Extension of the on-site assistance to Smolensk NPP

Description

Background

Smolensk NPP (SmNPP), located in the Smolensk region of Russia, comprises 3 power units. The site lies 3 km away from the nearby town of Desnogorsk on the bank of an artificial lake situated on the river Desna. Unit 1 was commissioned in 1982, Unit 2 in 1985 and Unit 3 in 1990. All three units have reactors of the RBMK-1000 type and were still in operation at the time of this contract.

This project formed part of a co-ordinated programme of On Site Assistance to a number of Nuclear Power Plants located in Russia, Ukraine, Armenia and Kazakhstan started under the TACIS Programme. The On-Site Assistance (OSA) programmes were a corner stone of the TACIS nuclear safety co-operation with these countries. Companies or consortia with experience of NPP operation in the European Union (EU) were contracted by the European Commission (EC) to work on site at nuclear power plants of the Beneficiary country. The aims were to provide the transfer of know-how and soft skills, in particular through 'soft' assistance, which addresses the human element of safety (i.e. safety culture, quality assurance, maintenance, management and training,...), and to upgrade the safety of the plant through the supply of equipment ('hard' assistance). In many cases the soft assistance was directly related to the equipment being provided through the hardware supply projects. Through the TACIS programme, OSA projects were implemented at seven NPPs in Russia (Kola, Balakovo, Kalinin, Leningrad, Smolensk, Beloyarsk and Novovoronezh).

At Smolensk Nuclear Power Plant, the On Site Assistance activity had been active since 1994, the first project being programmed in the TACIS 1992 Nuclear Safety Programme. The last project financed under the TACIS programme was R1.05/03 (see Contracts 76763 and 105679). The present project was financed under the Instrument for Nuclear Safety Cooperation (INSC) and provided continuation of the OSA activities while the supply of TACIS financed equipment for the Radioactive Waste Treatment Facility at Smolensk NPP was still ongoing.

Objectives

This contract provided both 'soft' and 'hard' assistance projects, as defined above. The specific objectives in the two areas are given in the following.
Soft On-Site Assistance

Near Miss Reporting

Operating experience feedback (OEF) is concerned with drawing lessons from the experience of operation of one's own and other NPPs and applying the lessons learned through Corrective Action Programmes (CAP) to improve nuclear operational safety. A major part of an OEF programme is the reporting of near miss and low level events. While the consequences of such events may have been minor, they could have held the potential for severe safety implications. Reporting and analysis of such events can provide essential feedback to prevent reoccurrence with potentially serious consequences. The objective of the task was to assist SmNPP to establish a culture of open reporting of near miss and low level events and to develop/improve the methodologies for event analysis and feedback of lessons learnt.

Enhancement of Safety Culture

The objective of the task was to assist SmNPP in reducing human error by implementing tried and proven error prevention tools and techniques and to improve the human performance leadership capabilities of SmNPP managers and supervisors by enhancing their observation skills and introducing a coaching programme.

Review of plant maintenance functions

The objective was for the Consultant to perform a detailed review of SmNPP maintenance practice according OSART guidelines and develop recommendations and suggestions for improvement as well as recognise existing good practices where appropriate.

Hard On-Site Assistance

Implementation of the Plant Improvement Project (PIP) [also referred to as 'Large-Scale Project']

The PIP purpose is the supply of equipment for the new Radwaste Treatment Facility (RWTF) that was being constructed by SmNPP to replace the existing facility. The new facility would enhance the methods by which solid radwastes are handled at site. Wastes will be sorted and characterised before being processed in facilities for incineration, compaction, smelting (at a later stage) and storage in an environmentally acceptable form.

The Radwaste Treatment Facility will be used for acceptance, sorting and processing of the liquid and solid radioactive waste generated during the operation, maintenance and decommissioning of the NPP. It will also be used for interim storage of the waste. The processing of radwaste results in a reduction of the volume of waste and the waste is processed in such a way that it can be stored, transported and disposed of in a safe way.

