

EXECUTIVE SUMMARY

At the invitation of Vattenfall AB, the IAEA conducted a SALTO (Safety Aspects of Long Term Operation) mission at Unit 3 of the Ringhals Nuclear Power Plant in Sweden from 27 February to 8 March 2018.

Vattenfall AB is the majority owner of Ringhals NPP (70.4 %). The other owner is Sydkraft Nuclear Power AB (29.6%). Operation of Unit 3 started in 1981. The unit will achieve its originally designed life time of 40 years of operation in 2021 and the company is preparing the PSR report covering the period of operation between 40 and 50 years.

MAIN MISSION CONDUCT AND RESULTS

This SALTO mission focused on the status of activities for the Long Term Operation (LTO) assessment of the plant. The review team consisted of three IAEA staff members (Team Leader, Deputy Team Leader, Observer), six external experts and three external observers, covering all areas of the standard scope of a SALTO mission.

The team reviewed the completed, in-progress and planned activities related to LTO, including Ageing Management (AM) of the Systems, Structures and Components (SSCs) important to safety and revalidation of Time-Limited Ageing Analyses (TLAAs).

Based on available documents, presentations and discussions with counterparts and other members of the plant staff, the IAEA team reviewed the progress in the field of ageing management and preparedness for safe long-term operation. The team observed that the LTO project of the plant addresses most of the topics as recommended by the IAEA. Some activities are still in implementation and some are fully completed. Based upon the observations of this SALTO mission, the team found a good progress in the field of ageing management and preparedness for safe long-term operation. Walk-downs also showed that the plant is in good condition.

The IAEA team found the plant staff to be professional, open and receptive to suggestions for improvement and the plant management to be committed to improving plant preparedness for LTO.

In addition, the team found several good practices and good performances, including the following:

- The LTO project is implemented using primarily the plant's own staff;
- The plant has successfully developed and implemented a comprehensive risk informed in-service inspection methodology for piping;
- The plant has used a novel approach to identify corrosion in concrete structures exposed to marine environment.

The team found areas which should be improved to reach the level of international good practice. Seventeen issues were raised for further improvement:

- A lack of detailed regulatory requirements is not compensated by an overall plant LTO programme;
- Plant processes to manage LTO activities are not comprehensive and the importance of LTO is not well communicated;
- Not all scope setting results for ageing management and LTO have been documented and used in an appropriate and traceable manner;
- The plant SSC identification system is not consistent for all SSCs within the LTO scope;

- Ageing management of mechanical components is not fully implemented;
- The traceability of the actions to manage ageing of mechanical SSCs has not been properly formalized to support LTO;
- Revalidation of TLAAAs for mechanical components is not completed to support LTO;
- Data consistency and data completeness for LTO assessment is not ensured;
- The plant equipment qualification programme is insufficient to demonstrate the qualification of all components important to safety;
- The plant ageing management programme for cables and connections is not sufficiently comprehensive for the purposes of LTO;
- Ageing management of civil structures is not comprehensive for LTO;
- The plant has not demonstrated that the containment prestressing tendons can maintain their design function during LTO;
- Human resources activities are not coordinated in a sustainable way to support LTO;
- The plant has not finalised the process of identifying and enhancing knowledge and competences related to ageing management for LTO period;
- A long term staffing plan for LTO is not established;
- Processes for competence management are not completely implemented;
- Knowledge management for LTO is not fully embedded in the plant strategy and the implementation of knowledge management processes is not complete.

A summary of the results was presented to the plant management during the exit meeting held on 8th March 2018. The plant management expressed a determination to address the areas identified for improvement and indicated the intention to invite a ‘SALTO Follow-up Peer Review Mission for Ringhals Nuclear Power Plant Unit 3 in January 2020 to review the progress in resolution of issues from this SALTO mission.

FOLLOW-UP MISSION CONDUCT AND RESULTS

The IAEA follow-up team consisted of two IAEA staff members (team leader and deputy team leader) and two external experts from Belgium. Both participating experts were members of the SALTO team in March 2018.

This document is the report from the March 2018 SALTO mission supplemented with the ‘counterpart actions’ and ‘follow-up assessment by the IAEA review team’.

The IAEA follow-up team reviewed the progress in solving each of the issues from the 2018 SALTO mission. The ‘counterpart actions’ provided in the issue sheets were reviewed by the IAEA team prior to the follow-up mission and confirmed in the field during the visit. Findings were reflected in ‘Follow-up assessment by the IAEA Review Team’. The IAEA overall observation is given in issue sheets section ‘Resolution Degree’. A summary on ‘Status at follow-up SALTO mission’ is also prepared by the IAEA team for each review area.

Based on the findings of the follow-up mission, the team noted that the plant had progressed in solving most of the issues. Resolution of some issues requires further work by the plant. The resolution degree was determined by the team for each issue sheet separately, with the following results:

- 1 issue was assessed as insufficient progress to date;
- 11 issues were assessed as satisfactory progress to date;

- 5 issues were assessed as issue resolved.

The plant management expressed determination to continue to address the remaining issues and prepare Ringhals unit 3 for safe LTO.