



Annex 1

ARGENTINA: ATUCHA 2 NPP — PRESERVATION AND MAINTENANCE

Summary

This annex deals with *preservation and maintenance*. It describes managerial actions and physical measures taken to preserve the equipment and facilities at site. Also described are the problems encountered, most of which appear to originate from management.

Overview

The construction of Atucha 2 (CNA-II) 700 MW(e) NPP experienced several delays. Construction has been suspended since 1995 except for some contracts of components, supplies and items related to emergency power supply systems in operation.

About 100 000 items have been delivered to the site including turbine-generator, reactor pressure vessel, pipes, fittings, valves, pumps, motors, transformers, electrical cables, etc.

About 95% of the items are already either stored or erected at site. The civil works of buildings are 99% complete. About 35% of electromechanical components have been erected. Spools of piping have been pre-assembled to the extent of 58% and stored. Piping systems to the extent of 19% have been erected.

Key elements

- The main activity at Atucha 2 is the preservation of site installations, structures and equipment. The preservation programme was planned starting at project suspension. The programme is oriented towards the achievement of preserving the good condition of the installations, structures and equipment.
- Organization responsible for the engineering, construction and commissioning is also responsible for the preservation of NPP.
- The programme defines the minimum scope of preservation which achieve the planned goals with available resources.
- The organizational structure has been modified to incorporate a sub -organization whose specific responsibility is preservation.
- In order to augment the scarce manpower, the participation of the engineering personnel who have been involved in the design has been increased.
- To achieve the target of maintaining readiness for resumption of the project when the conditions permit, a *preservation programme*, having the following attributes was developed:
 - provide protection against corrosion damage, contamination, mix-ups or loss
 - be described in a procedure
 - be set up so that effectiveness of preservation measures can be easily checked
 - ensure that parts and components are be clearly identified
 - preserve civil works, structures and installations
 - generate evidence which will enable verification of the achievement of the programme objectives.
- Additional procedures to train and qualify personnel have been established.

- Manufacturers have qualified personnel to work on their components.
- Additional project specifications and work instructions have been established in order to define the manner of preservation, approval of process and equipment, monitoring, control and recording.
- According to the recommendations of the manufacturers and the requirements of the project specifications, a methodology for preservation in "as delivered" condition has been developed which includes measures for:
 - Packing for physical protection
 - Temporary protection against contamination
 - Marking
 - Storage conditions at site for each package
 - Inspection and recording of the packages and parts and preservation conditions.
- The programme applied at Atucha 2 for the preservation of mechanical, electrical and I/C parts and components has been subdivided in three principal groups:
 - Preservation of mechanical, electrical and I/C parts and components packed in original condition as delivered (wooden boxes in most cases) and preserved suitably against corrosion by means of intermediate storage preservation
 - Preservation of mechanical, electrical and I/C parts and components between the time of removal of the intermediate storage preservation and start of commissioning
 - Preservation of civil works, structures and installations.
- A system for surveillance, inspection and recording has been implemented.
- Self assessment and independent assessment (Main Contractor, Insurance Company, Owner, etc.) are carried out to determine the programme effectiveness and the adherence to the specific engineering standards and project specifications.

Problems encountered

The following main problems have been experienced:

- Preservation of installations, structures and equipment was not included in the original QA programme
- Preservation activities were not sufficiently described in a procedure
- No original provision of enough place to storage
- The packaging of national suppliers was not suitable for long time preservation
- No sufficient initial experience to manage preservation of actual volume of items
- The responsibilities for preservation and the organization were dispersed into the organizational structure and were not defined
- General economic restrictions affected the necessary human and material resources
- Difficulties to maintain qualified personnel.

Additional information

None.

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