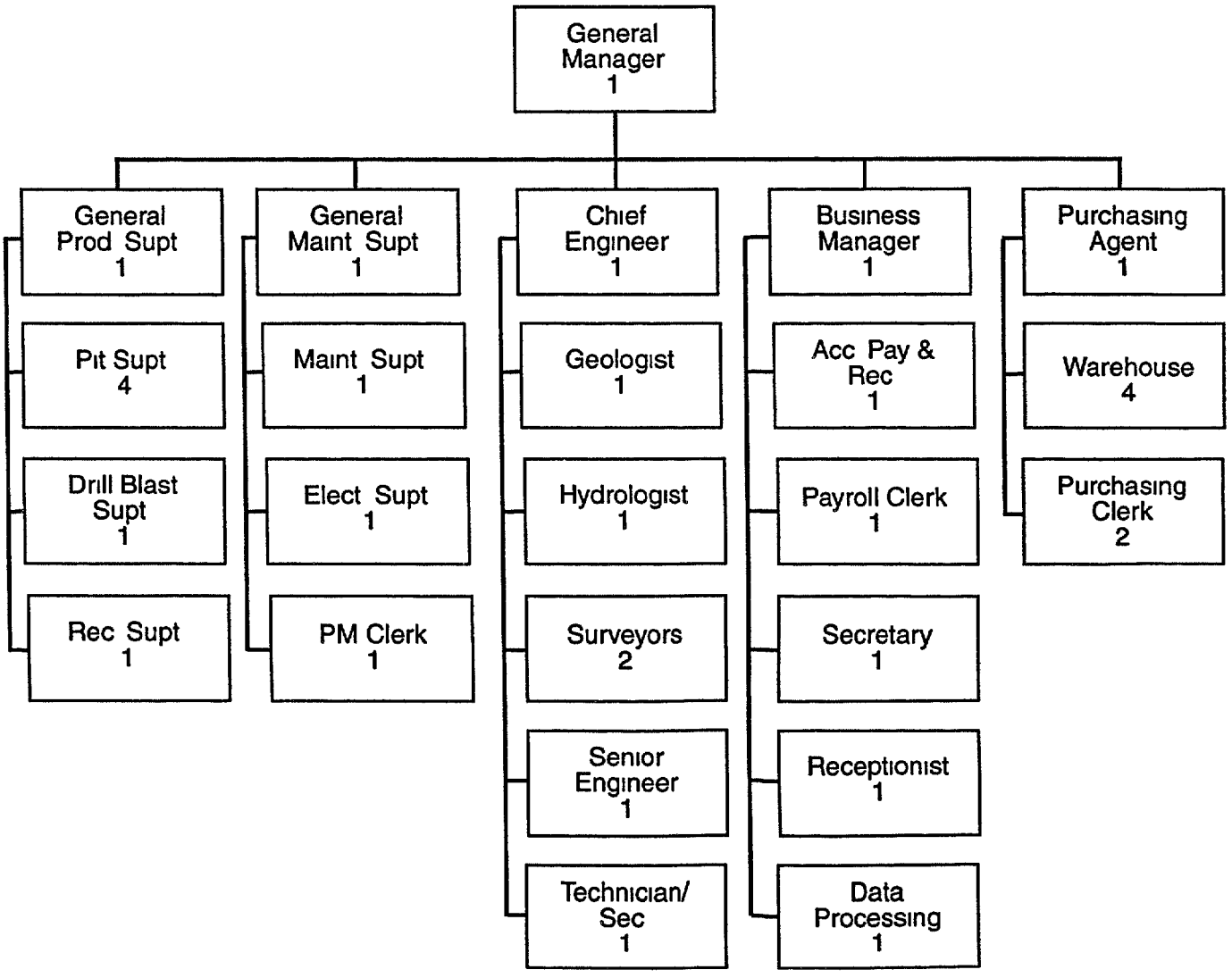
A total of 35 personnel are included in this organization structure, which would cover the years requiring maximum supervision for a 7 day per week schedule

TABLE 4.6-1
CRAFT MANPOWER REQUIREMENTS

ITEM YEAR >	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
DRAGLINE CREW				4	6	4	4	4	4	4	6	6	6	8	8	8	8
DOZERS	6	6	6	8	9	8	8	8	8	8	9	9	9	11	11	11	11
EASIMINER	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
TRUCKS	18	21	21	36	36	18	18	18	18	18	18	18	21	24	24	24	24
LOADERS	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
DRILLS	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
GRADER	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
WATER TRUCK	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
LABOR	6	6	6	8	8	6	6	6	6	6	6	6	6	6	6	6	6
OPERATIONS SUBTOTAL	48	51	53	76	79	56	56	56	56	56	59	59	62	69	69	69	69
MAINTENANCE PERSONNEL	20	21	22	31	32	23	23	23	23	23	24	24	25	28	28	28	28
TOTAL	68	72	75	107	111	79	79	79	79	79	83	83	87	97	97	97	97

TABLE 4.7-1

MANAGEMENT, ENGINEERING AND ADMINISTRATIVE ORGANIZATION CHART



TOTAL 35 PERSONNEL

4 8 INITIAL CAPITAL

Table 4 8-1 identifies initial capital initial capital investment to be incurred to bring this project on line as defined The cost includes actual purchase prices plus freight erection and a substantial inventory to support operations in Mongolia

4 9 OPERATING COST

The operating cost for this management overview exercise is based on historical operating cost recognized in similar operations which Morrison Knudsen runs in the United States Therefore, the operating cost represents typical American wage rates, material and supply cost, workmanship and work ethics Although the wage rate differs considerably between the U S and Mongolia, a significant portion of this differential is made up in operator proficiency and the exceedingly high cost of parts (transportation) which will be recognized in Mongolia Future evaluations should reconcile these differences to more appropriately define the actual cost We believe one will find the cost comparison extraordinarily difficult given the runaway inflation and exchange rates currently being realized in Mongolia However, for the benefit of further comparisons, Table 4 9-1 provides hourly operating cost of all the major pieces of equipment recommended in this study and the labor rate, fuel and power cost they are made up of These hourly "Equipment Operating Costs" are the basis for the unit cost developed in this estimate

Thus, the following unit costs have been developed

Dragline overburden cost per cubic meter	$0 26
Truck overburden cost per cubic meter	$1 17
Truck parting cost per cubic meter	$1 56
Coal load and haul cost per tonne	$1 65
Drill and blast cost per cubic meter	$0 20

