SUMMARY PROJECT FICHE

1. Basic Information

Project Number: BG 0009.02

Title: Institutional Building of the Bulgarian State Committee for the Use of Atomic Energy for Peaceful Purposes (CUAEPP) -- Support for Licensing Activity Related to Decommissioning of Kozloduy Units 1 & 2.

Sector: Energy (nuclear safety)

Location: Bulgaria

2. Objectives

Wider Objective

- To contribute to the strengthening of nuclear safety in Bulgaria
- To prepare Bulgaria for the accession to the European Union

Immediate Objectives

- To assist Bulgarian Nuclear Safety Authority (CUAEPP) in real-time licensing of decommissioning activities on Kozloduy Units 1 & 2 and related facilities.
- To transfer know-how to the local Technical Safety Organisations (TSO) supporting the safety authority on a long term perspective.
- To provide inputs to ensure consistency with Western approaches to decommissioning.

Accession Partnership and NPAA Priority

Relevant AP short term priorities:

- Adopt and implement a realistic timetable for closure and decommissioning of units 1, 2, 3 and 4 of Kozloduy Nuclear Power Plant, monitor management of spent fuel and radioactive waste.
- Continue strengthening the independence and technical capability of the nuclear safety authority.

Relevant NPAA priorities:

- Strengthening the regulatory body. Optimisation of the regulatory regime.
- Improvement of the quality of the technical control over the nuclear power plant facilities.
- Improvement of the safety requirements on activities at the NPP, and on implementation of safety requirements concerning the decommissioning.
- Regulation of the relationships concerning the use of atomic energy for peaceful purposes, and the control over activities and entities that perform these activities by law.
- Revision and updating of the requirements on safe collection, treatment, storage and disposal of radioactive waste.
- Establishment of requirements on environmental impact assessment of nuclear facilities under decommissioning.

3. Description

Background and justification

Bulgaria has announced that Kozloduy Units 1 and 2 will be closed at the end of 2002. After shutdown the reactors will be decommissioned. These are the first reactors to be decommissioned by Bulgaria and a
project has been undertaken to develop a Decommissioning Conceptual Plan. A further follow-up industrial project is being proposed. In parallel there is a need for assistance to the Bulgarian nuclear regulatory body (CUAEPP) with associated licensing activities as a “2 + 2” approach. The project will provide technical support to CUAEP and will ensure that the level of safety is secure and consistent with standard Western practice.

Linked activities

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<th>Code</th>
<th>Project Description</th>
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<tr>
<td>BG 9608-01-01-L001 (finished in April 2000)</td>
<td>Technical Design for the Decommissioning of NPP Kozloduy Units 1 &amp; 2</td>
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<tr>
<td>BG 97.0481.00 (to be finished in October 2000)</td>
<td>Assistance to CUAEP in the Development of Requirements and Procedures for Decommissioning of Kozloduy Units 1 &amp; 2</td>
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<td>BG 9809-02-03 (in preparation)</td>
<td>Technical Design for the Decommissioning of NPP Kozloduy Units 1 &amp; 2 -- Part II</td>
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</table>

Results

- Support in real-time licensing activities for decommissioning of Kozloduy Units 1 and 2 and related facilities
- Strengthening of the capabilities of CUAEP and their Technical Safety Organisations.
- Transfer of Western know-how and main safety practice in the licensing evaluation processes at CUAEP.
- Successful licensing of decommissioning activities.

Activities

The activities to be performed consist of technical and regulatory assistance to CUAEP and its TSOs in the licensing process of the relevant steps of decommissioning of Kozloduy Units 1 and 2 and related facilities. This will be achieved by review of the safety cases and other reference documentation submitted to CUAEP by the licensee.

In the following a preliminary list of main activities is identified and described in general terms. In this objective assumptions are made on choices going to be taken in Bulgaria, but they could need to be updated during the implementation of the assistance according to the real and formal proposal which will be submitted for licensing by the utility.

Activity N° 1 – Licensing of defuelling operations and spent fuel storage

The first stage of decommissioning is to remove the fuel from the reactor and place it in storage on the Kozloduy site. The current route will be used to transfer fuel to the Spent Fuel Store. Possible problems will arise within the existing fuel route, as the fuel will be of low burnup and hence high reactivity. The safety case will, therefore, be reviewed to ensure that no additional problems have been introduced.

The utility is proposing to increase the capacity of the current spent fuel store by reracking which allows the density of the fuel in the store to be increased. This introduces two potential problems – criticality due to the increased fuel density and overheating due to the increased heat load and the reduced cross sectional area for heat transfer. This potential for criticality is further exacerbated by the introduction of fuel with a lower burn-up. The safety case will be reviewed to demonstrate that the fuel store remains safe under all normal and fault conditions including internal and external hazards. The safety case is expected to include consideration of the fuel and racking integrity under all loadings. Demonstration of criticality and thermal safety will be reviewed, including the performance of service systems supporting the safety functions.

