EXECUTIVE SUMMARY

At the invitation of Swedish Radiation Safety Authority (SSM), the IAEA conducted a Pre-SALTO (Safety Aspects of Long Term Operation) mission at Forsmark Nuclear Power Plant (NPP) Unit 1 and 2 (further referred as 'the plant') from 11 to 20 June 2019 and a follow-up mission from 26 to 29 October 2021.

Units 1 and 2 have been in operation since 1980 and 1981 and will reach their design lifetime of 40 years in 2020 and 2021, respectively. NPP operating licenses are not time-limited in Sweden, but periodic safety review (PSR) is required every 10 years to demonstrate the safety of continued plant operation. The plant management intends to extend operation of both units for another 20 years.

MAIN MISSION CONDUCT AND RESULTS

The Pre-SALTO mission focused on the status of activities related to long term operation (LTO) of the plant. The review team consisted of three IAEA staff members (team leader, deputy team leader, observer), six international experts and three international observers, covering all six areas of the standard scope of a Pre-SALTO mission.

The team reviewed the completed, in-progress and planned activities related to LTO, including ageing management of the structures, systems and components (SSCs) important to safety and revalidation of time limited ageing analyses (TLAAs).

Through the review of available documents, presentations and discussions with counterparts and other members of the plant staff, the IAEA team assessed the progress in the field of ageing management and preparedness for safe long-term operation. The plant's LTO activities address some topics recommended by the IAEA, some activities are complete and some are still being implemented. Based upon the observations of the SALTO mission, the team noted progress in the field of ageing management and preparedness for safe long-term operation.

The team found the plant staff to be professional, open and receptive to suggestions for improvement. The mission team concluded that plant management is committed to improving plant preparedness for LTO. Walk-downs showed the plant to be in good condition.

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

- The plant takes part in cooperation among Northern European NPPs on sharing spare parts procurement (review area C);
- The plant maintains the condition and availability of spare parts through optimum storage solutions (review area D);
- The plant's staff planning initiatives promote it as an attractive employer (review area F).

The team found areas which should be improved to reach the level of IAEA Safety Standards and international good practices. Nineteen issues were noted:

- Organizational strategy to ensure implementation of LTO activities is not comprehensive;
- The current PSR is not comprehensive to support justification of LTO;
- Some ageing management aspects are not incorporated into the design and configuration management processes;
- Safety analysis report is not updated to support safe LTO;

- The process to identify SSCs for the LTO scope is inadequate;
- Results of scope setting and Ageing Management Reviews (AMR) are not reflected in plant programmes in a timely manner;
- The plant's corrective action programme is not used for ageing and LTO issues;
- Databases used for the assessment of the in-scope SSCs for LTO are not comprehensive;
- Commodity grouping for in-scope mechanical, electrical and I&C SSCs for LTO is not adequate to ensure a complete AMR;
- The analysis of surveillance data of the reactor pressure vessel is not comprehensive enough to definitively conclude about its structural integrity during the LTO period;
- The equipment qualification programme is not comprehensive for all components important to safety;
- The AMR content and action implementation plans for in-scope electrical and I&C SCs are incomplete;
- The plant's obsolescence management programme is insufficiently developed to demonstrate adequacy for LTO;
- Condition assessment and AMR of in-scope civil SSCs are not comprehensive;
- The Ageing Management Programmes (AMPs) of in-scope civil SSCs are not adequate;
- The plant has not fully implemented competency management for ageing management and LTO;
- The plant does not have an integrated and systematic programme for managing critical knowledge for LTO;
- The plant has insufficient information technology to manage information and records to support the organizational objectives, strategies and needs for LTO with regards to human resources development;
- LTO staffing policy, objectives and associated strategies for human resources are not fully established and implemented.

A summary of the results was presented to the plant management during the exit meeting held on 20 June 2019. The plant management expressed a determination to address the areas identified for improvement. It was agreed with the plant management and regulatory authority to consider this report as a Pre-SALTO mission report for unit 1 and 2 and to organize a 'SALTO Peer Review Mission to Forsmark Nuclear Power Plant Unit 1, 2 and 3' in 2021.

FOLLOW-UP MISSION CONDUCT AND RESULTS

The IAEA follow-up team consisted of four experts from Belgium, France, Spain and Switzerland, and one IAEA staff member covering all areas of the original Pre-SALTO review mission.

The IAEA follow-up team reviewed the progress in solving each of the issues from the 2019 pre-SALTO mission. Based on the observations 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:

- Four issues were assessed as issue resolved;
- Fourteen issues were assessed as satisfactory progress to date;
- One issue was assessed as insufficient progress to date.

The SALTO team concluded that actions taken to solve some recommendations and suggestions are sound and implemented well. The following can be highlighted:

- Issue A-4: The plant updated the Safety Analysis Report to support LTO.
- Issue C-3: The plant completed the analysis of surveillance data of the reactor pressure vessel.
- Issue D-3: The plant completed the development of a proactive obsolescence management programme.

Nevertheless, some issues will still require significant attention and effort of the plant. The most important ones are as follows:

- Issue A-3: The plant should consider ensuring that ageing management aspects are fully incorporated into the design and configuration management processes.
- Issue B-1:The plant should ensure an adequate scope setting process for LTO.
- Issue D-1: The plant should implement a comprehensive equipment qualification programme for all components important to safety.

A summary of the results was presented to the plant management during the exit meeting held on 29 October 2021.The plant management expressed determination to continue to address the remaining issues and prepare Forsmark unit 1 and 2 for safe LTO