



U.S. AGENCY FOR  
INTERNATIONAL  
DEVELOPMENT

PD-ABL-189

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~~PD DR 611~~

September 7, 1993

Dr. Ullrich Kiermayr  
Manager Company-Financing Operations  
European Bank for Reconstruction and Development  
One Exchange Square  
London EC2A 2EH, England

Subject: Cooperative Agreement for GAZPROM Project  
CCN-0002-A-00-3136-00

Dear Dr. Kiermayr:

Pursuant to the authority contained in the Foreign Assistance Act of 1961, as amended, the Agency for International Development (hereinafter referred to as "A.I.D.") hereby provides to the European Bank for Reconstruction and Development (hereinafter referred to as "Bank," "EBRD," or "Recipient"), the sum of \$1,500,000 to provide support for a program of technical assistance to the new independent states of the former Soviet Union (NIS), as more fully described in the Schedule (Attachment 1) of this Cooperative Agreement and in Attachment 2, entitled "Program Description."

This Agreement is effective and obligation is made as of the date of this letter and shall apply to commitments made by the Bank in furtherance of program objectives during the period beginning August 16, 1993 and ending December 31, 1994. Funds disbursed by A.I.D. but uncommitted by the Bank at the expiration of this period shall be refunded to A.I.D.

This Cooperative Agreement is considered by A.I.D. to be an exception to its normal practice of parallel financing with Multilateral financial institutions for such activities and not as precedent for similar future mechanisms. It is being pursued due to the urgency of the need to accelerate and catalyze assistance in the gas sector for Russia.

This Cooperative Agreement is made with the Bank on condition that the funds will be administered in accordance with the terms and conditions as set forth in Attachment 1 (the Schedule), Attachment 2 (Program Description) and Attachment 3 (Standard Provisions) which have been agreed to by your organization.

**BEST AVAILABLE DOCUMENT**

Communications and directions on interpretation of contractual issues related to this Cooperative Agreement should be referred to this Office of Procurement. Communications and directions related to technical issues under this Cooperative Agreement should be referred to U.S.A.I.D./Moscow Regional Office, Charles Moseley or designee.

Please sign the original and all enclosed copies of this letter to acknowledge your receipt of the Cooperative Agreement, and return the original and all but one copy to this office.

As discussed with Mr. Johan Weijers of the Bank staff, we will be pleased to process an initial request for advance of funds upon receipt of the signed acknowledgement of this award letter and an original and two copies of SF-270, "Request for Advance or Reimbursement."

Sincerely,



S. R. Nevin  
Grant Officer

Attachments:

1. Schedule
2. Program Description
3. Standard Provisions

ACKNOWLEDGED:

BY: Maria Samuella

TITLE: Vice-President Development Banking

DATE: 13 September 1993

FISCAL DATA

PIO/T No.:	110-0002-3-366-2624
Appropriation No.:	72-11X1093
Budget Plan Code:	WNIX-93-36110-EG-12 (393-68-110-06-69-31)
Amount Obligated this Action:	\$1,500,000
Cumulative Obligation:	\$1,500,000
Total Estimated Project Cost:	\$1,500,000
Total Estimated AID Obligation:	\$1,500,000

BEST AVAILABLE DOCUMENT



## ATTACHMENT 1

### SCHEDULE

#### A. PURPOSE OF THIS COOPERATIVE AGREEMENT

The purpose of this Cooperative Agreement is to provide for U.S. participation in an EBRD-led multi-national technical cooperation project for GAZPROM, the Russian Natural Gas Production and Transmission Company. With more than 140,000 kilometers of natural gas transmission pipeline, GAZPROM handles over 94% of Russia's natural gas. The objectives of the project are to identify and assess the investment and environmental requirements for immediate and long-term rehabilitation and up-grading of GAZPROM's production and transmission system.

Canada, France, Netherlands, Norway, and United Kingdom are the other bilateral supporters of the project. The amount and use of the contributions of the United States and each of the other countries are noted on Attachment A. USAID cooperative agreement funds will be used to contract the service described in Attachment B (Program Description) from a U.S. Firm or joint venture with one or more U.S. firms.

This Cooperative Agreement is considered by AID to be an exception to its normal practice of parallel financing with multinational financial institutions for such activities and not as precedent for similar future mechanisms. It is being pursued due to the urgency of the need to accelerate and catalyze assistance in the gas sector for Russia.

#### B. PERIOD OF COOPERATIVE AGREEMENT

1. The effective date of this Cooperative Agreement is August 16, 1993. The estimated completion date is December 31, 1994.

2. Funds obligated hereunder are for program expenditures for the estimated period of August 16, 1993 to December 31, 1994 as detailed in the Budget, below.

#### C. AMOUNT OF COOPERATIVE AGREEMENT AND PAYMENT

1. USAID hereby obligates the amount of \$1,500,000 for the purpose of this Cooperative Agreement.

2. Payment shall be made to the Bank in accordance with procedures set forth in Attachment 3 (Standard Provisions).

3

D. COOPERATIVE AGREEMENT BUDGET

The negotiated budget for this agreement is set forth below. Revisions to this budget, if any, shall be made in accordance with the applicable provisions of Attachment 3.

BUDGET

Engineers/Economist/Analysts Salaries	\$ 808,000
Russian Consulting Services	557,200
Travel & Per Diem	57,000
Other Direct Costs	32,800
EBRD Administration	<u>45,000</u>
Total	\$1,500,000

E. REPORTING AND EVALUATION

1. Financial Reports

The financial reporting requirements are set forth in Attachment 3 at Article 9 (b) and (c). All financial reports shall be submitted in an original and two copies to the payment office specified herein.

2. Programmatic Reports

The requirements for programmatic reports are set forth in Attachment 2 and below.

Ten (10) copies of all reports prepared under this Cooperative Agreement shall be submitted to USAID/MOSCOW.

The parties hereto agree that contracts awarded under this Cooperative Agreement will require that reports also be provided in electronic form on 3-1/2 inch IBM-compatible diskettes (either 360K or 1.2 MB format) as follows:

Text	Word Perfect Version 5.1
Graphics	Harvard Graphics (preferred)
Spreadsheets	Lotus 1-2-3

The activities designed and conducted under this Cooperative Agreement will be evaluated periodically. Evaluators will be drawn from AID and experts from the development community at large.

Reports financed under this program will be subject to review by USAID/MOSCOW before issuance and if approved will identify AID as a sponsor.

ATTACHMENT 2

PROGRAM DESCRIPTION

See Attachment 2-A entitled Memorandum of Understanding  
and Attachment 2-B entitled GAZPROM; Russia Unified Gas  
Supply System Reconstruction Study.

## Memorandum of Understanding

The co-financiers of the Russia Unified Gas Supply System Reconstruction Study under the chairmanship of the European Bank for Reconstruction and Development met at the European Bank headquarters on 2 April 1993. Participants included representatives from Canada, France, the Netherlands, Norway, the United Kingdom, and the United States. Also present were senior representatives from GAZPROM. (A list of participants is attached.)

The following points were agreed:

1. The final Terms of Reference (attached) for all the components of the study were agreed by GAZPROM and by the Donors.
2. The components to be funded by the six Donors will be as follows:

Component	Donor	<u>US\$ million</u>
Component A (Coordination)	Canada	0.8
	UK	<u>0.3</u> 1.1
Component B (Data Collection)	Novacorp (Canada)	1.7
Component C (Long Term Project ID)	France	1.1
	Norway	<u>0.8</u> 1.9
Component D (Financial Analysis)	UK	0.7
Component E (Environment)	The Netherlands	0.7
	Norway	<u>0.3</u> 1.0
Component F (Short Term Project ID)	US	1.5
	The Netherlands	<u>0.7</u> 2.2
	<u>Total</u>	8.6

3. The components of the study will be carried out as follows:

- Canada will fund Novacorp and Russian Institutes as consultants for Component A;
- Novacorp will fund itself and Russian Institutes as consultants for Component B;
- The UK will fund a consultant for part of Component A, and British consultants to be selected on a competitive basis and Russian Institutes for Component D;
- France will fund a consortium of French consultants led by BEICIP for Component C;
- Norway will fund Norwegian consultants and Russian Institutes for its share of Components C and E;
- The Netherlands will fund Netherlands consultants to be selected on a competitive basis and Russian Institutes for Components E and F;
- The US will fund American consultants and Russian sub-contractors to be selected on a competitive basis for Component F.