Even with the increased capacity of the existing spent fuel storage facility, further capacity will be needed by the end of 2004 and hence the utility is proposing to build a dry fuel store. During the timescale of the project proposed here, only the earlier stages of the dry fuel store project will be completed. The safety cases produced during these stages will be reviewed to address the adequacy of the safety case for normal and fault conditions including hazards such as seismic. The review will consider the civil structure, fuel handling equipment and all systems and services that ensure fuel integrity is maintained in the store. In
addition the safety case for transfer of the fuel from the spent fuel pool to the dry fuel store will be reviewed. It is assumed that the dry fuel store will be cooled by natural convection so that it does not rely on active safety systems. Particular consideration will be given to ensuring that this is effective for the life of the installation. The radiological consequences of operation of the facility will also be reviewed.

Activity N° 2 – Support to licensing of the modification of the installation in preparation for Safe Enclosure

Overall plant safety has to be reviewed following the termination of operations and the plant documentation and rules (e.g. safety reports and technical specifications) will need to be rearranged. Moreover, the safety functions that are no longer needed and possible new important functions have to be defined in both the states with spent fuel in the plant or outside the buildings. All the preparatory works have to be defined with respect to the objectives and limits that take in account the interface with the important systems and with radiological protection safety objectives.

Modifications that are necessary to prepare for Safe Enclosure will cover shutdown, isolation and possible removal of systems that are not needed, adaptation of some systems for new roles and the introduction of new systems.

Some of the systems that support reactor operation are shared between Units 1 & 2 and Units 3 & 4. The safety justifications for removal or modification of systems will therefore be reviewed to ensure that:
- They can be safely removed from or modified on Units 1 & 2 without an impact on the safety of the shutdown reactors;
- They do not impact on the safe operation of Units 3 & 4.

Where new systems are to be provided or systems modified to maintain the safety of the Safe Enclosure, the safety justification for their design and operation for the entire 35-year life of the Safe Enclosure life will be reviewed. Systems that are likely to require modifications or the introduction of new systems include ventilation, electrical supplies, lighting, monitoring systems and a new control room. The review will determine whether their safety functions have been fully defined and that the ability to meet them has been substantiated.

Activity N° 3 – Licensing of decontamination and partial plant dismantling

All plant outside the safe enclosure that has radiological contamination will need to be decontaminated including the Special Building 1. Within the Safe Enclosure hazardous and flammable materials and thermal insulation will be removed and in some cases will require decontamination. Assistance in licensing the decontamination and partial dismantling is required.

Activity N° 4 – Preparatory step for operation license of safe enclosure

Within the frame of the given time schedule, in order to prepare the next activities, the Kozloduy utility will define with external support:
- controls,
- supervisions works,
- inspections,
- and maintenance activities

necessary for safe enclosure of the plant. Those activities will be presented to the Safety Authority in the “Technical specifications of the SE”. Also, an overall safety justification of the safe enclosure plan, including all aspects (design, operation, and radiological protection) will be presented to the Safety Authority in a pre-operational safety report. Within the frame of this assistance contract, it is planned to provide technical support to CUAEP for evaluation of this pre-operational safety report (accompanied with the above-mentioned Technical Specifications but also with other supporting documentation. This will permit to transfer Western European know-how to the CUAEP but also to guarantee that the safety level planned for SE operation will be on line with the one achieved on similar cases on Western reactors.

Activity N° 5 – Technical support for licensing activities and related facilities for waste treatment and storage
The first component of this activity will be to support the CUAEP in its evaluation of existing criteria for radwaste classification. The approach that will be taken should consider both aspects: international practice, but also consequence analysis. If necessary proposal for modifications will be recommended.

Secondly, technical support will be provided to the CUAEP for its licensing activities on operation license of the new waste processing facility (Liquid evaporation, cementation, compaction, incineration). On the basis of Final Safety Report, an independent evaluation will be performed and technical recommendations will be made to the CUAEP which will consider for decision.

As far as needed, support also will be given to CUAEP for the evaluation of waste storage facilities. This includes among other things the analysis of long term liquid storage tanks but also evaluation of safety of any other liquid or solid storage facility.

Assistance in definition of requirements for siting the national RAW repository is required.

4. Institutional Framework

The Bulgarian Nuclear safety Authority - The Committee on the Use of Atomic Energy for Peaceful Purposes (CUAEPP) - is a State Body and the number of its personnel is determined by the Council of Ministers. The CUAEP is a legal entity with its own budget and implements its activities with the help of an administration.

