

NOTICIAS FAD/FEV

CONVOCATORIA DE CONCURSO PARA ELABORAR EL ESTUDIO DE VIABILIDAD «UNIDAD 2 DE LA CENTRAL NUCLEAR DE CERNAVODA». REPUBLICA DE RUMANIA

1. El Gobierno de la República de Rumanía, a través de la Empresa Nacional NUCLEARELECTRICA S.A., convoca a las empresas españolas a un concurso para elaborar el Estudio de Viabilidad para completar “la Unidad 2 de la Central Nuclear de CERNAVODA” en la República de Rumania.
2. Este Estudio de Viabilidad tiene un coste aproximado de hasta 50 millones de pesetas y será financiado con cargo a la Línea de Financiación de Estudios de Viabilidad (FEV Modalidad Pública), cuyos recursos provienen del Fondo de Ayuda al Desarrollo. La propuesta de donación para la financiación del Estudio fue presentada en la Comisión Interministerial del FAD de 31 de marzo de 2000.
3. Las empresas españolas interesadas en la realización del estudio deberán presentar sus ofertas según la documentación que se detalla en los Términos de Referencia (Anexos A y B) antes de las 12:00 horas del día **14 de julio de 2000**. La Empresa Nacional NUCLEARELECTRICA S.A., bajo la supervisión de la Administración española, evaluará las ofertas presentadas de acuerdo con los baremos recogidos en el Anexo C.

Se presentarán cuatro ejemplares. Dos copias en inglés para la Empresa Nacional NUCLEARELECTRICA, cliente de estudio, y dos copias en español, una para la Oficina Económica y Comercial de la Embajada de España en Rumanía y otra para la Subdirección General de Gestión de la Deuda Externa y Evaluación de Proyectos de la Secretaría de Estado de Comercio y Turismo.



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A. NUCLEARELECTRICA

Mr. Teodor Chirica
Director International Affairs, Trading and Communication
Societatea Nationala Nuclearelectrica
33, General Gh Magheru Blvd. 70164 Bucharest. Romania
Tel: 40-1-6507319
Fax: 40-1-3120800
E-mail: dchirica@snn.rdsnet.ro

B. Consejera Económico y Comercial de la Embajada de España en Rumanía

D^a M^a Dolores Loureda Martiñán
Bd. Dacia, 42 (16 antiguo)
79403 Bucharest. Romania.
Tel: 40-1-2100740/741
Fax: 40-1-2100497
E-mail: buzon.oficial@bucarest.ofecome.mcx.es

C. Subdirección General de Gestión de la Deuda Externa y Evaluación de Proyectos

D^a Begoña Montoro Zulueta
Paseo de la Castellana, 162 Planta: 8; Despacho: 16
28046 MADRID

4. Para ampliar información deberán dirigirse a:

Subdirección General de Gestión de la Deuda Externa y Evaluación de Proyectos
Teléfono: (91) 583 5245/ 5254/ 5463
Fax: (91) 583 52 55

Att: Begoña Montoro Zulueta
M^a Jesús de Gonzalo Gámir

FEASIBILITY STUDY OF THE COMPLETION OF CERNAVODA NPP UNIT 2

I. Introduction

The Spanish Government has offered a grant of 300,000 USD (ESP 50 million) to the Romanian Government to support the Romanian company Nuclearelectrica in organising and contracting the services and supplies required to complete Cernavoda Nuclear Power Plant (NPP) Unit 2 (the Project), as well as in concluding the financing of the Project.

Nuclearelectrica is a 100% state owned company dependent on the Romanian Ministry of Industry and Commerce. This company is the owner of Cernavoda NPP.

In the seventies, Romania decided to begin construction of a nuclear power plant in Cernavoda consisting of five units of 700 MWe each, using CANDU Technology (Canadian Deuterium Uranium). The first unit began operations in 1996 and continues to generate electricity with a high availability factor. Progress activities on the other Units, except preservation work, were practically stopped until 1995. Planning for the completion of Unit 2 has begun this year and recently the Romanian Government decided to complete this Unit.