The TACIS equipment supplies are associated with waste analysis equipment for
characterisation purposes, Control and Instrumentation (C&I) equipment for the cementation process (grouting lines), selected specific process components of the grouting lines, equipment for analysis of the incinerator off-gases and supercompaction equipment for waste reduction. The equipment was divided into 4 lots:

- Lot 1: Supply of a Supercompactor and Associated Equipment.
- Lot 2: Equipment for Monitoring and Analysis (Radiochemical Laboratory Equipment + On-line Gas Analyser for the Incinerator off-gas duct).
- Lot 3: Automatic Control and Monitoring System of the Grouting Units (Control and Instrumentation (C&I) Equipment).
- Lot 4: Process Control Equipment of the Grouting Units.

The TACIS supplies represent approximately 10% of the financial value of the total RWTF project.

**Results**

**Soft On-Site Assistance**

The soft assistance activities were implemented in accordance with the requirements through:

- Study tours/Workshops at UK and Finnish NPPs,
- Workshops at SmNPP,
- Preparation of training materials and implementation of training courses,
- Joint Consultant/SmNPP work on benchmarking of Russian approaches with western organisations, identification of improvement areas and development of enhancement programmes.

**Hard On-Site Assistance**

**Implementation of the Plant Improvement Project (PIP) [also referred to as ‘Large-Scale Project’]**

The status of the projects at the start of the present contract was as follows:

- Lot 1 - Supercompactor: Factory Acceptance Tests (FAT) completed; delivery awaited.
- Lot 2 - Equipment for Monitoring and Analysis: Equipment delivered, awaiting installation.
- Lot 3 - Automatic Control and Monitoring System: Equipment in manufacture; FAT planned.
- Lot 4 - Process Control Equipment: FAT completed; awaiting delivery.

The Consultant assisted SmNPP with the follow-up of these equipment supply projects, but delays due to the construction/refurbishment of the buildings of the RWTF prevented completion of the installation of the equipment prior to the end of the present service contract. The status of the projects at the end of the present contract was as follows:

- Lot 1 - Supercompactor: Delivery completed; awaiting readiness of building for final installation, testing and commissioning.
- Lot 2 - Equipment for Monitoring and Analysis: Equipment delivered. Laboratory equipment tested
and accepted. Gamma spectrometers of the grouting units and incinerator off-gas analyser awaiting final installation, testing and commissioning.

- Lot 3 - Automatic Control and Monitoring System: Equipment in manufacture; Equipment delivered; awaiting readiness of SmNPP for final installation, testing and commissioning.
- Lot 4 - Process Control Equipment: Equipment delivered; awaiting readiness of SmNPP for final installation, testing and commissioning.

The outstanding activities mentioned above were performed by the equipment suppliers with direct witnessing and supervision of DEVCO supported by JRC.

The contract was signed in November 2009 and was completed in December 2011.

---

**General Information**

<table>
<thead>
<tr>
<th>Title:</th>
<th>Extension of the on-site assistance to Smolensk NPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programme:</td>
<td>INSC</td>
</tr>
<tr>
<td>Amount:</td>
<td>€ 954,598,61</td>
</tr>
<tr>
<td>Budget year:</td>
<td>2009</td>
</tr>
<tr>
<td>Countries:</td>
<td>Russia</td>
</tr>
<tr>
<td>Nature:</td>
<td>Services</td>
</tr>
<tr>
<td>Types of activities:</td>
<td>On Site Assistance</td>
</tr>
<tr>
<td>NPP:</td>
<td>Smolensk</td>
</tr>
<tr>
<td>Duration (months):</td>
<td>25</td>
</tr>
<tr>
<td>Contracting authority:</td>
<td>European Commission</td>
</tr>
<tr>
<td>Contractors:</td>
<td>National Nuclear Corporation</td>
</tr>
<tr>
<td>Status:</td>
<td>Closed</td>
</tr>
<tr>
<td>CRIS number:</td>
<td>219321</td>
</tr>
<tr>
<td>Project reference:</td>
<td>R1.05/09</td>
</tr>
<tr>
<td>Decision number:</td>
<td>NSI/2009/021-717</td>
</tr>
<tr>
<td>Method of procurement:</td>
<td>Negotiated Procedure</td>
</tr>
<tr>
<td>Signature date:</td>
<td>12/10/2000</td>
</tr>
<tr>
<td>Effective contract date:</td>
<td>02/11/2009</td>
</tr>
<tr>
<td>Contract end date:</td>
<td>01/01/2012</td>
</tr>
<tr>
<td>Closure date:</td>
<td>28/02/2014</td>
</tr>
</tbody>
</table>