A Chairman governs CUAEP, supported by two deputy chairmen and executive secretary. The State Control on the safe utilization of atomic energy is carried out by the CUAEP through the Inspectorate on the Safe Use of Atomic Energy (ISUAE). ISUAE consists of three departments: Nuclear Safety Control Department, Nuclear Safety Assessment Department and Radiation Protection Department. ISUAE inspectors from the above mentioned departments have licensing and control functions, and issue obligatory prescriptions and ascertainment acts in cases of identified violations of the Act on the Use of Atomic Energy for Peaceful Purposes and the regulations for its enforcement.

The Ministry of Health, the Ministry of Environment and Water, the Ministry of Internal Affairs, the Ministry of Agriculture and Forestry and other state authorities conduct specialised control in the framework of their powers of authority.

The state policy on the safe use of atomic energy is implemented by the CUAEP through the following activities:

- determining the requirements for safe use of atomic energy and for accounting for control, storage and transport of nuclear materials;
- determining the criteria and requirements for training, qualification and licensing the work involved in the use of atomic energy;
- analysing and inspecting all activities;
- issuing and withdrawing licenses
- supervision and enforcement of the licensed activities;
- implementing the international co-operation;
- informing the public.

5. Detailed budget

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
<th>Budget (€)</th>
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<tr>
<td>Activity 1</td>
<td>Support to licensing of defuelling operations and spent fuel storage</td>
<td>500.000</td>
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<td>Activity 2</td>
<td>Support to licensing of the modification of the installation in preparation for Safe Enclosure</td>
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<td>Activity 3</td>
<td>Support to licensing of decontamination and partial plant dismantling</td>
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<td>Activity 4</td>
<td>Preparatory step for operation license of safe enclosure</td>
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<td>Activity 5</td>
<td>Technical support for licensing activities and related facilities for waste treatment and storage</td>
<td>500.000</td>
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6. Implementation Arrangements

Implementing Agency

All contractual and financial issues will be of the responsibility of CFCU, which will be the Implementing Agency.

The State Committee for Use of Atomic Energy for Peaceful Purposes (CUAEPP) will actively participate in the process of selection of companies to be pre-qualified, by providing experts and in close co-operation with the CFCU contribute to a sound and good selection of companies to provide the requested services.

The CUAEP will appoint a high official as Senior Programme Officer. The CUAEP will provide necessary office space, equipment and general administrative support for a successful implementation of the project. Day-to-day project monitoring, administration and control for the effective provision of services will be the responsibility of CUAEP.

The contact persons responsible from CUAEP for the implementation of the project and all project related issues are:

Contact person: Mr Tinko Ganchev
Address: 69 Shipchenkov Prokhod Blvd., BG-1574 Sofia, Bulgaria
Tel. +359-2-720217 Fax +359-2-702143

The inputs of the CUAEP will consist of the following:
Human resources: under the responsibility and co-ordination of the contact persons, the CUAEP will provide the experts from the relevant departments necessary to support the accomplishment of the specified project components;
Administrative and logistical support, such as adequate office space, office equipment, communications, fax and mailing facilities;

Non-Standard Aspects

Non-standard procedures and/or aspects are not expected. However, due to the highly technical scope of the services to be provided, it cannot be excluded that a direct agreement procedure may be required for this project. This is due to past experience in this respect, and the apparent limited number of organisations or non-profit associations able or interested in providing services of the specialised nature in question if made subject to the standard tendering procedure for services.

The EU regulatory authorities – which have been involved in the identification of the assistance needs under this project – will be informed as appropriate of implementation progress.

Contracts

One contract is expected with a total value of around € 1.85 million.

7. Implementation Schedule

Start of tendering: December 2000
Start of project activity: April 2001
Project Completion: Expected date of last payment December 2003
Note: The duration of the Project will strictly depend on the planning and implementation of industrial activity and related safety reports to be submitted to CUAEPP during the licensing process (in particular for Activities N° 2, 3 and 4).

8. Equal Opportunity

Equal participation of women and men will be achieved in all phases of the project.

9. Environment

Proper licensing and control on practical measures to prepare decommissioning of NPP Kozloduy Units 1 & 2 will ensure a safe enclosure of the reactor building and limit the risk of release of radioactivity to the environment during the 35 years period preceding dismantling.

10. Conditionality and Sequencing

Conditionality

Timely preparation of the detailed technical design for the decommissioning of Kozloduy 1 & 2 by the operator. Timely submission of request for licencing from the operator.

