

PDAAN-141  
ISN 31429  
3910 225

FINAL REPORT

# LYALLPUR THERMAL POWER STATION PROJECT



**West Pakistan**

**Water and Power Development Authority**

U.S. AID LOAN NO. 391-H-083

R-1623



**Commonwealth Associates Inc.**  
Engineers/Consultants/Architects

a member of the Gilbert/Commonwealth family of companies

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**FINAL REPORT**  
**WEST PAKISTAN**  
**WATER AND POWER DEVELOPMENT AUTHORITY**  
**LYALLPUR THERMAL POWER STATION**  
**U.S. AID LOAN NO. 391-H-083**  
**R-1623**  
**COMMONWEALTH ASSOCIATES INC.**  
**JANUARY, 1975**

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**January, 1975**

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**Commonwealth Associates Inc.**  
Engineers/Consultants/Architects

209 E. Washington Ave., Jackson, Mich. 49201 (517) 787-6000

Chief Engineer (GS) Construction  
Water And Power Development Authority  
Sunny View Estates  
Kashmir Road  
Lahore, West Pakistan

**SUBJECT: LYALLPUR THERMAL STATION  
FINAL REPORT U.S. AID  
LOAN NO. 391-H-083**

Dear Sir:

We are pleased to transmit herewith the Final Report required by Implementation Letter No. 1 of U.S. AID Loan No. 391-H-083 for the Lyallpur Thermal Station Project.

On behalf of Commonwealth Associates Inc. and all our personnel who worked on this Project, we would like to thank you for the co-operation and assistance we received from you and members of your staff during the implementation of this project.

We look forward to working with you and WAPDA on future projects in Pakistan.

Very truly yours,

R. E. Folmsbee, P.E.  
Division Director  
Construction Management  
Systems

AJR/CJS/tlc

GILBERT/COMMONWEALTH FAMILY OF COMPANIES

Gilbert Associates • Commonwealth Associates • Gilbert Management Consultants • Gilbert/Commonwealth International • Inter-America Consultants  
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**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY  
LAHORE, WEST PAKISTAN**

**FINAL REPORT  
SUMMARY**

The West Pakistan Water And Power Development Authority, a semi-autonomous corporate body established by the Government of West Pakistan, and charged with the responsibility for the unified and co-ordinated development of the water and power resources of West Pakistan, is financed as a public agency and may, with the sanction of the Government, obtain foreign loans or aids. Payment of such loans is guaranteed by the Government of Pakistan.

In October, 1963, the Authority submitted a loan application to the United States Government in the amount of \$18.1 million for the construction of a 130,000 kW gas-fired steam turbine generating station to be built near Lyallpur, West Pakistan. The use of natural gas, the major indigenous fuel resource, is compatible with the nation's development program to make maximum use of natural resources in place of imports, in order to conserve foreign exchange.

The gas from the Sui field has a heat value of 975 BTU per cubic foot, and 85 million cubic feet per day was available for thermal power requirements. The Lyallpur Thermal Generating Station was designed for the use of residual oil as standby fuel. The generating capacity of the plant was determined following an extensive power market survey conducted for the Authority by Harza Engineering Corp., its General Consultants, for the purpose of forecasting its future demand and energy requirements with respect to other planned and new thermal and hydro generating capabilities.

The services of Commonwealth Associates Inc. of Jackson, Michiga, USA were retained to assist the Authroity in the execution of the project and were responsible for engineering and design, co-ordination and integration of equipment furnished by others, engineering supervision of construction, supervision of start-up testing and initial operations, as well as training operating personnel.

The Lyallpur Station equipment consisted of the two 66 MW units, including turbine generator, steam generator, condensing equipment and auxiliaries, feedwater heaters, boiler feed pumps, electrical auxiliaries, interconnecting piping and wiring and all those auxiliary systems which are inherently a part of the Station, were purchased as an engineered package on a delivered and erected basis.

The construction of civil works was accomplished by Pakistani labor working under the supervision of contractors determined by competitive bidding.

**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY  
LAHORE, WEST PAKISTAN**

**PROJECT DESCRIPTION**

The project consisted of the design and construction of an electrical generating station having two 66 MW steam turbine generator units, complete with boiler set-up, transformers and auxiliary equipment located near Lyallpur, West Pakistan.

The Lyallpur Thermal Station Project was designed and constructed under the direction of the West Pakistan Water And Power Development Authority (WAPDA), a Governmental agency which had as its general consultant, Harza International.

U.S. AID Loan 391-H-083 was established pursuant to a WAPDA Contract with Commonwealth Associates Inc. of Jackson, Michigan and signed on July 16, 1963 to provide engineering services for this project.

The services of Commonwealth Associates Inc. were obtained to assist WAPDA in the execution of the project. Commonwealth was responsible for engineering and design, co-ordination and integration of equipment furnished by others, engineering supervision of construction, supervision of start-up and initial operations, and training of operating personnel.

Lyallpur Project equipment was purchased as an engineering package on a delivered and erected basis and included the following:

1. Turbine generator.
2. Steam generator
3. Condensing equipment.
4. Feed water heaters.
5. Boiler feed pumps.
6. Electrical auxiliaries.
7. Interconnecting piping and wiring.

8. All auxiliary systems which are inherently a part of the station.

Worldwide cost studies and equipment evaluations were conducted by the Water And Power Development Authority with the assistance of Commonwealth Associates Inc. prior to the AID loan authorization and were funded in the amount of \$70,000 by the Government of Pakistan.

Tender documents employed in the worldwide inquiry were revised to the satisfaction of AID and issued to qualified bidders.

In response to Tender Documents for installed plant equipment issued May 19, 1964 and Addendum A dated May 29, 1964, tenders were received and evaluated from the following vendors:

1. Westinghouse Electric International, U.S.A.
2. General Electric International, U.S.A.

A Westinghouse Electric International Proposal, No. FE20126, dated June 20, 1964, was accepted by the West Pakistan Water And Power Development Authority; and a Letter of Intent was issued on July 24, 1964. An Agreement was made on November 11, 1964.

The equipment furnished by Westinghouse under the Agreement was compatible with the specifications given.

The generators were hydrogen cooled and were equipped for synchronous condenser operation. The turbine was a tandem compound double flow unit manufactured by Westinghouse and had a steam flow capacity at the throttle of 525,000 lb/hr at 1,250 psig, 950 total temperature, a back pressure of 2½" hg absolute for an output of 73,770 kW measured at the generator terminals. The all welded steel condenser was manufactured by Westinghouse, sized to condense 400,000 lb/hr of steam at a condenser pressure of 2" hg absolute, requiring 50,200 gpm of cooling water at an inlet temperature of 80°F. The two condensate pumps for each condenser are vertical multistage type with a capacity of 1,100 gpm, design head of 585 feet, requiring 211 brake horsepower at an efficiency of 77 percent, and driven by a 250 horsepower motor.

The rating of the generators was increased to 86,800 kVA which permitted the full utilization of the turbine output of 73,770 kW @ .85 pf. The generator is equipped with the necessary auxiliary equipment so that it can be disengaged from the turbine for operation as a synchronous condenser.

The boiler has two drums, eight gas-oil burners, one regenerative air heater, one forced draft fan and is bottom supported. Rated temperature is reached at 400,000 lb/hr, and its efficiency rated load is 84 percent. The boiler was manufactured by Foster-Wheeler Inc. The forced draft fan requires 758 hp and its speed is regulated through a hydraulic coupling. Boiler controls and equipment are Hagan pneumatic and are complete with required instrumentation and control panels, ignition controls with flame monitoring, boiler purge interlocks and instrument air compressor. The cooling towers were manufactured by Fluor Products Co. and are of wood construction.

Other auxiliaries include boiler feed pumps, auxiliary cooling water pumps, feed water heaters, heater drain pumps, feed water make up and treatment flash evaporator with Zeolite softening pretreatment.

Under the civil works portion of the project, tenders were submitted by the following companies.

MWK International Ltd. Inc.	Seattle, Washington
Vinnell Corporation	Alhambra, California
Dillingham Overseas Corp.	Honolulu, Hawaii
Sainrapt and Brice	Karachi, West Pakistan
Motherwell Bridge Contracting Co.	Karachi, West Pakistan
McDonald Lyton Costain Ltd.	Karachi, West Pakistan
Gammon Pakistan Ltd.	Karachi, West Pakistan
Volkervam (Pakistan) Limited	Karachi, West Pakistan

On March 15, 1965, the West Pakistan Water And Power Development Authority accepted the tender of Volkervam (Pakistan) Ltd., whose address is No. 7 Wharf Road, Karachi, West Pakistan. A performance bond in the amount of Rps. 6,497,120 was duly posted in the name of Volkervam by the Algemene Bank, Nederland, N.V. (General Bank of the Netherlands), Bunder Road, Karachi, Pakistan. Under the terms of the contract and specifications, Volkervam was committed to the construction of the following structural, mechanical and electrical installations using material furnished by others.

1. Clearing and site preparations.

2. Contractor's camp.
3. Excavation and grading.
4. Base slabs and substructures.
5. Boiler and turbine foundations.
6. Main building.
7. Maintenance and storage building.
8. Office building and laboratory.
9. Cooling tower foundations.
10. Water tank foundations.
11. Fuel oil tanks.
12. Roadways.
13. Chimney.

Six 22 inch diameter tubewells were drilled to a depth of 175 feet by Boremaster Co., No. 6, The Mall, Rawalpindi, West Pakistan, a subcontractor of Volkervam, Ltd., and completed with the necessary casing, housing, strainers and fittings. The tubewells were under a separate Rupee Contract with owner-furnished materials.

On October 9, 1964, a tender was submitted for the piling work under separate Rupee Contract by Raymond International of Delaware, 140 Cedar Street, New York 6, New York.

A letter of Intent was issued on December 5, 1964, and a contract signed on February 15, 1965.

The switching station and grid tie-in were located nearby at Nishatabad Substation and connected to the Lyallpur Station by a 132 kV transmission line consisting of five structures. An 11 kV line was also provided from Nishatabad for start-up power and plant service. The line materials were supplied by Whitehead and Kales, International, River Rouge, Michigan; and the work was performed under a separate contract by British

**Insulated Callender Construction Co., Ltd., Lahore, West Pakistan. Greave Crompton Parkinson, Ltd., Lahore, West Pakistan also submitted tenders.**

**The switchgear at Nishatabad was installed at Nishatabad under the same contract and consisted of the following major equipment, with respective manufacturers:**

- 3 Air blast circuit breakers supplied by Allis Chalmers**
- 1 Air compressor . 370 psi Burkhardt 950 Rpm, 30 Kb/cm<sup>2</sup>**
- 1 Brown Bovari 1000 Litre air tank, 32 Kg/cm<sup>2</sup>**
- 3 750 kVA Allis Chalmers transformers with disconnects and auxiliaries**
- 1 15 MVA transformer by Allis Chalmers**
- 2 14.4 kVA oil circuit breakers by Allis Chalmers**

**The 50,000 gallon elevated water tank was furnished by the W. E. Caldwell Co. of Louisville, Kentucky, under Letter of Commitment No. 391-H-083-7 and Purchase Order No. 27, and erected under a separate Rupee Contract by Kohinoor Engineering Ltd., Lahore, West Pakistan. Other tenderers on the erection were B. R. Herman and Mohatta Ltd., Karachi, West Pakistan, and Karachi Shipyard and Engineering Works, Karachi, West Pakistan. The Chicago Bridge and Iron Co., Chicago, Illinois, was another tenderer for the water tank and related materials.**

**Construction of the civil works was performed by Pakistani laborers working under the supervision of construction contractors.**

**The general area in which the thermal station was constructed was at an elevation of about 650 feet above sea level. The site was situated in the Indus Valley alluvium and consisted, in general, of fine- to medium- to coarse-grain sand and silt of great depth. The entire formation was interspersed with occasional layers of finer silt and clay.**

**The climate was hot except during the winter months of November through February, and maximum temperatures approached 120°F. during the summer. Annual precipitation in the vicinity of the project was approximately 15 inches. Most of the precipitation occurred during the monsoons of July, August and September, and were accompanied by relatively high humidity.**

Throughout most of the area of the thermal station location, ground water was at relatively shallow depths and was readily available to supply water for construction and other purposes by means of tubewells. In some areas of the project site, shallow ground water was brackish, and care had to be taken to determine the salinity of the water before permitting its use for the permanent installation of the power station.

**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY  
LAHORE, WEST PAKISTAN**

**LYALLPUR POWER STATION  
PROJECT HISTORY**

In March, 1963, a Loan Application in the amount of approximately \$18.1 million was made by the West Pakistan Water And Power Development Authority to the United States for a new thermal electric plant at Lyallpur.

There were certain pre-conditions to the Loan required by U.S. AID in the form of legal, economic, engineering feasibility studies and preparation of an Implementation Plan for the proposed installation as set forth in Section 3.1 and Section 3.2 of the Loan Application.

In July, 1963, Commonwealth Associates Inc. of Jackson, Michigan entered into a "Basic Agreement" with WAPDA to provide certain engineering and other services for a period of 50 months from said date in connection with the proposed new thermal electric plant at Lyallpur. Engineering services included were as follows:

1. To provide assistance in preparing the loan application, tender, loan and contract documents as described in Article 1 A-1 of "Basic Agreement" and amended May 20, 1964.
2. To prepare equipment specifications and conceptual layouts showing major equipment engineering data and other detailed information collected for study, investigation, evaluation and selection of major equipment for the plant and economic appraisal for WAPDA approval.
3. To provide recommendations as to equipment, character of construction and cost estimates provided as per Article A A-2 of the "Basic Agreement."
4. To provide engineering designs and material and construction specifications for the powerhouse, switch yard and the several miles of transmission lines connecting the plant to the main grid system as per Article 1 A-3.
5. To make inspections and witness tests of mechanical and electrical equipment as per Article 1 A-4 amended May 20, 1964.

6. To assist WAPDA in negotiations, bid evaluations and contracts with contractors and suppliers as set forth in Article 1 A-5.
7. To prepare start-up and operating manuals as described in Article 1 A-6.
8. To provide engineering inspection, direction and supervision of construction as detailed in Article 1 B-1 as amended May 20, 1964.
9. To direct and conduct a training program for Pakistani personnel in accordance with Articles 1 B-5, 1 B-6, 1 B-7 and 1 B-8.
10. To direct and supervise purchasing, expediting and shipping of materials as set forth in Articles 1 C-1, 1 C-2 and 1 C-3.

As a result of investigations and the completion of engineering studies, tender documents were prepared and submitted to WAPDA and U.S. AID for approval on March 25, 1964. The tender documents were issued May 19, 1964 to prospective bidders.

Westinghouse Electric International Co. submitted a proposal on June 20, 1964 and the Letter of Intent was issued by WAPDA on July 24, 1964. This permitted WAPDA to request a Letter of Commitment be opened by U.S. AID on August 1, 1964. The WAPDA/Westinghouse Electric International Co. Agreement was signed on November 11, 1964. Letter of Commitment No. 391-H-083-2 was then issued on January 26, 1965 and Letter of Credit was established with Habib Bank of Pakistan on May 19, 1965.

Construction subsequently began with Westinghouse Electric International as the prime contractor, with MWK International Ltd., Inc. as a subcontractor for erection.

Civil works were performed by Volkervam Ltd. under a separate contract with WAPDA which was signed March 16, 1965.

As construction progressed, considerable difficulty was encountered as delays developed primarily from shipping problems as documented in the Shipping Section of this report.

A Second Amendatory Agreement was made effective on May 21, 1965 extending Commonwealth services for approximately 8½ months due to certain delays affecting construction schedule of the plant resulting from the following changes and additions outside the scope of the Basic Agreement.

1. To abandon original plan for a switch yard with oil circuit breakers at Lyallpur Thermal Station and in its place install air-blast breakers at Nishatabad together with the start-up transformer.
2. To provide limited engineering, purchasing assistance for materials and engineering supervision of construction of a communications system for the Colony and laboratory.
3. To provide required services for a complete communication installation, including telephone, teleprinter and carrier equipment between Nishatabad and Kot Lakhpat.
4. To provide services for the underground portion of the 11 kV feeders to the Colony and test laboratory from the 11 kV switch gear at the station.
5. To provide services for the Colony roadway lighting system.
6. To provide additional services for purchasing and expediting the above works.

The estimated dollar cost of the portion of the work under this Agreement was increased March 15, 1967 by \$373,000 from \$1,722,000 (Amendment No. 1 to Letter of Commitment No. 391-H-083-1) to \$2,095,000 in accordance with Paragraph 2 of Amended Article VI-D.

Unit 1 was placed in initial operation on June 11, 1967 and went into commercial operation November 28, 1967. Unit 2 was placed in initial operation on November 15, 1967 and went into commercial operation December 11, 1967.

A Third Amendatory Agreement, effective June 1, 1968, for additional delays in construction schedules required an extension of Commonwealth services for an additional six months to and including November 30, 1968.

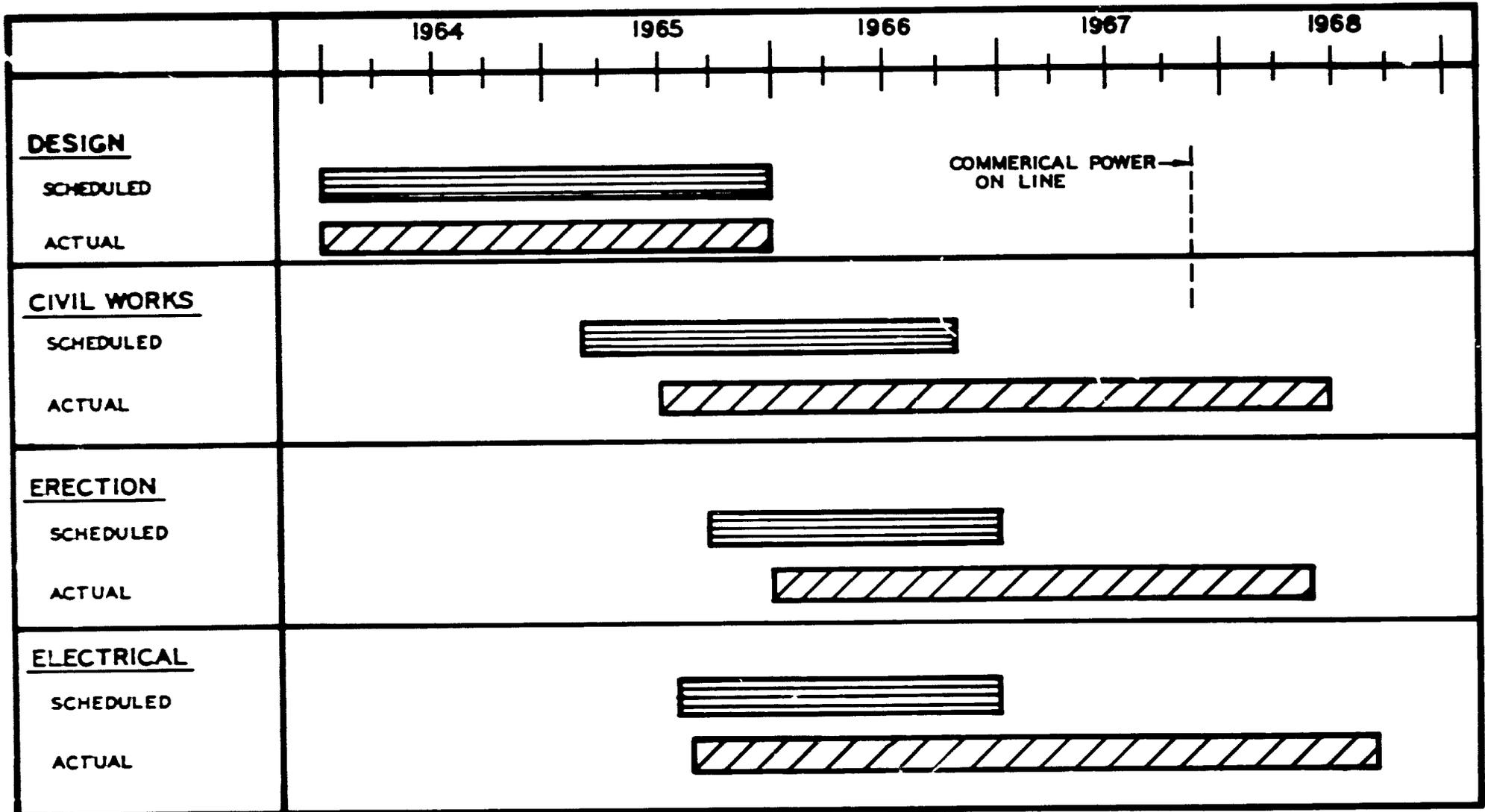
The estimated dollar cost of the Commonwealth work under the AID Loan portion of this Agreement was increased by \$245,000 to \$2,340,000 from \$2,095,000 as set forth in Section VI-D of the Basic Agreement.

