MINUTES OF THE MEETING
OF THE DISPOSAL SUBCOMMITTEE
OF THE BLUE RIBBON COMMISSION
ON AMERICA'S NUCLEAR FUTURE
AT THE HOTEL SOKOS VAAKUNA IN
PORI, FINLAND
ON OCTOBER 21, 2010

MEMBERS PRESENT:

JONATHAN LASH, Chair
VICKY BAILEY
ALLISON MacFARLANE
PER PETERSON

Jonni Silvennoinen, Program Manager for TVO, began the meeting at 6:35 p.m., thanking the Commission for inviting TVO to speak. The Onkalo Repository is co-located at the Okliluoto Nuclear Power Plant in Eurajoki, Finland. The Power Plant has two BWR reactors, each producing 860 megawatts-thermal. A third reactor, an EPR from AREVA, is under construction. The site has a harbor, though waste will be sent to the site by road. TVO, a privately owned non-profit company employing some 800 people, receives no government subsidies. Posiva, operator of Onkalo, is a subsidiary of TVO. The construction financing for Onkalo is coming from shareholders and private financing, not from borrow-back from the Finnish Disposal Fund borrow-back program. Olkiluoto has a capacity factor of 96%, "the best in the world," and modernization efforts (new turbines, better welds, higher efficiency, etc.) are ongoing.

TVO has six shareholders, one of whom is Fortum, owning 25% of the company. TVO and Fortum together operate Posiva. The site will be operated as a wet storage facility at a depth of 420 meters.

Olkiluoto Unit 3 (OLK3) has an EPR reactor because it was determined to be the most competitive alternative from technical and economic perspectives following an open bidding process. The reactor has four redundant safety trains. The Severe Accident Management plan calls for all radiation to be contained within the reactor building. The design calls for an Aircraft Shield building. An intensive design process yielded a plan that included all aspects prior to the beginning of construction. The volume of concrete anticipated and used has been higher than expected due to inaccurate plans and a problem with the concrete itself. The Shield building also added a large volume of concrete and rebar. Construction of inner containment is complete, while construction for outer containment and pre-stressing are ongoing. The containment should withstand 4-bar pressure.

Eurajoki has a population of around 6,000. There is a large population of construction workers, many foreign-born, around the site. About 1,000 Finns are employed in the construction effort. The site employed about 3,800 employees in 2009. The site averages 10 accidents per million man-hours. There has been one fatal accident.

An Environmental Impact Statement (EIS) was completed 10 years ago. The Decision in Principle (DIP) was made to go forward with construction, the license for which was granted

in 2005. The Operating License Application will be submitted in 2011. Once approved, further drilling will ensue and the site should be ready to begin encapsulation efforts and accept waste around 2020.

OLK4 received its construction license in 2009. Feasibility studies are ongoing and construction should be completed in 2013.

Timo Seppala gave an overview of final disposal of spent nuclear fuel in Olkiluoto. Under Finnish legislation, utilities are responsible for the waste they produce and it must be disposed of in Finland. Posiva, the company set up to deal with nuclear waste, employs about 90 people directly and some 200 indirectly as contractors. Finland currently stores a total of about 7000 fuel bundles in four different types in wet storage in pools approximately 14 meters below grade.

Heat generation is the most important aspect for determining a time table and layout for a repository. Finnish statute limits heat generation is limited to 800 watts per uranium-ton and a 40-year period was contemplated for interim storage. Higher burnup fuels requires longer cooling time than lower burnup. The next major goal is the submission of a construction license application for the repository. Fifty deep boreholes have been made to characterize the site and to ensure construction and research efforts comport with conditions in the ground. The repository will use the access tunnel originally constructed for the research facility. Some environmentalists have expressed concern about locating the storage facility two kilometers from operating reactors. Involving the public extensively has helped convince the community of safety. They will also receive the benefit of increased power generation and jobs, in addition to the benefits accrued to the municipality for hosting the waste.

Excavation of the tunnel began in 2004, using explosive charges rather than boring machines. The volume of spoil has been deposited on-site, often as paving material for roads. Three shafts have been excavated: one for personnel and two for ventilation. Approximately 35 liters of water per minute are pumped out of the excavation. Fractures in the rock are grouted. The facility will be filled over the course of 50 or 60 years, followed by a cooldown period. It should be shutdown and closed 2120. TVO's central tasks at the site for 2012 are to verify that the site rests in suitable bedrock, verify the storage canister and continue compiling the safety case. Acceptance criteria have been based on technical specicifications rather than rock conditions. Since the Finnish system is based on the Swedes', coordination between the two has been intensive and a cooperation agreement is in place.

The Finnish Nuclear Waste Management Fund projects expenditure of €3.3 billion for spent nuclear fuel costs.

The meeting adjourned at 7:55 p.m.