4. The funds provided by the donors will be disbursed as follows:

- Canada's funds will be channelled through the Canadian Technical Cooperation Fund managed by the European Bank;
- British funds will be disbursed either through the existing British Technical Cooperation Fund managed by the European Bank or directly by the British government and transferred to the selected consultants after certification of invoices by the European Bank;
- The French funds will be provided through a grant agreement to be signed between the French government and the Russian government and will be disbursed directly by the French government and transferred to the selected consultants after certification of invoices by the European Bank.
- Norwegian funds will be channelled through the Norwegian Technical Cooperation Fund managed by the European Bank;
- Netherlands' funds will be disbursed either through the existing Dutch Technical Cooperation Fund managed by the European Bank or through a separate fund to be agreed between the Netherlands government and the European Bank;

- American funds will be channelled through a separate cooperative agreement between USAID and the European Bank that will be negotiated and signed no later than 31 May 1993.

5. The European Bank will:

- i) coordinate the funding;
- ii) negotiate and issue all contracts, which will be between the Bank and the consultants. In the case of those countries making payments directly to the consultants, a tripartite contractual arrangement will be made;
- iii) report to the Donors on the progress of the study via written reports (Interim Reports every four months and a final Evaluation Report upon the study's conclusion), and on expenditures and management of funds that are channelled through TC funds. Six months after the start of the study a Donor coordination meeting will be held in Moscow.

6. To ensure cost effectiveness, the Bank will review in detail the competence of the experts to be provided by all consultants, including their previous experience and proposed work schedule. The Bank must be satisfied regarding these points in order for work to commence.

7. All reports and data resulting from the study will be the property of GAZPROM and will not be used without its consent.

8. Each of the consultants and Donors involved in the study shall have access to the data and reports prepared under other components of the study. However, data and other information disclosed to them may only be used by the consultants in accordance with item 7 above, which will be reflected in a confidentiality agreement contained in each consultant's contract and in the Terms of Reference.

9. The study, the roles of the Donors, and the Consultants involved may now be made public.

10. The Donors' commitments as indicated above are agreed in principle, subject to confirmation by 25 April 1993.

*Handwritten initials/signature*

The above points have been discussed and agreed by the signatories below, subject to confirmation by their respective national agencies.

Signed:

1. *[Signature]* GAZPROM
2. *David Horley* Canada
3. \_\_\_\_\_ France
4. \_\_\_\_\_ Netherlands
5. *Jan B. Henningsdal* Norway
6. \_\_\_\_\_ United Kingdom
7. *Michael Mosley* United States
8. *[Signature]* Novacorp (Canada)  
*W. S. WRIGHT*
9. *Ulrich Weismann* European Bank

*J.P.*

**GAZPROM  
RUSSIA UNIFIED GAS SUPPLY SYSTEM  
INDEPENDENT RECONSTRUCTION STUDY**

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3 March 1993

**GAZPROM**

**Russian State Gas Concern GAZPROM**

**RUSSIA UNIFIED GAS SUPPLY SYSTEM**

**INDEPENDENT RECONSTRUCTION STUDY**

**FULL TERMS OF REFERENCE**

## INTRODUCTION

GAZPROM is the world's largest integrated natural gas producer and pipeline enterprise. It produces the mainly onshore non-associated gas in Russia, as well as providing all underground storage, gas treatment, transmission and exports functions in the country, and is extending its interests into offshore gas developments. GAZPROM also receives associated gas from Russian oil producing enterprises, and gas imported from other CIS nations. In addition to the Russian domestic market, GAZPROM's export customers include Eastern and Western European gas companies, and other CIS countries. GAZPROM operates a central headquarters in Moscow, including a central despatch control and operates through a number of regional production and transmission associations, together with specialised research and service institutes.

GAZPROM is in the process of identifying and developing a comprehensive priority investment programme for system reconstruction to be supported by an expansion programme to meet future long term domestic and export demands. Primarily as a result of the recent severe shortage of funds, caused by extreme inflationary conditions and structural changes to GAZPROM's traditional funding methods, there is a large backlog of commercially attractive rehabilitation, upgrading and efficiency improvement investment. Without these investments, the future operational condition, safety and reliability of the system is uncertain.

The various components of GAZPROM's gas transmission systems are integrated into the Russian gas supply system, known as the Unified Gas Supply System ("EGS" in Russian). The system comprises over 140,000 kilometres of gas transmission pipelines, with compressor station capacity of over 36 gigawatts located over 500 sites. Approximately 60 percent of the total pipeline length in the system is greater than 1000 mm in diameter. The system includes around 100 gas, gas condensate and oil/gas fields with about 300 gas treatment plants, and over 20 underground storage facilities. In 1992 gas production in Russia was about 640 billion cubic meters with exports accounting for about 100 billion cubic meters. GAZPROM as a group has over 300,000 employees distributed through Russia.

GAZPROM has approached The European Bank for funding support to a joint Russian and Western independent assessment of its investment requirements, so as to assist in the reconstruction and upgrading of the EGS, and thus also in the reduction of emissions from the system. Accordingly, prior to undertaking an extensive investment programme, GAZPROM wishes to engage the services of qualified independent Western Consultants to re-assess in conjunction with Russian experts, the present condition, capability, efficiency and reliability of the EGS, and to analyse the most cost-effective means for its reconstruction and upgrading and for system efficiency improvement. The focus of this study is the EGS as a whole.

The EGS comprises the main pipeline corridors that transport gas to major consumption centres within Russia and to export markets, with three main corridors leading from the Tyumen: the Northern, the Central and the Southern; together with the main corridors from Central Asia and from the Orenburg area. It includes the compressor stations and ancillary installations, and gas storage facilities. The study will not include the local pipeline systems in Siberia and the Far East or the low pressure distribution lines which do not impact on the core of the EGS system.

## **2 SCOPE**

The main purpose of the study is to:

- (i) identify, based on the results of engineering, economic, financing, social, environmental and other pertinent analyses, the immediate and longer-term reconstruction, upgrading and productivity improvement programmes required for the EGS to meet gas export and domestic demand, as estimated for 1995, and to meet reasonable supply reliability criteria;
- (ii) include in the study an analysis of each of the major potential investment project areas defined by assessment of the technical and economic factors and to facilitate the identification of potential financing sources; and
- (iii) based on an environmental audit along accepted international lines for the gas industry, prepare, as far as is necessary, an environmental rehabilitation and preservation programme to enable the EGS to meet commonly accepted international environmental standards, and to recommend mitigating measures.

It should be noted that the final scope of the study will depend on the amount of funding ultimately dedicated to it, and that it is anticipated that this study will require to be followed up promptly by further studies on the EGS, particularly on future supply/demand scenarios and on long term gas productability, as well as on specific major investment expansion requirements of the EGS arising out of this and the further studies.

## **3 METHODOLOGY**

The Study Team will include the Study Coordinator (see below Section 4.1), a number of Western consultant teams ("Consultants"), with tasks defined in the next section, who, together with the principal organisation on the Russian Side called IKEM and a complementary Russian organisation called ENGO, are collectively referred to as being the "Contractors" for the study. IKEM as the main Russian Contractor and ENGO in respect of its own responsibilities are each with their supporting Russian organisations and individual specialists, collectively referred to as the "Russian Contributors".

The activity of the Contractors participating in the study will be regulated by (i) their contract with the relevant financing sources; (ii) instructions from the Study Coordinator and, where appropriate, (iii) the Alliance Agreement..

The Study will be executed under the control of a Coordination Committee. The Coordination Committee (CC) will (i) provide general direction for the execution of the study to the **Management Committee (MC)**; (ii) establish and revise as necessary the programme for the execution of the study; (iii) have full authority to revise, if necessary, the terms of reference of the study and to decide on possible revisions to the budget of the study (subject to funding conditions) and (iv) decide on the acceptability of reports submitted by the Consultants. The CC shall meet at regular intervals of about three to six months.

The CC shall comprise five members: two designated by GAZPROM, one representative of The European Bank, one designated by Novacorp and one designated by John R Lacey International. All decisions of the CC will be made by majority vote of the five members. In the event of a deadlock, GAZPROM shall have the casting vote.

The Management Committee (MC) shall direct all matters affecting the execution of the study and will resolve any question related to the execution of the study, the interpretation of the terms of reference, and, where appropriate, contracts for performance of the work related to the study. The MC will make periodic reports to the CC as the CC may require.

The MC shall meet at least every three months and comprise four members: two designated by the Russian side of whom at least one will be nominated by GAZPROM; and two designated by the Western side of whom one will be designated by Novacorp and one by the other Western consultants who are not members of the Alliance Agreement. One representative of the Western consultants will be appointed every three months by the consultants, or, in case of disagreement, be selected at random. The selected representative will represent all consultants on the MC who are not members of the Alliance Agreement. All decisions of the MC will be made by majority vote of the four members. In the event of a deadlock, GAZPROM shall have the casting vote.