A Fourth Amendatory Agreement providing for the extension of Commonwealth services for an additional 12 months, starting December 1, 1968, until such time as the unused funds in the existing Letter of Credit expiring December 21, 1968, were exhausted.

WEST PAKISTAN WATER AND POWER DEVELOPMENT AUTHORITY

LYALLPUR THERMAL POWER STATION

U.S. AID LOAN 301-H-083



**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY  
LAHORE, WEST PAKISTAN**

**LOAN IMPLEMENTATION**

Article III of the Loan Agreement between the President of Pakistan and the United States of America required the Borrower to fulfill certain conditions before any Letter of Commitment could be issued or any disbursement of the Loan funds made. The conditions precedent are of two categories, the first of which was to be fulfilled prior to establishment of a Letter of Commitment for Engineering Services, and the other which was to be fulfilled prior to the issuance of a Letter of Commitment for anything other than Engineering Services.

The conditions precedent to initial financing (Engineering Services) were fulfilled during the previous year; and on August 18, 1964, the Secretary to Government, President's Secretariat, Economic Affairs Division, Government of Pakistan, was notified that pre-conditions to initial financing required by Section 3.1 of the Loan Agreement had been fulfilled to the satisfaction of AID. Letter of Commitment No. 391-H-083-1 to finance the Engineering Services under the West Pakistan Water And Power Development Authority/Commonwealth Associates Inc. Agreement was issued in August, 1964.

The conditions precedent to the issuance of Letters of Commitment or disbursement of Loan funds for other than Engineering Services required the Borrower to submit for approval an Implementation Plan for the project showing project schedules, cost estimates, preliminary plans and major equipment specifications, evidence of construction services, a material procurement plan, site studies, evidence of maintenance capability, evidence of training arrangements for indigenous personnel, and a material control and cost accounting plan.

The Implementation Plan and evidence required by U.S. AID was submitted on August 1, 1964. The Plan was accepted by U.S. AID; and Implementation Letter No. 391-H-083-2 was issued on January 26, 1965 informing the Government of Pakistan that all conditions precedent to financing required under Section 3.02 of the Loan Agreement had been fulfilled, and WAPDA's request for a Letter of Commitment for the supply and commissioning of all mechanical and electrical equipment and materials had been forwarded to AID/Washington. The Letter of Credit was established on February 23, 1967.

**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY  
LAHORE, WEST PAKISTAN**

**DESIGN AND ENGINEERING**

Design engineering began during January, 1964. The structural sector design was completed as scheduled in August, 1965. In January, 1966, design of the electrical sector was completed as scheduled. The design of the mechanical sector was completed during October, 1965 and considered on schedule.

After engineering on the powerhouse substation was approximately 35 percent complete, CAI was requested to abandon the plan for a 132 kV substation at the powerhouse and install switching facilities at the Nishatabad Substation. The request further stipulated that, in order to conform with existing equipment, air blast breakers should be provided in place of oil breakers. This resulted in a loss of substation engineering already completed, and CAI proceeded on an accelerated schedule to meet the target in-service date.

Additional engineering was necessary to provide remote control for generator breakers, collect information on available facilities, provide a 132/11 kV stepdown substation at Nishatabad, install 11 kV underground service to the powerhouse at Lyallpur to provide start-up power, communications, telemetering and relaying. There were no vacant bays in the Nishatabad 132 kV substation for the three new circuit positions. Facilities at Nishatabad were outside the Westinghouse contract, and the breakers were of a type not manufactured by them.

Different facilities had to be engineered at the powerhouse to accommodate the termination of 132 kV lines and to provide 11 kV distribution. These changes were engineered with some of the original hours scheduled for the Lyallpur Substation and were not included with the Nishatabad charges. Since all the original Lyallpur Substation engineering was not required, due credit was given in the powerhouse contract's Second Amendatory Agreement.

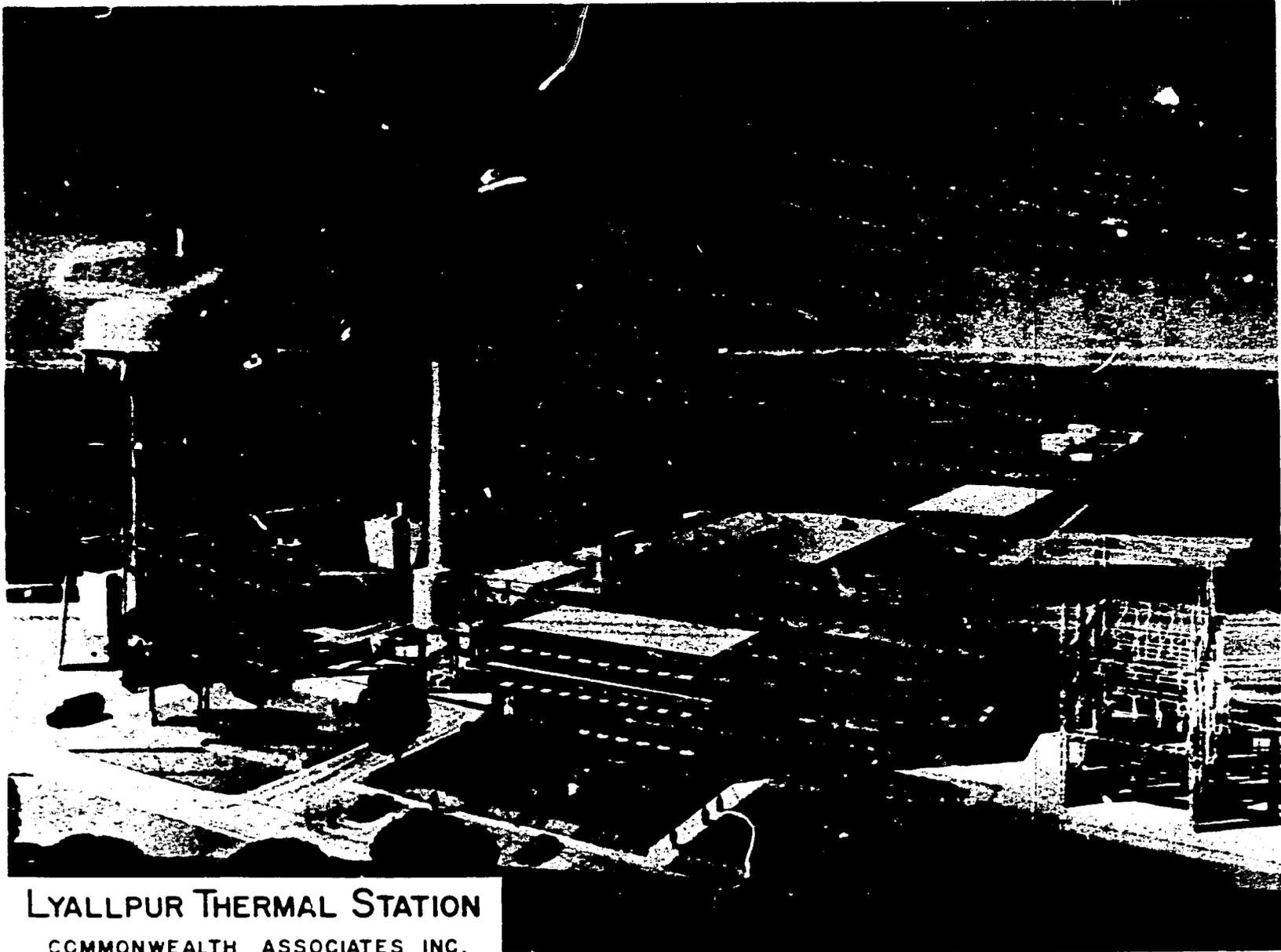
In addition to Nishatabad, extra services were provided for the following items:

1. Communications system outside the powerhouse.
2. Telephone facilities for Nishatabad and Kat Lakhpat.
3. Roadway lighting for the Colony.

The charges for services at Nishatabad as enumerated in the previous paragraph calculated per the Agreement amounted to \$77,700 and were incorporated as Article I-D of the Second Amendatory Agreement.

Other work items performed which were not specifically outlined in the scope of work were as follows:

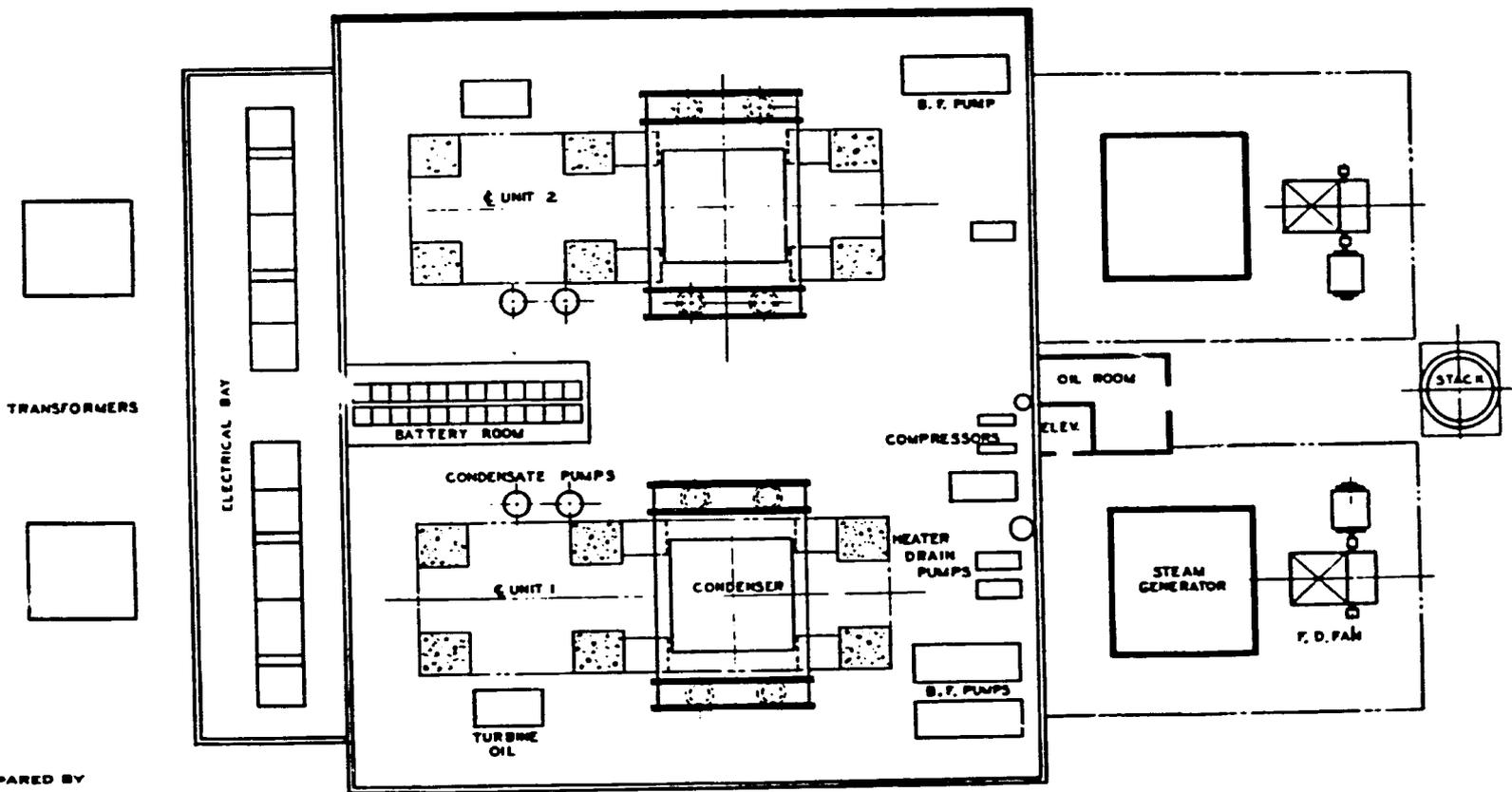
1. Investigate use of canal water as alternate source of cooling water for the plant. Plans had provided a source which remained the source, and original engineering had not provided for alternate studies.
2. Enlargement of maintenance building after original concepts.
3. Develop water treatment control program which was not a design requirement.



**LYALLPUR THERMAL STATION**

COMMONWEALTH ASSOCIATES INC.  
CONSULTANTS

STEAM TURBINE STATION  
2-66 MW UNITS  
NEAR LYALLPUR  
WEST PAKISTAN GRID SYSTEM



PREPARED BY  
COMMONWEALTH ASSOCIATES INC.  
JACKSON, MICHIGAN

GROUND PLAN

**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY  
LAHORE, WEST PAKISTAN**

**MATERIAL PROCUREMENT AND SHIPPING**

Amendatory Agreements extending construction schedules became necessary, primarily due to shipping delays. Shipping schedules became erratic because of several influences, one of which was scarcity of U.S. shipping, as well as some effects of the Pakistan-India hostilities and the closing of the Suez Canal. Delays resulted from the security measures implemented in cases of vessels which had been committed to previous ports of call in India. Also, food shipments having dockside handling and land transport priority extended construction site delivery time as much as four months. In March, 1966, the S. S. Flying Enterprise encountered a storm at sea and arrived with material badly damaged, requiring extensive repair or replacement, most seriously the turbine castings and governor valves.

All materials purchased with U.S. AID funds were procured in the U.S. and shipped on vessels of U.S. Flag as set forth in the following Shipping Reports.

Authorization for CAI Certification of air shipments of critical materials was established with final amendment to Letter of Credit No. 391 H-083-2.

The reports of expediting and the inspection of materials and equipment are also summarized in this Section.

Purchasing and expediting of civil works materials outside the scope of services of the Basic Agreement were done in accordance with WAPDA's requirements when this item was removed from the scope to be furnished by the Civil Works Contractor.

A total of seven Letters of Commitment were issued. Those not previously documented in the Loan Implementation Section were 391-H-083-3 through 391-H-083-7, which represent purchases outside the frame-work of the Westinghouse Electric International Contract and are further documented in the Financial Summary of this Report.

WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083  
INSPECTION OF MATERIALS & EQUIPMENT

REPORT NO.	MANUFACTURER	LOCATION	MATERIAL	DATE	INSPECTOR
1	Raymond Concrete Pile Co.	Baltimore, MD	Piling Shells	Feb. 23, 1965	AMGuy
2	Raymond Concrete Pile Co.	Baltimore, MD	Piling Shells	Mar. 15, 1965	AMGuy
3	U S Steel (Habag)	Morrisville, PA	Concrete	Apr. 2, 1965	AWLongacre, Jr.
4	U S Steel (Habag)	Duquesne, PA	Concrete	Apr. 7, 1965	AWLongacre, Jr.
5	U S Steel (Habag)	Duquesne, PA	Concrete	Apr. 13, 1965	AWLongacre, Jr.
6	Foster Wheeler Corp.	Mountaintop, PA	Steam Generator Drums	Apr. 20, 1965	AMGuy
7	VOID				
8	Foster Wheeler Corp.	Dansville, NY	Steam Generator	May 7, 1965	AMGuy
9	Osborne Eng. Corp.	Birmingham, AL	Base Slab Inserts	May 12, 1965	AMGuy
10	Osborne Eng. Corp.	Keenah, WI	Base Slab Inserts	May 11, 1965	AMGuy
11	Osborne Eng. Corp.	Louisville, KY	Base Slab Inserts	May 13, 1965	AMGuy
12	Westinghouse Electric Co.	Buffalo, NY	B.F. Pump Gears	July 7, 1965	AMGuy
13	Air Preheater Corp.	Wellsville, NY	Air Preheaters	July 8, 1965	AMGuy
14	Decatur Iron & Steel Co.	Decatur, AL	Turbine Steel & Inserts	July 20, 1965	AMGuy
15	Raymond Concrete Pile Co.	Baltimore, MD	Piling Casings	July 23, 1965	AMGuy
16	Osborne Eng. Corp. (Am. Cast Iron Pipe)	Birmingham, AL	Building Inserts	July 30, 1965	W Finn
17	Decatur Iron & Steel Co.	Decatur, AL	Structural Steel	Aug. 1, 1965	AMGuy
18	Decatur Iron & Steel Co.	Decatur, AL	Structural Steel	Aug. 1, 1965	AMGuy
19	Osborne Eng. Corp.	Perth Amboy, NJ	National Lead	Aug. 6, 1965	W Northrup
20	Osborne Eng. Corp. (Bartlett- snow)	Queens, NY	Corrosion Piping	Aug. 6, 1965	W Northrup

REPORT NO.	MANUFACTURER	LOCATION	MATERIAL	DATE	INSPECTOR
21	Osborne Eng. Corp.	Louisville, KY	Inserts	Aug. 11, 1965	WNorthrup
22	Osborne Eng. Corp.	Birmingham, AL	Inserts	Aug. 11, 1965	WNorthrup
23	Decatur Iron & Steel Co.	Tuscaloosa, AL	Reliance Grating	Aug. 18, 1965	AMGuy
24	Decatur Iron & Steel Co.	Tuscaloosa, AL	Structural Steel	Aug. 18, 1965	AMGuy
25	Decatur Iron & Steel Co.	Decatur, AL	Structural Steel	Aug. 18, 1965	AMGuy
26	Decatur Iron & Steel Co.	Gary, IN	High Strength Steel	Sep. 20, 1965	HEichstadt
27	Decatur Iron & Steel Co.	Decatur, AL	Structural Steel	Sep. 20, 1965	AMGuy
28	Westinghouse Electric Corp.	E. Pittsburgh, PA	Generator Unit 1	Oct.6-7, 1965	JMills
29	VOID				
30	VOID				
31	Decatur Iron & Steel Co.	Decatur, AL	Miscellaneous Steel	Sep. 20, 1965	AMGuy
32	Westinghouse Electric Corp.	Lester, PA	No. 1 H. P. Turbine	Oct. 27, 1965	AMGuy
33	Westinghouse Electric Corp.	Lester, PA	No. 1 H. P. Turbine	Nov. 7, 1965	AMGuy
34	Kaiser Jeep International	Toledo, OH	Jeeps	Nov. 11, 1965	AMGuy
35	Foster Wheeler Corp.	Mountaintop, PA	Feedwater Heaters	Aug. 30, 1965	AMGuy
36	Foster Wheeler Corp.	Mountaintop, PA	Feedwater Heaters	Oct. 25, 1965	AMGuy
37	Byron Jackson Pumps Inc.	Los Angeles, CA	Boiler Feed Pumps	Sep. 13, 1965	AMGuy
38	Chicago Heater Co.	Hempstead, NY	Deheater	Oct. 29, 1965	RWHunt
39	Westinghouse Electric Corp.	E. Pittsburgh, PA	No. 2 Generator	Nov. 10, 1965	JMills
40	Westinghouse Electric Corp.	E. Pittsburgh, PA	No. 2 Exciter	Dec. 2, 1965	HHenriksen
41	Westinghouse Electric Corp.	Muncie, IN	Main Power Transformer	Nov. 28, 1965	EBurkey
42	Westinghouse Electric Corp.	Muncie, IN	Main Power Transformer	Jan. 3, 1966	EBurkey
43	Pyramid Power Prod. Inc.	Amityville, NY	Diesel Driven Generator	Jan. 12, 1966	AMGuy
44	Whitlock Mfg. Co.	W. Hartford, CT	Closed System Head Exciter	Nov. 22, 1965	AMGuy
45	Westinghouse Electric Corp.	Lester, PA	H.P. Spindle-Turbine	Mar. 4, 1966	AWLongacre, Jr.