Completion of Cernavoda Unit 2 will entail contracting various services such as project management, detail engineering, equipment and material supply, completion of civil construction and mechanical, electrical and I&C equipment installation, testing and start-up.

Cernavoda NPP Unit 1 was completed and commissioned by a consortium comprising Atomic Energy of Canada Limited (AECL) and Ansaldo, reaching the commercial operation on December 2, 1996. Also, AECL and ANSALDO performed initial operation of Unit 1 until July 31, 1997. Unit 2, using the same technology as Unit 1, will necessarily require the participation of these two companies.

In order to achieve the completion of the Unit 2, Nuclearelectrica is seeking the support of a Spanish nuclear engineering company (Advisor) which will help them study different organisational schemes to control and manage the project, review the scope of services and supplies to be contracted, develop a greater number of contracting alternatives and support them in acquiring additional sources of finance.

A feasibility study is proposed to be developed to cover the items described in the previous paragraph.

II. Selection Procedures

1. The Terms of Reference prepared by the recipient country (Nuclearelectrica) and approved by the Spanish Administration will be attached to the tender as Annex A.
2. A general invitation to tender will be published, with the support of the Spanish Administration, so all interested Spanish Companies will be able to submit a Statement of Interest, enclosing the information requested in Annex A and B.
3. The Romanian Administration, under the supervision of the Spanish Administration will evaluate the final bids, according to the evaluation criteria outlined in Annex C.
4. The maximum cost of the Study will be 50 millions pesetas.



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ANNEX A

TERMS OF REFERENCE

1. Restricted to Spanish Companies
2. Goals of the Study.

The completion of Cernavoda Nuclear Power Plant, Unit 2, whose design is of the well-known CANDU-6 technology (Canadian reactor design with natural uranium fuel and heavy water coolant), requires an initial Nuclearelectrica effort to organise the project, arrange contracts with main suppliers and ensure reliable financing. Technical details of the plant are included in Annex D.

In order to efficiently perform these tasks, the Romanian company would require technical consultant services from a Spanish engineering company with experience in the nuclear field, which would support them to meet the following objectives:

- Arrange a basic agreement between Nuclearelectrica and main Contractors (AECL and Ansaldo)
- Specify the Nuclearelectrica project control functions and responsibilities as plant owner
- Develop project decision schemes and advice on proper Nuclearelectrica participation in Project completion, including Project Management
- Provide an adequate technical and financial background to Nuclearelectrica in support of negotiations with different project participants (main suppliers, other suppliers, local companies)
- Identify and group adequate contract packages
- Propose the best contract approach and conditions for each service or equipment package
- Review the current financing proposals and discuss or propose other alternatives to those already started

The above advisory services will be provided through the performance of several studies which are listed and described below.

3. Scope of the Study:

The following services are to be provided by the contractor:

- 3.1. Preparation of Project Management Feasibility Documentation
- 3.2. Preparation of the following studies:
 - 3.2.1. Review of pending services and equipment supplies with the purpose of defining bid packages and potential tenderers
 - 3.2.2. Contract alternatives (lump sum, cost plus, others) for procurement of the remaining services and supplies, and their advantages and disadvantages
Project organisation schemes and bases for their selection. Responsibilities and functions of the participating companies and of the Owner, review of the Project Management Contract (PMC)
 - 3.2.3. Support to Financing Settlement: compilation of technical and financial data for the request for and negotiation of financing and credit insurance
- 3.3. Participation in Meetings
The contractor shall attend project meetings with Nuclearelectrica and potential contractors or suppliers.
- 3.4. Progress Reports
Progress reports shall be submitted every three (3) months. They will describe the activities performed during the period covered, as well as deviations and proposals for the next term.
4. Technical Description of the Work
The following phases are proposed to carry out the Feasibility Project (FP):



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4.1. First Phase: Project Management Feasibility Documentation

This phase would consist in defining the framework for carrying out the Feasibility Project. A detailed schedule, project operation manual and quality plan would be prepared, identified in Section 3 as item 3.1.

4.2. Second Phase: Defining Bid Packages and Potential Tenderers

Cernavoda NPP Unit 2 is intended to be a replica of Unit 1, with the modifications required due to equipment availability or local adaptation (licensing requirements, local electricity supply requirements). Most of the engineering work has therefore already been performed and the only thing required is reviewing it.