The study will be managed by two Project Directors (PDs). The Russian PD will be appointed by the Russian members of the MC, and will be responsible for overall coordination and management of all Russian work on the study, for liaison on the Russian side with the MC and with the Western PD and with GAZPROM, and for the fulfilment of the Russian side's obligations. The Western PD will be appointed by the Study Coordinator and will be responsible as the person who is the managing coordinator of the study's work, as well as for reporting on the progress of work on the study to the MC.

On the Russian side the work on the study may be reviewed by the Russian Expert Committee (REC), if required by GAZPROM. The Expert Committee will comprise a number of experienced professionals with the skills required for the project in question, whose function it is to assess the quality of the work which has been undertaken and its appropriateness. The REC may give its opinion on the principal aspects of the work which has been done, without being in a position to make the final judgement. In this study, the function of the REC will be to advise GAZPROM on the quality of the work being done on the Russian side, to assess the appropriateness of all the study work in the general context of the study's objectives, and to assist GAZPROM as the study client in interpreting and assessing the study's conclusions.

The execution of the study will require the close collaboration of all Contractors and their subcontractors under the coordination of the Study Coordinator represented by the Western PD, working with the Russian PD representing the Russian side. To that effect, the study will comprise six separate, though interdependent, components as individual "Tasks", including that of the Study Coordinator. Each Task will be the responsibility of one or more separate consulting firms as Consultants working with the Russian Contributors, though one firm may handle more than one component. The Tasks of each such Consultant are detailed in the next section.

Each such Consultant, while being responsible for the proper completion of his task, using his own experience and analytical skills, will do so working in close collaboration with the corresponding Russian Contributors for that Task who will provide their input under IKEM'S contractual involvement.

The Contractors are expected to develop an extensive data base for the study drawing from among sources on GAZPROM's available data and information regarding the technical description, characteristics and condition of the EGS; they will conduct representative site visits to verify the validity and accuracy of data included in the data base which will be carried out under the responsibility of the Study Coordinator. The scope of the work which may still then be required will be established in agreement with the MC, and its implementation will depend on the availability of sufficient funding.

The European Bank will need to be satisfied that in their opinion, within the reasonable application of available funding, sufficient representative data and information has been provided to the study, in quality, depth and range, to permit the study to be satisfactorily developed and completed in accordance with its scope and objectives.

The study will analyse the present technical and economic condition of the EGS.

The Contractors will, to the extent possible, identify and define several alternatives investments to improve the operation and reliability of the EGS, including preliminary cost estimates.

Simultaneously, the Consultants will, in conjunction with the Russian Contributors working through IKEM, develop a system of models and procedures for assessing, screening and prioritising alternative investment projects based on accepted Russian and international industry economic and other criteria.

The Study Coordinator, in conjunction with the other Contractors will then prepare an investment programme based on such ranking for the overall EGS, using such models and procedures. He will also be responsible for the preparation and presentation of the study's interim and final reports, and on Component F below, using the respective results of each individual Consultant's work. The indicated content of the final report is set out later in this document.

An important feature of the study is that its goals and their implementation should meet the objectives of the Russian Side, and that its results can be properly analysed accordingly. The Study Coordinator will therefore establish the necessary procedures for this purpose, in accordance with the relevant provisions of the Alliance Agreement.

The study component Tasks are:

- Component A: Coordination of the overall project
- Component B: Identification, gathering and preparation of data and physical modelling
- Component C: Preparation of the EGS reconstruction and upgrading (longer term)
- Component D: Financial advising, financial and cost analysis
- Component E: Environmental study
- Component F: Preparation of the EGS reconstruction and upgrading (immediate)

## **4 TASKS**

### **4.1 Component A: Coordination of the Overall Project**

#### **4.1.1 General**

Novacorp International Consulting Inc. will assume the role of Study Coordinator working in close collaboration with the principal Russian Contractor, to coordinate all the Contractors to ensure the timely and efficient delivery of all Tasks required to complete the work of the study in accordance with the direction of the MC, including the smooth flow of data (whose definition for the purpose of this study includes all pertinent information) and the relationships between the various individual participants in the study work.

The Study Coordinator will work both inside and outside Russia as required to ensure satisfactory completion of the work. The Study Coordinator's team will consist of the Project Manager, three representatives with expertise in Pipeline Technology, Environment and Economic/Finance, the necessary Project Management support staff and other senior personnel for working in specific geographic areas to ensure timely execution of the project and to assist, guide and inform the Contractors on their roles and responsibilities.

The Study Coordinator's main role will be to coordinate the work of the other Consultants and the Russian PD, establish good working relations with the Russian Contributors, ensure that the goals of the study are met, and liaise appropriately with GAZPROM and The European Bank.

#### **4.1.2 Scope of Work**

This section describes in detail the work of the Study Coordinator.

##### **4.1.2.1 Development of Project Goals and Needs**

- define the detailed goals and needs of the study in collaboration with the Russian side and in keeping with Russian requirements
- define the parameters for the project
- prepare a Project Execution Plan (PEP) to ensure that management of the work meets the objectives and goals as required by GAZPROM and The European Bank.
- outline the scope of work
- document the project control methods

##### **4.1.2.2 Project Inception**

- hold a project inception meeting with the Contractors
- review and approve the Consultants' teams and organisation structure for the execution of the work
- assign detailed schedules, budgets, deliverables, task assignments, and milestones

##### **4.1.2.3 Project Coordination and Controls**

- provide a comprehensive project management system to ensure budget, quality and schedule objectives
- provide systems to ensure consistent reporting and scheduling and communications.

- review monthly progress and performance reports from the Consultants and the Russian PD.
- hold progress meetings with the Contractors at least on a monthly basis.
- provide monthly project progress reports to the MC.
- to attend MC meetings
- coordinate the Contractors' schedules to ensure they are meeting objectives on time
- monitor the progress and results of the Contractors
- accept or suspend acceptance of the work and reports provided by the Contractors in accordance with internationally accepted professional standards. The MC may take into consideration the opinion of the REC on the appropriateness of the work performed if it is provided in a timely manner.
- coordinate changes to scope for submission and approval by the MC
- assist, instruct and direct Contractors to ensure timely completion of the various Tasks
- review, analyse, comment and direct the study of alternate approaches for the reconstruction of the EGS.

#### **4.1.2.4 Liaison with GAZPROM and The European Bank**

- provide all contact between the Consultants and through the MC and CC with GAZPROM and The European Bank.

#### **4.1.2.5 Progress Payments**

- approve phased releases of all payments to the Contractors for satisfactory completed work and agreed expenses incurred as milestones are met according to the study's methodology. The MC may take into consideration the opinion of the REC. on the appropriateness of the work performed if it is provided in a timely manner.

#### **4.1.2.6 Creation and Issuance of Reports**

- Review interim task reports from the Consultants.
- Review final task reports from the Consultants.
- Compile and present the Study Interim Report.
- Compile and present the Draft Study Final Report .
- Compile and present the Study Final Report.
- The MC may take into consideration the opinion of the REC in the compilation of the above Reports if it is provided in a timely manner.
- Provide editorial services to ensure the Study Report is in a form suitable for submission to funding agencies.

In all this activity the Study Coordinator will follow the required methodology section.

## **4.2 Component B: Identification and Collection of Data and Physical Modelling**

### **4.2.1 Overview**

The Consultant, jointly with the Russian side, will identify, gather and assess relevant data on the EGS' condition, design capacity and actual capacity, using existing data sources already available, and review relevant thinking already developed by GAZPROM.

In conducting this work, special attention will be paid to the needs for reliability of the main gas pipeline system, especially for the delivery of exports.

This portion of the work will be divided into main activity headings that will be titled as follows:

- Identify, Gather and Review Data
- Verification of Data and Preliminary Assessment of the EGS
- Analysis and Assessment of the Present Condition of the EGS
- Modelling
- Interim and Final Task Performance Reports

## 4.2.2 Identify, Gather and Review Data

### 4.2.2.1 Identify Requirements for Available Data

- establish clear and specific data requirements

### 4.2.2.2 Gather, Assemble, Review Required Data

The principal Russian Contractor will provide for:

- the creation in conjunction with the Consultant, of the methodology by which data will be collected, assessed and presented
- the identification of the organisations/institutes/specialists best able to provide the required data
- the gathering of the data to be translated and assembled in the form of reports and data bases.