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TABLE 4 8-1

CAPITAL INVESTMENT

EQUIPMENT	QUANTITY	PURCHASE PRICE	FREIGHT COST	ERECTION COST	INVENTORY COST	TOTAL
DRAGLINE (43 M3 - 56 YD)	1	$23,500,000	$5,000,000	$3,500,000	$3,525,000	$35,525,000
DOZER (TRACK 500 HP)	2	$1,180,000	$130,000	$20,000	$88,000	$1,418,000
DOZER (TRACK 750 HP)	1	$908,000	$106,000	$15,000	$136,000	$1,165,000
DOZER (RUBBER TIRE)	1	$450,000	$65,000	$12,000	$68,000	$595,000
LOADER (13 M3)	3	$2,551,000	$390,000	$30,000	$191,000	$3,162,000
EASIMINER	2	$3,500,000	$376,000	$45,000	$525,000	$4,446,000
TRUCKS 110 TONNE	9	$8,820,000	$1,350,000	$180,000	$441,000	$10,791,000
DRILL	2	$800,000	$180,000	$25,000	$125,000	$1,130,000
GRADER	2	$720,000	$80,000	$15,000	$108,000	$923,000
WATER TRUCK	2	$400,000	$170,000	$30,000	$30,000	$630,000
FUEL TRUCK	2	$250,000	$30,000	$5,000	$19,000	$304,000
SERVICE TRUCK	2	$160,000	$30,000	$5,000	$16,000	$211,000
MAN TRIP	2	$70,000	$12,000	--	$7,000	$89,000
PICKUP TRUCK	10	$300,000	$50,000	--	$30,000	$380,000
FLATBED TRUCK	1	$100,000	$10,000	$3,000	$10,000	$123,000
CRANE	1	$280,000	$25,000	$5,000	$40,000	$350,000
MISC SUPPORT EQUIPMENT & TOOLS		$1,000,000	$150,000	$50,000	$150,000	$1,350,000
FACILITIES						
* SHOP & WAREHOUSE	1	$2,000,000	$200,000	$300,000	$50,000	$2,550,000
* ADMINISTRATIVE BUILDING	1	$200,000	$40,000	$50,000	--	$290,000
* FUEL FARM	1	$150,000	$20 000	$30,000	--	$200,000
* POWDER MAGAZINES	1	$150,000	$20,000	$30,000	--	$200,000
* READY LINE	1	$50,000	$5,000	$15,000	--	$70,000
CRUSHING PLANT	1	$2,500,000	$400,000	$300,000	$375,000	$3,575,000
DEWATERING / DEPRESSURIZATION SYSTEM	1	$500,000	$50,000	$50,000	--	$600,000
TOTAL		$50,539,000	$8,889,000	$4,715,000	$5,934,000	$70,077,000

* NOTE CONSTRUCTION MATERIALS SUPPLIED BY THE MONGOLIANS

TABLE 4 9-1

EQUIPMENT OPERATING COST

EQUIPMENT	OPERATING COST * U S $ / HOUR
DRAGLINE (43 M3 - 56 YD)	$500 00
DOZER (TRACK 500 HP)	$46 00
DOZER (TRACK 750 HP)	$56 00
DOZER (RUBBER TIRE)	$50 00
LOADER (10 M3)	$52 00
EASIMINER	$195 00
110 TONNE TRUCKS	$67 00
DRILL	$74 00
GRADER	$22 00
WATER TRUCK	$52 00
FUEL TRUCK	$15 00
SERVICE TRUCK	$15 00
COST BASIS	
MECHANIC LABOR	$21 00 / Hour
DIESEL FUEL	$0 20 / Liter
ELECTRIC POWER	$0 09 / KWH

* Operating costs are based on current U S A labor, fuel, power, parts and supply costs

Reclamation per square meter	$1 00
Coal crushing and loading per tonne	$0 50
General and administrative cost per month	$300,000

Utilizing this unit cost and the annual volumes to be encountered, the total annual operating cost was developed as shown in Table 4 9-2

TABLE 4 9-2

ANNUAL OPERATING COST

TASK	UNIT COST	UNITS	YEAR 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	TOTAL
DRAGLINE OVERBURDEN	$0 26	Cu Meters																		
VOLUME (Millions)			N/A	N/A	N/A	7 00	8 50	7 30	6 40	6 10	6 10	6 50	8 50	10 00	11 50	12 50	12 90	13 20	12 90	129.40
COST (Millions)			$0 00	$0 00	$0 00	$1 82	$2 21	$1 90	$1 66	$1 59	$1 59	$1 69	$2 21	$2 60	$2 99	$3 25	$3 35	$3 43	$3 35	$33 64
TRUCK OVERBURDEN	$1 17	Cu Meters																		
VOLUME (Millions)			2 60	3 60	4 00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1 00	1 25	1 50	1 75	2 00	17 70
COST (Millions)			$3 04	$4 21	$4 68	$0 00	$0 00	$0 00	$0 00	$0 00	$0 00	$0 00	$0 00	$0 00	$1 17	$1 46	$1 76	$2 05	$2 34	$20 71
TRUCK PARTING	$1 56	Cu Meters																		
VOLUME (Millions)			0 06	0 10	0 27	0 20	0 35	0 30	0 30	0 30	0 30	0 30	0 30	0 30	0 40	0 40	0 40	0 40	0 40	5 08
COST (Millions)			$0 09	$0 16	$0 42	$0 31	$0 55	$0 47	$0 47	$0 47	$0 47	$0 47	$0 47	$0 47	$0 62	$0 62	$0 62	$0 62	$0 62	$7 92
COAL LOAD & HAUL	$1 65	Tonnes																		
VOLUME (Millions)			2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	42 50
COST (Millions)			$4 13	$4 13	$4 13	$4 13	$4 13	$4 13	$4 13	$4 13	$4 13	$4 13	$4 13	$4 13	$4 13	$4 13	$4 13	$4 13	$4 13	$70 13
DRILL & BLAST	$0 20	Cu Meters																		
VOLUME (Millions)			2 60	3 70	4 27	4 75	5 78	4 96	4 29	4 15	4 15	4 36	5 79	6 80	6 50	7 00	7 50	8 00	8 50	93 10
COST (Millions)			$0 52	$0 74	$0 85	$0 95	$1 16	$0 99	$0 86	$0 83	$0 83	$0 87	$1 16	$1 36	$1 30	$1 40	$1 50	$1 60	$1 70	$18 62
RECLAMATION	$1 00	Sq Meters																		
VOLUME (Millions)			0 10	0 10	0 10	0 10	0 10	0 10	0 10	0 10	0 10	0 10	0 10	0 10	0 10	0 10	0 10	0 10	0 10	1 63
COST (Millions)			$0 10	$0 10	$0 10	$0 10	$0 10	$0 10	$0 10	$0 10	$0 10	$0 10	$0 10	$0 10	$0 10	$0 10	$0 10	$0 10	$0 10	$1 63
COAL CRUSHING & LOADING	$0 50	Tonnes																		
VOLUME (Millions)			2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	42 50
COST (Millions)			$1 25	$1 25	$1 25	$1 25	$1 25	$1 25	$1 25	$1 25	$1 25	$1 25	$1 25	$1 25	$1 25	$1 25	$1 25	$1 25	$1 25	$21.25
GENERAL & ADMINISTRATIVE	$300,000	Month																		
MONTHS			12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	204 00
COST (Millions)			$3 60	$3 60	$3 60	$3 60	$3 60	$3 60	$3 60	$3 60	$3 60	$3 60	$3 60	$3 60	$3 60	$3 60	$3 60	$3 60	$3 60	$61 20
TOTAL COST (Millions)			$12 73	$14 18	$15 03	$12 15	$12 98	$12 43	$12 06	$11 96	$11 96	$12 10	$12 91	$13 50	$15 16	$15 81	$16 30	$16 77	$17 09	$235 11
TOTAL TONNES (Millions)			2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	2 50	42 50
COST/TONNE			$5 09	$5 67	$6 01	$4 86	$5 19	$4 97	$4 82	$4 78	$4 78	$4 84	$5 16	$5 40	$6 06	$6 32	$6 52	$6 71	$6 84	$5 53