The following is an estimate of the current status (at the end of 1999) of Unit 2:

• Equipment and material procured and delivered.....	70%..
(545 M USD);	
• Construction erection progress	30%
• Civil construction completed	70%
• Mechanical and piping installation completed	15%
• Electrical and I&C installation completed	2%
• Overall project completion is estimated at	47%

Nuclearelectrica avails of detailed documentation on the current status of the plant and the specification of pending equipment and services, which will be provided to the successful bidder.

The bidders shall propose plans to review the existing information in order to organise the pending services and equipment in the most suitable packages to optimise the Equipment Procurement Process, both the schedule and the price.

As part of this phase, a list of potential tenderers for each group would be prepared, as well as a basic planning for the supply.

The deliverable from this phase would be the study listed as item 3.2.1 of Section 3.

4.3. Third Phase: Contract Alternatives, Project Organisation Schemes and review of the PMC

A comparison study shall be performed to determine the most suitable contract alternative for each of the packages defined above.

A guide project management contract will be provided to Nuclearelectrica.

Standard purchase conditions and contract texts shall be drawn up and those already existing will be commented on.

Support shall be provided to Nuclearelectrica to prepare meetings with the most relevant tenderers and to review their proposals.

Bidders shall also describe the method proposed to support Nuclearelectrica during the preparation of contracts.

Also, this phase would be dedicated to developing organisation schemes and related functions. It should be taken into account that Cernavoda NPP, Unit 1, was basically completed on a project management mandate basis, due to the limited experience of the Romanian companies in the nuclear field.

The organisation for the completion of Unit 2 should be developed taking into account that Romanian companies have broader experience based on their knowledge of the design, construction and operation of Cernavoda NPP, Unit 1. Therefore organisation schemes should be developed which would imply broader



domestic participation and a more competitive bidding process to minimise the price. The Adviser will review the main contract and its appendices, mainly in terms of scope of work, management of work and organization, warranties & schedule, work orders, expenses scheme, definition of interfaces, delegation of authority, contract changes, customer obligations, etc

Bidders shall include in their proposals the detailed content of the study to be performed and shall propose the methods and bases they plan to follow for the preparation of the required organisation schemes and the content of the report they propose to write up, previously identified as item 3.2.2 in Section 3.

4.4. Fourth Phase: Support to Financing Settlement

Nuclearelectrica and the Romanian Ministry of Industry and Commerce are currently negotiating the financing of the plant with several financial institutions outside Romania.

The purpose of this phase is to support Nuclearelectrica in the preparation of the technical and financial data required by the credit suppliers and to assist Nuclearelectrica during negotiations and meetings to be held with financial and political institutions and Credit Insurance Agencies.

The deliverable for this phase will be the report identified as item 3.2.3 in Section 3.

Tenders shall propose, based on their experience, the type of data required to be collected and the method to be followed for the preparation of data and during negotiations with financial institutions.

5. The client will provide to the Spanish consultant, on confidentiality basis, all the information and documents that may be useful in the execution of the feasibility study, as well as a work team (to be determined the names of the persons and facilities: telephone, fax, ... etc.). Nuclearelectrica will be financially responsible for all local travel and per diem for its own staff.
6. Interested companies should submit certain documents, in accordance with the criteria in Annex B, in order to qualify for the final bids. Four copies should be submitted, included in sealed envelopes: two in English to Nuclearelectrica and two in Spanish, one to the Spanish Embassy's Commercial Office in Bucharest and one to the Subdirección General de Gestión de Deuda Externa y Evaluación de Proyectos in Madrid. On the envelopes should be mentioned the following addresses, respectively:

NUCLEARELECTRICA

Mr Teodor Chirica

Director, International Affairs, Trading and Communication

Societatea Nationala Nuclearelectrica

33, General Gh Magheru Blvd

70164 Bucharest. Romania

Tel: 40-1-6507319

Fax/Tel: 40-1-3120800

E-mail: dchirica@snn.rdsnet.ro

CERNAVODA NPP – UNIT #2 COMPLETION

Advisory services

DO NOT OPEN BEFORE July 14, 2000

12:00 NOON, BUCHAREST TIME

COMMERCIAL OFFICE IN BUCHAREST

Sra. D^a M^a Dolores Loureda Martiñán

Consejera Económico y Comercial

Bd. Dacia, 42 (16 antiguo)

79 403 Bucharest



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ROMANIA

Tel: 40-1-2100740/741

Fax: 40-1-2100497

E-mail: buzon.official@bucarest.ofcomes.mcx.es

SUBDIRECCION GENERAL DE GESTION DE DEUDA EXTERNA Y EVALUACION DE PROYECTOS

Sra.Dª Begoña Montoro Zulueta

Ministerio de Economía

Paseo de la Castellana 162

MADRID 28071 SPAIN

Tel: (00341) 583 52 45

Fax: (00341) 583 52 55

E-mail: begona.montoro@sscc.mcx.es

7. Any change in the proposed team should be discussed beforehand with both Nucleraelectrica and the Spanish Administration and, if not accepted, will cause the termination of the contract.
8. The bids shall be issued in a typed form, having the authorized signatures and seals (stamps) of the Bidder or of an authorized representative of the Bidder. The Bidder has to submit four sealed envelopes, as per previous Item 6. Inside of each envelope will be included two other sealed envelopes, one economic proposal and one technical proposal.

The bid will not have any added supplementary rows, erasure, corrections or overwritten words, with the exception when all these modifications will be made during the bid's award in the presence of RENEL's authorized representatives.

9. The technical proposal will determine the scope of the study, methodology used, work plan, and activities' timetable. Also, the technical proposal will include the following:
 - a) An indicative schedule of missions in Romania, progress meetings, milestones and reports, in accordance with the timetable will be included.
 - b) CVs and signed commitment letters for all the proposed Adviser team members; and company profiles for all members of the Adviser team, and their experience within this field.
 - c) The number and job titles of the staff concerned, with a description of the function and specific tasks assigned to the nominated team leader and each individual expert; a bar chart indicating the professionals; and showing periods in duty station and in the home country; and estimates of total numbers of man/months required broken down by individual staff and individual task
10. The economic proposal should be broken down into cost units on requested tasks, unitary cost and total cost for each category team. Other expenses related to the completion of the study, such as fees, field trips, per diem for Spanish experts, local expenditure, costs for the Romanian sub-contractors, if necessary, etc, should also be broken down. This should include every cost factor of the project. The cost should be stated in Spanish local spendi should be pesetas.
11. The proposal shall be submitted on or before 12.00 noon, Bucharest Time, of July 14, 2000 to Nuclearelectrica, Direction of International Affairs, Trading and Comunication, Bd. Gral Gh. Magheru nr. 33, sector 1, Bucuresti. The technical proposals will be opened at 12.30 hours on the same day in presence of the representatives of the bidders, if any.
12. Any proposal received after the deadline for submission of bids will be returned unopened to the sender.
13. The proposal has a validity of six months. During this period, the conditions are to be maintained, especially those related with the work team, scope and methodology, schedule of the works and price.



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14. Companies are encouraged to associate. In this case, their should make explicit their links with other companies and when a collective bid is made, responsibilities should be clearly defined for each of the consultants involved. Each bidder shall submit only one bid either by himself, or as a partner in a joint venture. A bidder who submits or participate in more than one bid will be disqualified.

15. There is a limit for the local expenditure at 15% of the total costs of the Study. Romanian sub-contractor can participate in more than one bid.

Nuclearelectrica will evaluate the bids, under the supervision of the Spanish Administration, according to the evaluation criteria of Annex C.

16. The project language will be English and all documents to be provided to the Beneficiary shall be written in English. All correspondence exchanged by the bidder and Nuclearelectrica and/or Spanish Administration shall be written also in English.

