

## EXECUTIVE SUMMARY

Upon the invitation of CNNO, a Pre-SALTO peer review mission on safe long term operation (Pre-SALTO) was conducted to review programmes/activities of the Qinshan Nuclear Power Plant 320 MWe Unit (further referred as “the plant”).

The administrative address of the plant is CNNP Nuclear Power Operations management Co., Ltd. (CNNO), Haiyan, Zhejiang, 314300, People’s Republic of China. The plant is located on the eastern coast of China. The plant is owned and operated by CNNP. Operation started in 1991. The NSSS is of Westinghouse type, designed by SNERDI. The unit is equipped with a reactor operating with enriched uranium (U-235) as fuel and light water as moderator and coolant (PWR type reactor).

The initial license to operate the plant was issued by the National Nuclear Safety Administration (NNSA) and the plant has been in operation since 1991. The assumed design life of the plant is 30 years. The NNSA interfaces with the plant through CNNP Corporate, with NNSA inspectors on site. It is further required that every 10 years a Periodic Safety Review (PSR) be performed. The first PSR was carried out in 2001 and a second in 2014. The regulatory requirements for LTO have not been established yet; however NNSA plans to issue a technical policy for LTO in 2015. The plant licence will expire in 2021. The plant has an intention to extend its life time to 50 years. A licensing renewal application should be submitted to NNSA in 2016.

This Pre-SALTO mission reviewed the status of the plant activities for safe LTO assessment. A preparatory meeting was held in June 2015. The scope of the Pre-SALTO mission was agreed on and defined in the Terms of Reference issued in June 2015. The review team was organised accordingly; it comprised four IAEA staff members, four external experts and three observers covering all disciplines stated in the Terms of Reference.

The mission reviewed completed, in-progress and planned plant activities related to LTO, including activities involving the ageing management 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 and other plant documents, presentations and discussions with counterparts and other members of the plant staff, the IAEA team concluded that the plant has worked extensively in the field of long-term operation and ageing management. Operation License Extension (OLE) project is covering many topics as recommended by IAEA and other topics are addressed by relevant processes. Based upon the observations of this Pre-SALTO review, the team finds good progress in preparation for the long-term operation of the plant. The team has found the plant staff professional, open and very receptive to suggestions for improvement. Walk-downs showed that the power plant is in a good condition.

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

- Steam generator tube bundle ageing management;
- Key knowledge training.

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. Fourteen issues were raised:

- International codes and standards are being applied selectively by the plant and hence are not addressing all topics important for safe LTO;
- Design basis documentation is not adequately managed to assure its availability for the plant;
- Ageing of active and short-lived passive components is not assessed for LTO;
- The current plant programmes relevant to LTO have not been evaluated for their effectiveness in managing ageing;
- Scoping and screening for LTO, including identification of active and short-lived passive components, with clear indications of boundaries, is not yet complete;
- The ageing management review and ageing management programmes for mechanical components are incomplete;
- The scope, evaluation and revalidation of TLAs for mechanical components are incomplete;
- The plant has not established an environmental qualification programme which is a precondition for LTO;
- Not all criteria and time limited ageing assumptions necessary for performing a comprehensive ageing management review of electrical and I&C equipment for the period of LTO have been established;
- Obsolescence of SSCs important to safety is not managed proactively throughout their service life;
- Comprehensive ageing management review and subsequent establishment or enhancement of ageing management programmes for civil components is incomplete;
- The relevant information required for AMR and for assessment of the current physical status of the plant is not readily accessible by the plant staff;
- The plant does not have a comprehensive strategy and plan for the management of human resources, and necessary competences, for LTO;
- The plant does not have a comprehensive Knowledge Management policy and processes for LTO.

A summary of the review was presented to plant management during the exit meeting held on 21 October 2015. Plant management expressed a determination to address the areas identified for improvement, and indicated its intention to invite a “SALTO peer review mission” in May 2017 to complete the review of the plant preparation for LTO.

Appendix III of this report includes the team’s detailed recommendations and suggestions arising from this mission.