REPORT No.	MANUFACTURER	LOCATION	MATERIAL	DATE	INSPECTOR
46	Westinghouse Electric Corp.	Lester, PA	L.P.Spindle-Turbine 2	Mar. 4, 1966	AWLongacre, Jr.
47	Hagan Controls	Orrville, OH	Control Panel Unit 2	June 4, 1966 (Shipped 6/10)	AWLongacre, Jr.
48	Hagan Controls	Orrville, OH	Control Panel Unit 1	July 5, 1966	AWLongacre, Jr.
49	Aluminum Co. of America	Massena, NY	850 Miles of 11 Kv Distribution Line	Sep. 8, 1966	JPTimberlake
50	Grinnell Co.	Warren, OH	Piping, Hangers for Units 1 & 2	Sep. 27, 1966	WNorthrup
51	Westinghouse Electric Corp.	Hillside, NJ	Elec. Control Panels Units 1 & 2	Sep. 13, 1966	JEBeach
52	Belmont Iron Works	Eddystone, PA	Subst. Structural Steel & Anchor Bolts	Oct. 5, 1966	JPTimberlake
53	Ohio Brass, Hi-Voltage, Southern States & Anderson Electric	Barberton, OH; Cleveland, OH; Hampton, GA; Leeds, AL	Insulators, Etc.	Sep. 26-29, 1966	WNorthrup
54	Bodenieck Tool Co.	Taylorville, IL	Switch Sticks for Units 1 & 2	Oct. 5, 1966	LGEwing
55	Westinghouse Electric Corp.	Hillside, NJ	Elec. Control Panel Units 1 & 2	Oct. 5, 1966	JEBeach
56	Grinnell Co. Inc.	Warren, OH	Piping & Hangers	Oct. 18, 1966	WNorthrup
57	VOID				
58	Grinnell Co. Inc.	Warren, OH	Piping & Hangers	Nov. 15, 1966	LGEwing
59	Grinnell Co. Inc.	Warren, OH	Piping & Hangers	Nov. 30, 1966	WNorthrup
60	Okonite Co.	Passaic, NJ	Cable	Nov. 21, 1966	LGEwing
61	Davidson Pipe Co.	Brooklyn, NY	Edwards Valves	Nov. 21, 1966	LGEwing
62	Grinnell Co.	Warren, OH	Piping & Hangers	Dec. 21, 1966	WNorthrup
63	Davidson Pipe Co.	Greensburg, PA	Walworth Valves	Jan. 12, 1967	TNKing
64	Okonite Co.	Passaic, NJ	Cable	Dec. 21, 1966	JRTimberlake
65	OHM Electric Co.	Hawthorne, NY	Cable	Dec. 21, 1966	JRTimberlake

**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY**

**LYALLPUR POWER STATION  
LOAN NO. 391-H-083  
SHIPPING STATEMENT**

**SUMMARY OF THE  
TOTAL SHIPPING TONNAGE  
TO NOVEMBER, 1968**

**LONG TONNAGE**

	<b>U.S. Flag</b>	<b>Foreign</b>	<b>Percentage U.S. Flag</b>
1965 Shipment	2,142.8	114.0	95
1966 Shipment	417.0	--	100
1967 Shipment	382.32	--	100
1968 Shipment	--	--	--
<b>TOTALS</b>	<b>2,942.12</b>	<b>114.0</b>	<b>96</b>

**POUNDS**

	<b>U.S. Flag</b>	<b>Foreign</b>	<b>Percentage U.S. Flag</b>
1965 Shipment	--	--	--
1966 Shipment	7,406,840	574,500	92
1967 Shipment	108,260	--	100
1968 Shipment	6,988	--	100
<b>TOTALS</b>	<b>7,522,088</b>	<b>574,500</b>	<b>93</b>

Shipments on vessels of Foreign Flag were paid from WAPDA funds.

WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY

SHIPPING STATEMENT  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083

QUARTER ENDING June 30, 1965

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
Item #1	Steel Vendor	Baltimore	Karachi	3/23/65	Pile Shell	49,572.00	83.8	8,006.25	
Item #2	Brooklyn Heights	Baltimore	Karachi	3/25/65	Pile Shell	39,657.60	65.9	5,652.19	
Item #3	Flying Enterprise	Baltimore	Karachi	3/26/65	Pile Shell	9,914.40	15.5	1,176.56	
Item #4	SS Express	Baltimore	Karachi	4/7/65	Pile Shell	33,048.00	56.0	4,826.25	
Item #5	Green Harbour	Baltimore	Karachi	5/7/65	Resteel	77,652.18	671.0	19,132.79	
Item #6	Green Wave	Mobile	Karachi	6/4/65	Inserts	14,524.66	42.3	2,245.71	
Item #7	SS Exminister	Baltimore	Karachi	6/17/65	Pile Shell	30,294.00	49.3	4,082.81	
					TOTALS	254,662.84	983.8	45,122.56	

\* Expressed in U. S. Dollar Equivalents

WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY

SHIPPING STATEMENT  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083

QUARTER ENDING September 30, 1965

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
46796 Aug. 30, 1965	Steel Vendor	New Orleans	Karachi	7/31/65	Structural Steel, Electrical Inserts	19,068.02	39.8	2,480.98	
8 Aug. 19, 1965	Brooklyn Heights	Baltimore	Karachi	8/1/65	Pile Shells	9,480.05	21.6	2,661.53	
15248A July 15, 1965	Steel Vendor	New York	Karachi	8/10/65	Pipe Inserts (Misplaced Box 9)	2,914.04	0.6	0	
15312 July 30, 1965	Steel Fabricator	Mobile	Karachi	8/24/65	Pipe Inserts	1,887.98	4.1	187.22	
46824 July 31, 1965									
46894 Aug. 20, 1965	Steel Fabricator	Mobile	Karachi	8/24/65	Structural Steel, Grating, Electrical Inserts	173,947.28	500.8	29,287.72	
46918 Aug. 27, 1965									
46921 Aug. 30, 1965									

**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY**

**SHIPPING STATEMENT  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083**

QUARTER ENDING September 30, 1965

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
15392 Aug. 1, 1965	Green Port	New York	Karachi	9/16/65	Pipe and Electrical Inserts	8,250.52	7.0	321.48	
85578 Aug. 12, 1965	Alcoa Master	Baltimore	Karachi	8/6/65	Fuel Oil Storage				
85577 Aug. 12, 1965	Alcoa Master	Baltimore	Karachi	8/6/65	Boiler Parts				
85571 85572 85573 85574 85575 85576 Aug. 12, 1965	Alcoa Mariner	New York	Karachi	8/7/65	Boiler Parts & Turbine Foundation Anchor Bolts				
85224 Sept. 1, 1965	Enterprise	Hoboken	Karachi	8/27/65	Boiler Parts				
85222 Sept. 13, 1965	Exemplar	New York	Karachi	9/8/65	Boiler Parts				
					TOTALS	215,547.89	573.9	34,938.93	

\*Expressed in U.S. Dollar Equivalents  
\*\*All Vessels are U.S. Flag

WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY

SHIPPING STATEMENT  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083

QUARTER ENDING December 31, 1965

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
▲700h Sept. 30, 1965	Steel Voyager	Mobile	Karachi	10/4/65	Structural & Miscellaneous Steel	99,500.63	435.0	27,575.42	
VII-4730 Nov. 18, 1965	Steel Rover	New York	Karachi	12/9/65	Pick-up Trucks	NA	6.6	NA	
VII-4731 Nov. 18, 1965	Steel Rover	New York	Karachi	12/9/65	Station Wagons	NA	9.3	NA	
▲7276 Dec. 16, 1965	Steel Surveyor	Mobile	Karachi	12/13/65	Miscellaneous Steel (Office Stairway, Etc.)	2,828.87	5.7	293.83	
8688h-C	Muisi Lloyd	Philadel- phia	Karachi	12/17/65	Generator Stator, Unit 1	230,400.00	114.0		13,577.54
8697B Dec. 22, 1965	Green Ridge	Newark	Karachi	12/24/65	Turbine Anchor Bolts, Unit #2	5,000.00	1.5	249.00	
86056 Sep. 28, 1965	Green Ridge	Newark	Karachi	12/24/65	Two Vacuum Pumps	7,385.00	NA	Included Above	

WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY

SHIPPING STATEMENT  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083

QUARTER ENDING December 31, 1965

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
86055	Green Ridge	Newark	Karachi	12/24/65	Four Distillate Pumps	2,260.00	NA	Included Above	
89572	Express	Hoboken	Karachi	12/30/65	Boiler Parts, Partial Shipment #10	220,446.00	91.0	19,877.00	
88127 Nov. 29, 1965	Express	Hoboken	Karachi	12/30/65	Boiler Feed Pump Motors(4)	80,264.00	18.0	Included Above	
86027 Sept. 28, 1965	Express	Hoboken	Karachi	12/30/65	Boiler Parts, Partial Shipment #9	32,972.00	18.0	Included Above	
						681,056.50	699.1	47,995.25	13,577.54

**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY**

**SHIPPING STATEMENT  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083**

QUARTER ENDING March 31, 1966

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8) Lbs.	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
58126 Nov. 29, 1965	Neder Weser	New York	Karachi	1/13/66	1 Generator Stator	230,400.00	254,500		24,413.97
88237 Nov. 30, 1965	Neder Weser	New York	Karachi	1/13/66	Power Transformer #2	118,300.00	160,000		Included Above
88236 Nov. 30, 1965	Neder Weser	New York	Karachi	1/13/66	Power Transformer #1	118,300.00	160,000		Included Above
88238 Nov. 30, 1965	Flying Enterprise	Baltimore	Karachi	1/19/66	Partial Shipment of Power Transformer #1	16,255.00	106,680	6,073.80	
88239 Nov. 30, 1965	Flying Enterprise	Baltimore	Karachi	1/19/66		16,255.00	Included Above	Included Above	
87282 Oct. 29, 1965	Flying Enterprise	Philadelphia	Karachi	1/21/66	Partial Shipment of Turbine No. 1	716,740.00	606,445	26,492.04	
86052 Sep. 28, 1965	Flying Enterprise	Philadelphia	Karachi	1/21/66	2 Flash Evaporators	131,785.00	Included Above	Included Above	
88124 Nov. 29, 1965	Flying Enterprise	Philadelphia	Karachi	1/21/66	Partial Shipment of Turbine #1	172,900.00	Included Above	Included Above	
88277 Dec. 22, 1965	Flying Enterprise	Philadelphia	Karachi	1/21/66	2 Gland Steam Condensers	13,050.00	Included Above	Included Above	

WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY

SHIPPING STATEMENT  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083

QUARTER ENDING March 31, 1966

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
89981 Jan. 27, 1966	Flying Enterprise	Philadel- phia	Karachi	1/21/66	Partial No. 11 Boiler	20,057.00	Included Above	Included Above	
88976 Dec. 22, 1965	Flying Enterprise	Hoboken	Karachi	1/25/66	Secondary Controller	17,295.00	548,205	35,279.41	
86054 Sept. 28, 1966	Flying Enterprise	Hoboken	Karachi	1/25/66	2 Recirc. Pumps	3,718.00	Included Above	Included Above	
88128 Nov. 29, 1965	Flying Enterprise	Hoboken	Karachi	1/25/66	Bases for Cubi- cles & Transfor- mers	415.00	Included Above	Included Above	
86053 Sept. 28, 1965	Flying Enterprise	Hoboken	Karachi	1/25/66	Valves for Flash Evaporator	300.00	Included Above	Included Above	
90157 Jan. 31, 1966	Flying Enterprise	Hoboken	Karachi	1/25/66	2 Relief Valves for Deaerator Water Softening System	10,398.00	Included Above	Included Above	

WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY

SHIPPING STATEMENT  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083

QUARTER ENDING March 31, 1966

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
90156	Flying Enterprise	Hoboken	Karachi	1/25/66	Partial Shipment No. 12 of Boiler & Partial Shipment No. 1 of Condenser & Partial Shipment No. 1 of Feed-water Heaters		Included Above	Included Above	
90611 Feb. 17, 1966	Flying Hawk	Baltimore	Karachi	2/15/66	2 Condensate Storage Tanks	9,378.00	54,570	1,529.02	
89153 Dec. 29, 1965	Flying Endeavor	Baltimore	Karachi	3/2/66	1 Boiler Feed Pump Motors	20,066.00	50,755	2,113.48	
89154 Dec. 29, 1965	Flying Endeavor	Baltimore	Karachi	3/2/66	3 Forced Draft Fan Motors	73,215.00	Included Above	Included Above	
90080 Jan. 28, 1966	Flying Hawk	Phildel-phia	Karachi	2/17/66	Partial Shipment of Turbine	71,000.00	50,035	3,031.91	
86051 Sept. 28, 1965	Southport	Baltimore	Karachi	2/19/66	6600 V Indoor Meta-Clad Switchgear	141,200.00	362,290	27,836.81	
88129 Nov. 29, 1965	Southport	Baltimore	Karachi	2/19/66	Generator Bus Duct	115,000.00	Included Above	Included Above	

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SHIPPING STATEMENT  
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LOAN NO. 391-H-083

QUARTER ENDING March 31, 1966

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
88130 Nov. 29, 1965	Flying Endeavor	Baltimore	Karachi	2/19/66	2 Magastat Voltage Regulators	66,596.00	Included Above	Included Above	
89151 Dec. 29, 1965	Southport	Baltimore	Karachi	2/19/66	Partial Shipment of Turbine Generators Nos. 1 & 2	39,590.00	Included Above	Included Above	
88883-C Dec. 20, 1965	Southport	Baltimore	Karachi	2/19/66	Partial Shipment of 1 Turbine Generator	298,525.00	Included Above	Included Above	
90635 Feb. 18, 1966	Flying Eagle	Phildelphia	Karachi	2/23/66	Partial Shipment of Turbine Generator No. 1	30,000.00	33,162	3,451.31	
90950 Feb. 28, 1966	Flying Eagle	Phildelphia	Karachi	2/23/66	H <sub>2</sub> Generating Equipment	30,000.00	Included Above	Included Above	
90833 Feb. 25, 1966	Flying Hawk	Hoboken	Karachi	2/23/66	1 Station Crane	78,719.00	156,775	10,022.25 Separate L/C	LE 20179

WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY

SHIPPING STATEMENT  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083

QUARTER ENDING March 31, 1966

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
90862 Feb. 25, 1966	Steel Voyager	Brooklyn	Karachi	2/26/66	1 Condensate Pump Motor (Spare)	2,100.00	727,703	30,385.33	
90861 Feb. 25, 1966	Steel Voyager	Brooklyn	Karachi	2/26/66	Outdoor Neutral Ground Resistors	9,000.00	Included Above	Included Above	
90881 Feb. 25, 1966	Steel Voyager	Brooklyn	Karachi	2/26/66	Partial No. 14 of Boiler Material, Partial No. 3 of Condenser Material, Instrument Air Compressors, Piping		Included Above	Included Above	
90882 Feb. 25, 1966	Flying Hawk	Brooklyn	Karachi	2/23/66	Partial Shipment No. 13 of Boiler & Partial Shipment No. 2 of Condenser & Partial Shipment No. 2 of Feedwater Heaters & 2 Deserators & Diesel Generating Set		640,593	54,577.34	

**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY**

**SHIPPING STATEMENT  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083**

QUARTER ENDING March 31, 1966

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
88123 Nov. 29, 1965	Flying Hawk	Brooklyn	Karachi	2/23/66	Partial Shipment of one Turbine Generator	72,210.00	Included Above	Included Above	
87283 Oct. 29, 1965	Flying Hawk	Brooklyn	Karachi	2/23/66	2 Forced Draft Fans	25,112.00	Included Above	Included Above	
90865 Feb. 25, 1966	Flying Endeavor	Philadelphia	Karachi	3/4/66	Partial Shipment of Turbine Unit #2	70,000.00	178,930	5,991.87	
91212 March 8, 1966	Flying Endeavor	Philadelphia	Karachi	3/4/66		5,930.00	Included Above	Included Above	
91213 March 8, 1966	Pres. Jackson	San Francisco	Karachi	3/7/66		90,000.00	585,845	21,033.83	
90867 Feb. 25, 1966	Green Bay	Baltimore	Karachi	3/7/66	Plant Auxiliary Transformers	75,000.00	320,229	16,658.07	
90866 Feb. 25, 1966	Green Bay	Baltimore	Karachi	3/7/66	Unit Auxiliary Transformers	30,000.00	Included Above	Included Above	
90863 Feb. 25, 1966	Green Bay	Baltimore	Karachi	3/7/66	Partial Shipment of Turbines No. 1 & No. 2	1,000.00	Included Above	Included Above	

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QUARTER ENDING March 31, 1966

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
90634 Feb. 18, 1966	Green Bay	Baltimore	Karachi	3/7/66	Partial Shipment of Turbine Generator	2,535.00	Included Above	Included Above	
90079 Jan. 28, 1966	Green Bay	Baltimore	Karachi	3/7/66		68,640.00	Included Above	Included Above	
89152 Dec. 29, 1965	Green Bay	Baltimore	Karachi	3/7/66	Partial Shipment of one Turbine Generator	72,210.00	Included Above	Included Above	
88125 Nov. 29, 1965	Green Bay	Baltimore	Karachi	3/7/66	Partial Shipment of one Turbine Generator	298,525.00	Included Above	Included Above	
91387 March 14, 1966	Pres. Taylor	Los Angeles	Karachi	3/8/66	Closed Cooling H <sub>2</sub> O Pumps, Cir. Water Pumps, Boiler Fill Pumps	50,000.00	63,146	4,12.	
91388 March 14, 1966	Pres. Taylor	San Francisco	Karachi	3/4/66	1 Cooling Tower	90,000.00	573,350	20,852.61	
90864 Feb. 25, 1966	Flying Endeavor	Hoboken	Karachi	3/10/66	4 TPL1-2 Field Discharge Resistors	500.00	289,719	29,036.64	

