

EXECUTIVE SUMMARY

Upon the invitation of the ELECTRABEL GDF-SUEZ, a peer review mission on safe long term operation (SALTO) was provided to review programmes/ activities of the Tihange Nuclear Power Plant Unit 1 (“the plant”).

The administrative address of the plant is Avenue de l'Industrie 1, 4500 Tihange. The plant is located in the southern part of Belgium, on the river Meuse. The turn-key contracts were awarded to TRABEL (Tractebel) and ELECTRICITE DE FRANCE for the design, to the temporary association A.C.L.F, headed by FRAMATOME (AREVA), BELGONUCLEAIRE, GROUPEMENT ATOMIQUE ALSACIENNE ATLANTIQUE, CAMPENON BERNARD and C.F.E. for the construction. The initial start-up operation of the plant 1 was awarded to ELECTRABEL. The plant is a pressurised water reactor power plant. Its nuclear steam supply system was provided by the temporary association A.C.L.F and is located in a double containment concrete building. Its reactor output is 2,873MWth and the electrical output of the turbine generator is 960MWe. The turbine sets were supplied by Alstom.

The plant started its commercial operation in October 1975. The unit will be 40 years old in October 2015, reaching the lifetime foreseen in the 2003 Nuclear Phase-out Act. Given the intention of the Belgian government to grant a 10 year life extension to the plant, an Long Term Operation (LTO) evaluation was required by the Federal Agency for Nuclear Control (FANC).

In June 2012 ELECTRABEL GDF-SUEZ submitted its LTO-file to the FANC.

The plant is required to perform an LTO assessment to demonstrate the safety of the plant for 50 years of operation. This SALTO mission has reviewed details related to this LTO assessment. The scope of the SALTO mission was agreed to and defined in the Terms of Reference issued in September 2012. A preparatory meeting was held in August 2012. Further details were specified in the Preparatory Meeting Minutes. The review team was organised accordingly; it comprises two IAEA staff members and five external experts covering all disciplines stated in the Terms of Reference and the Preparatory Meeting Minutes.

The mission reviewed planned, in-progress and completed plant activities related to LTO as well as the ageing management of systems, structures and components (SSCs) important to safety.

The IAEA team found that plans are being prepared and extensive engineering work has been carried out to review ageing degradation mechanisms, and to review/implement ageing management programmes in order to justify safe long-term operation beyond September 2015, with a 50 year operational lifetime horizon. In addition, the team noticed the following good practice:

- Collaborative and transparent approach to LTO project.

Taking into account the above mentioned points, the team recognised that the plant approach and preparatory work for safe long term operation generally followed the IAEA Safety Standards and international practices.

Nevertheless, the team identified areas for further improvement. Thirteen issues were raised including:

- The plant and the involved entities do not have a clear role with regards to the design authority function.
- The process of the modifications documentation as part of the current physical configuration documentation of the plant is not properly carried out.
- Design basis documentation for the plant is difficult to obtain.
- The system health reporting process in the plant surveillance and monitoring programme does not include the appropriate SSCs within the scope of LTO.
- Ageing management programmes (AMP) do not address all generic IAEA AMP attributes.
- Data collection and record keeping do not ensure the consistency and update of data for scoping and screening of SSCs.
- The cable system (cables, cable trays, electrical connections) has a lack of environmental qualification (EQ) for LTO.
- The LTO database containing results of ageing management and environmental qualification (Q-List) is not complete.
- Fire protection of cables and masonry partitions qualification has not been revalidated in the LTO process.
- Ageing Management Evaluation of components and structures anchorages does not address potential stress corrosion cracking of high-grade steel bolting.
- Staffing of the LTO project is not adequate.
- Systematic approach for Competence and Knowledge management is not implemented for long term operation of the plant.
- Staffing plans for the long term operation of the plant are not adequate.

A summary of the review was presented to the plant management during an exit meeting held on 14 November 2012.