MINUTES OF THE MEETING
OF THE DISPOSAL SUBCOMMITTEE
OF THE BLUE RIBBON COMMISSION
ON AMERICA'S NUCLEAR FUTURE
AT VUOJOKI MANSION IN
EURAJOKI, FINLAND
ON OCTOBER 22, 2010

COMMISSIONERS PRESENT:

JONATHAN LASH, Chair
VICKY BAILEY
ALLISON MacFARLANE
PER PETERSON

Tim Frazier convened the meeting at 1:30 p.m.

Harry Hiitio, Mayor of Eurajoki Municipality, welcomed the Commission, saying he hoped their visit in Finland and Eurajoki would be successful. He hoped the Commission's discussions would be diverse.

Chair Lash thanked the Mayor for his welcome. The efforts made by the municipality and Posiva are appreciated. The mission of the Commission is to provide recommendations to Secretary of Energy Chu on management of nuclear waste issues. President Obama decided to stop work on Yucca Mountain. The United States has waste from over 100 civilian power reactors as well as defense-related waste. The Commission is interested in hearing about technical issues, but is particularly interested in the political process in Finland that has led to their successes. He noted that the failure in the United States thus far to manage its waste has been both technical and political in nature.

Mr. Hiitio provided some demographic information about Eurajoki. The first mention of the town name occurred in 1344 and the municipality was established formally in 1869. The population is currently approximately 6,000 persons. Some 3,000 foreign persons working on the Olkiluoto project reside in Eurajoki. Fifty-three percent of the populace work in "salary" services, 41% in industrial work and 6% in agriculture. The state handles income distribution where healthcare and social security are major expenditures. The Municipality handles education and infrastructure funding. National taxes are levied up to 30% of income; municipal tax rates are around 14%. The Municipality's population has increased since 2002, when the Olkiluoto 3 construction project began. The rate of unemployment is satisfactory. There was a local depression in 2009, though incomes are stable. Because of relative stability in the tax base, it is easy to make long-term plans. The mission of the Municipality is to provide a suitable lifestyle for residents. They are working to attract young, educated adults because the present population is skewing old.

Collaboration with Posiva has been essential in placement of the OLK3 reactor. The whole community supports the OLK3 and 4 projects. They will improve the whole province's image, importance and impact. OLK3 represents approximately 10,000 worker-years, which leads directly to increased business opportunities in the area.

Decisionmaking processes in Finland are practical. Finland needs energy and they have

two basic options: make their own or import it from Russia. "Russia will not determine our standard of living." The Finnish people trust in and rely on their officials. They also receive lots of information about nuclear power; it is necessary to decide what information is reliable. By law, nuclear waste cannot be exported from Finland, so Finland must take care of its own waste. The relationship of Eurajoki to the Finnish nuclear industry is one of complete transparency. This has been the case from the beginning. They are proud of nuclear energy.

Member Bailey asked what the jobs picture would be in Eurajoki without the nuclear industry there. Mr Hiitio replied that, while there is some unemployment now, those numbers would be much higher without nuclear sector jobs.

Chair Lash asked for comment about the institutional mechanisms of transparency. The Mayor replied that the attitude of transparency is the most important aspect and must permeate all activities and interactions. This is not common elsewhere.

Member MacFarlane asked the Mayor if he could think of a time that Posiva had acted wrongly and then changed. He replied that he could not. She asked what made Eurajoki's initial refusal to site a repository there to change. He said that there had not been a change. With nuclear power, you have to take both the electrical and waste production.

Member Peterson asked what happened to build trust in the nuclear industry in Eurajoki and whether officials live locally to the projects. Mr Hiitio said that it is the Finnish way to trust. It is important to choose trustworthy people as leaders and communicators.

Member Bailey asked if any citizens of Eurajoki had been opposed to the repository. The Mayor replied, of course. She asked how the opposition has been involved in the political process. He said that the organization is not organized.

Chair Lash whether TVO or Posiva had guaranteed local jobs. No, job placement has been based on competition. **Member Bailey** asked about the perception of jobs being taken from Eurajokians. The Mayor replied that these are big projects and there are enough jobs.

Juhani Vira, Senior Vice President of Research at Posiva Oy, spoke on site selection and long-term safety of the planned repository at Olkiluoto. Nuclear waste must be decoupled from the environment and the human domain. To those ends, waste must be isolated and contained. Earlier focus was centered on salt formations; current thinking is inclined toward clay. Finland does not have enough clay because Finnish bedrock is crystalline in nature. The bedrock is some 3 billion years old and is perhaps not as reliable as clay formations. The key component of the repository system is the waste canister. This is a copper capsule with an iron insert for mechanical strength.

The Posiva safety concept can be seen as several pillars: engineered barriers, depth, favorable bedrock, technology and understood properties. The pillars rest on a foundation of robust system design. The first 10,000 years of performance are assessed on a dose criteria; the performance after that time will be assessed based on flux. There is no defined cut-off for the period of concern. Assessment of component and safety performance is contingent on the quality of data as well as uncertainty and sensitivity analyses.

The TVO-99 Decision-in-Principle stated that there were no disqualifying deficiencies at any of the four sites selected for detailed site investigation. The safety case has been strengthened by good dialogue between Posiva and STUK, the Finnish nuclear regulator. Regular meetings are held and issue lists have been compiled and communicated. There is good consensus on the technical issues. Consensus is not strong on the quanitative level of uncertainty.

Member MacFarlane asked how heavily performance assessment has been relied on.