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QUARTER ENDING March 31, 1966

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
91448 March 15, 1966	Flying Endeavor	Hoboken	Karachi	3/10/66	Partial Shipment No. 15 of Boiler	256,520.00	Included Above	Included Above	
MEM 711 (Replacement Material)	Flying Endeavor	Hoboken	Karachi	3/10/66	Partial Shipment No. 4 of Condenser  Cooling Tower Fan Motors  Partial Shipment of Turbine Generators  Partial Shipment of Synch. Cond. Material		Included Above	Included Above	
92003 March 29, 1966	Green Lake	New Orleans	Karachi	3/24/66	Partial Shipment 15 of Boiler	9,000.00	135,234	2,365.84	
90859 Feb. 25, 1966	Export Champion	Baltimore	Karachi	3/31/66	Circ. Water Pump Motors	115,810.00	78,750	6,891.30	

**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY**

**SHIPPING STATEMENT  
LYALLPUR POWER STATION  
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QUARTER ENDING March 31, 1966

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
92273 April 6, 1966	Export Champion	Baltimore	Karachi	3/31/66	2 Drain Tanks 1 Waste Oil Storage Tank 2 Blowoff Tanks 1 Oil Storage Tank	9,214.00	25,024	Included Above	
						3,912,763.00	6,161,940	307,746.15	24,413.97

WEST PAKISTAN  
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SHIPPING STATEMENT  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083

QUARTER ENDING June 30, 1966

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
93899 May 31, 1966	Flying Clipper	New York	Karachi	6/30/66	Miscellaneous Control Equipment	1,881.00	430	9,579.80	
94941 July 1, 1966	Flying Gull	New York	Karachi	6/15/66	Partial Turbine Generator	30,429.00	2,341		
93913 May 31, 1966	Flying Gull	New York	Karachi	6/15/66	Misc. Control Equipment	2,800.00	886	1,811.10	
93900 May 31, 1966	Flying Enterprise	New York	Karachi	6/15/66	Unit 2 Boiler - Turbine Gauge Board	60,000.00	9,400	25,746.35	
94461 June 20, 1966	Flying Enterprise	New York	Karachi	6/15/66	Partial Piping & Valves	123,748.00	161,130		
94041 June 6, 1966	Flying Enterprise	Baltimore	Karachi	6/3/66	Tanks	4,862.00	10,712	1,139.65	
93896 May 31, 1966	Flying Enterprise	Philadelphia	Karachi	6/3/66	Partial Turbine Generator No. 2	15,000.00	11,030		
93897 May 31, 1966	Flying Enterprise	Philadelphia	Karachi	6/3/66	Partial Turbine Generator No. 1	5,000.00	2,960	1,399.78	
93838 May 31, 1966	Exchester	New York	Karachi	5/28/66	Instruments	1,900.00	340	213.52	

**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY**

**SHIPPING STATEMENT  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083**

QUARTER ENDING June 30, 1966

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
93961 June 2, 1966	Excbeater	New York	Karachi	5/28/66	Misc. Boiler Parts, Controls and Pipe Hangers	4,228.00	7,969		
93361 May 31, 1966	Steel Seafarer	New York	Karachi	5/5/66	Misc. Turbine, Piping & Controls	78,709.00	154,628		
92100 March 31, 1966	Steel Seafarer	New York	Karachi	5/5/65	Misc. Control Equipment	2,400.00	700		
92875 April 28, 1966	Steel Seafarer	New York	Karachi	5/5/66	Misc. Control Equipment	20,000.00	8,146	10,698.18	
92876 April 28, 1966	Steel Seafarer	New York	Karachi	5/5/66	Misc. Control Equipment	7,070.00	2,170		
93249 May 10, 1966	Exemplar	New York	Karachi	5/5/66	Circ. Water Piping	11,000.00	47,464	6,807.28	
93248 May 10, 1966	Exemplar	New York	Karachi	5/5/66	Misc. Sta. Equipment	40,836.30	67,017		
93151 May 5, 1966	Exemplar	Philadel- phia	Karachi	5/5/66	Transformer Oil	1,850.00	450	18,501.52	

**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY**

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LOAN NO. 391-H-083**

QUARTER ENDING June 30, 1966

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
93150 May 5, 1966	Exemplar	Philadel- phia	Karachi	5/5/66	Cable Trays	21,000.00	28,649		
90860 Feb. 25, 1966	Steel Seafarer	Baltimore	Karachi	4/29/66	Switchgear	29,700.00	17,919		
92002 March 29, 1966	Exempla-	Philadel- phia	Karachi	4/29/66	Partial Turbine No. 1	1,260.00	1,330		
92099 March 31, 1966	Exemplar	Philadel- phia	Karachi	4/29/66	Partial Turbine No. 2	900.00	1,530		
90881 Feb. 25, 1966	Pres. Garfield		Karachi	4/10/66	Motor Control Centers	36,835.00	11,000	1,040.12	
92102 March 31, 1966	Export Champion	New York	Karachi	4/5/66	Sampling Equip- ment	10,000.00	594	26,202.26	
92101 March 31, 1966	Export Champion	New York	Karachi	4/5/66	Pressure Gauges	10,050.00	885		
92479 April 14, 1966	Export Champion	New York	Karachi	4/5/66	Valves, Piping, Fan Motors	142,026.00	297,473		
91057 Feb. 28, 1966	Green Island	Newark	Karachi	4/19/66	Misc. Control Equipment	41,200.00	9,396	14,665.95	

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Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
92478 April 14, 1966	Green Island	Newark	Karachi	4/19/66	Partial Boiler	19,115.00	37,904		
					TOTALS	723,799.30	894,453	117,805.51	

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QUARTER ENDING September 30, 1966

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
97827 Oct. 3, 1966	Excelsior	Hoboken	Karachi	9/26/66	Piping and Fittings	46,835.00	82,249	2,271.28	
97122 Sept. 13, 1966	Exminster	Hoboken	Karachi	9/9/66	Piping, Valves, & Fittings	61,934.00	83,000	7,699.43	
96990 Sept. 7, 1966	Steel Surveyor	Brooklyn	Karachi	8/30/66	Partial Turbine	51,195.00		2,944.84	
96400 Aug. 19, 1966	Exchequer	Hoboken	Karachi	8/15/66	Piping, Valves, & Electrical	100,902.00	164,853	13,944.98	
96260 Aug. 16, 1966	(By Air)		Karachi	8/18/66	Replacement Part for Turbine No. 1	200.00	200		
96100 Aug. 10, 1966	Exchequer	Philadel- phia	Karachi	8/6/66	Partial - Tur- bines 1 & 2	3,000.00		461.36	
96099 Aug. 10, 1966	Flying Endeavor	Hoboken	Karachi	8/5/66	Pipe & Fittings	71,175.00	87,000	7,546.56	
94928 June 30, 1966	Flying Hawk	Hoboken	Karachi	7/21/66	Control Panel	68,882.00	17,000	10,099.67	
95810 July 29, 1966	By Air Freight			8/5/66	Turbine Part	150.00	5		

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Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
95709 July 28, 1966	Flying Hawk	Hoboken	Karachi	7/21/66	Piping, Pumps, Controls & Partial Turbine	122,342.00	193,000		
95076	Flying Clipper	Hoboken	Karachi	6/30/66	Partial Turbine	47,931.00	109,000	10,099.67	
RTC/T2 Aug. 18, 1966	Pres. Garfield	San Francisco	Karachi	7/22/66	Office Equipment	3,660.75	660	91.25	
1453793 Sept. 16, 1966	Steel Fabricator	New Orleans	Karachi	9/27/66	Chimney Lining Material	7,512.61	148,240	2,653.93	
2325 Oct. 5, 1966	Pres. Buchanan	San Francisco	Karachi	9/30/66	Special Building Inserts, Partial Shipment	23,436.17	39,040	1,950.03	
					TOTALS	609,154.53	924,947	59,763.00	

\* Expressed in U. S. Dollars Equivalent  
\*\* All vessels U. S. Flag

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QUARTER ENDING December 31, 1966

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
98122 Oct. 12, 1966	Exemplar	New York	Karachi	10/10/66	Pipe, Fittings & Hangers	35,226.00	9.7	(A)	
98842 Nov. 2, 1966	Flying Enterprise	New York	Karachi	10/26/66	Pipe, Hangers, Valves & Cable	94,842.75	110.0	(A)	
99260 Nov. 16, 1966	Flying Fish	New York	Karachi	11/14/66	Pipe, Fittings & Hardware	41,231.25	75.5	(A)	
99311 Nov. 18, 1966	Flying Fish	New York	Karachi	11/14/66	Valve, Cable & Conduit	69,213.75	26.1	(A)	
99692 Nov. 30, 1966	Flying Endeavor	New York	Karachi	11/21/66	Piping & Hardware	14,615.25	13.3	903.43	
99800 Dec. 5, 1966	Flying Hawk	New York	Karachi	11/23/66	Cable & Conduit	12,102.00	6.2	643.53	
70431 Dec. 28, 1966	Flying Foam	New York	Karachi	12/18/66	Cable, Valves & Piping	95,766.00	43.8	(A)	
70432 Dec. 28, 1966	Flying Foam	New York	Karachi	12/18/66	Electrical Controls	1,228.50	0.5	(A)	
70433 Dec. 28, 1966	Flying Foam	New York	Karachi	12/18/66	Relay Control Switchboard	58,674.00	4.5	(A)	
Total Freight for Items Marked Thus:					(A) . . . . .			45,684.02	

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LYALLPUR POWER STATION  
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Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
2343 Oct. 26, 1966	President Arthur	San Francisco	Karachi	10/18/66	Special Building Inserts & Chimney Material	7,687.51	5.4	616.70	
A-5411 Nov. 8, 1966	Flying Foam	New York	Karachi	12/15/66	Scientific Lab. Equipment	18,951.38	13.3	2,789.62	
2405 Dec. 16, 1966	Pres. Garfield	San Francisco	Karachi	12/12/66	Office Building Plumbing	22,152.88	20.1	1,797.50	
79-09-1788 Sept. 26, 1966	Flying Foam	New York	Karachi	12/15/66	11 Kv Substation	1,067.47	1.0	152.53	
	Steel Maker	New York	Karachi	10/28/66	11 Kv Substation	14,909.23	9.2	812.90	
R12-68 Dec. 12, 1966	Exchequer	New York	Karachi	12/22/66	Lighting Fixtures	4,165.13	1.7	955.97	
84 Oct. 20, 1966	Exemplar	New York	Karachi	10/4/66	Line Towers	1,114.00 (B)	1.0		
85 Oct. 28, 1966	Flying Enterprise	Baltimore	Karachi	10/16/66	Line Towers	27,748.50 (B)	44.1		
86 Nov. 30, 1966	Pres. Jackson	San Francisco	Karachi	11/10/66	Line Towers	8,386.75 (B)	12.2		

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Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
88 Nov. 7, 1966	Flying Enterprise	New York	Karachi	10/25/66	Line Towers	382.00 (B)	0.1		
90 Nov. 21, 1966	Flying Fish	New York	Karachi	11/13/66	Line Towers	1,153.00 (B)	1.8		
91 Dec. 5, 1966	Flying Hawk	New York	Karachi	11/23/66	Line Towers	177.00 (B)	0.1		
95 Dec. 29, 1966	Flying Foam	New York	Karachi	12/16/66	Line Towers	3,364.00 (B)	5.2		
D8-120E Aug. 6, 1966	Excelsior	New York	Karachi	10/11/66	Electrical Material	2,789.23	0.4	121.49	
D12-85E Dec. 12, 1966	Flying Foam	New York	Karachi	12/9/66	Electrical Material	3,306.80	11.8	661.07	
					TOTALS	540,254.38	417.00	55,138.76	
(B) Ocean Freight included, total freight all invoices marked thus: \$3,601.13									
* Expressed in U. S. Dollars Equivalent									
** All vessels U. S. Flag									

**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY**

**SHIPPING STATEMENT  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083**

QUARTER ENDING March 31, 1967

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
T0761 Jan. 1, 1967	Exchequer	New York	Karachi	1/2/67	Turbine Material Piping, Hardware	61,415.00	77.92	4,659.17	
T0945 Jan 17, 1967	Expeditor	New York	Karachi	1/10/67	Piping, Hardware	4,342.00	0.25	21,216.51	
T0946 Jan. 17, 1967	Expeditor	New York	Karachi	1/10/67	Cable, Piping, Hardware	103,526.00	64.28	Included Above	
T1252 Jan. 26, 1967	Flying Gull	New York	Karachi	1/19/67	Valves, Piping, Hardware	21,176.00	20.93	5,010.49	
T1433 Feb. 3, 1967	Exminister	New York	Karachi	1/20/67	Cable, Insula- tion	20,958.00	34.03	2,184.66	
T3002 March 28, 1967	Flying Eagle	New York	Karachi	3/16/67	Gas Cylinders	2,951.00	4.30	220.20	
D-12-29 Dec. 6, 1966	Flying Gull	New York	Karachi	1/16/67	Lighting Fix- tures	1,494.47	0.73	420.39	
WA-37200 Dec. 31, 1966	Green Port	New York	Karachi	1/11/67	Circuit Breaker Parts	735.57	0.15	27.06	
SAR 12-114E Dec. 15, 1966	Excelsior	New York	Karachi	2/7/67	Electrical Material	4,465.72	2.06	405.54	

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Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
R1-114 Jan. 3, 1967	Green Port	New York	Karachi	1/11/67	Lighting Fixtures	716.53	0.24	183.43	
D1-7-E Jan. 3, 1967	Flying Gull	New York	Karachi	1/16/67	Electrical Material	557.46	3.61	686.81	
WA-37753 Jan. 10, 1966	Steelmaker	New York	Karachi	3/22/67	Circuit Breaker Parts	1,138.29	1.41	190.55	
WA-37754 Jan. 10, 1967	Flying Gull	New York	Karachi	1/19/67	Valves, Tubing	1,867.56	0.44	54.95	
SAR1-116-E Jan. 19, 1967	Excelsior	New York	Karachi	2/6/67	Conduit, Fitting	10,625.39	11.10	1,147.06	
(No Number) Jan. 19, 1967	Excelsior	New York	Karachi	1/31/67	Toilet Doors & Stiles	299.00	0.12	(A)	
2445 Jan. 23, 1967	President Hayes	San Francisco	Karachi	1/6/67	Office Building Plumbing	2,175.78	0.77	78.88	
2446 Jan. 24, 1967	President Adams	San Francisco	Karachi	12/22/66	Trolley Hoist	1,538.94	0.40	72.06	
100 Jan. 31, 1967	Exminster	New York	Karachi	1/25/67	Line Hardware	263.50	0.17	21.50	

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Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
D2-2-E Feb. 1, 1967	Alcoa Explorer	New York	Karachi	2/28/67	Steel Poles	11,919.06	5.94	798.45	
SAR2-64-E	Alcoa Explorer	New York	Karachi	2/28/67	Electrical Materials	7,529.96	3.13	1,037.55	
D2-54-E Feb. 9, 1967	Alcoa Explorer	New York	Karachi	2/28/67	Electrical Materials	18,956.46	22.50	1,974.00	
102 Feb. 20, 1967	Excelsior	New York	Karachi	2/10/67	Bolts & Nuts, & Rods	2,861.17	0.46	23.83	
D2-141-E Feb. 24, 1967	Flying Eagle	New York	Karachi	3/15/67	Lighting Fixtures	9,149.03	2.96	1,893.64	
D2-148-E Feb. 24, 1967	Flying Eagle	New York	Karachi	3/17/67	Cable	1,599.52	2.06	197.28	
D3-39-E March 1, 1967	Flying Eagle	New York	Karachi	3/15/67	Aluminum Pipe	465.60	0.53	144.40	
D3-41-E March 6, 1967	Flying Eagle	New York	Karachi	3/17/67	Lighting Fixtures	11,052.98	2.73	962.79	
D3-68-E March 7, 1967	Flying Eagle	New York	Karachi	3/21/67	Lighting Fixtures	2,173.96	0.82	793.09	

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Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
2493 March 7, 1967	President Buchanan	San Francisco	Karachi	1/26/67	Office Building Plumbing	1,119.77	0.35	94.12	
SAR3-T2-B March 7, 1967	Green Harbour	New York	Karachi	3/15/67	Electrical Materials	1,278.45	0.32	(A)	
D3-113-B March 9, 1967	Flying Eagle	New York	Karachi	3/17/67	Lighting Fixtures	2,433.68	0.45	136.35	
105 April 7, 1967	President Coolidge	Los Angeles	Karachi	3/17/67	Aluminum Cable	3,556.10	3.58	161.03	
					TOTALS	314,341.94	268.74	44,795.79	

(A) Ocean Freight Included in P.O.B. Value  
 \* Expressed in U. S. Dollars Equivalent  
 \*\* All Vessels U. S. Flag

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								AID Funds (9)	Other Funds (10)
55219 Feb. 6, 1967	Alcoa Explorer	New York	Karachi	2/28/67	Metal Lath & Accessories	2,240.00	7.32	450.00	
46199 Feb. 28, 1967	Fanwood	New Orleans	Karachi	4/14/67	Elevated Water Tank	22,378.56	37.27	3,172.00	
12467 April 12, 1967	Express	New York	Karachi	4/10/67	Grinder	1,023.00	.38	71.58	
7B3-400274 April 21, 1967	Steel Director	New York	Karachi	4/27/67	Heating, Vent & Air Conditioning Equipment	31,076.82	10.35	2,461.13	
71902 & 71903 April 26, 1967	Exchequer	New York	Karachi	5/19/67	Machine Shop Crane	14,680.82	5.53	638.16	
2510 April 26, 1967	Steel Director	New York	Karachi	4/28/67	Grinders	422.34	.16	27.66	
2515 May 31, 1967	Steel Age	New York	Karachi	5/31/67	Lathe & Band Saw	1,004.02	.43	195.98	
RTC/100 May 23, 1967	President Adams	San Francisco	Karachi	4/17/67	Air Filter & Frames	3,993.21	.81	272.91	
RTC/100 May 23, 1967	President Buchanan	Philadelphia	Karachi	5/13/67	Caulking Material	Included Above	.42	79.88	

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								AID Funds (9)	Other Funds (10)
71251 Jan. 26, 1967	Flying Hawk	New York	Karachi	3/28/67	Generator Spares	11,059.75	1.80	6,133.86	
73364 April 12, 1967	Flying Hawk	New York	Karachi	3/28/67	Piping Insulation	136.00	21.62	Included Above	
D2-60-E Feb. 13, 1967	Flying Hawk	New York	Karachi	3/27/67	Lighting Fixtures	1,848.28	.76	139.46	
D2-125-E March 17, 1967	Flying Hawk	New York	Karachi	3/31/67	Copper Cable	15,634.71	7.82	861.20	
SAR3-137-E March 17, 1967	Flying Hawk	New York	Karachi	3/27/67	Electrical Material	9,673.25	1.56	588.48	
D3-150-E March 20, 1967	Express	New York	Karachi	5/3/67	Electrical Material	655.37	.74	233.03	
D3-188-E March 28, 1967	Flying Fish	New York	Karachi	4/17/67	Electrical Material	2,799.55	3.04	337.49	
SAR4-82-E April 13, 1967	Flying Fish	New York	Karachi	4/20/67	Electrical Material	901.37	.91	141.24	
D4-157-E April 25, 1967	President	Los Angeles	Karachi	5/15/67	Copper Cable	29,053.98	10.58	525.83	

