## EXECUTIVE SUMMARY

Upon the invitation of Swedish Radiation Safety Authority (SSM), a peer review mission on long term operation (Pre-SALTO) was conducted to review programmes/activities of the Forsmark Nuclear Power Plant Unit 1 and 2 (further referred to as "the plant") important for demonstration of safety of long term operation.

The plant is one of ten operating power reactors in the Kingdom of Sweden located 120 kilometres north of the capital Stockholm in the municipality of Östhammar. Three ASEA-ATOM boiling water reactor (BWR) units have been constructed on the site.

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. Currently, NPP operating licenses are not time-limited in Sweden, but Periodic Safety Review is required each 10 years to demonstrate safety of the plant operation. The plant management intends to extend operation of all units for another 20 years.

This Pre-SALTO mission reviewed the status of plant activities for the long term operation (LTO) assessment of the plant. A preparatory meeting was held in April 2016. The scope of the Pre-SALTO mission was agreed upon and defined in the Terms of Reference (ToR) issued in April 2016. The ToR also outlined the review team comprising two IAEA staff members, six external experts and four observers covering all areas of the standard scope of a Pre-SALTO mission.

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

Through the review of available documents, including the Advance Information Package (AIP), plant documents, contractors' documents, presentations and discussions with counterparts, as well as with other members of the plant staff, the mission team concluded that the plant has initiated most of the activities for safe LTO and ageing management. The LTO project covers many of the topics recommended by the IAEA. Some technical work has already been performed by the plant staff and contractors to prepare for LTO. Nevertheless, the team concluded that many activities important for demonstration of preparedness for safe LTO are in an initial phase or have not yet been initiated.

The team found the plant staff professional, open and very receptive to suggestions for improvement. The mission team concluded that plant management is committed to improving plant preparedness for LTO. Walk-downs showed that the plant is in a very good condition. In addition, the team noticed the following good performances:

- Comprehensive safety review process for major plant modifications;
- Use of PSA to expand the scope of SSC for LTO evaluation;
- Plant participation in regional initiatives such as Nordic Framework and Norderf organization to exchange operational experience from Swedish and Finish BWR NPPs, including subjects related to LTO.

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.

However, the team identified several fundamental areas for further improvement. Sixteen issues were raised:

- Regulatory expectations related to LTO and AM are not clear for the plant;
- The plant organizational structure to support LTO project is not adequate to ensure effective preparation for safe LTO;
- Design basis documentation is not completely accessible and updated to support LTO;
- Methodology and guidance for the scoping and screening are not sufficiently detailed to ensure consistent identification of SSCs for LTO assessment;
- Clear rules, methodology and walk-down plans to identify non-safety structures and components (SCs) within the LTO scope have not been established;
- The current schedule for the scoping and screening process is ambitious, however effective work management for the scoping and screening process does not exist;
- Existing plant programmes are not sufficiently evaluated for LTO;
- Current approach for identification and revalidation of TLAAs for mechanical components is not comprehensive enough to support LTO;
- A proactive and systematic programme for managing technological obsolescence is not developed;
- Several databases are used for the assessment of the SCs in LTO scope, but the process to ensure data consistency between databases and data completeness is not defined;
- The equipment qualification programme is not comprehensive;
- The plant's operation practice of storing equipment and material close to electrical and I&C safety equipment is not conducive to ensure equipment operability during and after seismic event;
- Approach to revalidation of civil structure TLAAs is not comprehensive;
- Ageing management review for mechanical and civil SSCs has not been properly performed to support LTO;
- Human resources policy and strategy for LTO is missing;
- Knowledge management and knowledge transfer for LTO is neither systematically formalized nor embedded within management system.

A summary of the review was presented to plant management during the exit meeting held on 9 November 2016. The plant management expressed a determination to address the areas identified for improvement, and indicated the intention to invite a second "Pre-SALTO peer review mission" for Unit 1 and 2 in November 2018 to continue in the review of the plant preparation for LTO.

Appendix III of this report includes the team's detailed recommendations and suggestions arising over the course of this mission.