

October 20, 2009

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Unofficial translation

Ministry of Employment and the Economy
PO Box 32
00023 GOVERNMENT

Request for statement 49/815/2009, 15 April 2009

PRELIMINARY SAFETY ASSESSMENT OF THE FENNOVOIMA OY NUCLEAR POWER PLANT PROJECT

In the letter referred to above, the Ministry of Employment and the Economy (TEM) requested the Radiation and Nuclear Safety Authority (STUK) to conduct a preliminary safety assessment as provided for in section 12 of the Nuclear Energy Act on the application for a decision-in-principle concerning the Fennovoima Oy nuclear power plant project, submitted by the company to the Government on 5 February 2009.

The preliminary safety assessment prepared by STUK is enclosed with the present letter. STUK further requested a statement from the Advisory Committee on Nuclear Safety concerning the application for a decision-in-principle, and this statement is also enclosed.

Fennovoima Oy has submitted an application for a Government decision-in-principle concerning the construction of a new nuclear power plant in Finland with a thermal output of 4,300 to 6,800 MW and an electrical output of 1,500 to 2,500 MW. According to this application, the new nuclear power plant would consist of one or two nuclear power plant units equipped with a light water reactor (LWR). Fennovoima intends to build this power plant at one of three alternative locations: Pyhäjoki, Ruotsinpyhtää or Simo. In addition to the new nuclear power plant, the application concerns the buildings and storage facilities required for nuclear fuel management and nuclear waste management at the nuclear power plant, and a repository for the final disposal of low level and medium level reactor waste generated in the operations of the nuclear power plant, the volume of the waste stored there being no more than 36,000 m³.

The Fennovoima application presents both a pressurized water reactor (PWR) of the type in use at Loviisa (Loviisa 1 and 2) and under construction at Olkiluoto (Olkiluoto 3) and a boiling water reactor (BWR) of the type in use at Olkiluoto (Olkiluoto 1 and 2). In the preliminary safety assessment, STUK reviewed whether Finnish safety requirements

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can in principle be complied with in the project as described in the Fennovoima application.

Nuclear power plant safety requirements are given at a general level in the Government Decree on the safety of nuclear power plants (733/2008) and in more detail in the YVL Guides published by STUK. The STUK preliminary safety assessment is based on the assumption that complying with these safety requirements is equivalent to compliance with the requirements of section 6 of the Nuclear Energy Act.

The safety requirements for a new nuclear power plant unit are in many respects more stringent than those that were applied in the construction of the nuclear power plant units currently in operation. The existing Finnish nuclear power plant units have been continuously renovated to improve their safety in keeping with scientific and technological advances and as dictated by operating experience. This principle of continuous development of safety is incorporated in the legislation and regulations on nuclear safety (Nuclear Energy Act 342/2008, section 7a; Government Decree 733/2008, section 24; YVL Guide 1.11) and will also be enforced for any new nuclear power plant. International development in nuclear safety regulation indicates that the requirements currently applied in Finland are relatively strict and will remain so even in the long term.

In setting the safety requirements, the projected service life time of the proposed power plant alternatives (typically 60 years) has been taken into account as applicable. This long service life span calls for training and research to be organized in the field in order to secure expertise and ensure continued development in the long term, over several decades. There will be a growing need for nuclear safety experts in Finland if the Government and Parliament adopt and ratify a decision-in-principle to build a new nuclear power plant. It is the considered opinion of STUK that Finnish universities must ensure the comprehensive availability of basic studies in nuclear technology in Finland.

The nuclear power plant alternatives proposed in the application do not meet Finnish safety requirements as such. However, STUK estimates that the proposed alternatives can be redesigned so as to bring them into compliance. The nature and the extent of the required modifications vary between the plant alternatives. Some plant alternatives would only require fairly minor modifications; some would require more extensive structural modifications. The required technical solutions are still open for some alternatives.

The Fennovoima application includes the technical possibility of combined heat and power production (CHP) at the new power plant unit. According to Fennovoima, if the new nuclear power plant were built in Ruotsinpyhtää, it would be technically possible to transfer district heating

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generated there to Porvoon Energia, Vantaan Energia and Keravan Energia, which are shareholders in the Fennovoima. Fennovoima is also prepared to offer district heating to energy utilities in Helsinki and its vicinity. If built to these specifications, the new nuclear power plant would become the world's largest district heating generation unit. Disruptions are possible in district heating production and transfer, and the impact of such disruptions on the safety of the nuclear power plant must be examined and taken into account in the basic design of the power plant unit. It is the considered opinion of STUK that district heating production and transfer can be implemented in such a way that environmental radiation safety and the nuclear safety of the power plant are not compromised.

Fennovoima has the potential to create a management system conducive to safety and quality management and a good safety culture for the construction and operating stages of the power plant units. Fennovoima is also prepared to recruit a sufficient number of expert personnel for the various stages of the project. It is necessary to increase the size of the organization and its collective expertise continuously and systematically to ensure that Fennovoima will have sufficient nuclear safety and radiation safety resources in its own organization at every stage of the project.

STUK has assessed the suitability of the proposed alternative plant sites of the Fennovoima nuclear power plant for the purpose, and also the potential for implementing physical security, emergency response, nuclear waste management and nuclear proliferation safeguards at these locations. It is the considered opinion of STUK that there are no features at any of the proposed alternative locations that would constitute an obstacle to the construction of a new nuclear power plant and related facilities in compliance with the safety requirements. Physical security and emergency response arrangements can be implemented at all proposed alternative locations for the new nuclear power plant in compliance with existing regulations.

Pursuant to section 6 of the Nuclear Energy Act, the use of nuclear energy must be safe and it shall not cause injury to people, or damage to the environment or property. No obstacles have been found in the preliminary assessment to the construction of the new nuclear power plant proposed by Fennovoima in accordance with the provisions of section 6 of the Nuclear Energy Act.

General Director

Jukka Laaksonen

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FOR INFORMATION Ministry of Social Affairs and Health, Fennovoima Oy, Municipality of Pyhäjoki, Municipality of Simo, Municipality of Ruotsinpyhtää

JL, HAK, PT, TVa, LR, MIJ, KV, MV, JSa, RV, RSr, PVa, OVi, KW, TV, KiA, AnS, MaN, TS, LPn, PS, SSu, KIH, KaH, JN

APPENDICES

Preliminary safety assessment of the Fennovoima Oy nuclear power plant project, 19 October 2009
Appendix 1 Assessment of the suitability of plant alternatives,
Appendix 2 Assessment of the suitability of alternative plant sites,

Statement from the Advisory Committee on Nuclear Safety, 30 September 2009

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