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Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
R5-53-E May 3, 1967	Exchequer	New York	Karachi	5/19/67	Electrical Material	6,367.10	2.27	644.57	
SAR5-94-E May 10, 1967	Steel Age	New York	Karachi	5/31/67	Electrical Material	1,832.13	2.73	287.96	
					TOTALS	156,780.26	116.50	17,262.32	
* Expressed in U. S. Dollars Equivalent									
** All Vessels U. S. Flag									

**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY**

**SHIPPING STATEMENT  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083**

QUARTER ENDING September 30, 1967

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
12468 June 28, 1967	Exiloom	New York	Karachi	7/7/67	Hydraulic Press	4,395.00	1.47	135.93	
CTC-3390-1 Aug. 24, 1967	Flying Cloud	New York	Karachi	8/28/67	Hand Tools & Instruments	27,862.90	5.61	1,198.60	
					TOTALS	32,257.90	7.08	1,334.53	

\* Expressed in U. S. Dollars Equivalent  
\*\* All Vessels U. S. Flag

**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY**

**SHIPPING STATEMENT  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083**

QUARTER ENDING December 31, 1967

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* POB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
CTC-3390-2 Nov. 15, 1967	Flying Fish	New York	Karachi	12/11/67	Tools & Instruments	21,376.48	5,434	755.75	
CTC-3390-3 Nov. 15, 1967	Flying Fish	New York	Karachi	12/11/67	Chemicals	1,200.00	2,170	191.18	
CTC-3501 Dec. 7, 1967	Flying Fish	New York	Karachi	12/11/67	Crane Runway Steel	12,608.32	69,189	1,731.68	
TH3-400274 Dec. 15, 1967	Steel Fabricator	New York	Karachi	12/29/67	Refrigerant	1,185.04	1,320	54.63	
TH3-400274 Oct. 13, 1967	Flying Foam	New York	Karachi	10/20/67	Heating Ventilating	10,957.38	5,603	Included Above	
80968, 80969, 81128, 81132, 81134, 88208 Aug 10, 1967	Green Wave	New York	Karachi	9/29/67	Telephone & P. A. System Equipment	51,478.19	24,490	3,465.08	
					<b>TOTALS</b>	98,805.41	108,206	6,198.32	

\* Expressed in U. S. Dollars Equivalent

\*\* All Vessels U. S. Flag

**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY**

**SHIPPING STATEMENT  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083**

QUARTER ENDING March 31, 1968

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
RTC/103 Jan. 22, 1968	Flying Eagle	Philadel- phia	Karachi	1/18/68	Ventilators & Fans	6,515.46	5,816	1,491.54	
CTC-3390-4 Jan. 31, 1968	Air	New York	Karachi		Hand Tools & Instruments	1,063.70		Included Above	
CTC-3390-5 March 6, 1968	Flying Enterprise	New York	Karachi	3/14/68	Hand Tools & Instruments	1,081.00	234	Included Above	
<b>TOTALS</b>						<b>8,660.16</b>	<b>6,050</b>	<b>1,491.54</b>	

\* Expressed in U. S. Dollars Equivalent  
\*\* All U. S. Flag Vessels

**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY**

**SHIPPING STATEMENT  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083**

QUARTER ENDING June 30, 1968

Invoice No. & Date (1)	Name of Vessel & Flag (2)**	Port of Exit (3)	Port of Destination (4)	Sailing or B/L Date (5)	Description of Cargo (6)	* FOB Value of Cargo (7)	Gross L. T. Weight (8)	Cost of Ocean Freight	
								AID Funds (9)	Other Funds (10)
CTC-3390-6 May 10, 1968	Flying Fish	New York	Karachi	5/10/68	Handtools	# 512.20	85	Included Previously	
RTC/103 June 4, 1968	Air	San Francisco	Karachi	6/11/68	Starters & Drive Belts	78.00	3	8.36	
RTC/129 June 7, 1968	President Coolidge	San Francisco	Karachi	6/14/68	Chemicals	3,680.00	250	Included	
RTC/128A June 7, 1968	Air	San Francisco	Karachi	6/11/68	Chemicals	1,319.00	600	Included	
					<b>TOTALS</b>	<u>5,589.20</u>	<u>938</u>	<u>8.36</u>	

\* Expressed in U. S. Dollars Equivalent  
 \*\* All U. S. Flag Vessels  
 # Value Included in Prior Reports

**DAMAGED TURBINE BLADE RINGS**

TURBINE SHELL  
BOTTOM DAMAGE

**DAMAGED HIGH PRESSURE CYLINDER  
GOVERNOR VALVE LINKAGE**



**EXAMPLE OF GRATING DAMAGE**

**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY  
LAHORE, WEST PAKISTAN**

**CONSTRUCTION**

Volkervam Pakistan Ltd., the contractor for the civil works portion of the project, mobilized and began the site preparation and construction of the contractor's camp in April, 1965. Base slab and foundation excavation began in August. During the prior interim, Raymond International of Delaware, the contractor for the pile driving, proceeded with their installation simultaneously with the excavation and site work.

The piling and foundation work were delayed at the outset due to shipping delays on the pile shells as well as the slab and foundation inserts primarily due to the Pakistan-India conflict during September of 1965.

The civil work progressed as materials became available and the work force expanded as required to 280 personnel of the diverse trades and administrative skills necessary for the project. All the civil work was performed by a Pakistan contractor and Pakistani labor. The unloading and storage of civil works materials at the site was performed by Volkervam as specified in the Civil Works Contract.

Contract completion dates were extended as a result of delays stated in the aforementioned Force Majeure, and a Certificate of Completion was issued on June 4, 1968, with one year maintenance thereafter as specified in the Agreement.

Mobilization and construction by Westinghouse Electric International and their subcontractor, MWK, began in July, 1965. In the plan for execution of the project, the station equipment (including turbine generator, steam generator, condensing equipment and auxiliaries, feedwater heaters, boiler feed pumps, electrical auxiliaries, interconnecting piping and wiring, and all those auxiliary systems which were inherently a part of the station) was purchased as an engineered package on a delivered and erected basis.

The work was performed by a varying field force consisting of 18 expatriates and the following indigenous personnel:

6 Engineers

1 Doctor

- 6 Accounting and Administrative Personnel
- 6 Warehouse, Stores and Tool Room Personnel
- 570 Field Force of Diverse Skills and Trades

The following major items of equipment were used in the course of plant equipment erection:

- 3 Station Wagons
- 1 Ambulance Station Wagon
- 1 Jeep
- 2 Pickup Trucks
- 1 Auto Car Tractor with 50-Ton Low-Boy Trailer
- 1 Ten-Ton Auto Car Truck
- 1 P & H 100-Ton Crawler Crane
- 1 Thirty-Ton Lorraine Crane
- 1 Twenty-Five-Ton Mobile Crane
- 1 D-6 Caterpillar Tractor with Side Boom
- 4 Gas Welding Machines
- 20 Electric Welding Machines
- 3 Air Tuggers
- 1 Air Compressor

The original Construction Schedules were extended several times due to various influences, primarily delays in shipping as a result of the September, 1965 Pakistan-India conflict, the closing of the Suez Canal, and the non-availability of U.S. shipping. Land transport for a time was committed to the Pakistan-India conflict and internal security. Site delivery time was delayed as much as four months, food shipments having dockside handling and land transport priority.

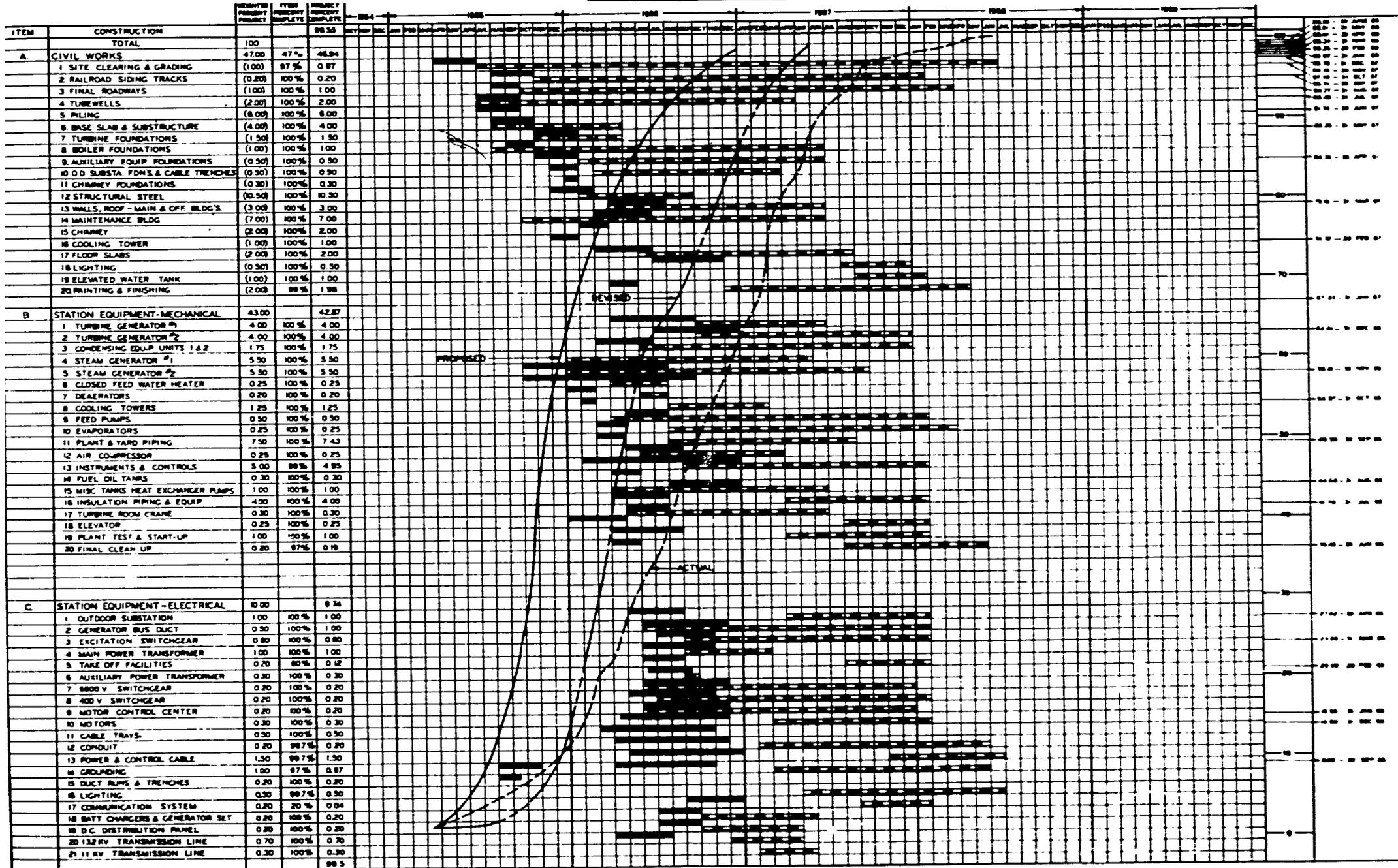
Further complicating the materials supply problem was the extensive amount of damage to equipment in transit on both land and sea, which is further documented in the Materials Section of this report. In addition, the Number 1 boiler was found, on arrival, to have a heavy, localized area of internal scale which required acid bath cleaning and testing before installation could be effected.

Force Majeure claims by Westinghouse extended the contract completion date on Unit 1 for 260 days and on Unit 2 for 264 days. Unit No. 1 was operational on July 11, 1967, and Unit No. 2 was operational on October 22, 1967, with the plant, after a period of operating tests, producing commercial power on line November 15, 1967.

A Certification of Acceptance was issued by the West Pakistan Water And Power Development Authority effective October 22, 1968.

CONSTRUCTION PROGRESS SCHEDULE  
LYALLPUR THERMAL STATION

PROGRESS UP TO JUNE 30, 1968



**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY  
LAHORE, WEST PAKISTAN**

**TRAINING**

Six Water And Power Development Authority Engineers and Operators visited the United States in June, 1966 for a training program. An intensive, one-week orientation course was held in Washington, D. C. and consisted of lectures, tours and open forum discussions promoting the various aspects of economics, education and social studies affecting the program.

Following this course, six days were spent at the Lester Works of Westinghouse Electric Corporation in Philadelphia. The Westinghouse Engineers conducted a program of study involving steam turbines, heat transfer and gas turbines. The program included a tour of the shops. The prominent Eddystone Plant of Philadelphia was visited as a point of general interest. This Station operates at 5000 psig and 1200 F. with double reheat of 1050 F. each. Unit 1 at Eddystone is rated 325 MW.

The manufacturing facilities of Electric Heating Equipment Company were then visited to inspect and see in operation the type of hydrogen gas generating apparatus to be used at Lyallpur. Following this, the Hungerford & Terry Company Plant at Clayton, New Jersey was visited to study this firm's Zeolite water softening equipment.

The following days were spent in New York City and in a visit to the World's Fair. The group visited Niagra Falls, New York and were conducted through the 13 unit Robert Moses Hydro-Electric Station of the New York Power Authority.

The Wellsville, New York manufacturing plant of the Airheater Corporation was visited to inspect and to see the Lungstrom air preheaters which were partially completed.

A one-month program of plant layout, piping diagrams, flow diagrams, heat balance studies, equipment locations, instrument and control functions along with operation and maintenance procedures for the Lyallpur Station was held at the Jackson, Michigan office of Commonwealth Associates Inc. Following this course, several Midwest power plants were visited for studies with respect to gas fired steam generators and Westinghouse turbines.

One month was spent at the Parkdale Station of Dallas Power and Light Company in Dallas, Texas. The Station has three natural gas-fired units with cooling towers and a station capability of 300 MW.

The next six weeks were with the Arkansas Power and Light Company at Forrest City and Helena, Arkansas. The Hamilton Moses Station at Forrest City has two units, each 66 MW, natural gas-fired and uses oil as a back-up fuel. The cooling towers are supplied with water from either a nearby stream or from deep wells on the property. Major studies at this Station were on the maintenance of auxiliary equipment.

Two weeks were spent at the Ritchie Station at Helena, Arkansas where a 325 MW Westinghouse turbine generator was undergoing overhaul and inspection. The Station is also natural gas-fired with oil for standby, and it operates at 2000 psig with main steam at 1000 F. and one reheat at 1000 F.

A week at the Elmer Smith Station of the Owensboro, Kentucky Municipal Utility System gave an opportunity to study the operation of a Westinghouse flash evaporator similar to that being used at Lyallpur.

Two courses in instruments and controls at the Hagan Corporation in Pittsburgh, Pennsylvania, were attended by the WAPDA's Instrument and Control Supervisor, Mr. M. Sanallah.

The Byron Jackson Manufacturing Company in Los Angeles, California, was visited for several days where an actual, full-scale test of one of the Lyallpur boiler feed pumps was witnessed. Following this test, the pump was dismantled, inspected and reassembled for the benefit of WAPDA Engineers.

Other manufacturing plants visited were as follows:

1. Foster Wheeler Corporation at Mountaintop, Pennsylvania. Information was gathered on welding and rolling techniques of boiler and feedwater heater tubes.
2. Westinghouse Electric Corporation's Sharon, Pennsylvania Plant for studies of the design, manufacture and testing of small transformers.
3. The Westinghouse Plant at Muncie, Indiana was visited where discussions were held relative to larger transformers as used at Lyallpur.
4. Diamond Power Specialty Company of Lancaster, Ohio, where instructions on operation and maintenance techniques were provided for soot blowers and boiler gauge classes.
5. Fisher Governor Company of Marshalltown, Iowa, was visited to see and learn about pressure control valves, pressure regulators and flow control and level control valves and instruments.

6. Crosby Steam Gauge and Valve Company, Wrentham, Massachusetts, to study boiler safety valves and the setting and maintenance of them.
7. Westinghouse Electric Corporation at Pittsburgh, Pennsylvania, where demonstrations were given on the manufacture of electric generators and large motors. A lecture was held there on the operation of the generator as a synchronous condenser.
8. Westinghouse Electric Corporation at Bloomington, Indiana, was visited to gather information on static condensers, lightning arresters and fuse cut-outs.
9. Gardner Denver Company, Quincy, Illinois, was the manufacturer of the instrument air compressors. Demonstrations were given on the operation and maintenance of the Teflon ringed air compressors.
10. Foster Wheeler Corporation, Livingston, New Jersey, the corporate offices and design engineering headquarters for steam generators, condenser and feedwater heaters, was also visited briefly.

Weekly progress reports were written by each Engineer and copies were provided for both WAPDA and CAI. The program terminated December 1, 1965, and was not only interesting, but was most helpful to each of the six WAPDA Engineers.

An on site training program was instituted with emphasis on training of the control room operators, senior shift engineers, boiler firemen and auxiliary operators in their specific duties. Training included class instruction as well as actual performance of specific duties before, during and after initial electrolytic filling, purging and start-up periods. Start-up and shut down procedures were rehearsed or simulated with less qualified WAPDA personnel receiving training from the more experienced WAPDA personnel.

A comprehensive preventative maintenance program was developed and each of the trainees prepared one line diagrams of each major steam and water circuit (including steam and water cycles) and participated in the preparation of the operator's handbooks and maintenance manuals.

**PAKISTANI ENGINEERS IN U.S. TRAINING  
AND ON SITE PROGRAMS**

<b>NAME</b>	<b>DUTIES AND JOB TITLE</b>
Mr. Iqbal Ashraf	Resident Engineer
Mr. Fida Hussain	Assistant Resident Engineer Lyallpur Assistant Operation Superintendent
Mr. Yousaf Eida	Mechanical Maintenance Engineer Lyallpur
Mr. Abdullah Samad Khan	Senior Shift Operating Engineer Lyallpur
Mr. Mohd Sannaullah	Instrument Engineer Lyallpur (In charge of Plant Instrument and Controls Maintenance)
Mr. Chaudry Siddique	Senior Shift Engineer, Multan Natural Gas Power Station

**ADDITIONAL PRINCIPAL PAKISTANI PERSONNEL PARTICIPATING  
IN ON SITE TRAINING PROGRAM**

<b>NAME</b>	<b>DUTIES AND JOB TITLE</b>
Mr. Mohd Abdullah	Shift Foreman
Mr. Mohammad Rafiq	Electrical Control Board Operator
Mr. Mohammad Ashraf	Thermal Control Board Operator
Mr. Mushtap Muhammed	Turbine Operator
Mr. Inayat Ullah	Turbine Operator
Mr. Fayyaz Ahmad	Boiler Operator

**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY  
LAHORE, WEST PAKISTAN**

**FINANCIAL AND CONTRACTUAL**

A total of seven Letters of Commitment were issued by AID for the Loan portion of the project in the amount of \$17.1 million and were assigned to the following entities of contract and material costs.