SECTION 5
BLASTING TRAINING SESSIONS AND EVALUATIONS

During the "continuing efforts" of technical assistance, MK followed its initial blasting seminars with additional classroom and in-field training in the use of explosives Western technology was demonstrated using actual western materials acquired from the Ensign-Bickford Company The success and acceptance of this effort was significant

5.1 OVERVIEW

The purpose of the training was to educate the Mongolians in the techniques and benefits of controlled blasting Blasting practices observed at the mines are the practices which were last seen in the late 1950's and early 1960's in the major mining countries of the non-communist world Mongolia's long isolation has resulted in the lack of exposure to modern blasting practices Proper delay sequencing of blast holes within a blast pattern are not understood Hole damage and energy loss as a result of utilizing high-strength detonating cord for down lines in blast holes is not understood Minimizing back break through proper selection of burdens and spacings is not understood Energy loss as a result of insufficient stemming is ignored Blast patterns are not properly prepared prior to drilling resulting in poor pattern layout and excessive front-row burdens Both MK and Ensign-Bickford supplied video cassettes in which a number of controlled blasts were visually represented These video cassettes, more than anything else, demonstrated to the Mongolians what real controlled blasting is, and they then understood how uncontrolled their current blasting practices are

5 2 MINISTRY OF FUEL AND ENERGY SEMINAR - ULAANBAATAR

A seminar was conducted from 11 00 AM until 1 00 PM on March 20, 1993, at the Ministry of Fuel and Energy Conference Room Approximately 20 engineers and key staff members attended Visual aids included numerous texts and brochures on various blasting products,

overheads, and the video cassettes The video cassettes, which last a total of approximately 8 minutes, were played first at the very beginning of the seminar prior to any discussion and then again at the end of the seminar The purpose of sequential delaying of individual blast holes was explained Also covered were blast hole terminology, importance of stemming heights, blast pattern burdens and spacings, and blast hole energy losses due to detonating cord The technology behind shock tube was explained in great detail along with the reasons it is replacing detonating cord around the world The Mongolians were unaware of the existence of shock tube in blast initiation systems prior to our earlier blasting seminars given last December

The subject of ANFO vs AMMONIT was again addressed Tom Treleaven, who has conducted blasts in more than forty countries worldwide, stated that until he came to Mongolia, he had never conducted or seen any blasts which used AMMONIT He stated that ANFO is the universal explosive used around the world The gas energy produced in an ANFO explosion is much greater than an AMMONIT explosion This is evidenced by the large orange cloud generated by AMMONIT This orange cloud is NO_2, a poisonous gas which is generated when Ammonium Nitrate is detonated without a carbon source (fuel oil) AMMONIT consists of 78% AN (fertilizer grade) and 22% prilled or flaked TNT (trinitrotoluene) On the other hand, ANFO, when detonated, produces water vapor and carbon dioxide gases These gases occupy more space than nitrous gases and, therefore, create greater gas energy Gas energy performs 85% of the work energy in blast hole breakage and, as a result, is very important

5 3 SHARYN GOL MINE SEMINAR AND EVALUATION

We drove to the Sharyn Gol Mine on Monday morning, March 22, arriving at the mine site at 12 00 noon The trip took 5 hours due to the muddy condition of the access road caused by the spring thaw On Monday afternoon, the Blast Engineer showed us three different blast patterns he had available, and we chose the one best suited for a demonstration Approximately 90 holes were made available for demonstrating controlled blasting utilizing

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the EZ Det initiation system The blast holes were all 12 meters in depth and laid out on a rectangular pattern of burden (4 5 meters) x spacing (5 0 meters) Blast hole diameter was 160 mm The pattern was primarily three rows deep except for one end which was four rows for a short distance The actual depth of the drill holes was checked by measuring tape and found to be consistently 12 meters The EZ Det initiators were viewed in the explosives magazine Quantities were checked against what was purchased Then 900 EZ Dets of 17-meter length were removed and taken to the demonstration blast site At the blast site, the Blasting Engineer and blast crew were shown how to prime the blast holes using the EZ Det initiator Each EZ Det contained a 25-ms (millisececond) surface delay and a 350-ms down-the-hole delay Not having standard cast primers for the blast holes, we used Sharyn Gol's standard primer consisting of 10 cartridges (2 kg) of AMMONIT and inserted the down-hole delay into a center cartridge, tying the bundle together with a double half hitch of shock tube down line At every hole, 60 kg of bulk AMMONIT was poured in the blast hole, and then the hole was stemmed with drill cuttings This created blast holes with 4 meters of explosives column and 8 meters of stemming The resultant powder factor was 0 27 kg/cubic meter After the blast, it was learned that this powder factor was reduced from the blasting previously used at this mine, prior to this shot, blasting was done at 0 36 kg/cubic meter On prior shots, two 40-kg bags, or 80 kg, of explosives were used per hole (25% reduction) The reason given was that this pattern would not be excavated until June at which time the frost would be out of the rock