The comprehensive Russian data will be items such as:

Technical characteristics and drawings for the

- pipelines
- compressor stations
- metering stations

Information on

- gas process facilities
- underground storage etc.
- efficiency of facilities
- quality control
- operation procedures
- condition of equipment
- failure incidents
- cost of facilities
- repair records
- operating problems

Maintenance procedures detailing

- present methods used
- records
- cost of maintenance
- emergency response procedures

System integrity data including

- pipeline loss and failure statistic
- history of cathodic protection levels
- results of representative coating inspections

Present practices regarding

- inspection methods
- inspection data recorded

Construction practices

- techniques used
- procedures
- quality controls

Pertinent representative examples of current facilities under reconstruction

Prepare selected available reconstruction feasibility information including:

- characteristics of national gas resources
- characteristics of operating costs in transmission
- present content of and future trends for local and foreign material, component, and equipment costs
- construction costs, including labour costs
- characteristics of the availability of construction equipment and the market for it
- availability of skilled and unskilled labour
- availability of local materials
- description of the gas market in Russia, in the CIS, in Eastern and Western Europe
- characteristics of contractual sales arrangements with consumers in Russia and for transmission, including reported pricing data
- taxes and other local matters that affect economics; such as government take, ruble exchange rates, etc.
- data on cost of service

Provide the data necessary to undertake an environmental audit of the present condition of the EGS as shown in Section 4.5.1.2

Provide the data necessary to permit the financial Consultant to undertake and address the issues included in Section 4.4.3.

Translate into English all data provided, assemble and format as specified by Study Coordinator jointly with the Russian side to meet the schedule. Data available at the commencement of the study will be provided in accordance with the scope defined in the methodology for

the collection, assessment and presentation of data, as well as in such further detail as is necessary for the satisfactory completion of the Study Final Report.

#### 4.2.3 Verification of Data and Preliminary Assessment of the EGS

- detailed review and analysis of all delivered data to be done jointly by both sides
- request and obtain deficient data and required clarifications from Russian Contributors responsible for the respective area of data
- visit facilities to verify the accuracy and quality of data
- perform a preliminary assessment of the condition of facilities
- analyse data on facilities to be visited in advance of visits
- it is anticipated that by assessing at least four regions within the EGS which are representative of the entire system in terms of age and condition of equipment, volumes transported etc., it will be possible to verify the reliability and completeness of data. GAZPROM will make the facilities available for the visits and the Russian Contractors will make all arrangement necessary to transport and support the Consultant's specialists to the sites.

##### Prior to site visits:

- the exact number and location of verification visits will be determined as part of data methodology in 4.2.2.2 above.
- identify data requirements for each type of facility to be visited.
- previously gathered incomplete data will be updated and listed to the extent that this is necessary for the satisfactory completion of the study and in accordance with the study methodology
- translate into English all field data gathered, assembled and consistently formatted.
- additional site visits may be needed to complete the assessment, such visits to be defined and agreed with the MC in the content of the availability of sufficient funds and the context of the Study Interim Report.

#### 4.2.4 Analysis and Assessment of the Present Condition of the EGS

- In keeping with the required methodology, assess the overall condition of the EGS operating systems for the following operating components of the system:
- Pipelines:
  - Establish assessment criteria
  - Technical assessment of corrosion inspection methods
  - Technical assessment of effectiveness of Cathodic Protection and existing coating systems
  - Technical assessment of leak history of pipeline and prioritise pipelines for inspection and reconstruction
  - Analyse alternate methods for pipeline reconstruction including cost benefit analysis (in-line inspection, coating surveys, hydro-test, coating reconstruction, repairs, pipe replacement)
- Compressors
  - Establish assessment criteria
  - Technical assessment of compressor data
  - Develop plans for reconstruction of compressor stations
  - Prepare cost estimates for reconstructing compressor stations
- Meter Stations
  - Establish assessment criteria
  - Technical assessment of metering
  - Develop a plan for upgrading meter stations
  - Prepare cost estimate for upgrading meter stations
- Gas Treatment Facilities
  - Establish and analyse the data required on such facilities for the satisfactory completion of the Final Study Report
- Underground Storage:
  - Establish and analyse the data required on such facilities for the satisfactory completion of the Final Study Report

#### 4.2.5 Modelling

Develop or select available models for use on the pipeline system to permit the undertaking of an hydraulic analysis of the system and an assessment of reconstructed or upgraded facilities and their impact on supply capacity, reliability and economic efficiency.

Models may include those needed to address such matters as:

- (i) supply demand balances, including losses
- (ii) hydraulic simulation of pipeline networks
- (iii) simulation of new or reconstructed facilities
- (iv) forecast of operating cost estimates for reconstructed and upgraded facilities and for the entire EGS
- (v) economic analysis of alternative reconstruction/upgrading programme

Hydraulic models to assess transient pressure effects and impacts on supply created by interruptions or failures of network components may also be utilised.

The above models and assessment procedures will be developed so as to be able to operate off the data developed on the EGS system and the pipeline reconstruction projects identified.

Economic, Financial and Environmental modelling will be undertaken under Components C, D and E. The selection of models in each Component will be done jointly by the Western and Russian sides in conjunction with the opinion of the REC.

#### **4.2.6 Reports Input**

Prepare the data and results for inclusion in the Interim and Final Study Reports as outlined in Annex 1.

#### **Assessment of Overall Condition of the EGS System**

All assessment activities will be compiled in accordance with agreed required methodology and documented in English and Russian.

### **4.3 Component C: Preparation of the EGS Reconstruction and Upgrading (longer term)**

#### **4.3.1 Overview**

The Consultant jointly with the Russian side will define EGS system economic performance evaluation criteria, develop cost benefit models and assessment procedures to select the most beneficial reconstruction, upgrading and productivity improvement investment projects. This includes an assessment of risk and the preparation of appropriate engineering studies of

specific projects for cost-benefit analysis, and for the presentation of pre-feasibility studies for each of the retained projects.

#### **4.3.2 Cost/Benefit Analysis**

Cost/benefit analysis will be made for each project, and in respect of wider investment packages, based on the prioritised reconstruction and upgrading requirements generated in the technical assessments. These analyses will cover:

- Investment requirements
- Detailed project cost estimate including assessment of the local and foreign costs
- Benefit flow schedules
- Project economic performance
- Economic risk assessment
- Project benefits, assessment and distribution

#### **4.3.3 Economic Modelling**

Economic models will be developed or accessed to permit assessment and ranking of the identified projects on Russian and international industry standard basis. Some data for such models will be generated in Component B and D, and other data in this Component. These models may take the form of economic assessment models, tariffication models or such other models as the Consultant and the MC determine necessary during the assessment.

#### **4.3.4 Economic System Assessment**

The economic assessment and ranking of the reconstruction and upgrading projects identified will be based on Russian and international industry standard procedures, which will take into account and include:

- An economics description of the current gas supply/chain and projected condition without reconstruction from the gas field to the market as a base case.
- A description of the current market .
- Study of the impact of the various projects on the EGS capacity and economic cost effectiveness, based on the economic model.
- Ranking of the envisaged projects using economic criteria and the EGS economic assessment model.
- Assessment of technical risks of selected projects.
- Outline of methods to minimise risks.

- Addressing technical, financial, and political risks, together with possible methods to reduce risk exposure.

#### **4.3.5 Plan for Reconstruction/Upgrading and Productivity Improvement of the EGS System**

- Prioritise projects
- Generate scope of work, cost estimates and alternative investment programmes for reconstruction and productivity improvement for the EGS for the next 5 and 10 years

#### **Identification of Programmes**

- Pipeline reconstruction projects
- Compressor station reconstruction projects
- Other necessary reconstruction projects
- Upgrading projects
- Productivity improvement
- System reconstruction alternatives and strategies

#### **Methods of Reconstruction, Upgrading and Productivity Improvement**

Review and prioritise the most effective methods and technologies to execute projects generated.

#### **4.3.6 Reports Input**

Prepare the data and results for inclusion in the Interim and Final Study Reports.

### **4.4 Component D: Financial Advising, Financial and Cost Analysis**

#### **4.4.1 Overview**

The Consultant jointly with the Russian side will provide independent financial advice regarding the various options for financing the various components of the reconstruction programme. The Consultant will in particular identify a number of possible financial engineering techniques for major reconstruction schemes based on Western practices as well as possibilities in Russian conditions.

#### **4.4.2 Assessment Factors**

The financiability assessment will take as a base case a conservative view of the technical and economic factors applying to a particular project or part of

the future programme work. To this base case will be applied both the risk factors arising out of the project's local physical and social circumstances and also a range of criteria normally applied in Western banking appraisal.