- 391-H-083-01     Engineering and Consulting Services Commonwealth Associates Inc.
- 391-H-083-02     Construction and Plant Equipment Westinghouse Electric International Inc.
- 391-H-083-03     Piling in Place, Raymond International of Delaware
- 391-H-083-04     Reinforcing Bars and Structural Steel
- 391-H-083-05     Vehicles, Kaiser Jeep International
- 391-H-083-06     Concrete Inserts, Osborne Engineering Co.
- 391-H-083-07     Other Structural Materials, Equipment and Spare Parts from the Various Vendors as Listed

As of November 30, 1968, the termination date of the Commonwealth Contract, several final payments to Dollar contractors and suppliers were still outstanding as indicated in final accounting, inasmuch as the termination date of Letters of Credit had been extended to June 30, 1969.

Purchase Orders Numbers 49 through 53 for instrument dryers, air compressors and miscellaneous spare parts were not shipped prior to November 30, 1968.

Provisions were made to amend the above Purchase Orders and Letters of Credit inasmuch as there was no inspection and certification of said invoices after the terminal date of the Commonwealth presence in Pakistan.

As a result of certain delays incurred due to damage of materials in shipment, closing of the Suez Canal, sea and overland transport stoppages resulting from the Pakistan-India conflict, as well as a delay in the issuance of the initial shipping Letter of Credit,

Westinghouse Electric Company invoked Force Majeure claims which, when compiled with deductions for time overlap, effectively extended contractual operational date of Unit 1 from September 24, 1966 for a period of 328 days. Unit 1 was operational on July 11, 1967, or 260 days after the initial contract date, thereby establishing a 68 day bonus credit then applied to Unit 2.

The Force Majeure claim on Unit 2 effectively extended the contractual operational date 264 composite days from December 24, 1966. Unit 2 was completed on November 15, 1967, 62 days over the 264 days allowable under the Force Majeure. The applied bonus days credited from Unit 1 in effect offset the penalties applicable to Unit 2.

On the recommendation and certification of Commonwealth Associates Inc., the West Pakistan Water And Power Development Authority granted acceptance of the plant in accordance with the terms and conditions of the Westinghouse Electric International Contract, Section 11-C-18, Clause 41A. The acceptance was effective as of October 22, 1968.

The established monetary rate of exchange was 4.76 Rupees per Dollar.

**COMMONWEALTH ASSOCIATES INC.  
LYALLPUR THERMAL STATION COSTS  
COSTS THROUGH JUNE 30, 1969**

Item	Description	Man Months	Dollar Costs
1	Overseas Base Salary	259	\$ 326,942
2	Overseas Salary Differentials		82,724
3	Home Office Base Salaries	876	683,011
4	Subtotal (Lines 1-3)	1,135	\$1,092,677
5	Employee Benefits		250,870
6	Total Payroll Costs (Lines 4 & 5)		\$1,343,547
7	Overhead		577,724
8	Fixed Fee		199,064
9	Total Cost of Services	1,135	\$2,120,335
10	Consultants		4,824
11	Travel and Per Diem – Personnel		
	A. International Travel		4,085
	A.1 Per Diem – International		8,305
	B. Domestic – Travel		13,354
	B.1 Per Diem – Domestic		9,305
	Total Travel & Per Diem		\$ 35,049
12	Transportation – Personnel Baggage		3,193
13	Transportation -- Household Effects		29,604
14	Transportation -- Equipment		
15	Equipment		2,362
16	Other Direct Costs		
	A. Insurance		391
	B. Out-of-Pocket Expenses		50,393
	C. Miscellaneous		55,439
	Total – Other Direct Costs		\$ 141,382
17	Subtotal – Lines 10-16		181,255
18	Subtotal -- Lines 9 and 17		2,301,590
19	LESS Service & Expenses Covered by WAPDA Dollar Funds Prior to April 23, 1964		70,000
20	PLUS Training Program		19,520
21	TOTAL COSTS		\$2,251,110

WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083  
L/COM AND L/C STATUS AT PROJECT COMPLETION

391-H-083	COMPANY	L/COM AMOUNT	L/C NO.	L/C AMOUNT	DESCRIPTION	ACCRUED CHARGES	PAYMENT RECEIVED
01	Commonwealth Associates Inc.	2,340,000	WAPDA ICA-2201-3	2,340,000	Fee, Direct/Indirect and Trainee Costs	2,251,110	2,019,138
02	WEICO MIUS 27 SEPT	12,560,000 400,000	HW/1220/DLF) HW/1672/DLF) HW/1221/DLF HW/1222/DLF HW/1291/DLF HW/1292/DLF HW/1993/DLF	9,175,483* 1,358,944** 900,000 189,826 75,778 22,773	Equipment Erection Ins. Freight Add. Equipment (PO4) Erection (PO 4) Ins. Freight (PO 4)	9,167,983 1,351,444 881,141 189,826 75,778 13,627	8,023,735 1,300,001 391,147 171,155 75,778 13,627
Total 02:		12,160,000		11,722,804		11,679,799	10,465,437
03	Raymond Pile Plus 13 Aug. 65	250,000	HW/1232/DLF	247,762	Taper Pile	247,762	247,762
04	Habag Corp. Plus 9 Sept 65 Decatur		HW/1239/DLF HW/1316/DLF	97,072 420,652	Rebar Structural Steel and Inserts	97,072 420,652	97,072 404,694
Total 04:		517,724		517,724		517,724	501,766
05	Kaiser	60,000	HW/1339/DLF	22,560	Vehicles	22,560	22,560
06	Osborne	43,000	HW/1250/DLF	31,553	Inserts	31,553	31,553
Total 02 - 06:		13,030,724		12,542,403		12,488,401	11,269,078
NOTES :	* Includes \$7,500 for Boiler Foundation Material. ** Includes \$15,000 for No. 2 Turbine Inspection.						

**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083  
L/COM AND L/C STATUS AT PROJECT COMPLETION**

391-H-083	COMPANY	L/COM AMOUNT	L/C NO.	L/C AMOUNT	DESCRIPTION	ACCRUED CHARGES	PAYMENT RECEIVED
	Sanymetal	PO No. 30	HW/1642/DLF	299	Doors & Styles	299	269
	Inland Steel	PO No. 31	HW/1645/DLF	2,690	Lathe	2,690	2,421
	Royce	PO No. 32	HW/1646/DLF	4,346	Air Filters/Frames	4,346	3,911
	Carrier	PO No. 33	HW/1747/DLF	45,735	Air Cond. Equipment	45,735	41,162
	Leviant	PO No. 34	HW/1674/DLF	2,745	Lathe, Etc.	2,745	2,472
	N.W. Export	PO No. 35	HW/1736/DLF	5,626	Press & Grinder	5,626	5,064
	New World	PO No. 36	HW/1737/DLF	50,159	Hand Tools, Etc.	50,159	45,144
	Royce	PO No. 39	HW/1742/DLF	8,007	Ventilating Equip.	8,132	2,472
	New World	PO No. 40	HW/1803/DLF	14,340	Crane Runway Steel	14,340	12,906
	Sunco	PC No. 42	-	19,732	Chem. Cleaning Equip.	19,732	19,732
	Royce	PO No. 43	HW/2043/DLF	4,999	Water Treatment Chemicals	1,319	1,319
	WEICO	PO No. 44	-	285,000*	Spare Parts	-	-
	P.T. Micro Corp	PO No. 49	-	8,241	Air Dryers	-	-
	A. Chalmers	PO No. 50	-	24,351	Air Compressors	-	-
	United Export	PO No. 51	-	2,566	Misc. Equipment	-	-
	Royce	PO No. 52	-	36,852	Misc. Equipment	-	-
	CEM Int.	PO No. 53	-	5,863	Misc. Equipment	-	-
Total	07:	1,760,000		1,344,664		977,750	863,429
Total	02 - 07:	14,790,724		13,887,067		13,477,148	12,132,507
Total	01 - 07:	17,130,724		16,227,067		15,728,258	14,151,645

NOTE: \* Includes \$35,000 to cover equipment/material purchased from WEICO at Layllpur Site.

WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY  
LYALLPUR POWER STATION  
LOAN NO. 391-H-083  
L/COM AND L/C STATUS AT PROJECT COMPLETION

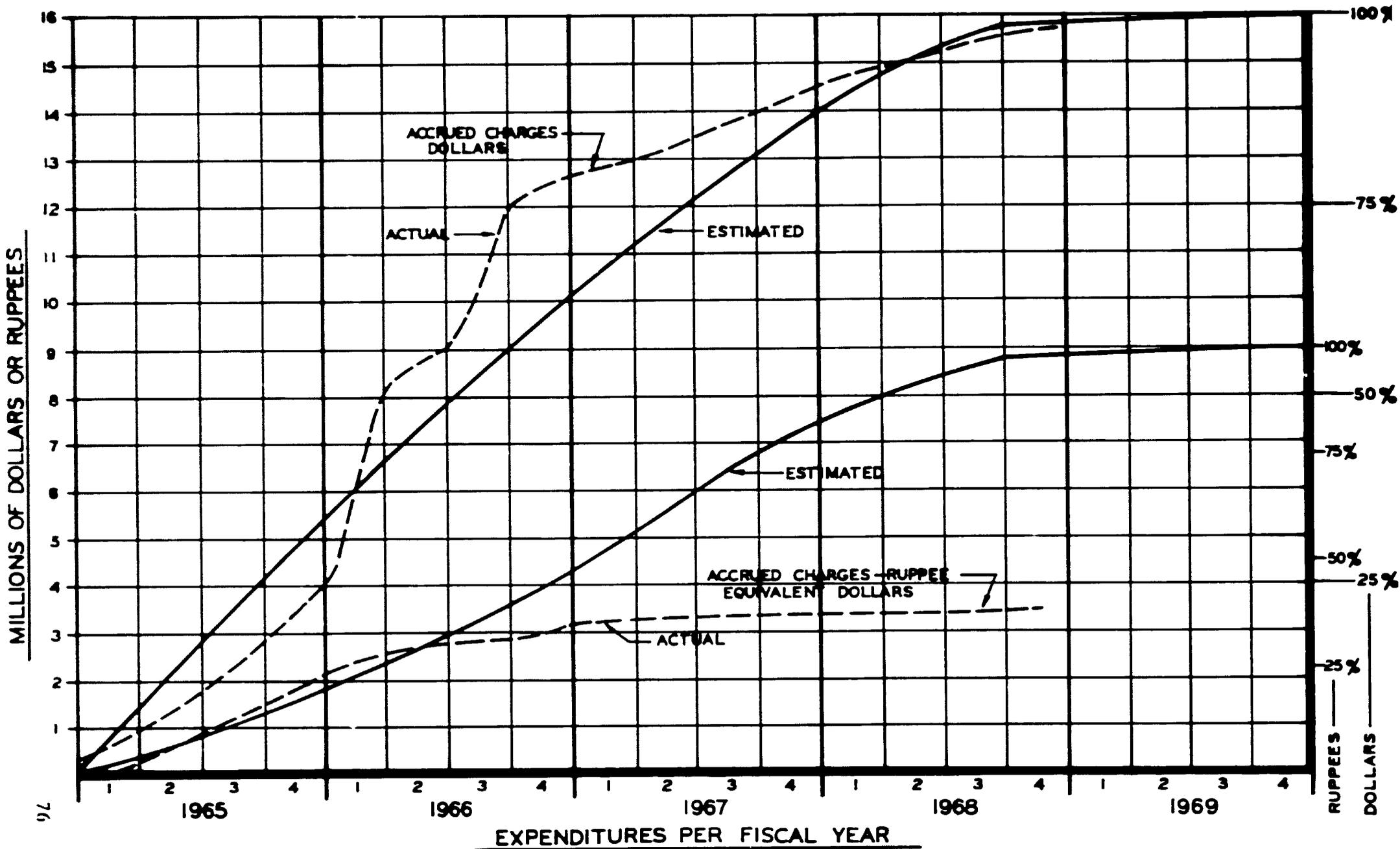
391-H-083	COMPANY	L/COM AMOUNT	L/C NO.	L/C AMOUNT	DESCRIPTION	ACCRUED CHARGES	PAYMENT RECEIVED
07	Electrical	1,760,000					
	G.E.C.	PO No. 9	HW/1342/DLF	75,754	Transformer	75,754	68,179
	A. Chalmer	PO No. 10	HW/1393/DLF	8,336	14 KV OCBS	8,336	8,336
	A. Chalmer	PO No. 11	HW/1394/DLF	221,132	132 KV Line	221,132	193,491
	W. & Kales	PO No. 12	HW/1429/DLF	50,012	132 & 11 Kv Lines	50,012	50,012
	CHM Int.	PC No. 13	HW/1439/DLF	36,863	Electrical Fixtures	36,863	31,334
	CHM Int.	PC No. 14	HW/1466/DLF	168,150	Electrical Material	168,150	142,928
	Joslyn, Int.	PO No. 15	HW/1467/DLF	16,942	11 KV Bus	16,942	14,401
	Royce	PO No. 19	HW/1483/DLF	3,862	Office Equipment	3,377	3,040
	R. Nelson	PO No. 20	HW/1497/DLF	33,690	Inserts	33,690	30,321
	Kavanaugh	PO No. 21	HW/1526/DLF	21,741	Lab. Equipment	21,741	19,567
	H. Walker	PO No. 22	HW/1612/DLF	10,166	Chimney Liner	10,166	9,150
	C.T. & E.	PO No. 23	HW/1624/DLF	63,841	Comm. System	63,841	54,265
	N.Y. Air Breaker	PO No. 24	HW/1630/DLF	12,324	Pumps, Etc.	12,323	11,091
	R. Nelson	PC No. 25	HW/1629/DLF	27,418	Plumbing Equipment	27,418	24,677
	Royce	PO No. 26	HW/1639/DLF	30,401	Electrical Equipment	30,401	27,371
	Caldwell	PO No. 27	HW/1640/DLF	25,551	Water Tank	25,551	22,996
	Nelson	PO No. 28	HW/1643/DLF	1,611	Trolley Hoist	1,611	1,611
	M.M. & Mocre	PO No. 29	HW/1641/DLF	15,319	Crane	15,319	13,787

**RUPEE COSTS  
THROUGH  
NOVEMBER 30, 1968**

<b>COMPANY</b>	<b>COMMITMENT</b>	<b>BILLING</b>	<b>PAYMENTS</b>
C.A.I.	2,520,886	2,520,886	2,256,342
W.E.I.C.O.	5,978,826	5,978,826	5,949,530
RAYMOND	720,000	730,258	617,705
VOLKERVAM	10,497,120	6,274,462	5,264,438 <sup>1</sup>
KAISER JEEP	97,350	97,350	97,350
BORE MASTER	29,550	29,550	29,509
G.E.C.	21,108	21,108	21,108
NORTHERN ELECTRIC	9,350	9,350	9,350
IMPERIAL ELECTRIC	6,881	6,881	6,881
B.I.C.C.	85,026	85,026	85,026
B.I.C.C.	82,615	82,615	82,615
AMEEJEE	146,640	146,640	124,644
KOHINOOR	120,000	120,000	120,000
BROWN BOVARI CORP.	8,970	8,970	8,970
MUSHRA	39,859	30,573	12,001
<b>TOTAL:</b>	<b>20,364,173</b>	<b>16,142,495</b>	<b>14,678,469</b>

- NOTE:**
1. Includes payments of Rs 146,000 made in October and November 1968.
  2. WAPDA overhead Rupee costs not supplied; therefore, NOT included in above tabulations.

**LYALLPUR THERMAL STATION  
FINANCIAL PLAN AND CASH FLOW  
ESTIMATED AND ACTUAL**



**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY  
LAHORE, WEST PAKISTAN**

**PROJECT PERSONNEL**

**COMMONWEALTH PERSONNEL ASSIGNED TO THIS PROJECT**

**Chicago Office**

**N. L. Reaume**      **CAI Project Manager, U.S.A.**  
**N. D. French**      **Structural Supervising Engineer**  
**R. Kinsey**          **Electrical Supervising Engineer**

**COMMONWEALTH PERSONNEL ASSIGNED TO THIS PROJECT IN PAKISTAN**

**G. W. Swanson**      **Project Manager – April, 1965 to June, 1966**  
**F. Smurr**            **Project Manager – April, 1966 to January, 1969**  
**G. A. Steimling**    **Electrical and Acting Resident Civil Engineer – August, 1965 to September, 1967**  
**W. D. Finn**         **Resident Mechanical Engineer – August, 1965 to September, 1967**  
**A. M. Guy**          **Chief Resident Engineer – May, 1966 to November, 1968**  
**I. M. Salmond**      **Staff Engineer – September, 1964 to March, 1966**  
**R. I. Dice**          **Resident Civil Engineer – February, 1964 to July, 1966**  
**T. Monaghan**      **Administrative Officer – December, 1965 to December, 1968**  
**B. E. Brush, Sr.**    **Senior Operating Engineer – August, 1966 to November, 1968**  
**O. W. Bennett**      **Senior Operating Engineer, February, 1967 to June, 1968**

**C. R. Landreth**      **Plant Operating Engineer – April, 1966 to March, 1968**

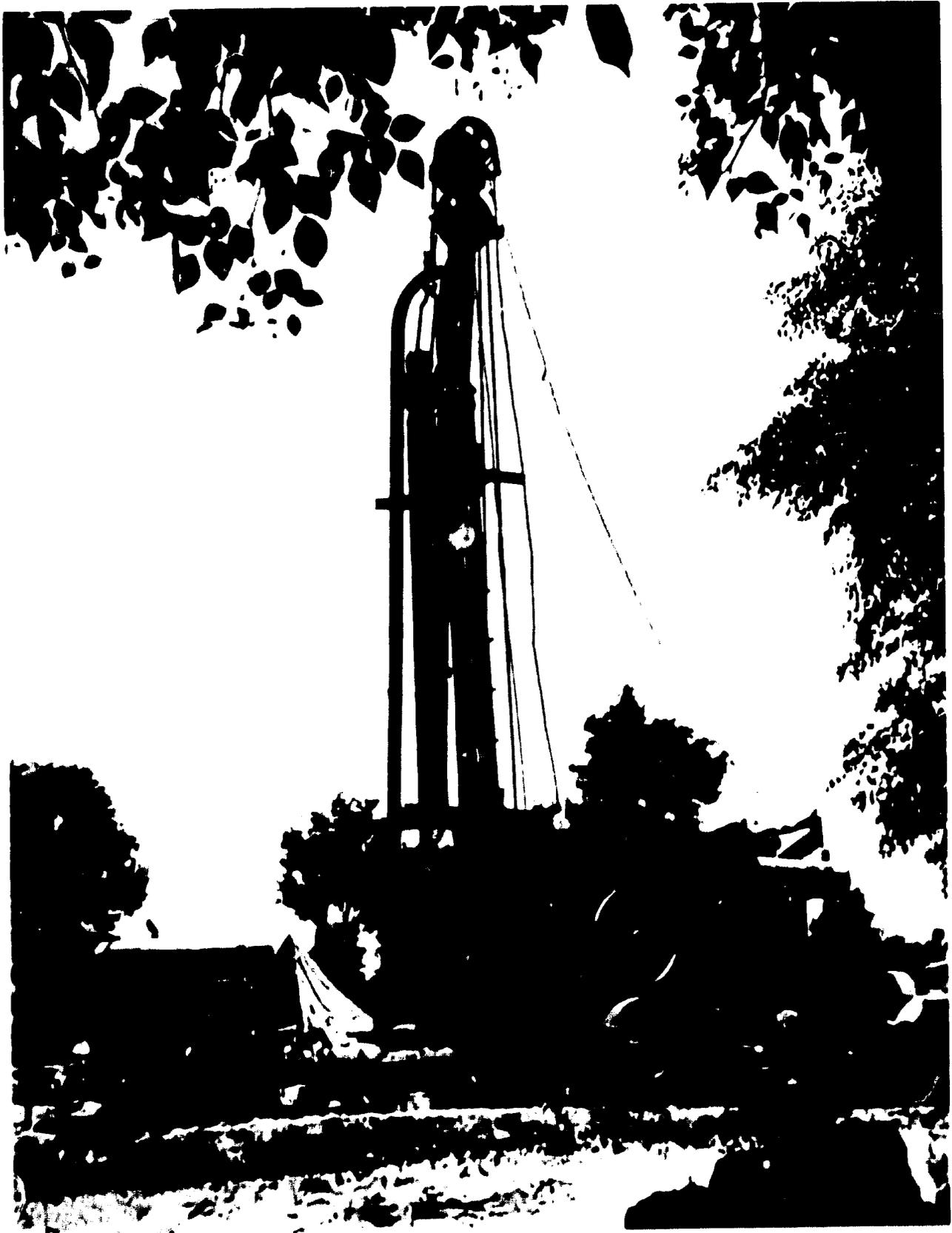
**W. R. Ray**            **Plant Operating Engineer – August, 1966 to March, 1968**

