

EXECUTIVE SUMMARY

At the invitation of ESKOM, the IAEA conducted a Pre-SALTO (Safety Aspects of Long Term Operation) mission at the Koeberg Nuclear Power Plant (NPP) (further referred to as ‘the plant’) from 3 to 11 September 2019.

Koeberg NPP is the only NPP in South Africa and is owned and operated by ESKOM. Unit 1 was commissioned in 1984 and Unit 2 in 1985. The initial design assumed an operating life of 40 years. A Periodic Safety Review (PSR) is performed periodically. The plant is currently carrying out a PSR to identify safety improvements for the long term operation (LTO) period. The regulatory requirements for operation beyond 40 years are established and agreed on by the National Nuclear Regulator (NNR).

The Pre-SALTO mission reviewed the status of activities related to LTO assessment of the plant against IAEA Safety Standards and international best practices. 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 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 observed progress in the development of ageing management and preparedness for safe LTO. The LTO project already addresses some of the topics as recommended by IAEA and other topics are planned to be addressed in upcoming years. Many activities are still in progress or not completed.

The team found the plant staff to be professional, open and receptive to suggestions for improvement. The mission team observed that plant management is committed to improving plant preparedness for LTO. Walkdowns showed the plant to be generally in good condition but some SSCs will require increased attention. In addition, the team noted the following good performances:

- Water chemistry programme implemented in line with IAEA Safety Standards supporting ageing management for safe LTO (review area B);
- The reactor vessel surveillance programme for reactor vessel embrittlement under operation for all relevant plant conditions (review area C);
- Simulator of mechanical, electrical, chemistry and radiation protection processes for human performance and safety improvement (review area F).

The team recognised that the plant approach to and preparatory work for safe LTO generally follows the IAEA Safety Standards and international practices. However, the team identified several areas for further improvement. Nineteen issues were noted:

- Eskom management does not provide adequate organisation, processes or resources for integration and timely completion of all activities for safe LTO;
- The plant-based LTO project arrangements are not adequate to implement the ageing management related LTO assessments in a timely manner;
- Current status of PSR activities does not ensure complete and timely implementation of PSR for LTO;
- The Safety Analysis Report (SAR) does not contain ageing management or LTO assessments;
- The documentation of scope setting methodology for LTO does not provide for complete, justified and traceable scope setting results;

- Evaluation of existing plant programmes for effectiveness in managing ageing for LTO has not been completed;
- An effective and conclusive AMR for mechanical, electrical and Instrumentation & Control (I&C) SCs has not been completed;
- Adequate ageing management programmes for mechanical, electrical and I&C SCs have not been developed and/or implemented for LTO;
- Revalidation of TLAAs for mechanical and civil SCs has not been completed;
- The plant has not fully implemented the Equipment Qualification (EQ) programme and has not revalidated the EQ TLAA;
- The obsolescence management programme has not been timely and completely implemented;
- A systematic cable ageing management programme with adequate technical justification is not fully in place;
- Planning and implementation of impressed current cathodic protection (ICCP) including tests with a mock-up is not adequate;
- The plant does not recognize the potential risk of hydrogen embrittlement of containment tendons linked to ICCP implementation;
- Ageing management of anchorages is not appropriate;
- There are inconsistencies in documents regarding ageing management of civil structures;
- The human resources policy and strategy is inadequate for the LTO period;
- Competence management procedures are inconsistent for LTO;
- A knowledge management programme has not been developed.

A summary of the review was presented to the plant management during the exit meeting held on 11 September 2019. The plant management expressed a determination to address the areas identified for improvement and indicated the intention to invite a ‘SALTO Peer Review Mission to Koeberg Nuclear Power Plant’ in September 2021.