These risk factors used will depend on the particular form of financing being considered and will include such questions as:

- The general economic strength of the project
- The perceived technical risks
- The projected available cash flows
- The anticipated pay back period
- The quality of the project sponsor
- The market outlook for the product
- The availability of input supplies
- Who will do the work, and their record in comparable conditions
- The short and long term political outlook.
- The "newness" factor
- How international cooperation may work out

The results of such assessment will indicate if the project falls within acceptable guidelines either for commercial credit or for international agency or inter government credit.

This exercise will indicate the suitability of different sources of finance and the likely levels of availability.

#### **4.4.3 GAZPROM Credit Worthiness Assessment**

The eligibility under standard financial evaluation criteria of reconstruction and upgrading projects identified under the Pipeline Technology Assessment and evaluated under the Economics Section will be analysed in light of GAZPROM's overall credit worthiness, as external financing is likely to be forthcoming mainly for financially viable projects for the benefit of a financially sound entity, with reasonably good long-term prospects. Consideration will be given to such issues as:

- The levels of borrowing which GAZPROM, as a comprehensive borrowing unit, can support, over what period of time and on what terms; including bases of existing credit arrangements.
- The need, if any, to support GAZPROM's borrowing from external sources such as government undertakings, banking and governmental guarantees, special terms or conditions associated with long term contracts, and third party equity project funding.
- The likely impact of overall Russian national credit needs on GAZPROM's access to local credit.

- The incidence of risk between GAZPROM, the guarantor of GAZPROM's funding (if any), the suppliers of the equipment and services being funded, the financial lenders and the gas buyers.
- The capacity of GAZPROM to meet cost overruns or income shortfalls, however arising, and the required contingency provisions.
- The variation needed to optimum funding in order to accommodate firm supply or credit availability possibilities.

#### **4.4.4 Finance Modelling**

The Consultant will develop such computer models of corporate finance as are necessary to assess the financiability of the projects within the scope of GAZPROM's financial capacity and to minimise borrowing and finance risk.

#### **4.4.5 Cost Analysis**

The Consultant, working with the Russian side, will collect costs on the operation of the various components of the EGS. This will include suitable cost breakdown by nature (labour, contracted services, supplies etc.); an analysis of fixed and variable costs; an assessment of average and marginal unit costs; an assessment of financial and economic unit costs; and, if needed, proposed shadow pricing.

#### **4.4.6 Reports Input**

Prepare the data and results for inclusion in the Interim and Final Study Reports.

### **4.5 Component E: Environmental Study**

#### **4.5.1 Environmental Audit of Present Condition of the EGS**

##### **4.5.1.1 Overview**

The Consultant, jointly with the Russian side, will determine the state of environment on the existing EGS. An environmental audit will be performed which will generally follow the protocol set out for the independent engineering assessment of the system.

##### **4.5.1.2 Establish Data Requirements**

The data to be gathered will be related to the environmental aspects of the system including land, air, water and soils. Some of the data gathered on the engineering technical side can be extrapolated to project environmental impacts particularly with respect to air emissions. Specific requirements will include available maps, air

photos, alignment sheets and general natural resource information, and will be used in accordance with the study methodology.

Upon receipt, the facilities data will be organised into the following categories:

- Representative facilities inventory (compressor stations, meter stations, storage facilities etc.) as defined in the methodology for the study
- Operating data
- Equipment design specifications
- Pipeline gas qualities and volumes
- Liquid waste generation, collection and disposal
- Operating practices
- Maintenance procedures
- Government regulations
- GAZPROM policies and standards
- Local topography
- Climatology

Data should include geology, soils, water resources, fish and wildlife, vegetation and cultural issues.

All data that is collected will be translated into English by the Russian Contractor and will be reviewed by the joint environmental assessment team. Areas of environmental significance will be highlighted as potential target items for the assessments. All data discrepancies and deficiencies will also be identified.

#### **4.5.1.3 Facilities Investigations**

Based on the data collected, key data will be identified and reviewed for completeness and consistency. A list of data to be collected or verified in the field will be compiled by the assessment team. Sites will be selected for visits and auditing based on similarity of facilities with respect to size, type of equipment, age, location, local conditions (topography, etc.) and any other factors which will allow meaningful data extrapolation.

Environmental specialists will visit facilities to verify the accuracy and quality of data along with the engineering specialists. Audit protocols will be used to ensure standard analysis, reporting and verification.

Environmental experts will perform the audits at selected sites. These sites will include pipelines, compressor stations, meter stations and storage facilities which can closely represent the majority of facilities on the core EGS system.

All data collected from the field visits and all analytical data resulting from sampling will be reconciled. Items which cannot be reconciled will be identified for further attention.

#### **4.5.1.4 Report on Present Condition**

Issues of significant environmental concern will be identified for intensive review during the environmental assessments of the EGS reconstruction activities. The significant issues will be identified and confirmed by site visits and personnel interviews conducted.

It is anticipated that some environmental issues identified may not be addressed due to the low risk associated with the items or if little or no change is expected due to reconstruction activities. These issues will also be identified with justification for reallocation of resources to higher priority areas.

An interim task performance report will be prepared to identify the areas that are of current environmental importance in the EGS core system and which may be significantly impacted (either adversely or positively) from reconstruction activities.

#### **4.5.2 Environmental Impact Assessment**

##### **4.5.2.1 Overview**

The scope of the work consists of the preparation of the environmental impact assessments as well as developing environmental protection policies in accordance with accepted Russian and international standards for proposed reconstruction projects.

The purpose of the work is to ensure that the reconstruction projects recommended are environmentally sound and that any environmental consequences are taken into account early in the project design.

##### **4.5.2.2 Environmental Impact Assessment of Reconstruction Projects**

The environmental impact assessment should focus on areas for which reconstruction will have the most impact.

As appropriate, the views of local population should be incorporated into the assessments.

##### **Describe Projects**

The Consultant will describe the proposed projects.

### **Describe Affected Environment**

The Consultant will describe the affected environment (geological resources, soils, terrain, terrestrial biology, aquatic biology, vegetation, water resources, air and air quality, socio-cultural issues, natural hazards, wild lands, land use).

### **Analyse Effects of Proposed Projects**

An analysis of the effects of each of the proposed projects on environmental resources, and the cumulative effects on a resource will be incorporated.

### **Analyse Alternate Proposals**

Includes an analysis of the environmental impacts of alternate proposals and a ranking of projects according to environmental criteria.

### **Discuss Mitigating Options**

Discuss mitigating options which can be used to reduce environmental impacts during construction or operations.

#### **4.5.2.3 Environmental Protection Policies and Procedures**

Environmental Protection Policies and Procedures to be developed should be based on the following criteria:

1. Conformance to accepted international and Russian standards and practices.
2. Both short and long term impacts must be addressed.

#### **4.5.2.4 Environmental Modelling**

The Consultant may, if necessary to the assessment of the environmental impacts of the EGS, develop or utilise computer models to assist in this task.

#### **4.5.3 Reports**

Prepare the data and results for inclusion in the Interim and Final Study Reports.

## **4.6 Component F: Preparation of the EGS Reconstruction and Upgrading (Immediate)**

### **4.6.1 Overview**

The Consultant will work with the Russian Side to identify and assess high priority investments that address the immediate needs of the system, focusing on short gestation, high return investments that enable the system to meet its supply obligation.

### **4.6.2 Screening Analysis**

The Consultant will undertake a screening analysis of GAZPROM's most urgent investments needed to maintain effective physical delivery capacity and reliability of the system.

### **4.6.3 Identification of High Priority Investment**

Determine the highest priority economically and technically justified investments; for these investments prepare and/or review project engineering and design, procurement, and packaging; estimates of local and foreign costs, project implementation mechanism and schedule, project physical and price contingencies.

### **4.6.4 Economic and Financial Analysis**

The Consultant will prepare detailed economic and financial analysis of each of the retained projects.

### **4.6.5 Environmental Assessment**

The Consultant will ensure that under the Environmental component of the study, adequate environmental assessment is prepared in priority.

These tasks will be carried out to meet the requirements of GAZPROM as well as those of potential financing sources, including the European Bank.

### **4.6.6 Gas Sub-Sector Description for Report Presentation**

With a view to facilitate the presentation of envisaged priority projects to potential financing sources, the Consultant will prepare, in accordance with The European Bank standards and requirements, a presentation of the gas sub-sector and GAZPROM.