The blast crew quickly learned how to load the blast holes using the EZ Det initiators, and the entire shot was loaded in preparation for blasting Tuesday morning Mr Zhargalsaihan, Executive Director of Production, and the Blast Engineer watched and supervised the entire loading operation The shooting of the blast was postponed until Tuesday morning to allow a substation and electric trailing cable to be moved away from the blast pattern

On Tuesday morning, at 9 00 AM, a classroom training seminar was held for the mine management, engineers, and the blast crew Again, the video cassettes were the highlight of the presentation Having used the EZ Det initiators the prior day in loading the blast

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holes at the demonstration blast site, the mine personnel were more familiar with the initiation system and eager to have it explained The seminar was well attended with the General Director also in attendance The seminar lasted 1 1/2 hours or until 10 30 AM At 10 30 AM, we went to the demonstration site and showed the blast crew how to hook up the initiation system After showing them only a few holes, they were allowed to complete the process themselves The rows were connected with a 17-ms-delay connector tube This then gave each individual hole a separate sequential delay The connection of the holes and rows took approximately 15 minutes to complete Under the old system, this would have taken one to two hours Mr Dagvadorj (General Director), Mr Ahargalsaihan (Executive Director - Production), and Mr Davatseden (Blast Engineer) all observed the initiation process and witnessed the firing at 11 00 AM The General Director was especially impressed by the absence of noise and flyrock from the blast He doubted at first that the shot had fired as it was so different from the previous shots he had observed The blast had a good energy trough extending the length of the blast, indicating good rock movement As on all shots, the frost zone contained large chunks, but these should break apart during the coming warmer months It is felt the demonstration shot would have been more impressive if the powder factor had not been reduced A 0 27 kg/cubic meter powder factor is too light of an explosive load The proof will be in the digging, and this may be acceptable at this mine The use of a good quality ANFO blasting prill explosive would also improve rock movement and fragmentation The mine may want to consider drilling a smaller diameter hole to bring the explosive column higher in the bore hole Use of a 140-mm-diameter blast hole instead of the current 160-mm-diameter blast hole to achieve better surface breakage This change would alter the 12-meter-hole-length specifications as follows at the 0 27 powder factor

	160-mm Hole	140-mm Hole
Explosive column (meters)	4	7
Stemming height (meters)	8	5
Hole length	12	12

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The purchase of cast PETN primers would also give more explosive energy to the explosive column due to their higher detonation pressures, approximately 5 times higher than that being achieved with the cartridged AMMONIT One 340-gram cast primer would replace the current 2,000 grams of cartridged AMMONIT being used This is a 80% reduction in explosive usage for hole priming The ease of handling alone could justify the purchase of cast primers The mine could prime with 1,000 grams (5-cartridge AMMONIT) immediately and cut their usage by 50% This is how the mine at Baga Nuur successfully primes their blast holes

Following the blast, the mine management informed us that they would like to obtain a year's supply of the EZ Det initiators An exit meeting was held with the General Director and his staff We then returned to Ulaanbaatar Two cases of EZ Det initiators were checked out of the explosives magazine and transported to Baga Nuur for the next day's demonstration blast Not knowing the depths of blast holes at Baga Nuur to be blasted, it was necessary to transport a case of long-lead (17 meter) detonators and a case of short-lead (9 meter) detonators Each case contains 60 EZ Dets

Recommendation Sharyn Gol should replace their explosives and explosive initiators as follows

Old	New
AMMONIT Bulk Powder	ANFO Bulk Blasting Prill /with 8 tonne mix truck
AMMONIT Cartridges	Prepackaged emulsion for wet holes cast boosters (340 grams)
60-70 Grain Det Cord	25 Grain Det Cord MS Nonel Primadets No 12 - 4 meters MS Connectors - 65 ms EZ Dets - 17 meters

For the short frost holes (2-meter depth), 4 meters of MS Primadet down-hole delays (No 12's -400 ms) should be used in the holes, and the surface should be connected with grain det cord and MS Connectors (65 ms) This would be the most cost efficient and still have a good delay system The EZ Det initiation system should be used only for the 12-meter-deep waste rock shots For any blast hole depths under 8 meters, the EZ Det system should not be used for economic reasons The most cost effective method is a combination of MS Primadets, MS Connectors, detonating cord, cast boosters, and ANFO

5 4 BAGA NUUR MINE SEMINAR AND EVALUATION

We drove to the Baga Nuur Mine, arriving at the site at 9 00 AM, March 24, 1993 On the trip to Baga Nuur Mine, we took Mr Tulga, Ph d (Sr Officer-Coal Dept), along with us He has worked many years with the Research Institute but was recently reassigned to the coal department At the mine, we were greeted by Mr Dambapelje, Chief Engineer, who was to be our host This was the first visit to the Baga Nuur Mine where we were allowed to make our presentation to the mine engineers and production supervisors They were aggressive and uninformed about our role or purpose in visiting the mine This was good for many excellent questions were asked and answered We were shown a drill pattern where our demonstration blast would be set off adjacent to a production blast The combined number of blast holes totalled approximately 600 holes We had only brought EZ Det initiators of the correct length to blast a 60-hole pattern The remaining holes were to be initiated by the mine's normal loading method

After viewing the demonstration pattern, we returned to the Chief Engineer's office where we discussed the explosives consumption at Baga Nuur This discussion revealed that the explosives used at Baga Nuur exceeds that of Sharyn Gol by 200% The coal at Baga Nuur is covered by permafrost, not just winter surface frost While the winter frost is only a problem in winter and blasted with short 2-meter blast holes, the permafrost is a year-round problem requiring a large volume of explosives daily and blasted with 8-to 9-meter blast holes The mine is using approximately 3,400 tonnes of explosives per year and

blasting between 7,000 and 10,000 holes per month The powder factor being used in the 8-meter holes is very large at 0 56 kg/cubic meter This is excessive by any blast standard In addition, the mine decks the 8-meter holes The blast-hole diameter is 160 mm Therefore, 20 kg, or one meter, of explosives should be placed in the bottom of the hole, then 3 meters of stemming, then another 20 kg of explosives, and finally 3 meters of stemming to the surface The first recommendation is that the mine reduce its blast-hole diameter to 140 mm from the 160 mm now used As at the Sharyn Gol Mine, this will eliminate the necessity to deck the blast holes by increasing the explosives column length From these numbers, a close estimate of the annual initiator consumption can be determined and recommendations for purchase compiled

