

EXECUTIVE SUMMARY

Upon the invitation of FANC, an expert mission on safe long term operation was conducted to review programmes/activities of the Doel Nuclear Power Plant units 1 and 2.

Doel Nuclear Power Plant units 1 and 2 (further also referred to as “the plant”) in Belgium are owned and operated by Electrabel. Electrabel is part of ENGIE (formerly GDF Suez). Industrial operation of unit 1 started on 15 February 1975 and unit 2 on 1 December 1975 respectively. The NSSS is of Westinghouse design, constructed by a temporary association ACECOWEN (ACEC + COCKERILL OUGREE + PROVIDENCE) under Westinghouse license. The units are equipped with a reactor operating with enriched uranium (U-235) as fuel and light water as moderator and coolant. This type of reactor is known as a PWR.

On 4 July 2012, the Belgian Government decided on decommissioning of Doel units 1&2. Nevertheless, it became clear in September 2014 that long term operation (LTO) for Doel units 1 and 2 was reconsidered as a possibility by the new Belgian government. On 18 December 2014, the new government provided a new context and decided to allow LTO of Doel units 1 and 2 again. The decommissioning project was cancelled and the LTO project relaunched. The plants reached the 40 years of industrial operation in 2015. The plant has an intention to extend the plant lifetime by 10 years. An updated LTO file was submitted to FANC in April 2015 for regulatory review.

This expert mission reviewed the status of the plant activities for a safe LTO assessment. A preparatory meeting was held in August 2015. The scope of the expert mission was agreed on and defined in the Terms of Reference (ToR) issued in August 2015. The ToR also outlined a review team comprising two IAEA staff members, three external experts and two observers covering areas A, B, D and F of a SALTO peer review service.

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. The LTO project is covering most of the topics as recommended by IAEA and other topics are addressed by relevant plant processes. Based upon the observations of this expert mission, 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 plant is in a good condition.

The mission team concluded that the plant management is committed to improving plant preparedness for LTO. In addition, the team noticed the following good practice:

- Quality aspects of the In-service Inspection Programme.

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 some fundamental areas for further improvement. The majority of the issues are connected with interruption of LTO works between July 2012 and December 2015 due to the changing national nuclear strategy. Ten issues were raised:

- The current organizational structure does not reflect the needs of ageing management over the period of LTO;
- Continuous improvement of ageing management process is not well established;
- The plant has not comprehensively assessed the knowledge and training needed to fulfil all design authority roles in modification processes;
- The current plant programmes have not been evaluated for their effectiveness in managing ageing for LTO according to all nine attributes of an effective programme;
- Housekeeping and maintenance practices for electrical and I&C equipment and cabinets are not fully comprehensive;
- Some practice of storing equipment and furniture in close proximity of electrical and I&C safety equipment may jeopardize operability during and after a seismic event;
- Several databases are used for assessment of the SSCs in the scope of LTO but the process to assure data consistency between databases and completeness is not defined;
- There are no strategic human resource plans for the period of LTO and decommissioning;
- A lack of sufficient trained and competent staff can negatively impact LTO;
- There is no systematic plan for the transfer of LTO related knowledge into the line organisation.

A summary of the review was presented to plant management during the exit meeting held on 9 February 2016. The plant management expressed a determination to address the areas identified for improvement, and indicated the intention to invite a “SALTO peer review mission” in February 2017 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 from this mission.