

UPDATE ON GENTILLY-2 DECOMMISSIONING

S. PLANTE

Hydro-Québec Gentilly-2 facilities, Bécancour, Québec, Canada
plante.steve@hydro.qc.ca

Abstract

Gentilly-2 NPP operated from 1983 to the end of 2012. It was a CANDU-6 reactor producing 680 MWe on Hydro-Québec's electricity grid. The plant's annual electricity production was 4,7 TWh on average, which represents 2,3% of the 2017 total Hydro-Québec's production. In September 2012, the provincial government decided to put an end to the refurbishment project and to initiate the decommissioning of the plant by the end of that year.

The Preliminary Decommissioning Plan includes the following phases: Stabilization, Wet Safe Storage, Storage With Surveillance, dismantling and final site restoration. The reactor was permanently shut down on December 28th 2012 and the unit entered Stabilization phase for two years. During that phase, the preparation of subsequent activities was done in parallel with the realization of the priority activities. The first year, the reactor's core fuel was transferred in the storage pool. The second year was dedicated to the draining, drying and layup of the PHT, the moderator and the Balance of Plant circuits. At the end of the stabilization phase, two safety risks remained on site: the cooling of the fuel in the pool and the storage of the tritiated heavy water that was used for the moderator.

Then the "Wet Safe Storage" state started for six years in 2015. The major activity during that phase is the transfer of the fuel from the storage pool to the onsite interim dry storage, the CANSTOR. According to analysis, the fuel has to be cooled in the pool for a period of 7 years. This constraint has dictated that phase's duration. The dry storage campaigns went as expected until now. Only one campaign remains to be done in 2020. The other main activities still to be completed to reach the Safe Storage State are the draining of the end shields and their cooling circuit, the removal of the LLW, ILW and HLW from the auxiliary pools, the draining of the pools and the reconfiguration of the reactor and service building's ventilation and access. Although the challenges and the workload are very high to reach Storage With Surveillance phase, the target date is still the end of 2020. The tritiated heavy water will be stored on a site beside Gentilly-2 installations to reduce safety risks. The transfer was initiated in June 2019 and should be completed in 2021.

The following orientations allowed us to carry out the activities safely and efficiently. It is essential to maintain the same safety culture during decommissioning as developed in operation. Dedicated teams performed the critical activities 24 hours a day, 7 days a week when needed. Readiness review meeting were held until the preparation of critical activities was completed. To confirm orientations and strategies, meetings with the CNSC were held every two weeks. It accelerated the approval process and kept the regulator informed.

Keywords: Decommissioning, Transformation