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Organisational Challenge of Posiva's Final Disposal Programme: From an R&D Organisation to a Project Organisation, and Further Towards an Operational Organisation

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Posiva Oy is an expert organisation established in 1995 and responsible for the final disposal of the spent nuclear fuel of its owners. Posiva currently employs around 100 people and has a turnover of some EUR 63 million (2015). The Company headquarters are located in Olkiluoto in the municipality of Eurajoki, Finland. Posiva is owned by two Finnish NPP operators Teollisuuden Voima Oyj (60%) (TVO) and Fortum Power & Heat Oy (40%), both of which are responsible for their costs of nuclear waste management.

The Finnish final disposal programme has a long history. When NPP unit Olkiluoto 1 renewed its operating licence for the first time in 1983, TVO presented a programme showing final disposal to commence in the 2020s. In the 1980s and 1990s, the programme concentrated on concept development and site selection activities. After 2003, when Posiva received the decision in principle from the Finnish Government, a new phase began in the programme.

Since 2004, Posiva Oy has constructed an underground rock characterisation facility on the repository site in Olkiluoto, in western Finland. This facility, called ONKALO, has provided an opportunity to carry out further site investigations, develop construction techniques, and test and demonstrate the engineered barrier system in an actual repository environment. As a result of these investigations and development efforts, the application for a licence to construct the encapsulation plant and the geological repository was submitted in 2012. The Radiation and Nuclear Safety Authority in Finland (STUK) first gave a positive review on the safety of the facility, and consequently the Finnish Government granted the construction licence in November 2015.

After receiving the construction licence as the first disposal programme in the world, the next phase in the program will be the construction project of the final disposal facilities required for the disposal operations. A significant first-of-a-kind construction project like this includes many activities requiring a considerable amount of knowledge, such as meticulous design work, construction, procurement, licensing, installation of equipment and commissioning of the encapsulation plant and the underground repository panel.

In addition to construction activities, the research, technical design and development activities conducted by Posiva with numerous Finnish and foreign expert organisations in a multitude of fields still continues, aiming at the submission of the application for the operating licence and for the development of the necessary equipment for the operation of the repository. One important activity at the next phase is also to build up an industrial supply chain for the unique main barrier components of the repository, e.g. the bentonite blocks and the copper canister.

After the significant construction project, the next phase in the final disposal programme comprises the operations. Operations should be industrial actions executed according to regulations under the oversight of the safety authority. This operational phase again requires different competences than the previous R&D phase or the ongoing construction project phase. Also, during the about 100-year long operational phase, the management of the knowledge of the design basis is necessary to ensure safe operations.

To manage these organisational and knowledge management challenges, Posiva has carried out many actions. One of the most significant ones has been the establishment of a subsidiary company, Posiva Solutions Oy. It

will focus on the preserving the knowhow accumulated from the design, research and development efforts in the final disposal of spent nuclear fuel, as well as on associated consulting services.

Country or International Organization

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