#### **4.6.7 Task Performance Report**

The Consultant will prepare the data and results for inclusion in one or more separate reports as identified priority projects, under a format acceptable to potential IFIs.

### **5 DURATION OF THE STUDY**

An Interim Report will be prepared for delivery through the MC to the ACC within six months after the beginning of the study. A Draft Final Report is expected to be delivered within twelve (12) months from the commencement of the study and the ultimate Final Report about three months later. Report(s) for Component F of the study will be prepared within five months after the beginning of the study.

### **6 REVIEW MEETINGS**

The Study Coordinator will an initial meeting with the Russian Contractors to clarify the methodology to be used in the study and the management of the study.

Thereafter, he will arrange the following review meetings, to The European Bank's satisfaction, which will be chaired by the Western PD:

- 1 An Inception Workshop after all contracts for the study's work have been awarded; the purpose of the workshop will be to finalise details of the work to be carried out by each Contractor, to clarify relationships between the various participants in the study and agree on the detailed work schedules. The workshop will also establish the detailed logistics requirements for each participant in the study. The conclusions of the Inception Workshop will be submitted to the MC and the CC for approval.
- 2 A second meeting comprising the Contractors will take place about eight weeks after the beginning of the Study to (i) review the sufficiency of the available data and information; (ii) suggest any revisions to the Terms of Reference, if needed; (iii) present a final work programme for each of the participants in the study. The recommendations of the meeting will be presented to the MC for approval and, if necessary, to the CC.
- 3 A third meeting will take place about six months after the commencement of the study, to discuss the Study Interim Report, when the Consultants in cooperation with the Russian Contractors have collected all the necessary data and have made substantive progress in completing the analyses and completed Component F. The purpose of the meeting will be to identify problems encountered to that point, and to agree on a work programme for any final completion of the Study Interim Report and for completion of the

study. The conclusions of the meeting will be submitted to the MC and CC for approval.

- 4 A fourth meeting will take place three weeks after the Draft Study Final Report has been prepared (twelve months from the commencement of the study) to be submitted to the European Bank, GAZPROM and the CC. This meeting will enable the PDs, Consultants and Russian Contributors to provide detailed comments on the Draft Study Final Report, and agree, if needed, on any additional work to be carried out to achieve the objectives of the study within its budget. The meeting will collect comments from GAZPROM, The European Bank and other donors on the Draft Study Final Report and agree how these comments will be reflected in the Final Study Report.
- 5 A last meeting will take place three weeks after submission of the Final Study Report for final comments and acceptance of the Final Study Report by GAZPROM, and The European Bank.

## 7 REPORTING

Each Consultant, and the Russian PD, will be required to provide the Western PD with a monthly report on their work to date, which the Western PD will promptly coordinate into his monthly report to the MC and the European Bank on the progress of the study as a whole. In addition each Consultant and the Russian PD will be required to prepare an interim task performance report on his work in time to support the Study Coordinator's Interim Study Report as indicated in subsection (ii) below.

The Study Coordinator in consultation with the Russian PD will present to the European Bank and GAZPROM;

- (i) an Inception Report for the preparation of the Second Meeting indicating in detail individual work plans and schedules, etc.
- (ii) within five and a half (5½) months after the beginning the study, an Interim Study Report for the preparation of the Third Meeting including a detailed progress report and any revised work programmes and schedules; the draft inventory of the current condition of the EGS; the presentation of the methodology to be used and the computer models to be developed for ranking the various investment projects for system reconstruction and upgrading; and a preliminary list of the resulting potential priority projects for system reconstruction and upgrading; and the results of Component F.
- (iii) a Draft Study Final Report within twelve (12) months after the beginning of the study, along the lines suggested in Annex 1 to the present Terms of Reference

- (iv) a Final Study Report reflecting comments received on the Draft version of the Study Final Report within three months after the presentation of the Draft Final Study Report.

The Final Study Report will cover, inter alia, the detailed inventory of the condition of the EGS; methodological details on the EGS improvements that are recommended, based on the models and procedures which have been developed in the study; the estimates of the present transmission capacity of the network; a prioritised list of projects for reconstruction, capacity upgrading and productivity improvement by main functions of the EGS and by geographic and major market sectors including cost estimates and list of expected benefits and priority level; a least cost investment programme including a detailed list and justification of retained projects; recommendations regarding possible financing solutions which may be of relevance to GAZPROM for the implementation of the programme; and the detailed environmental recommendations.

## **8 ASSISTANCE TO BE PROVIDED BY THE RUSSIAN CONTRACTORS**

The Russian Contractors, supported by GAZPROM, will provide the support services and facilities to the Consultants as reasonably required by them, including:

- Administrative assistance in obtaining visas, custom clearances, and all other administrative permits required by the Consultants for the performance of their work.
- Transport to and access to such sites on the EGS as the Consultants and the Russian Contributors may wish to visit.
- Relevant available data, maps, surveys, studies (including existing studies required to assess the reconstruction and upgrading needs of the analysed segments of the EGS) including performance data for the system, gas supply and demand information, detailed assessment of previous down-rating, interruptions, corrosion, gas losses and compressor failures in the system, and all other similar information which the Consultants may reasonably require in order to perform their work.
- Liaison with the Russian government and local government bodies, gas distribution companies, and major customers.
- Adequate characteristics for the purpose of the study and market trends for gas sales in the domestic market.

- Adequate estimates of unit costs of domestically procured materials and construction and installation services.
- Adequate estimates of operating costs for the various types of installations (pipelines, compressor stations, storage, etc.) in a reasonable degree of detail relevant to the study's assessment of the EGS.
- Adequate information on taxes and other imposts and charges on the revenues from gas production, delivery and sales (including export revenue retentions).
- Adequate information on gas reserves and gas supply.

## **9 CONFIDENTIALITY AND OWNERSHIP OF THE STUDY**

- 9.1 All parties to the study work will keep confidential all data in whatever form used in or included in the study work.
- 9.2 The confidentiality requirements of Section 9.1 above do not apply to data that:
- (i) Is in the public domain or which comes into the public domain without breach of this confidentiality requirement and when used with reference to its alternative source; or
  - (ii) Is derived or received lawfully and independently of the work for this study on a non-confidential basis.
- 9.3 All information related to the study work which is to be used for press releases, conferences and general publications shall be controlled according to procedures to be developed by the MC.
- 9.4 The results of the study work and its Reports will be the property of GAZPROM and all parties to the study work will not use or distribute such results or Reports of their contents to third parties without the prior written consent of GAZPROM (which consent shall not be unreasonably withheld).

**UNIFIED GAS SUPPLY SYSTEM**  
**INDEPENDENT RECONSTRUCTION STUDY**  
**FINAL REPORT**

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# UNIFIED GAS SUPPLY SYSTEM

## INDEPENDENT RECONSTRUCTION STUDY

### FINAL REPORT

## INDICATIVE DESCRIPTION OF THE CONTENTS OF EACH SECTION

### A. General Data

#### 1.0 The Unified Gas Supply System in 1992

This section will provide a general description of the Unified Gas Supply System, including the physical layout of the system, the gas supply and demand balance and volumes transported in the base year 1992.

#### 1.1 Gas Consumption

This section will describe the annual and seasonal gas volumes including maximum peak and seasonal swing within Russia by sector and region for the previous ten-year period and for 1992.

The section will also detail the annual delivered export volumes to the main markets outside Russia over the previous ten-year period and for 1992, by country.

#### 1.2 Gas Reserves and Production

This section will review Russia's gas reserves and estimated production potential in the short term, excluding un-developed gas fields. It will also provide current and historical production volumes for the previous ten years by region and, if necessary, for the main fields. Reserves and production figures will be provided for non-associated, associated and solution gas.

#### 1.3 Description of Unified Gas Supply System

This section will describe the general physical layout of the core portions of the Unified Gas Supply System including gas treatment facilities, pipelines, compressor main stations, main metering facilities and underground storage facilities. Drawings will be provided showing the main characteristics of the facilities, their capacities, and other pertinent information.

## 2.0 GAZPROM

This section will describe the overall organisation of GAZPROM, its organisational policies and its relationship with other enterprises and government entities.

### 2.1 Management and Organisational Structure

This section will describe the management and organisational structure of GAZPROM by way of a written description and organisation charts. GAZPROM's Board will be described, including responsibilities and accountability. The section will fully describe GAZPROM's administrative bodies and its regional production and transmission organisations. This section will also describe GAZPROM's relationship to the relevant government organisations that provide oversight, policy guidance, support services etc.