Mr Vira replied that, while models and judgment are necessary, performance assessment will not be relied on entirely. She noted that one of the problems with performance assessment is that they tend to be "opaque." Mr Vira agreed, adding that people should trust true experts. The challenge is to determine who is trustworthy. Member MacFarlane asked how to build trust. He replied that trust could be built through transparency and a willingness to openly explain problems as they arise. Additionally, the Finnish two-step licensing process does not require "perfect knowledge" for the issuance of a construction license.

Chair Lash asked how the Posiva system contrasted with that of the Swedes. Mr Vira said their system was basically the same parts in a different arrangement. Differences also exist in the engineered barriers and the quality of information.

Member MacFarlane asked if anything new had been found in the geology during the course of site investigation. Mr Vira replied that there have not been surprises. There are still challenges, including prediction of future salinities and avoidance of disturbing the natural hydrology of the site.

Member Peterson asked if there were a Finnish analogue to the US's Nuclear Waste Technical Review Board. Mr Vira replied, not exactly. STUK has an Advisory Board and has hired consultants to assist in their work. The Swedes have a waste council.

Member Bailey asked if there were changes from the 2008 to the 2012 safety cases. He replied that the 2012 safety case is more comprehensive and contains more explanation and background of the data. The 2012 safety case is also much longer. She asked how much the work is costing. He said the Research and Development work cost about €30 million per year, not including costs associated with the Onkalo facility.

Member MacFarlane asked if he had wisdom to share about dealing with the public. Mr Vira said that Posiva's policy changed in the late 1990s. Prior to then, Posiva wanted to confine public interactions to technical matters. New emphasis is on policy. It is important to use the same language with people. The public information program can lead to assembly of the safety case. The Posiva attitude is to listen, not teach. You should go deeper into people's concerns; psychological and social angles should be accounted for. Take people's fears seriously. Public interaction has actually caused better research.

Erkki Palonen, Design Manager for Posiva Oy, spoke on the Finnish experience in facility design and the Onkalo facility. The period of license application has recently ended. Posiva is now preparing to submit the construction application. Encapsulation at the site will begin soon. Onkalo will hold 12,000 metric tons of uranium in horizontal or vertical configurations. Current plans are for vertical reposal, though horizontal positions are being studied. Isolation is assured in layers of protection. Onkalo will accommodate three different canister types for waste. Current tasks for Posiva include completing the design of Onkalo, refining and industrializing encapsulation technology, and completion of thermal imaging and rock characterization at the site. Supporting work includes transportation planning and refining cost estimates.

Member MacFarlane asked if there were a transportation reference case. Mr Palonen replied that rail, sea and road transportation are all being evaluated. A study project will be undertaken next year.

Onkalo's design allows for further study and increasing knowledge on construction techniques. Flexibility must be maintained. Demonstration tunnels will be excavated in 2011 using drill and blast methodologies. Posiva has bought machinery and hired contractors for Quality Assurance. There are now three ventilation shafts with two more to come.

Member MacFarlane asked why the copper canisters are so thick. Mr Palonen replied that this is a good question. Fifteen millimeters of copper would be sufficient for the design; the present design calls for 50 millimeters. Mr Vira said the current design is a good size. Each one costs approximately €120,000.

Member Peterson asked who provides oversight and review of the project. Mr Vira replied, STUK and the Ministry of the Environment.

Tapio Sella of Friends of the Earth, Finland, thanked the Commission for the opportunity to speak. There are parallels to the US rejection of Yucca Mountain in the Finnish experience. Both sites would reside in poor host communities in need of finance and jobs. Both sites have unsuitably high watertables. Thus, there are essentially only man-made barriers for isolation. Man-made barriers can really only be guaranteed for about 100 years, not 1,000 or one million years. German plans call for the use of salt formations. Fortum and STUK opposed change of the law allowing export of nuclear waste to Russia. Repository candidate sites were extensively geomapped in the 1980s. The systematic approach was costly and did not account for local resistance. A more flexible approach ensued in 1985. The volunteering city was prioritized over other considerations. Candidate sites were politically, if not necessarily technically, suitable. When Eurajoki was selected, it was "in a bad way" economically. TVO paid Eurajoki between €84 and 110 million. Municipal subsidies to TVO are levied by means of a real estate tax. The nuclear industry has representation on the municipal council. Mr Sella encouraged the Commission to ask questions about the community and the process. Why were opposed citizens silent? Being an outsider, Mr Sella said he did not know. Studies show about one third of residents are opposed to the storage site. Being a small town, opponents were pressured into silence. There is clear evidence of pressure and threats of violence.

Chair Lash asked for comment about the role of opposition in a consent-based process. Mr Sella replied that there has been unfair pressure in Eurajoki. The Chair asked if Mr Sella had any recommendations for the Commission. Mr Sella said that the city should gain clear financial benefit for agreeing to take on a repository. The municipality has become dependent on the site and now has "an umbilical cord" to the industry. Chair Lash asked what difference it would make if greater government funds were provided to municipalities and NGOs for experts during the site selection process. Mr Sella replied that the city is alone against "big players" in the current system.

Member MacFarlane asked Mr Sella to give an example of something Posiva has done right. Mr Sella replied, "I am not expert on these things. I don't live here."

Chair Lash asked Mayor Hiitio about the state of government financing in the siting process. Mr Hiitio replied that the town has a good relationship with the regulator and that the information that they provided merited trust from the municipality. The same was true for Posiva and TVO. Negotiations have been equal.

Mr Frazier asked if attendees wished to provide comments; none did. He thanked everyone for coming and speaking, and adjourned the meeting at 3:06 p.m.