Cigeo Project:
FROM BASIC DESIGN TO DETAILED DESIGN – PURSUANT TO REVERSIBILITY

F. Launeau, G. Ouzounian

Andra, French National Radioactive Waste Management Agency, Parc de la Croix Blanche, 92298 Châtenay-Malabry, France

E-mail contact of main author: frederic.launeau@andra.fr

In France, the project to provide a geological disposal facility for high-level waste and intermediate-level long-lived waste was triggered by the 1991 Bataille Act. Andra has, since, completed several stages of the project: geological research, installation and operation of an underground laboratory (clay media) in eastern France, and the location of sites for future constructions. In 2011 the project, now named Cigeo, entered the development of its industrial phase to enable the full licensing of the disposal activities at the end of the next decade. A major milestone has just been reached with the completion of the preliminary basic design (APS) phase, preceding the final preliminary detailed design (APD) phase. APD will be used as the slab for the construction licence application planned for 2017, targeting start of construction by 2021. The APS phase retained the main safety and security principles for a disposal facility established during the conceptual design phase: physical separation between nuclear and construction zones; a layout with three main disposal zones (ILW-LL, slightly exothermic and highly exothermic HLW), groups of ramps and shafts; and containment sealing concepts preventing long term water flows. The APS phase began with optimization studies designed to justify the conceptual design choices. These studies were used to define in detail the waste delivery flows and optimize the surface nuclear facilities (number of process lines, area and volume, etc.) and the underground facilities (design and scale of structures, etc.). The first construction phase constitutes a major challenge as it must enable the facility to operate for several decades while retaining the possibility of incorporating changes and upgrades based on feedback from experience, and technological improvements. An expert review was conducted at the end of the APS phase to analyse the elements enabling to move into the APD phase. Alongside the APS, Andra had also to take into account the opinions and expectations expressed during the public debate held in 2013. This introduced changes as the inclusion of an industrial pilot phase, a master plan for operations, an updated agenda, the involvement of civil society, and a proposal for reversibility and staged retrievability. One of the most important characteristics of the Cigeo project is that it will offer reversibility, which means flexibility for future generations to change the chosen options, make improvements, and accommodate forms of waste likely to evolve over the 130-year service life of the disposal.