Sequencing

The Project will be a logical continuation of previous assistance financed by Phare under the project BG 97.0481.00. Linkages shall be established with the Phare support to the operator (BG 9809-02-03).

ANNEXES

1. Logframe matrix
2. Implementation chart
3. Contracting and disbursement schedule
**ANNEX 1**

**LOGFRAME PLANNING MATRIX FOR**
Institutional Building of the Bulgarian State Committee for the Use of Atomic Energy for Peaceful Purposes (CUAEPP) -- Support for Licensing Activity Related to Decommissioning of Kozloduy Units 1 & 2.

<table>
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<tr>
<th>Wider Objective(s)</th>
<th>Indicators of Achievement*</th>
<th>How, When and By Whom Indicators Will Be Measured</th>
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| • To contribute to the strengthening of nuclear safety in Bulgaria  
  • To prepare Bulgaria for the accession to the European Union | • Fully independent and competent nuclear safety authority capable of reaching effective decisions on the safety of nuclear installations within their jurisdiction corresponding to the regulatory state-of-art in the Union  
  • Accession to EU | • Annual Report of CUAEPP Chairman to Council of Ministers  
  • Accession reports published by Ministry of Foreign Affairs  
  • Regular reports of the Commission on the progress of Bulgaria towards accession |

<table>
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<tr>
<th>Immediate Objective (Purpose)</th>
<th>Indicators of Achievement*</th>
<th>How, When and By Whom Indicators Will Be Measured</th>
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| • To assist Bulgarian Nuclear Safety Authority (CUAEPP) in real-time licensing of decommissioning activities on Kozloduy Units 1 & 2 and relate facilities.  
  • To transfer know-how to the local Technical Safety Organisations (TSO) supporting the safety authority on a long term perspective.  
  • To provide inputs to ensure consistency with Western approaches to decommissioning. | • Timely and effective realisation of CUAEPP’s duties as regards licensing of decommissioning of Kozloduy Unit 1&2 in compliance with the agreement for their earlier closure (29.11.1999).  
  • Local TSO raised at international standards  
  • Decommissioning procedures in compliance with international recognised standards | • Annual Report of CUAEPP Chairman to Council of Ministers.  
  • Licensing documentation for decommissioning of Unit 1&2  
  • Reports from relevant International Organisations |

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<th>Assumptions and Risks</th>
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| | • Timely submission of licensing request from the operator (KNPP)  
  • Continued commitment of GOB in respecting the provisions of the “Work Plan for decommissioning” agreed with the EC |
<table>
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<tr>
<th>Results</th>
<th>Indicators of Achievement*</th>
<th>How, When and By Whom Indicators Will Be Measured</th>
<th>Assumptions and Risks</th>
</tr>
</thead>
</table>
| • Activities for decommissioning of Kozloduy Units 1 and 2 and related facilities successfully licensed in real-time  
• Strengthening of the capabilities of CUAEP and their Technical Safety Organisations.  
• Transfer of Western know-how and main safety practice in the licensing evaluation processes at CUAEP. | • Timely authorisations for implementation of all post-operational measures | • Annual Report of CUAEP Chairman to Council of Ministers  
• Progress reports of the Consultant  
• Timely implementation of decommissioning process in accordance with plan as verified by KNPP operator and EU Commission. | • Bulgarian Government must ensure further support to CUAEP within national priorities  
• Will depend on KNPP's schedule for submitting real and formal proposals for licensing to the safety authority |
| Activities | Assumptions and Risks | |
| • Support to licensing of defuelling operations and spent fuel storage  
• Support to licensing of the modification of the installation in preparation for Safe Enclosure  
• Support to licensing of decontamination and partial plant dismantling  
• Preparatory step for operation license of safe enclosure  
• Technical support for licensing activities and related facilities for waste treatment and storage | • Operation license for the new dry fuel store  
• Timely approval of the "post-operation Technical specifications"  
• Operation license for the waste treatment and storage facilities | • Will depend on timescale for the dry spent fuel construction to be financially supported by the KIDS fund  
• Will depend on the safety justification in the pre-operational report and other supporting documentation to be provided by the operator  
• Continued support and cooperation from CUAEP. |
ANNEX 2

Institutional Building of the Bulgarian State Committee for the Use of Atomic Energy for Peaceful Purposes (CUAEPP) -- Support for Licensing Activity
Related to Decommissioning of Kozloduy Units 1 & 2

Detailed Implementation Schedule

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### ANNEX 3

**CUMULATIVE CONTRACTING AND DISBURSEMENT SCHEDULE**

**Name of programme:**

**Institutional Building of the Bulgarian State Committee for the Use of Atomic Energy for Peaceful Purposes**

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