**T. R. Bailey**         **Resident Project Representative – January, 1968 to July, 1968**

**T. J. Plaskota**       **Associate Engineer – December, 1967 to January, 1969**



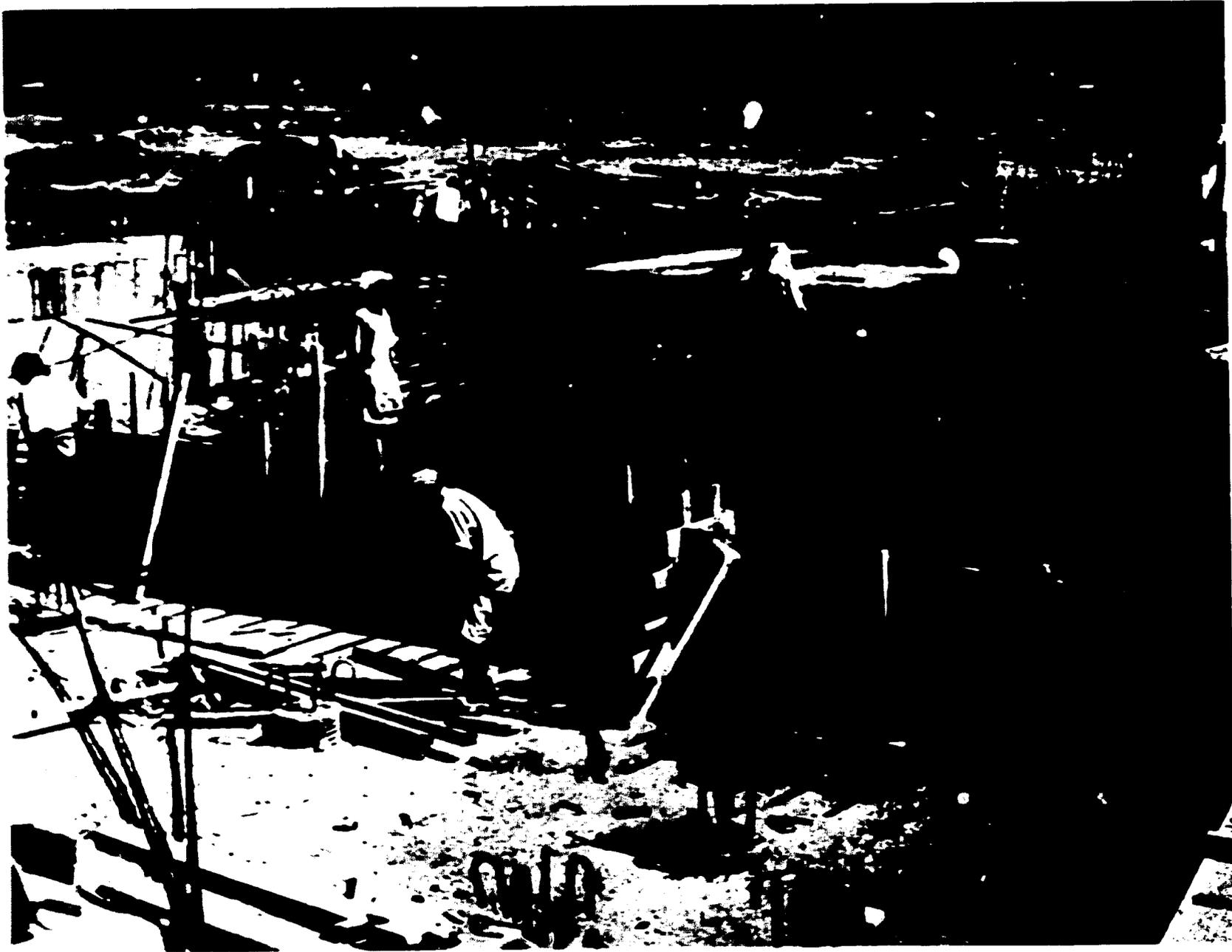
PREPILING EXCAVATION OF POWER PLANT AREA.  
RAYMOND PILING EQUIPMENT LEFT BACKGROUND.