17. The contractor shall supply one copy of the following deliverables to the beneficiary ("T₀" is the project commencement date, when the advance payment is made):

Deliverables	Time
• Project Management Feasibility Documentation (including Detail Project Schedule, Quality Plan and Operations Manual)	T ₀ + 1 month
• Progress Reports	T ₀ + n x 3 months
• Feasibility Studies	
➢ Defining Bid Packages and Potential Tenderers	T ₀ + 2 months
➢ Contract Alternatives, Project Organisation Schemes and review of the PMC	T ₀ + 3 months
➢ Support to Financing Settlement	T ₀ + 6 months
• Final Report	T ₀ + 12 months



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18. The total duration of the project will be 12 months from contract signature. A time schedule of the project activities shall be included in the Tender.

19. Payment:

- 25% the contract (advance payment), on the part of Spanish Administration, based on an Invoice endorsed by Nuclearelectrica
- 25% at T₀+ 6 months after the date of signing the contract on the part of the Spanish Administration, based on an Invoice endorsed by Nuclearelectrica.
- 50% upon acceptance of completed study on the part of the Spanish Administration, based on an Invoice endorsed by Nuclearelectrica.

20. Final Instructions to the Bidders

- a) The bidder shall bear all costs associated with the preparation and submission of its bid, and Nuclearelectrica and Spanish Administration will in no case be responsible or liable for those costs
- b) At any time prior the deadline for submission of bids, Nuclearelectrica and Spanish Administration may amend the bidding documents by issuing Addenda, subject to proper notice to all bidders and a new submission date extended as necessary

- c) Nuclearelectrica and Spanish Administration reserve the right to accept or reject any bid, and to cancel the bidding process and reject all bids, at any time prior to award of contract, without thereby incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidder or bidders of the grounds for Nuclearelectrica and Spanish Administration
- d) The successful bidder shall be notified by Nuclearelectrica and Spanish Administration by cable confirmed by registered letter that its bid has been accepted; this letter, called the “Letter of Acceptance”, shall specify the sum which Spanish Administration will pay the successful Adviser in consideration of the execution and completion of the Works; the notification of award will constitute the formation of the contract

ANNEX B

STATEMENT OF INTEREST IN THE TENDER

1. Company profile

- a) Company Annual Report or audited Balance Sheet and Financial Statement of the last available year.
- b) General information on the company, which must include:
 - Shareholders
 - Date of establishment
 - Sales of the last five years
 - Workforce. Part-time and full-time workers; their qualifications and experience.
- c) Reputed qualified Spanish firm(s) with background and experience in the area of project management and engineering interested in undertaking this assignment are requested to submit their proposals. The Adviser and its team shall have the following knowledge and experience:
 - (i) Advisory of large projects in energy and power sector
 - (ii) Economic analysis and modeling, cost of capital analysis and optimization using modern tools
 - (iii) Cost and Schedule review
 - (iv) Management services
 - (v) Experience of working in countries with risk similar to Romania (emerging markets)
 - (vi) Excellent communication, team-working and managerial skills
 - (vii) High degree of flexibility in working approach
 - (viii) Fluent English (the possibility to communicate in Romanian would be appreciated).

2. An exhaustive reference list of relevant projects describing scope of work

3. Short description of intended approach and general scope of the project

- 4. Proposed work team. This should include CVs of each member of the team and a letter of commitment valid for six (6) months. The CVs should contain the following data:
 - Name
 - Place and date of birth
 - Nationality
 - Academic degrees
 - Working languages
 - Relevant experience (including responsibilities and descriptions of the jobs)
 - Miscellaneous (publications, seminars, etc.)



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ANNEX C

CRITERIA FOR EVALUATION OF THE PROPOSALS

Criteria	Weight
I. TECHNICAL PROPOSAL	80
1. Company Capabilities	20
– Similar projects	8
– Similar countries of completion	8
– General International Experience	4
2. Technical Proposal	40
– Methodology	15
– Work Plan	10
– Approach	5
– Scope	5
– Time schedule	5
3. Work Team (key members)	20
Experience in similar projects	7
Experience in similar countries	7
Relationship with the company	3
Commitment to the project	3
II. ECONOMIC PROPOSAL	20
Price	20
TOTAL SCORE	100/100



