EXECUTIVE SUMMARY

At the invitation of the Government of Armenia the IAEA conducted a SALTO (Safety Aspects of Long Term Operation) mission at Unit 2 of the Armenian Nuclear Power Plant (NPP) from 27 November to 6 December 2018 and a SALTO follow-up mission from 26 to 29 October 2021.

The Armenian Nuclear Power Plant (ANPP) is a subsidiary of the Ministry of Energy, Infrastructures and Natural Resources of Armenia. At the plant, only Unit 2 is in operation. The design lifetime of the Russian-designed WWER-440 was 30 years. The plant was put into operation in 1980, temporarily shut down in 1989 and restarted in 1995. The plant's operating licence expires in 2021.

MAIN MISSION CONDUCT AND RESULTS

The SALTO mission focused on the status of activities related to Long Term Operation (LTO) of the plant. The review team consisted of two IAEA staff members (Team Leader, Deputy Team Leader), six international experts and four international observers, covering all six 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).

Through the review of available documents, presentations and discussions with counterparts and other members of the plant staff, the IAEA team assessed progress in the field of ageing management and preparedness for safe long-term operation. The plant's LTO project addresses most of the topics recommended by the IAEA. Some activities are completed, and some are still being implemented. Based upon the observations of this 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. Walk-downs showed that the plant is in maintained condition. The team observed that the plant management is committed to improving plant preparedness for LTO.

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

- Weekly training for plant managers that includes LTO areas for plant modernization;
- A comprehensive chemistry monitoring process that provides information for ageing management;
- A dedicated crack monitoring programme to ensure the integrity of the dry spent fuel storage facility.

The team found areas which should be improved to meet the level of international good practice. Fifteen issues were noted:

- The plant does not apply a proactive approach for preparation for LTO.
- Safety Analysis Report is not being updated throughout LTO.
- The plant has not performed a systematic safety assessment for LTO.
- The scoping methodology for ageing management and LTO is not comprehensive and not properly implemented.
- Ageing management programmes and ageing management implementation does not ensure safe operation of SSC within LTO scope.

- Management of ageing related data does not fully support effective ageing management of SSCs in the scope of LTO.
- The plant has not assessed all necessary data used to ensure completeness of the ageing management review for mechanical, electrical and I&C components and civil structures.
- Ageing management for mechanical components is not comprehensive to support reliable operation of SSCs for LTO.
- The plant has not identified, developed and revalidated TLAAs.
- The environmental qualification of in-scope SSCs is not preserved.
- The plant does not have a proactive technological obsolescence programme.
- The plant has not performed comprehensive scoping of mechanical components and civil structures for ageing management and LTO.
- The plant does not have adequate AMPs to address all in-scope civil structures.
- The plant has inadequate human resources policy and processes for LTO.
- The plant has an incomplete knowledge management process for LTO.

A summary of the results was presented to the plant management during the exit meeting held on 6 December 2018. The plant management expressed a determination to address the areas identified for improvement and indicated their intent to invite a 'SALTO follow-up Peer Review Mission to Armenian Nuclear Power Plant' in November 2020.

FOLLOW-UP MISSION CONDUCT AND RESULTS

The IAEA follow-up team consisted of one IAEA staff member (team leader) and three external experts covering all areas of the original SALTO peer review mission.

In October 2021, the Armenian Nuclear Regulatory Authority (ANRA) issued a permit to operate Unit 2 until September 2026, beyond the originally granted licence valid until the end of 2021. The extension was granted based on a request of the plant, which completed an extensive modernization and safety improvement programme in 2021, including: heat treatment of the reactor pressure vessel to recover material strength; replacement of a large number of components of emergency systems; modernization of emergency systems and the control and monitoring systems; and replacement of safety related cables.

The IAEA SALTO follow-up team reviewed the progress in addressing each issue from the 2018 SALTO mission. Based on the findings the team noted that the plant had progressed in resolving most of the issues. Complete resolution of some issues requires further work by the plant. The progress was assessed by the team for each issue sheet separately, with the following results:

- Five issues were assessed as insufficient progress to date;
- Eight issues were assessed as satisfactory progress to date;
- Two issues were assessed as issue resolved.

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-1 – The plant developed a proactive approach to prepare for the second LTO.
- Issue A-2 – The plant improved and updated its Safety Analysis Report to support LTO.

- Issue B-1 – The plant improved the methodology for defining the scope of components designated for ageing management.

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

- Issue A-3 – The plant should perform a systematic safety assessment for LTO.
- Issue D-1 – The plant should ensure preserving environmental qualification of in-scope equipment.
- Issue C-2 – The plant should consider assessing all data used for ageing management review for mechanical, electrical and I&C components.

A summary of the results was presented to the plant management during the exit meeting held on 29 October 2021. The plant was encouraged to completely address all remaining issues. The plant management expressed a determination to continue addressing all issues and strengthen preparation for safe LTO.