**BOREMASTER TUBEWELL DRILLING RIG**



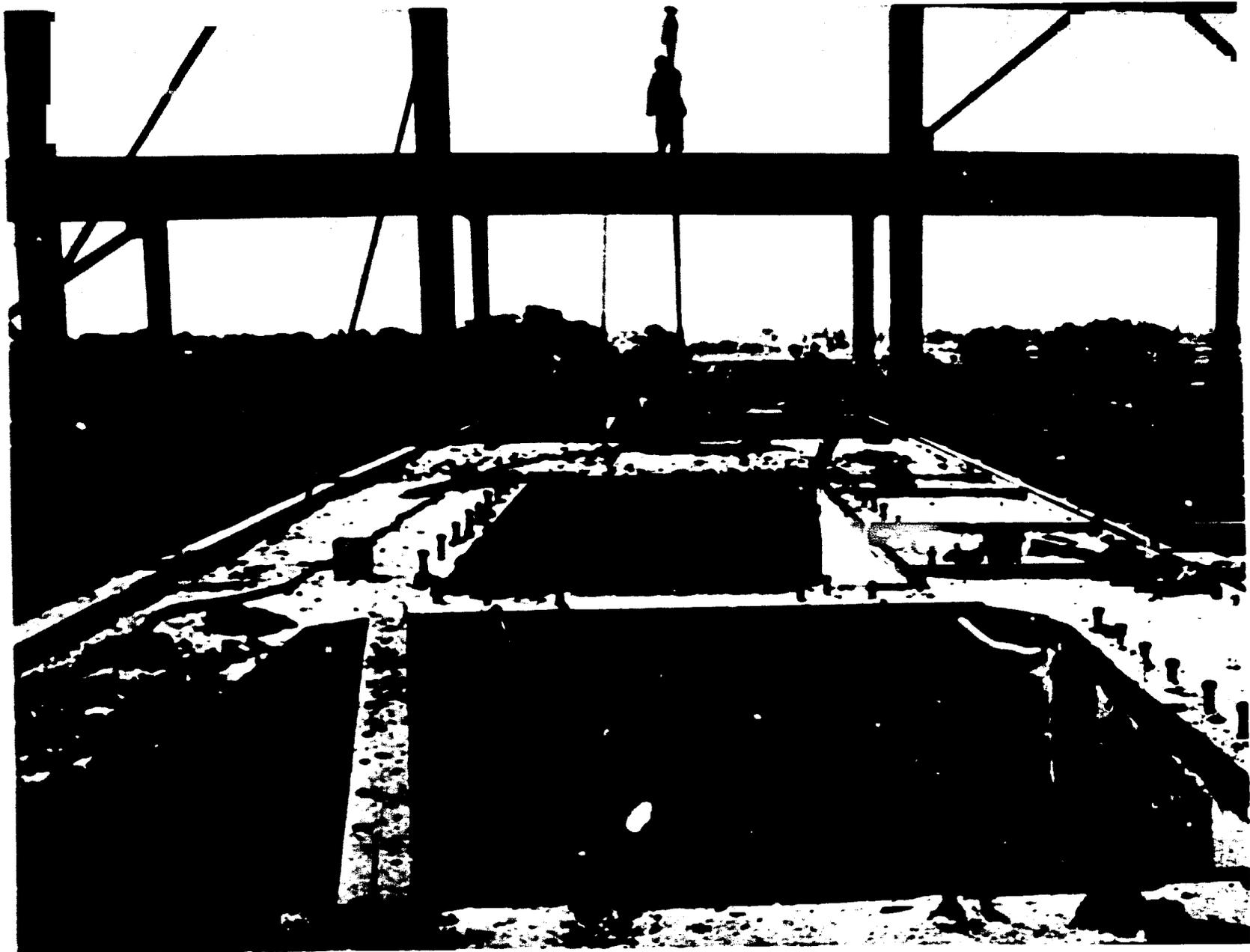
COOLING TOWER PILES



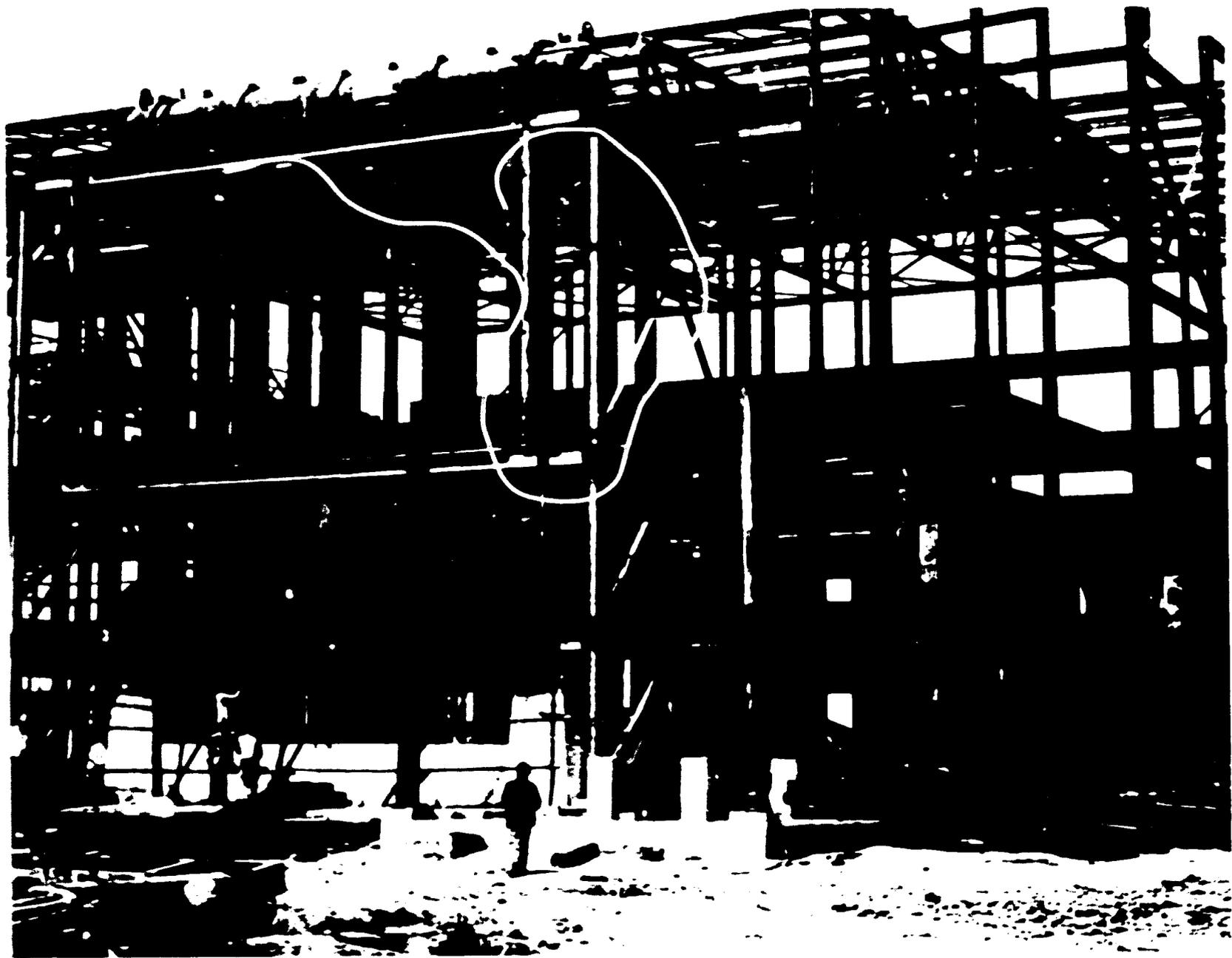
REBAR FOR BOILER PADS



TURBINE PEDESTAL



UNIT NO. 1 TURBINE FOUNDATION



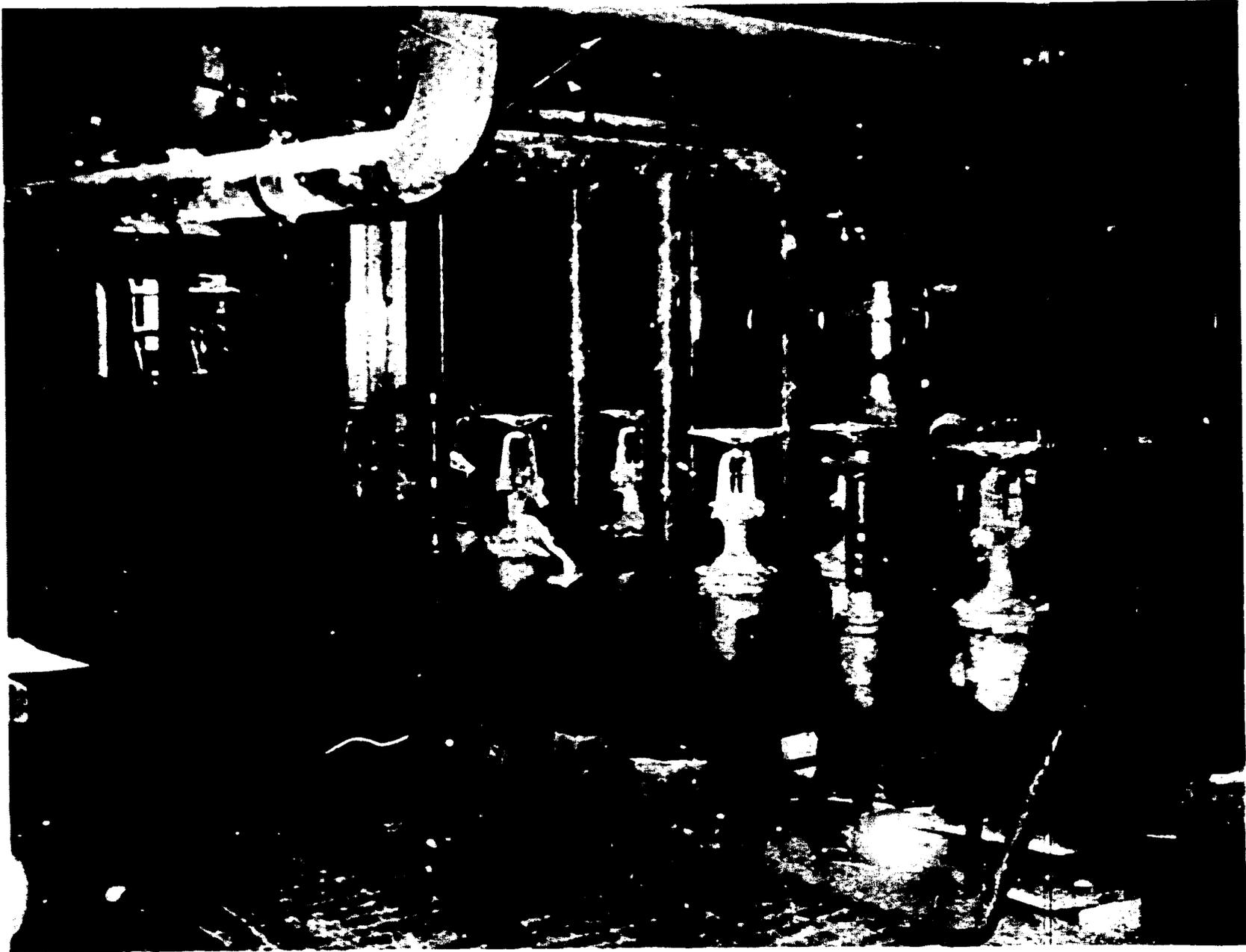
NO. 1 BOILER ERECTION



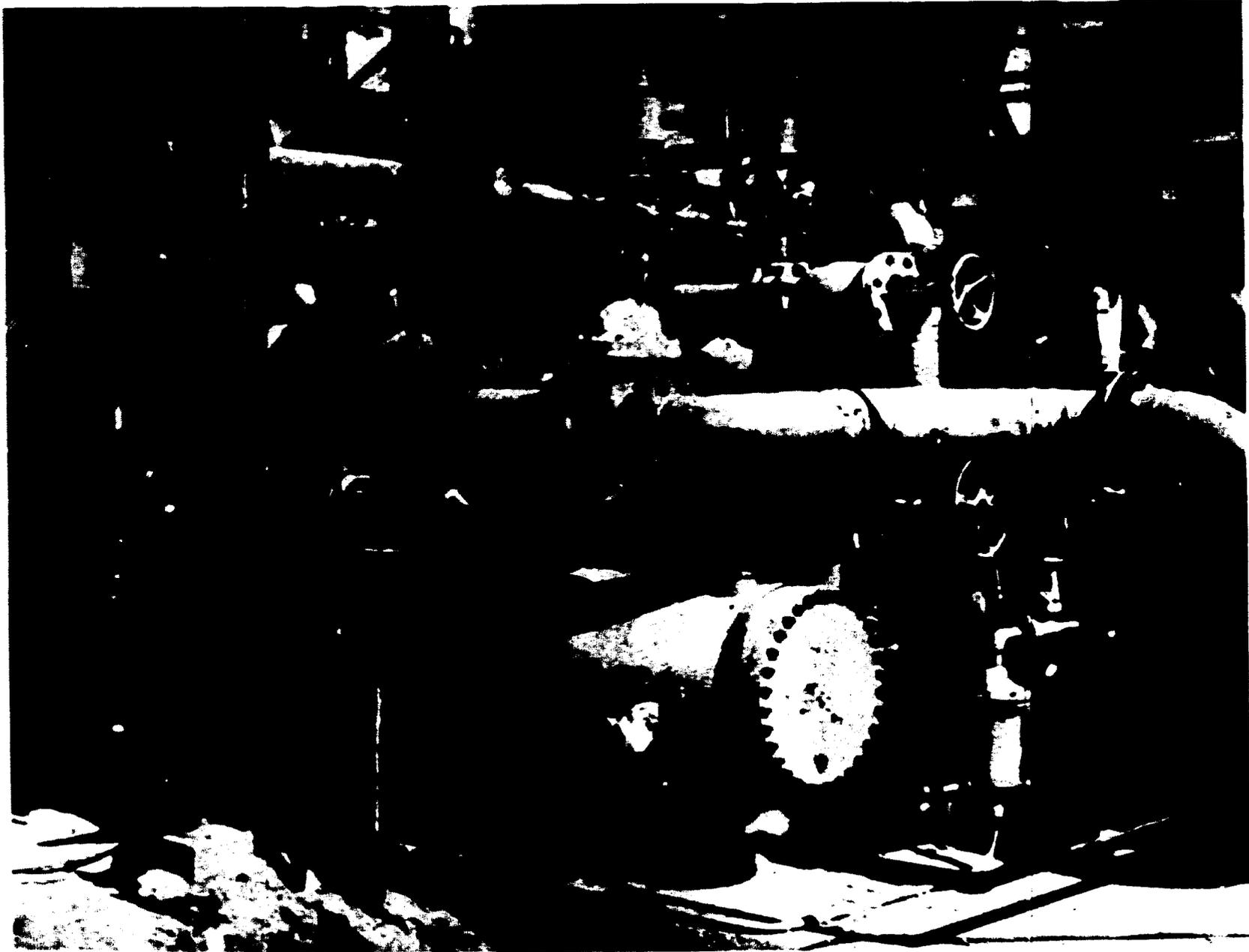
OVERHEAD TURBINE CRANE



TURBINE GENERATOR NO. 2



CONDENSATE CONTROL VALVE SECTION



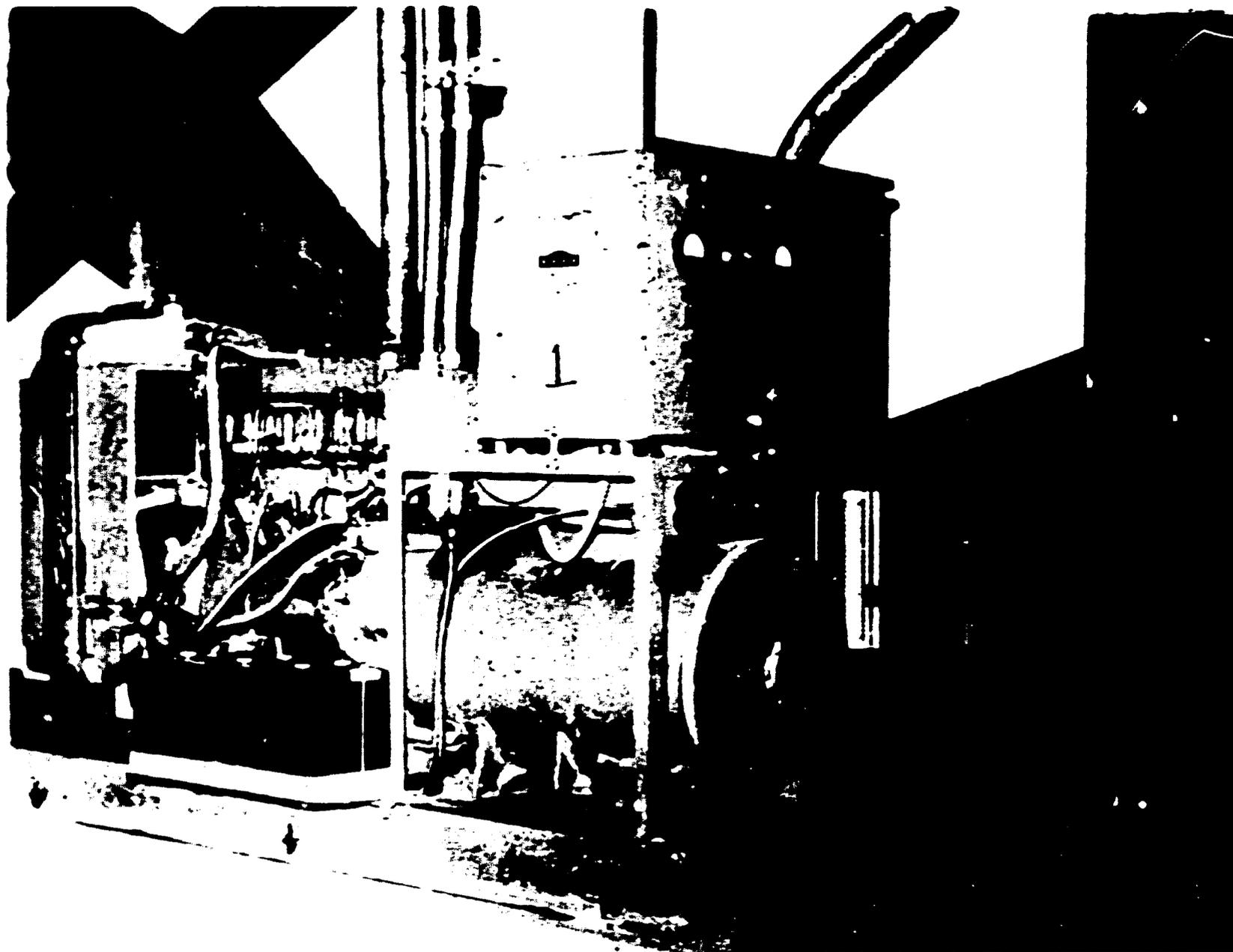
EMERGENCY FUEL OIL SUPPLY PUMP AND HEATER  
SET WITH FILTERS. SERVES TWO UNITS



BOILER INSPECTION



MAIN POWER AND UNIT AUXILIARY TRANSFORMERS  
ON NORTH SIDE OF STATION



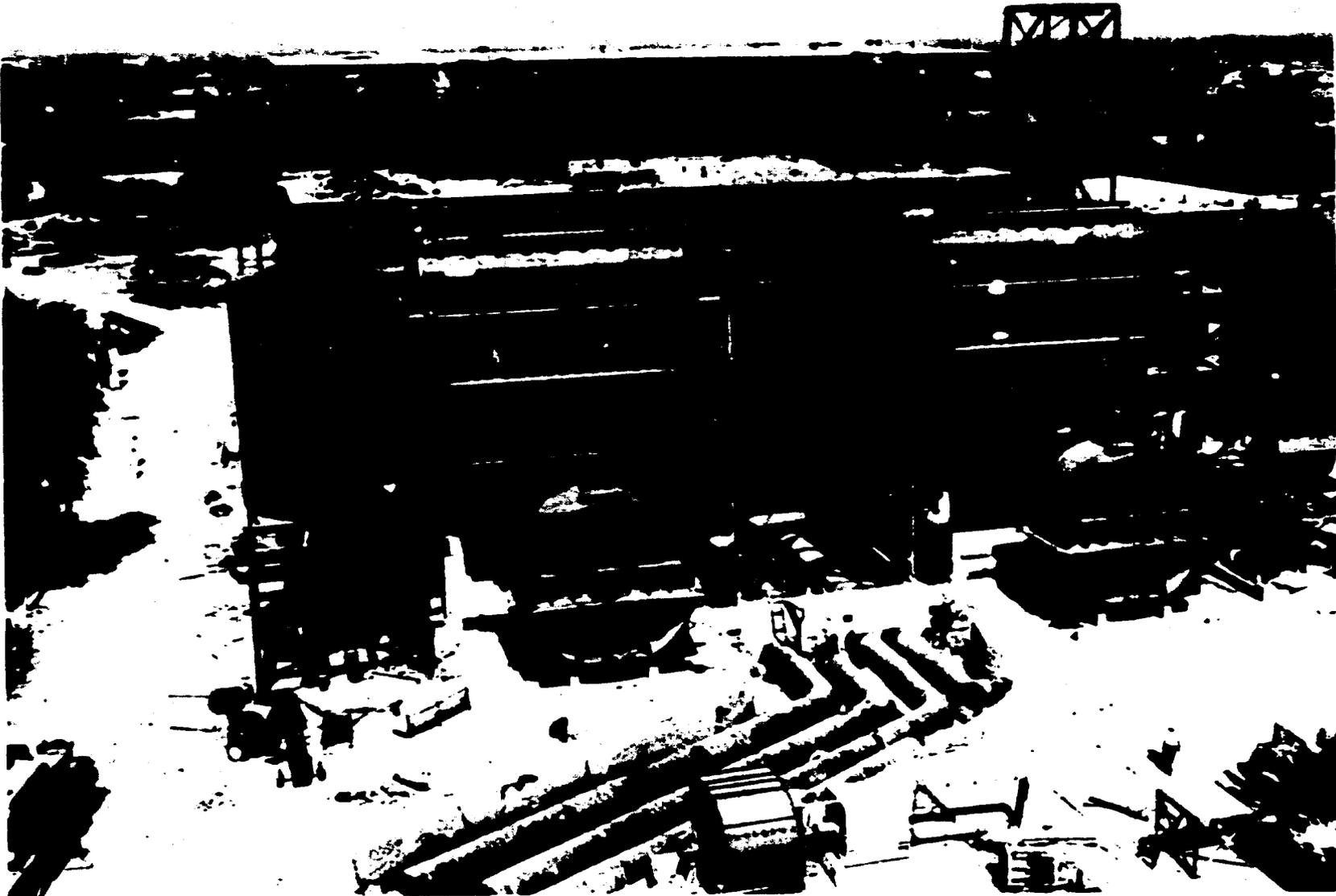
EMERGENCY PLANT SERVICE GENERATOR



MAINTENANCE BUILDING CONSTRUCTION

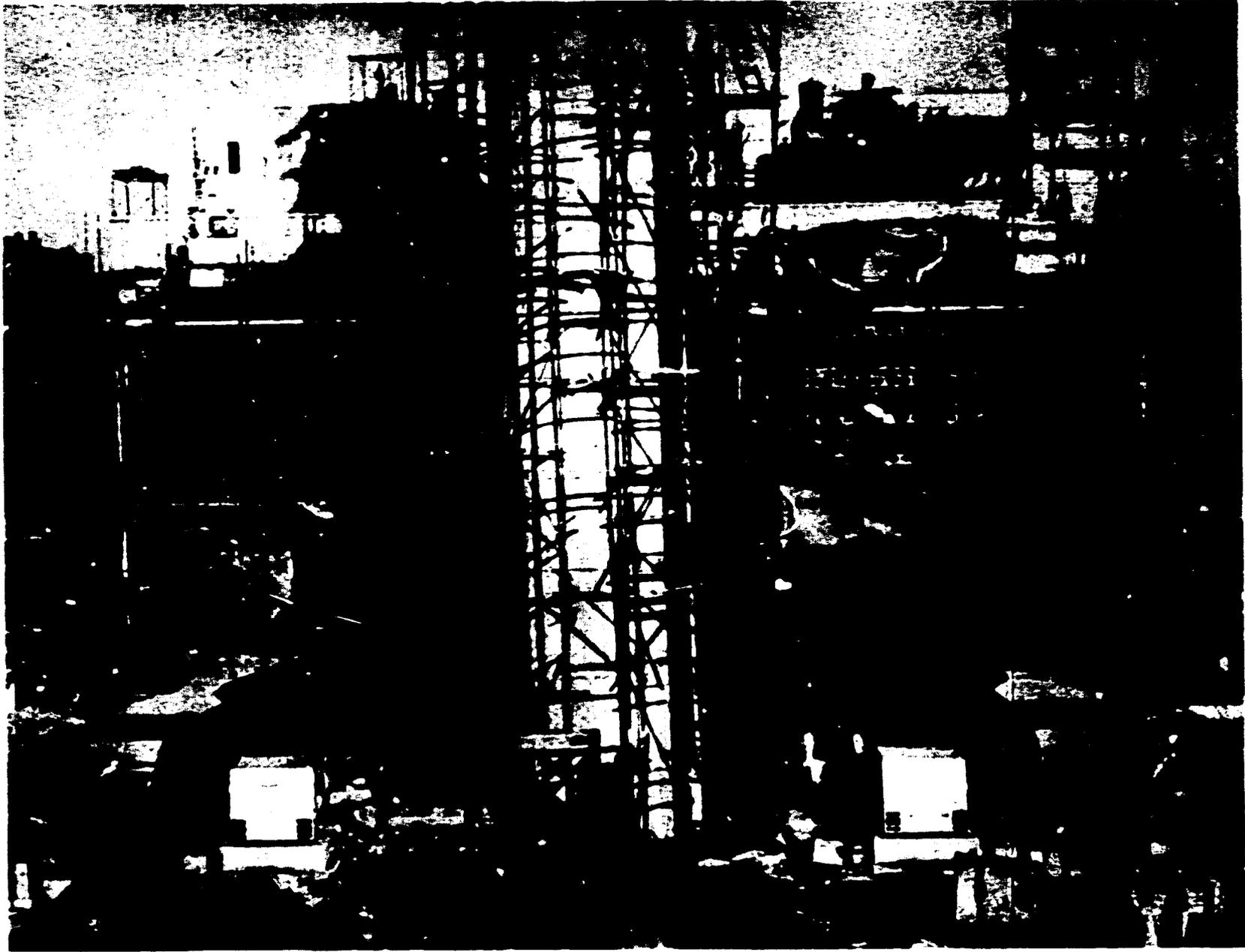


FUEL OIL STORAGE TANKS



BOILERS AND WATER CIRCULATING PIPE



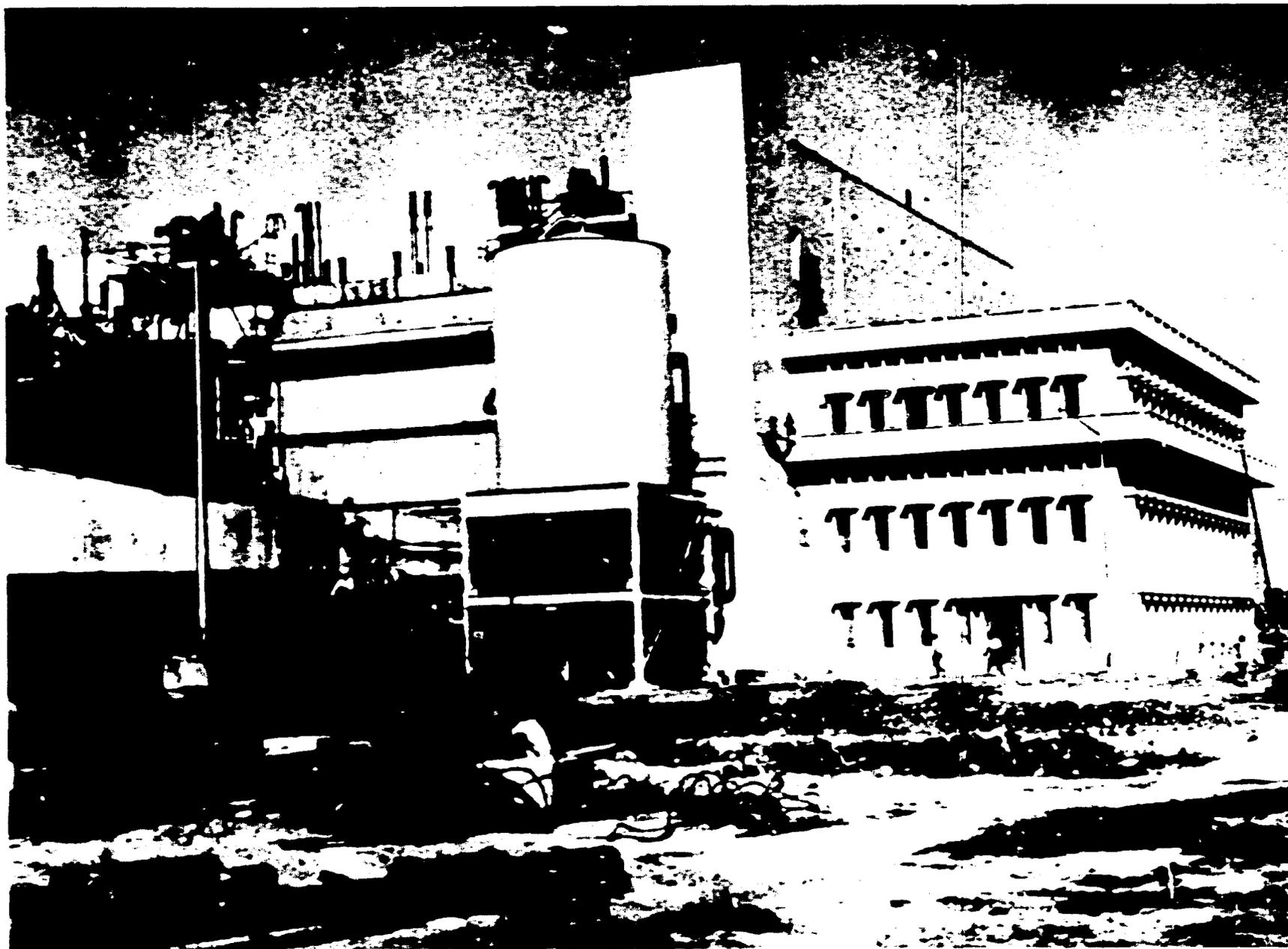




TURBINE GENERATOR BUILDING



**POWER ON LINE JUNE 1967**



OVERALL VIEW OF LYALLPUR STATION SHOWING  
CONDENSATE STORAGE TANK, BOILER' ELEVATOR  
SHAFT AND OFFICE SECTION



FRONT VIEW LYALLPUR STATION

**WEST PAKISTAN  
WATER AND POWER DEVELOPMENT AUTHORITY  
LAHORE, WEST PAKISTAN**

**ADDITIONAL NOTES**

As built drawings for the project consisting of manufacturer's details of plant operating equipment, electrical piping and control diagrams, instruction booklets, plant operating and maintenance manuals are available with the West Pakistan Water And Power Development Authority, Lahore, West Pakistan and with Commonwealth Associates Inc., Jackson, Michigan. Also, civil works drawings, including manufacturer's drawings for the 132 kV transmission line and switching station at Nishatabad are available at the aforementioned locations.

Spare parts and materials for electric maintenance and testing equipment, hand tools, gauge and meter testing apparatus are available with the West Pakistan Water And Power Development Authority. In addition, the following office machines and vehicles are available with the Water And Power Development Authority at Lahore, West Pakistan.

- 1 Friden Automatic Calculator
- 1 NCR Adding Machine
- 2 IBM Electric Typewriters
- 1 APECO Copying Machine
- 4 Four-Wheel Drive Jeep Wagoneers, Model J-100, Code No. 1414

<b>Jeep No.</b>	<b>Serial No.</b>	<b>Motor No.</b>
1	38750	TS 47502
2	38740	TS 47533
3	38793	TS 48090
4	38748	TS 47489

**3 Two-Wheel Drive Jeep Gladiator Trucks, Model J-2600, Code 2306X**

<b>Truck No.</b>	<b>Serial No.</b>	<b>Motor No.</b>
<b>1</b>	<b>11120</b>	<b>TS 47533</b>
<b>2</b>	<b>11118</b>	<b>TS 47544</b>
<b>3</b>	<b>11117</b>	<b>TS 46102</b>

All other Project Documents, such as Quarterly Reports, Material Specifications, Contracts, Loan Agreements, Shipping Documents, and Test Reports, etc. are available with the Water And Power Development Authority, Lahore, West Pakistan, and Commonwealth Associates Inc., Jackson, Michigan.