

## EXECUTIVE SUMMARY

Upon the invitation of Ringhals AB, Sweden, a peer review mission on safe long term operation (SALTO) was provided to review programmes/ activities of Ringhals nuclear power plant units 1 and 2 (further referred as “the plant”).

Unit 1 is an Asea-Atom designed boiling-water reactor (BWR) put into commercial operation in 1976 while unit 2 is a Westinghouse designed pressurized-water reactor (PWR) put into commercial operation in 1975.

The design lifetime of both plants is 40 years. Swedish nuclear power plants operating licenses have no time limits; however a periodic safety review (PSR) shall be conducted every 10 years. Both plants are aiming for 50 years of operation as a current target lifetime.

The mission reviewed completed, in-progress and planned plant activities related to long term operation (LTO) including activities involving the ageing management of systems, structures and components (SSCs) important to safety and revalidation of time limited ageing analyses (TLAA).

Through the review of information obtained from available documents, programmes, presentations, and discussions with counterparts and other members of the plant staff, the IAEA team found that while the plant has initiated activities for LTO preparation. This was done rather late to enter the LTO period with all tasks fulfilled. Based upon the observations of this SALTO review, the team concluded that the plant has yet to complete a significant part of the activities important for safe LTO.

The SALTO team concluded that plant management is committed to improving plant preparedness for LTO. In addition, the team noticed the following good practices:

- Expert system for in-service inspection management;
- Specialist Programme.

Taking into account the above mentioned points, the team recognised that the plant approach and preparatory work for safe LTO generally follows the IAEA Safety Standards and international practices.

The team identified areas for further improvement. Sixteen issues were raised:

- There is no complete and consistent set of requirements related to LTO;
- The roles and responsibilities, organization and interfaces concerning the preparation and implementation of the LTO project are not appropriately defined;
- The methodology for scoping and screening is not appropriately defined and part of the safety relevant SC's scope is screened out of the LTO assessment;
- There is a lack of expectations/ agreements with all information holders relevant to performing the LTO assessment;
- The existing methodology, schedule and available resources do not assure timely implementation of the LTO programme;
- The LTO approach is not consistent for all mechanical components;

- The existing plant documentation does not fully cover all attributes of effective AMP and the effective conversion of the existing SUPs and DOSs into AMR reports is not properly described;
- There is no fully implemented proactive obsolescence management programme in place;
- Existing practices in maintaining some electrical and I&C equipment do not assure its qualification and functionality during the period of LTO;
- The practice of storing equipment and furniture in close proximity to electrical and I&C safety equipment is inconsistent with the LTO preconditions and may jeopardize operability during and after a seismic event;
- The process for incorporating external operating experience consideration for LTO is not effective;
- There are several lists of SCs relevant for LTO which are not coordinated;
- The plant has not demonstrated that assessment of the unit 1 grouted containment tendons operability is valid for the period of LTO;
- Tendon surveillance programme has not demonstrated that the unit 2 containment prestressing tendons can maintain their design function during LTO;
- The plant has not demonstrated that the unit 2 spent fuel pool can maintain its structural integrity during LTO;
- Various human resource (HR), competence (CM) and knowledge management (KM) processes and procedures for LTO are not consistently implemented.

A summary of the review was presented to the plant management during the exit meeting held on 13 March 2014. The plant management expressed a determination to address the areas identified for improvement, and indicated the intention to invite a “SALTO peer review mission” in 2016 to continue the review of the plant preparation for LTO. This mission will also review progress in solving issues raised during this mission.