### 2.2 Relationship with Regional Distribution Organisations.

This section will describe GAZPROM's relationships with regional gas Distribution enterprises in terms of planning, budgetary control, capital construction activities and their specific responsibilities for operations and system maintenance.

## B. Economic and Financial Data

### 1.0 Operating Costs by Function

This section will present, tabulate and analyse operating costs for the main functions of the system, including pipes, compressor stations, etc. It will identify domestic, direct foreign and indirect foreign costs.

### 2.0 Cost Breakdown by Main Components

This section will present for each of the Functions the breakdown of operating costs between cash operating costs (labour, consumables, services, etc.), taxes and ownership costs.

### 3.0 Calculation of Marginal and Average Costs

This section will propose a definition for the marginal cost by function, particularly, the time horizon to be taken into consideration for the definition of short- and long-run marginal and average costs. This section will also present the system average costs by function.

## 4.0 Conversion of Financial Costs into Economic Costs

For the preparation of the economic analysis of the system reconstruction plan, this section will analyse the correction to be brought to the financial data to derive valid economic costs, taking into account in particular, the tax impact, possible subsidies to certain categories of inputs, and possible distortions due to market failures.

### C. System Analysis

#### 1.0 Methodology and Validation of Network Modelling and Other Assessment Procedures.

In this section, the Consultant will present a review of the model to be used and the reason for their selection. He will propose and develop methods for modelling the EGS as a network. The model and assessment procedures will be set up with a view to analysing the impact of alternative reconstruction and efficiency improvement investment projects on the overall system capacity and efficiency, including possible sectional costs involved.

Also, in this section, the Report will validate the model and analytical system to be used based on 1992 data as a base year, including gas transmission volumes by origin and destination, and the associated operating.

#### 2.0 Analysis of System Using 1992 Data

Assessment procedures will be established to rank alternative projects according to selection criteria to be defined and justified in the Report, in agreement with GAZPROM.

### D. Analysis of the present Technical Condition of the EGS

#### 1.0 Detailed Description and Evaluation by Main Functions.

This section will comprise a comprehensive detailing, section by section and for each installation, of the specifications of the equipment, its condition, design capacity and de-rated capacity under its present condition; it will also indicate the level of utilisation in 1992 compared to de-rated capacity. The main text will present an in-depth analysis of the condition of the EGS by main functions, i.e. pipes, compressor stations, storage, metering, dispatching, etc.; each function will be analysed as a system. The Report will indicate in detail the possibility of any un-satisfactory condition. To the extent possible, the Report's analysis will address such factors as: operational efficiency; equipment condition; remaining equipment life; failure rates; operating, maintenance and construction problems. The analysis will also require a review of GAZPROM's technical standards of construction, maintenance and operations practices with corresponding international standards and practices. This will include comparison of standards and

practices related to quality control, inspection, maintenance procedures, control and SCADA systems, reporting procedures, etc.

## 2.0 Analysis by Main Regions and Routes

This section will present by region and route, instead of by system component, the data analysed in the previous section. With a view to facilitate the preparation of regional reconstruction and upgrading projects, the section will present the condition of the system by region. When the installations are export oriented, the presentation will focus on specific routes.

### E. Short Term Supply/Demand

#### 1.0 Domestic and Foreign Demand and Geographical Location for 1995

This section will analyse the capability of accessible markets (Russian, other CIS, European) to absorb quantities of Russian gas. As the study is mainly a reconstruction and upgrading study, the demand estimates will be limited to the 1992 to 1995 period; it will be based on short term scenarios and will not attempt to present a marketing strategy for GAZPROM. The evaluation of short term demand should not include major structural changes in West European demand, but include reasonable global demand estimates for East European countries, based on a recovery of these economies after 1995.

#### 2.0 Gas Production Potential in Volume and Geographical Location 1995

In this section, the short term production of the Russian gas producing regions (indicating the main fields) and associated gas fields will be estimated through an analytical approach (field by field) taking into account available data on recent new drilling, workover programmes, and expansion programmes already under execution.

For the next three years, production development forecasts will be based on feasible investment programmes assuming that gas prices are significantly raised in real terms. Relevant assumptions in this respect will be discussed and agreed with GAZPROM and The European Bank in due time.

### F. Pre-feasibility of Reconstruction, Upgrading and Efficiency Projects of the EGS

#### 1.0 Project Identification into Specifications

The section will present a set of pre-feasibility studies for specific projects aiming at the reconstruction and upgrading of existing installations. Immediately required investment projects will be presented separately, as indicated in the description of Component F of the study. This section of the Report will also present efficiency improvement projects, though they may not be directly related to system rehabilitation. The selection of projects for

which pre-feasibility studies will be presented will be based on the physical and economic assessment of the facilities.

Retained projects will be presented under the following categories:

### 1.1 Pipeline Reconstruction

The assessment will address the relative economic benefits of pipeline rehabilitation by intelligent pigging and repair (including repair or enhancement of cathodic protection) versus pipeline reconstruction by installation of new pipe. The Consultant will also investigate the feasibility of increasing the system's operating pressure.

### 1.2 Compressor Station Reconstruction and Upgrading Projects

This section will present the pre-feasibility studies related to compressor station reconstruction projects and assess their technical viability. Specific investment components will be defined based on a least-cost analysis.

### 1.3 Storage Modernisation and Upgrading

This section will present the pre-feasibility studies related to reconstruction and upgrading of storage capacities.

### 1.4 Other Projects

This section will describe other projects that have been identified and assess their technical viability. These projects may include such components as: installation of advanced SCADA systems, construction of facilities to eliminate system bottlenecks, or other EGS core projects.

### 1.5 Environmental

The environment section of each pre-feasibility report will describe the anticipated environmental impacts of each of the envisaged projects.

This report will include a separate Environmental Impact Assessment (EA), following standards acceptable to the Russian Ministry of Fuel and Energy, the Russian Ministry of Environment, and major IFIs. The EA will take into account as needed all Russian statutory and regulatory requirements, as well as internationally accepted standards. The EA will describe the existing environment in the vicinity of proposed reconstruction, and the anticipated impacts associated with the construction. Modelling and calculations may be required to determine the incremental effects of the reconstruction activities on the environment.

The EA will describe in detail the management of the identified impacts to minimise or eliminate them, and will set out the mitigating and restoration measures that GAZPROM will implement during and after reconstruction. The EA will present a plan to monitor and report on the implementation of these measures both during the following reconstruction until the environmental restoration has been successfully completed.

The EA will address the conservation of: rare and endangered species (both fauna and flora), critical animal habitats, cultural resources, wetlands, and environmentally sensitive areas. In addition, the EA will address project affected population rehabilitation and resettlement, protection of indigenous populations, as well as the occupational health and safety issues of the construction workforce in accordance with all applicable Russian statutory and regulatory requirements, and in accordance with the major IFIs' standards. The handling and disposal of hazardous materials either used or encountered during construction, and the provision for control and clean-up of any spills of hazardous materials will also be formulated in the EA.

## 2.0 Individual Pre-Feasibility Studies (Costs, Benefits, Risks)

The scopes of work and cost estimates for each identified project will be presented along with estimated costs, specifying local costs and possible needs for imported equipment and services, and identification of impact on operations and efficiency, by reference with a "base case" without the project. The economic benefits will be estimated, and for each project, the ERR will be calculated, along with the NPV (at 12%) per dollar of capital invested. For each project, non economic benefits (employment, impact on environment, etc.) will be briefly described. Projects for environment protection and mitigation of impact of operations on the environment will be presented separately.

## G. Economic Analysis of Investment Programme

### 1.0 Project Screening and Ranking

This section will evaluate the priority to be attached to each of the projects for which pre-feasibility studies have been prepared. The screening and ranking will be based on the various types of benefits accruing to the system as a whole through the implementation of each project. Project inter-dependence will also be examined.

This work will be done using the system simulation and investment models and procedures prepared previously. The final result will be a relative ranking of projects in decreasing order of emergency and economic appeal.

## 2.0 Selection and Explanation of Cut-off Criteria

In this section, the Report, in close co-ordination with GAZPROM, will propose one or more cut-off criteria to decide which projects should be included in the investment plan. Possible criteria may be Economic Rate of Return, or maximised Net Present Value of a given investment budget.

## 3.0 Proposed Investment Programmes and Impact on Overall System Efficiency

This section will describe the capital investment programme (list of projects and scheduling) recommended for GAZPROM in the Report for the period 1992-95 by category, separately identifying: base local and foreign costs at 1993 prices, inflation, taxes and duties, interest during construction, and the forecast financial and technical impact of the recommended investment programme on the EGS capacity and efficiency.