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ANNEX D

700 MWE NUCLEAR POWER PLANT - CERNAVODA, UNIT 2 BASIC TECHNICAL DATA

1. Location

- Cernavoda, Constanta County, SE of Romania

2. Purpose

- Electric power production for domestic consumption

3. Owner

- Societatea Nationala Nuclearelectrica (SNN) SA

4. Contractors

- Design
 - Nuclear Steam Plant: AECL Canada
 - Main Power Island: Ansaldo Italy
 - Support Systems, Common Services and General Designer: CITON Romania
- Project Management: AECL – ANSALDO – SNN SA

- Construction
 - Constructor: CNE SA Cernavoda
 - Installation: Nuclearmontaj SA, NIMB, AMEA SA, TMUCB SA, Energomontaj SA

5. Reactor Type

- CANDU - PHW, horizontal, with pressure tubes, heavy water moderated and cooled
- Fuel - natural UO₂

6. Rated Power

- Thermal power: 2.180 MWt
- Electric power output: 706.494 MWe
- Net electric power: 653,5 MWe

7. Reactor

- Number of channels: 380
- Arrangement of channels: Square lattice
- Core radius: 314.17 cms
- Core length: 394.36 cms
- Fuel quantity: 95.76 tons UO₂ (4560 fuel elements)/year
- Burnup: 180 MWh/kg U (average)
260 MWh/kg U (maximum)

8. Moderator

- D₂O inventory: 264.3 tons (concentration 99.75% mol)
- Thermal load: 120 MWt
- Reactor inlet/outlet temperatures: 49/77° C
- Flow rate: 940 l/sec

9. Reactor Primary Coolant

- D₂O inventory: 199.1 tons (concentration - 99.5% mol)
- Thermal load: 2064 MWt
- Reactor inlet/outlet temperatures: 266/310°C
- Flow rate: 7.7x10³ kg/sec
- Header inlet/outlet pressures: 11.13/9.89 MPa
- Number of loops: 2, double

10. Fuel Handling

- Number of fuelling machines (F/M): 2
- On-power loading
- Position as to the reactor: Outside
- D₂O Inventory 4,5 tons

11. Secondary Agent

- Fluid: Steam
- Pressure: 4.7 MPa
- Temperature: 260° C
- Flow rate: 3,800 t/h

12. Turbine - Generator Assy:

Supplier: General Turbo Bucharest (under General Electric USA license)

- Type: Condensation, multistage action, axial on one shaft line, consisting of four sections, a double flow high pressure section and three double flow low pressure sections 1500 RPM
- Rated speed: 5
- Number of steam extraction lines: 4 kPa
- Condenser vacuum 46 m³/sec



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- Condenser circulation water flow rate:
- Electrical generator
 - rated power: 800 MVA
 - power factor: 0.9
 - rated voltage: 24 KV
 - stator cooling agent: H₂O
 - rotor cooling agent: H₂

13. Instrumentation and Control

- Process control is carried-out by two process computers
- Measurements are duplicated or triplicated
- Plant control is carried out from the Main Control Room (MCR) or, in the event of MCR unavailability, the plant is controlled from the Secondary Control Room (SCR)

14. Nuclear Safety Design Philosophy and Special Systems

- NPP design, construction and operation should provide that the occurrence probability of any radioactive release due to any component failure or human error in manoeuvring, is under 10⁻⁷ year reactor
- Prestressed concrete shielding containment (outer diameter - 43.59 m; height - 51.21 m)
- Emergency core cooling systems
- Shutdown cooling systems No. 1 (shutdown rods) and No. 2 (6 shut-down liquid injection units with boron or gadolinium solution)

15. Main Buildings

- Nuclear Steam Plant
 - Reactor Building
 - Service Building
 - Heavy Water Upgrading Plant
 - Emergency Core Cooling System Building
 - Secondary Control Room
 - Emergency Power Supply
- Connecting Building (K – L Gap)
- Conventional Plant
 - Deaerator Bay
 - Electrical Bay
 - Turbine Building
 - Standby Diesel Generator
 - Chiller Bay
 - Power Transformers Area
- Common Structures
 - Cooling and Service Water Pump House
 - Emergency Water Supply Building



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