The explosives seminar was conducted in the mine conference room from 1 00 PM to 3 00 PM As in the other seminars, the video presentation was the most enlightening Again, discussions came back to AMMONIT versus ANFO Why ANFO is a better explosive was explained along with why they had experienced ANFO that burned instead of properly detonating The difference between agricultural AN prills and blasting AN prills was again covered We explained the stemming damage and explosives damage caused by their high-load detonating cord

When the seminar ended, we proceeded to the demonstration blast site with all the attendees from the seminar At the blast site, we demonstrated how to prime and prepare the blast holes using the EZ Det initiation system After demonstrating on several holes, the blast crew was allowed to prepare all the remaining blast holes of the demonstration pattern The blast crew at Baga Nuur has 14 hourly employees so they are able to load many holes in a short time The demonstration pattern consisted of 60 holes reported to be 8-meters deep The holes were drilled on a 3-meter x 3-meter square pattern, and was basically a three-row pattern The loading went quickly on the EZ Det holes It was then necessary to wait another 2 hours while the remaining 540 blast holes were loaded

While waiting for the completion of loading, 20 or 30 open blast holes were tape measured to check the accuracy of the drilling It discovered that the blast holes were not 8 meters as designed but only 5 to 6 meters in depth We notified the Chief Engineer, and he began quickly checking the hole depths wherever he could find them Our findings were confirmed Two problems now surfaced First, the drillers are paid on meters drilled and, therefore, had been paid 30% more than they should have been Second, with the drill holes so short and having been deck loaded as described previously, these holes had explosives all the way to the top of the holes This creates a very dangerous and costly flyrock condition

The demonstration blast was initiated about 6 00 PM and followed by the regular blast at 6 30 PM The demonstration blast was viewed from the spoil piles on the opposite side of the dragline pit, approximately 1/2 kilometer from the blast The delays were clearly seen and the rock had good movement However, there was an excessive amount of flyrock, but this was due to the short holes and overloading with explosives. The EZ Det system performed well under the conditions For the regular Baga Nuur blast, we moved all the vehicles and personnel another full kilometer away The blast was instantaneous and violent Flyrock came within 50 meters of our viewing position Judging by the flyrock observed on the fields surrounding the dragline pit, this is a common occurrence Tremendous amounts of equipment damage and unnecessary work is a result of this type of blasting The explosive is vented so violently into the atmosphere that it does not produce sufficient work energy to break the rock before being sucked into the air So while the air show is spectacular, the rock breakage is poor The only way to describe the blast is that it ranks among the worst ever witnessed A violation of almost all blasting principles and rules

The current method of loading is very costly and inefficient The mine is capable of an immediate 20% savings in explosives consumption by changing their hole loading procedure This procedure change was explained to the Chief Engineer Instead of placing one 40-kg bag of explosives in each hole, the stemming height of each hole should be the

controlling factor on how much explosive is put in each hole This can be done by using loading poles marked with the correct stemming height When the explosive is loaded to the correct stemming height, the remaining explosive in the 40-kg bag is taken to the next unloaded blast hole An added advantage of this method is that the mine could also control their flyrock, thus minimizing equipment damage and unnecessary clean-up of haul and access roads

With very large blast patterns and blast holes only 8 meters in depth, the use of the EZ Det initiation system is not recommended at this mine Instead, a more cost efficient system would be a combination of MS Primadets (No 12's - 400 ms) for down the holes, MS Surface Connectors (65 ms), 25-grain detonating cord, cast boosters (0 25 kg), and bulk ANFO The blast hole size should also be reduced from 160 mm to 140 mm, to eliminate decking of explosives Decking is much more expensive than not decking the explosives Also, the depth of the blast holes should be checked after drilling is concluded

Following inspection of the demonstration blast and regular blast areas, we returned to the mine offices The blast crew requested the opportunity to view the videos which demonstrated controlled blasting and were shown to the staff earlier at the seminar This completed, we held a dinner meeting with the Chief Engineer prior to returning to Ulaanbaatar at 12 00 midnight

APPENDIX

Correspondence included in the Appendix is as follows

- New Equipment Recently Supplied To Mongolia
- Trip Report - Sharyn Gol Mine 2/18/93
- Freeze Up Of Sharyn Gol Buildings 2/14/93
- Disappearance Of Sharyn Gol Coal 2/13/93

Date: March 11, 1993

To: Jerry Paradysz, UE&C

From: A F. Helbig

Subject: Two Draft Documents Dealing With Parts Sourceing

Accompanying this letter are two (2) draft documents These will be described as follows

NEW EQUIPMENT RECENTLY SUPPLIED TO MONGOLIA

The smaller consists of four (4) pages and deals with the new mining equipment, other than Russian sourced, that has been purchased and delivered to the Mongolian coal mines This equipment, with the exception of the two (2) Caterpillar D8N dozers funded by AID, has been funded by grants from countries such as Japan or British/Chinese Spare parts for this mining equipment continues to be funded by the donor countries through 1993

The larger consists of thirteen (13) pages and deals with mining consumable spare parts that might be realistically sourced in the USA This document attempts to clarify the particular use of specific supplies and parts (NOT ATTACHED)

Use histories of these parts were requested from "Nuurs" Company in order to establish the accuracy of the annual projected requirements I was informed that the records "Nuurs" maintains would be very inaccurate as to annual consumptions at the individual mines It was explained that the mines bartered and traded parts individually in order to keep equipment operational Therefore what was purchased by "Nuurs" may not reflect the actual usage

If you have any questions please do not hesitate to address them with me

Sincerely,

Arthur F Helbig
Project Manager - MK

DRAFT

New Equipment Recently Supplied To Mongolia

New Equipment Supplied to the Coal Mines of Mongolia, a general discussion to increase the general appreciation and understanding The overall political plan by the government is to fund the three major coal producing mines for Central Mongolia as follows Shivee Ovoo (American Funding), Baga Nuur (Japanese Funding), and Sharyn Gol (all other funding) This philosophy is supported by the current placement of new equipment purchases at the mines

TEREX 3307 Haul Trucks (40 to 45 tonne)

Seventeen (17) of these units were purchased through a joint British and Chinese funding agreement These units were purchased in June 1991 and will be out of warranty in June 1993 Of the original 17 units, only 14 are currently operational Three (3) were involved in mine collisions or wrecks, as of this date 10 March 1993 "Nuurs" has informed me that two (2) of the trucks could be put back into service with the purchase of two (2) replacement engines This needs to be investigated at the mine to determine if this is actually all that is keeping two of the units from operating These replacement engines have not been ordered, as of this date, under any funding arrangement