This section will also quantify the effect of the recommended programme on system cost efficiency, compared to the "without" case, and also to the present situation.

## H. Financial Engineering

Although the main purpose of the study is the identification of the most favoured reconstruction programme, complementary information on international experience is required regarding financial engineering techniques in the gas transport sector.

### 1.0 Existing Financial Engineering Techniques

In this section, the consultant will list a number of financial engineering techniques used in various relevant countries, including BOT contracts for installations or segments of gas transport systems. The review will particularly focus on techniques to associate private and foreign capital, including raising equity capital. Samples of significant documentation and agreements (suitably revised to make them anonymous, if necessary) will be provided.

### 2.0 Review of International Practices for Gas Transmission and Supply Contracts.

In this section, the Consultant will provide a review of current practices regarding transmission and supply contracts, with a particular emphasis on the financial aspects of such operations. The Consultant will also provide a comparative analysis of the advantages and draw-backs associated to each type of contract, and an assessment of the relevance of those contracts to the Russian situation.

ATTACHMENT 3

STANDARD PROVISIONS

1. Allowable Costs
2. Refunds
3. Revision of Cooperative Agreement Budget
4. Termination Procedures
5. U.S. Officials Not to Benefit
6. Nonliability
7. Amendment
8. Notices
9. Publications
10. Audit and Records
11. Payment

1. ALLOWABLE COSTS (JULY 1988)

a. The recipient shall be reimbursed for costs incurred in carrying out the purposes of this cooperative agreement which are reasonable, allocable, and allowable.

(1) Reasonable shall mean those costs that do not exceed those which would be incurred by an ordinarily prudent person in the conduct of normal business.

(2) Allocable shall mean those costs which are necessary to the cooperative agreement.

(3) Allowable shall mean those costs which are reasonable and allocable, and which conform to any limitations set forth in this cooperative agreement.

b. Prior to incurring a questionable or unique cost, the recipient is encouraged to obtain the grant officer's written determination as to whether the cost will be allowable.

2. REFUNDS (JULY 1988)

a. The recipient is encouraged to utilize interest bearing accounts where feasible and shall remit to AID all interest earned on funds provided by AID.

b. Funds obligated by AID but not disbursed to the recipient at the time the cooperative agreement expires or is terminated shall revert to AID, except for such funds encumbered by the recipient by a legally binding transaction applicable to this cooperative agreement. Any funds advanced to but not expended by the recipient at the time of expiration or termination of the cooperative agreement shall be refunded to AID except for such funds encumbered by the recipient by a legally binding transaction applicable to this cooperative agreement.

c. If, at any time during the life of the cooperative agreement, or as a result of final audit, it is determined that AID funds provided under this cooperative agreement have been expended for purposes not in accordance with the terms of this cooperative agreement, the recipient shall refund such amount to AID.

3. REVISION OF COOPERATIVE AGREEMENT BUDGET (JULY 1988)

a. The approved cooperative agreement budget is the financial expression of the recipient's program as approved during the cooperative agreement award process.

b. The recipient shall immediately request approval from the grant officer when there is reason to believe that within the next 30 calendar days a revision of the approved cooperative agreement budget will be necessary for any of the following reasons:

(1) To change the scope or the objectives of the project and/or revise the funding allocated among project objectives.

(2) Additional funding is needed.

(3) The recipient expects the amount of AID authorized funds to exceed its needs by more than \$5,000 or five percent of the AID award, whichever is greater.

c. Except as required by other provisions of this cooperative agreement specifically stated to be an exception from this provision, the Government shall not be obligated to reimburse the recipient for costs incurred in excess of the total amount obligated under the cooperative agreement. The recipient shall not be obligated to continue performance under the cooperative agreement (including actions under the "Termination Procedures" provision) or otherwise to incur costs in excess of the amount obligated under the cooperative agreement, unless and until the grant officer has notified the recipient in writing that such obligated amount has been increased and has specified the new cooperative agreement total amount.

4. TERMINATION PROCEDURES (JULY 1988)

This agreement may be terminated, in whole or in part, by either party at any time upon 30 days written notice of termination. Upon receipt of and in accordance with a termination notice from the grant officer, the recipient shall take immediate action to cease all expenditures financed by this agreement and to cancel all unliquidated obligations if possible. Further, upon receipt of notice of termination, the recipient shall not enter into any further obligations under this agreement. Except as provided below, no further reimbursement shall be made after the effective date of termination. The recipient shall within 30 days of the effective date of termination repay to the Government all unexpended

AID funds which are not otherwise obligated by a legally binding transaction applicable to this cooperative agreement. Should the funds paid by the Government to the recipient prior to the effective date of termination be insufficient to cover the recipient's obligations in a legally binding transaction, the recipient may submit to the Government within 90 days after the effective date of termination a written claim for such amount. The grant officer shall determine the amount(s) to be paid by the Government to the recipient under such claim in accordance with the "Allowable Costs" provision of this cooperative agreement.

5. U.S. OFFICIALS NOT TO BENEFIT (JULY 1988)

No member of or delegate to the U.S. Congress or resident U.S. Commissioner shall be admitted to any share or part of this cooperative agreement or to any benefit that may arise therefrom.

6. NONLIABILITY (JULY 1988)

AID does not assume liability for any third party claims for damages arising out of this cooperative agreement.

7. AMENDMENT (JULY 1988)

The cooperative agreement may be amended upon mutual consent of the parties by formal modifications to the basic cooperative agreement document or by means of an exchange of letters between the grant officer and an appropriate official of the recipient organization.

8. NOTICES (JULY 1988)

Any notice given by AID or the recipient shall be sufficient only if in writing and delivered in person, mailed, or cabled as follows:

To the AID grant officer, at the address specified in the cooperative agreement.

To the recipient, at the recipient's address shown in the cooperative agreement or to such other address designated within the cooperative agreement.

Notices shall be effective when delivered in accordance with this provision, or on the effective date of the notice, whichever is later.

9. PUBLICATIONS (JULY 1988)

(This provision is applicable when publications are financed under the cooperative agreement.)

- a. If it is the recipient's intention to identify AID's contribution to any publication resulting from this cooperative agreement, the recipient shall consult with AID on the nature of the acknowledgement prior to publication.
- b. The recipient shall provide the AID project officer with one copy of all published works developed under this agreement and with lists of other written work produced under the cooperative agreement.
- c. Except as otherwise provided in the terms and conditions of the cooperative agreement, the author or the recipient is free to copyright any books, publications, or other copyrightable materials developed in the course of or under this agreement, but AID reserves a royalty-free nonexclusive and irrevocable right to reproduce, publish, or otherwise use, and to authorize others to use the work for U.S. Government purposes.

#### 10. AUDIT AND RECORDS (JULY 1988)

The recipient shall maintain books, records, documents, and other evidence in accordance with the recipient's usual accounting procedures to sufficiently substantiate charges to the cooperative agreement. The recipient confirms that this program will be subject to an independent audit in accordance with the Recipient's usual auditing procedure, and agrees to furnish copies of these audit reports to AID along with such other related information as may be requested by AID with respect to questions arising from the audit report.

#### 11. PAYMENT (PERIODIC ADVANCE) (OCTOBER 1991)

(This provision is applicable when: (i) the recipient maintains procedures to minimize the time elapsing between the transfer of funds and the disbursement thereof, and (ii) the recipient's financial management system meets generally accepted accounting standards for funds control and accountability.)

- a. Quarterly advances shall be made in the amounts needed to meet current disbursement needs and shall be scheduled to make the funds available to the recipient as close as is administratively feasible to the actual disbursements by the recipient for program costs.
- b. The recipient shall submit requests for advances (using SF-270, "Request for Advance or Reimbursement") to the paying office specified in the agreement letter. Requests shall state the estimated disbursements to be made during the period covered by the request, less the estimated balance of cash on hand at the beginning of the period and the advance amount being requested.

c. The recipient shall submit a "Financial Status Report" (SF 269A) quarterly, no later than 30 days after the end of the period, to the paying office specified in the agreement letter. The report shall show disbursements, advances received, and any cash remaining on hand for the period covered by the report. Within 90 days following the expiration of the cooperative agreement, the recipient shall submit an SF 269A showing total disbursements, total advances received, and any cash remaining on hand, which will be refunded to AID.

d. If at any time, the AID Controller determines that the recipient has demonstrated an unwillingness or inability to: (1) establish procedures that will minimize the time elapsing between cash advances and the disbursement thereof and (2) timely report cash disbursements and balances as required by the terms of the agreement, the AID Controller shall advise the grant officer who may suspend or revoke the advance payment procedure.