"Nuurs" Company has recently placed an annual order for filters, spare parts, etc for these trucks This order is being funded by a source other than "Nuurs"(Mongolian Government), presumably another country is furnishing the funding Therefore, US-AID purchase of parts for these units is not necessary, regardless that all of the parts could be USA manufactured and supplied Mr Ellis and I viewed this parts order listing and found it to be quite complete for the purpose

The primary problem the Mongolians have had with the TEREX 3307 Haul Trucks has been the **radiator** This problem is a familiar problem to Morrison Knudsen Company (MK), where we have had similar problems with the TEREX Haul Trucks at our mines in the USA It is a design problem within the radiator assembly, leakage occurs due to twisting and flexing of the haul truck while traversing haul roads This problem is intensified when the haul roads are not properly constructed or maintained as in the Sharyn Gol Mine MK corrected this problem with the TEREX radiator design at it's USA mines by replacing these radiators with **Mesabi** manufactured radiators, a much more robust and durable unit These replacement radiators are USA manufactured units, while none have been ordered as the haul trucks are under TEREX warranty until June 1993

Tires - Size 21 00 x 35(36PR) E-3
Terex Haul Truck tires for the next two years were ordered by "Nuurs" on 1 January 1993 The tires which they ordered were E-3's It is my opinion, after visiting

the Sharyn Gol Mine, that this was a bad decision The tires should have been ordered with an E-4 rating and a different lug design I have personally discussed this with both the General Director at the mine and with "Nuurs" in Ulaanbaatar The difference between the ratings is as follows

E-4 The E-4 rating signifies a greater thickness of rubber on the tire casing This is to allow more resistance to rock cuts or punctures from poorly maintained working benches and haul roads The primary disadvantage of the thicker casing is that it does not dissipate heat as readily, the heat builds up due to flexing within the tires Two much heat buildup can result in separation of the tires individual layers E-4's are used where the haul roads or routes dictate (such as long up hill pulls) a slower average speed for the haul trucks, the haul distances do not include long flat distances where high speeds can be obtained, the haul roads and benches are poorly maintained, the haul trucks must make frequent stops, and finally the average operating ambient temperatures are not excessively high

E-3 The E-3 rating signifies a thinner side wall and face rubber thickness. It is used on well maintained haul roads and working benches, and where long high speed hauls are involved It may also be necessary to use this type of tire in areas where extremely high ambient temperatures prevail.

Engine Cummins KTA-19C 4 cycle
If this is all two of the wrecked haul trucks require to become again operational, this needs to be investigated These engines have not been ordered, are USA manufactured and could be supplied under US-AID funding

KOMATSU HD-325-5 HAUL TRUCKS (40 to 45 tonne)

Twenty (20) haul trucks were furnished to the Baga Nuur Mine under a Japanese funding grant These units became operational at this mine in April of 1992 Complete parts orders for these haul trucks were placed on 1 January 1993. These parts are being funded by the Japanese The parts lists ordered, were viewed by Mr Ellis and myself and thought to be very complete While some of the parts such as filters (air, oil, fuel) are all manufactured in the USA, none will be required in addition to those allready ordered this coming year April 93/ April 94

A major difference between purchasing for this Komatsu Haul Truck and the TEREX Haul Truck is in the area of **tires** Komatsu Haul Truck tires were only purchased as a one year supply In October 1993 a new order for tires must be placed At this time,

USA manufactured tires could be purchased under US-AID funding The tire order would be for approximately 120 to 130 tires

Tires - Size 18 00 x 33 x 28 ply E-3
As with the TEREX Haul Truck tires, MK would recommend that E-4 rated tires be purchased in the future

KOMATSU D-155-2 BULLDOZERS

Under an agreement with the Japanese for funding, ten (10) of these bulldozers were to be supplied to the Mongolian Coal Industry Five were to be delivered and put into operation in 1992, with a second five delivered and put into operation in 1993 This has in fact occurred In January 1992, three (3) units were delivered to the Baga Nuur Mine and two (2) units were delivered to the Sharyn Gol Mine Then again in January 1993, three (3) additional units were delivered to the Baga Nuur Mine and two (2) additional units were delivered to the Sharyn Gol Mine. The two latest units at Sharyn Gol Mine were viewed when MK visited the mine on 17 February 1993 with Mr. Paul Armstrong (AID auditor)

It must be stated that in MK's opinion, the bulldozers being purchased under all the various fundings are **ENTIRELY TOO UNDERSIZED** for the intended purposes at the mines The only purpose for which this size dozer is suited is to maintain working bench for draglines It is too small for major road construction or for movement of waste by dozing Future bulldozer purchases should be of units with a 500 plus horsepower rating The Mongolians would find that the larger units are more versatile, easier to train on and much easier to operate than the smaller units currently being purchased I feel strongly that the purchase of these 155 horsepower class bulldozers has been **a gross error** by the Mongolian coal industry and should not have been endorsed by any funding group

CATERPILLAR D-8N DOZERS

Two (2) Cat D-8N bulldozers were purchased under US-AID funding and delivered to Ulaanbaatar, Mongolia during February 1993 It is the Mongolian governments intention that these two units be delivered to the Shivee Ovoo Mine This follows their long term purpose to have this mine equipped with USA equipment As with the Komatsu dozers, these units are also **ENTIRELY TOO UNDERSIZED** If it is allowed, that this mine is equipped in this piece meal fashion then in all likelihood the equipment purchased will be miss matched for the mine and its intended use As these two bulldozers were purchased with US-AID funding, parts back up will be funded by USA manufactured parts A substantial parts supply was included under the initial purchase arrangement with Caterpillar Therefore no spare parts would be required for these two units during the next

year phase of April 93/ April 94

In conclusion, it is my opinion that all the equipment currently being purchased is entirely too small if the purpose is to modernize the Mongolian Coal Industry This applies equally to the **Haul Trucks and the Bulldozers** purchased to date This trend to undersize equipment purchases must somehow be reversed Future equipment purchases also must be directed towards the obtaining of support equipment for the mines

MN3-10/afh

AD-132
UEC2-41

Date: February 18, 1993

To Jerry Paradysz, UE&C

From: A. F. Helbig

Subject: Report on Trip to Sharyn Gol Mine
Accompanying AID Auditor, Paul Armstrong

This report is in compliance with the terms of the EXTENDED SCOPE OF WORK FOR M-K, Section 7 0, Sub-section 7.1.

On Monday, February 15th, a plan was developed. This plan was that the auditors (Armstrong & Khow) would meet the charter plane bringing parts from the USA with Jerry Paradysz on Tuesday, February 16th, then both auditors would travel to Sharyngol Mine and Darhan Power Plant on Wednesday, February 17th The purpose of the visits to Sharyngol and Darhan was to conduct a physical inventory of spare parts delivered under AID funding This included at Sharyngol some explosives delivered under a funding arrangement for the previous winter. As both of the auditors had never seen or been to a coal mining operation, the auditors requested that MK accompany them and explain the mining operation and now the spare parts were used Jerry Paradysz also planned to accompany the auditors on this tour of the mine and power plant On Tuesday afternoon, MK was notified by William Nance that the air charter plane would not arrive until Wednesday, February 17th. Therefore Mr Nance informed MK that the auditors were going to split up and that Mr Khow would meet the air charter while Mr Armstrong would tour Sharyngol Mine and Darhan Power Station MK was requested to accompany Mr Armstrong on the tour of Sharyngol Mine while Mr Paradysz accompanied Mr. Khow during delivery of the air shipment from the USA

Departed Ulaanbaatar at 0700 hrs. and arrived at the mine at 0945 hrs , where a meeting was organized with the mine's Gen. Director Mr Armstrong's primary mission was to obtain documentation on explosives delivered under a previous funding by AID, and conduct a physical inventory of tires (small and large), vehicle batteries - 24 volt, plus 1200mm conveyor belt delivered under the current funding While the paperwork was being gathered, the Gen Director gave a personal tour of the explosives magazine storage facilities and the mine to Mr Armstrong MK was able to explain how the mining at Sharyngol is unique when compared to other coal mines. The general geology was explained as well as the area in the center of the pit where major faulting has offset the coal At 1130 hrs we returned to the mine office where we were informed that the records had not been entirely gathered and because the mine personnel were going to lunch the records would not be available until after 1300 hrs. nor would access to the locked warehouse be possible until later We were offered lunch but Mr Armstrong prefered to work through, so we inspected the 1200mm Russian conveyor in an outside storage yard In this same

yard we found the 39mm (1 1/2inch) hoist cable that arrived from USA on the December 20th air charter shipment While waiting for the lunch hour to be over, we did a walk through tour of the mine's heating plant and the mine's workshops It was noted that only one hot water unit was operational for heating the town and that the pulverizer on the other unit had broken down. The second hot water unit had been down for about a week according to the workers. None of the four steam units were operational Three of which didn't appear to have worked for quite some time based on the accumulation of rust and ice on otherwise moving parts At 1300 hrs we were taken to a warehouse where the tires and batteries were stored and the receival records were reviewed Following the physical inventory in the warehouse we returned to the mine office where Mr. Armstrong went over documentation concerning explosives shipped and received at the mine during the early months of 1992. At 1500 hrs the review of mine records was complete Mr Armstrong decided that there was insufficient time to go on to Darhan Power Station and so we returned to Ulaanbaatar. Arriving back at 1815 hours.

During the drive to and from the mine, Mr. Armstrong had questions concerning the purchase of Russian parts and equipment over USA manufactured parts The purchase of Russian explosives over the purchase of US explosives, and how US explosives could be shipped to Mongolia. Mr Armstrong expiessed concern over the completeness of shipping records, packing lists and manifests especially with the air charter shipment of December 20, 1992 He appeared concerned that an independent local firm had not been hired to verify the contents of materials received

Other information gathered during the tour included the **annual explosives consumption at Sharyngol Mine** assuming they are operating at the design production level and **the storage capacity of their bunker magazines**

1) The Sharyngol Mine consumes approximately 6 tonnes of explosives per day, 200 tonnes per month in the winter, 150 tonnes per month in the summer. The Gen. Director estimated his annual use as 1500 to 2000 tonnes per year

2) The explosives storage magazines consist of 10 buildings each of which can hold 200 tonnes of palletized explosive Total capacity is therefore 2,000 tonnes The magazines are serviced by rail unloading docks within the magazine compound.

Two brand new Komatsu D-155 bulldozers were viewed in the open warehouse storage area, I was informed that these two units arrived three weeks ago This is interseting because one of the two Caterpillar D-8 bulldozers currently setting in Ulaanbaatar is to be for Sharyngol Mine and the other for unidentified local mines

The haul roads in the mine continue to be in deploreable condition both due to uneven travel surfaces and the existance of stray pieces of iron and other mining debri strewn over the driving surfaces. This poor condition of the haul roads was a subject

addressed in meetings held last December at the mine There does not appear to be any improvement in this area Thirteen of the mine's haul trucks were observed to be mechanically down at the truck shop for various repairs. The one area where some progress can be demonstrated at this mine is in the area of explosives and changes that the mine is making to improve their blasting techniques. The explosives detonators shipped to Mongolia on the air charter which arrived February 17th are to be utilized exclusively at the Sharyngol Mine for demonstration purposes Training in the use of these new detonator systems will be conducted during the first week of March 1993. Ensign Bickford, the manufacturer, is suppling their Manager of Export Sales and Trainer, Tom Treleaven to assist MK in demonstrating the latest in delay blasting technology to the Mongolian Coal Industry

If you have any questions or instructions please inform us.

Yours truly,

Arthur F. Helbig
Project Manager - MK

cc: Fred Scheaffer
B.P. DeMarcus

MN2-18

Date: February 14, 1993

To: Jerry Paradysz, UE&C

From: A. F. Helbig, MK

Subject: FREEZE UP OF SHARYNGOL BUILDINGS

Mr. Eric Peterson of AID in Washington, D C. phoned B P. DeMarcus during the first week of February 1993 and requested a report on the rumored freezing up of the town of Sharyngol. Don Ellis and I arrived in Mongolia on Tuesday, February 9th. On the morning of Wednesday, February 10th, you informed me that you had Mr Ganbaatar of Nuur's Company preparing for you a report on this particular situation in response to inquiries by Mr. Peterson As Don Ellis and I were traveling to the mine on Friday, February 12, 1993, regarding the disappearance of the Sharyngol coal seam; we took this opportunity to also conduct a site inspection of the mine's heating plant and determine the seriousness of rumored freezing up of town and mine facilities Several versions of the seriousness of the situation were being voiced and a site visit to talk to the mine General Director, Mr. Dadnadarj, was warranted.

The facts that I am presenting were given to me and Don Ellis personally by the mine's General Director. Following receiving his assessment of the situation, he conducted us on a tour of the heating plant MK project director, B P DeMarcus and Mr. Peterson of AID had toured this heating plant in December 1992 and hence we were aware of it's deteriorated mechanical condition.

The Sharyngol Heating Plant consists of two hot water boiler units and four steam units. The two hot water boiler units were designed to furnish heat for the Mine Administration Building and for all the buildings in the town of Sharyngol. The four steam units were designed to furnish heat for the mine facilities such as· maintenance workshops, crushing and screening buildings, etc.

The two hot water boiler units have been working continuously and furnishing heat. Regardless of this there has been some freezing up of buildings in the town of Sharyngol. At the time of our visit, the School and three (3) apartment buildings are frozen up and with out heat. This is due not to any fault with the heating plant operation but is a result of pipe leaks in the town. When the leaks occurred, the pressure in the hot water recirculation system fell and the water froze in the multi story structures The School and the three apartment buildings account for approximately 10% of the towns buildings. Work is in progress to repair the leaking water lines in town People continue to occupy the frozen up buildings and are furnishing heat by means of small electric heating coils or coal burning fireplaces.

The four steam units which furnish heat to the mine facilities were all mechanically broken down and frozen up This occurred several days ago and was a result of inattention by mine personnel

who were responsible for ash removal from the steam units Ash had been allowed to build up beneath the boilers and caused massive plugging As a result of the plugging up with ash the units shut down and then froze up During our tour of the heating plant, a mine maintenance crew was attempting a repair on one of the four steam units and had a fire going in the boiler The loss of the four steam units has not caused a shut down of work in any portion of the mine facilities. Workers are coping by wearing of additional clothing While cumbersome it has not caused any marked decrease in operations or maintenance activities.

The General Director was specifically asked if any of the current breakdowns of the heating plant could be contributed to spare parts which were not delivered or ordered under AID funding. His answer was that none of the problems being encountered could be attributed to the lack of spare parts or actions of AID funding.

This should clarify the situation as exists at the town and mine of Sharyngol

Yours truly,

Arthur F. Helbig
Project Manager - MK

cc Fred Scheaffer
B.P DeMarcus

MN2-14

Date: February 13, 1993

To: Jerry Paradysz, UE&C

From: A. F. Helbig, MK

Subject: DISAPPEARANCE OF SHARYNGOL COAL SEAM

Prior to my departure from the U S.A., B.P. DeMarcus received a phone call from Eric Peterson of AID. Mr. Peterson had been informed that the coal seam at Sharyngol Mine had disappeared, he requested that on my arrival in Mongolia that I look into this matter as soon as possible. On Wednesday, February 10th, you and I met with W. Nance for the purpose of introducing Don Ellis, MK Maintenance Specialist who accompanied me to Mongolia. At this meeting, Mr Nance reinforced the prior request of Mr. Peterson concerning the disappearance of the Sharyngol coal seam and requested that I travel to the mine and clarify the situation. Don Ellis and I did so on Friday, February 12, 1993.

The facts that I am presenting were given to me personally by the General Director of the Sharyngol Mine, Mr. Dagnadarj We then went into the mine and the faulting was observed, where it was abundantly clear as to what had transpired.

First, the Sharyngol Mine has only one coal seam that it mines: there are no other coal seams in the mine In general, this single coal seam averages 30 meters (100 ft.) in thickness, and dips at an average of 12 degrees. The mine is currently about 140 meters (450 ft.) in total depth from the surface with 10 working benches. When the mine reaches the final design limits, the mine will be approximately 250 meters (800 ft.) in total depth from the surface with 18 working benches. The coal seam is offset in the center of the mine by **TWO** major geological faults. These major faults divide the mine into three distinct coal producing areas. These are: Erdinet Pit, North Pit, and South Pit. The mine in recent months has been producing coal from the North Pit and advancing towards the major geological fault which offsets and separates the two production areas (North Pit and South Pit). While mining coal from the North Pit the mine operators have been removing waste rock and preparing a new block of coal (250,000 tonnes) in the South Pit.

Major geological faults are seldom one single fault plane, but consist of a primary fault plane and parallel secondary fault planes on either side of the primary fault plane. Secondary fault planes have less offset of the rock strata than the primary fault plane. As the mine operators removed the coal seam closer and closer to the primary fault plane, they encountered an unexpected secondary fault plane. The secondary fault plane was a drag fault which had offset a small portion of coal between the secondary and primary fault planes. The mine operators have mined around the secondary fault plane displacement and re-entered the coal seam isolated between the two fault planes. The offset block of coal

contains approximately 20,000 tonnes of coal prior to being truncated by the primary fault plane as previously known by the mine engineers The secondary fault plane as encountered was small in size and had not been predicted. The secondary fault plane's proximity to the major fault masked its earlier detection We know the mine property was drilled with the help of the Russians in the early 1960's on 250 meter drilling grid This small fault just fell inside of the drill hole spacings and due to its close proximity to the primary fault, it went undetected. Total coal lost due to this offset was approximately 20,000 tonnes.

Therefore instead of 40,000 tonnes (10 days of coal) existing in the North Pit when the mine encountered the secondary fault plane, the mine had to spend about 5 days excavating around the displacement and had only 20,000 tonnes (5 days of coal) remaining in the North Pit. After mining the remaining North Pit coal, mine operations will move the coal excavator and haul trucks into the South Pit where a 250,000 tonne block of coal is being readied.

The fault zones of this pit are extremely important, for they are a major controlling factor in the design of the pit highwall slope angle. The lower the angle of the highwall slope the greater the quantity of waste rock that must be removed to uncover a tonne of coal. Conversely, the higher the angle of the highwall slope the lower the volume of waste rock per tonne of coal exposed. The geological stresses created during faulting fragments the original layered rock structure therefore making the rock structurally weaker and unable to safely stand at higher highwall slope angles. The design pit highwall slope angle at Sharyngol is approximately 20 degrees. A very flat pit slope by most mining standards. This flat slope is not due entirely to the faulting but is also due in some measure to the use of rail haulage in the pit. Rail haulage in the pit is very sensitive to highwall movement for this movement affects the track alignment. Therefore the mine design engineers will adopt a flat overall pit slope to protect the rail haulage system and especially in known fault areas.

I hope this explains and clarifies the recent events that transpired concerning Sharyngol's disappearing coal seam.

Yours truly,

Arthur F. Helbig
Project Manager - MK

cc: Fred Scheaffer
B.P. DeMarcus

MN2-13/afh