

Safety and quality
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ANSWER TO AUSTRIAN GOVERNMENT REGARDING WORST CASE SEVERE ACCIDENT SCENARIO IN A NEW FINNISH NUCLEAR POWER PLANT

The Ministry of Environment has requested Fennovoima Ltd to explain the justification of using a 100 TBq Cs-137 release as the limit for the most severe accident event in a Finnish nuclear power plant and why there is no need to consider accident scenarios where more than 100 TBq of Cs-137 is released.

Since the question has been raised by the Austrian Government, Fennovoima discusses particularly possible impacts of a severe reactor accident on a Fennovoima site to Austria.

The use of 100 TBq Cs-137 is based on the requirement in Finnish statutes (Section 10 of the Decision of the Council of State 733/2008) stating that in order for a new nuclear power plant to receive construction and operating license, the design of the plant must be such that the exceeding of the limit is extremely unlikely. This qualitative expression can be interpreted as a categorical denial in the Finnish safety rules. In engineering design, very few properties of the product are absolutely certain, and therefore this categorical denial has been assigned a probability of less than one in two million per reactor year (YVL Guide 2.8). Failure to meet the limit of less than 100 TBq release of Cs-137 would result in construction and operating licenses not being granted to the plant, making such accident impossible in the first place.

Finnish authorities have accepted the use of the 100 TBq limit as the worst severe accident scenario to be analyzed in the Environmental Impact Assessment for new reactors. It has also been used by Teollisuuden Voima Oy and Fortum Power and Heat Oyj in their recent EIA's.

In modern reactor designs that Fennovoima has presented in its application for Decision-in-Principle, the release of 100 TBq even in the worst conceivable severe accident scenarios is a significant overestimation due to safety oriented inherent characteristics, robust containments, and other advanced severe accident mitigation features. Past reactors suffering a severe accident, such as Chernobyl, lacked all

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these safety characteristics. Thus a release exceeding 100 TBq was possible in that case.

In the consultation between Finnish authorities, Austrian Government and Fennovoima on 28 January 2009, Fennovoima presented a rough estimation of what is realistic when considered possible impacts of a severe reactor accident to Austria. With this order-of-magnitude analysis, using trajectory information provided in the Austrian review report, Fennovoima showed that – even with some conservative assumptions – the radiation protection intervention limits could be exceeded in Austria once in 10 billion years (1/10 000 000 000 years) as a result of a new nuclear power plant in any of Fennovoima sites in Finland. This risk is negligible if compared to other risk of life, and although still is in principle an additional risk to the Austrian citizens, is more than outweighed by the environmental benefit of utilizing nuclear as a CO₂-free source of energy. Thanks to the global nature of this benefit, Fennovoima's power plant in Finland of benefit to the Austrian citizens as well.

Based on the arguments given above, there is no legally based, tradition based, nuclear power plant design based nor risk based need to analyze accidents worse than what Fennovoima has done in Environmental Impact Assessment and in Decision-in-Principle application.

In accordance with the closing statement given by the Ministry of Employment and the Economy regarding Fennovoima's Environmental Impact Assessment report, Fennovoima prepared a set of variation analyses requested by the Finnish Radiation and Nuclear Safety Authority of Finland. The purpose of these sensitivity analyses was to see how the short term doses in the vicinity of the plant change if the amount of radioactive noble gases and weather parameters are varied. A summary of the results of the analyses were delivered to the Ministry of Employment and the Economy on 9 April 2009. The Austrian radiation protection intervention limit, allegedly exceedable, is based ground contamination due to cesium deposition, and variation of the noble gas release has no effect on this. Therefore, even after these sensitivity calculations, Fennovoima's conclusion about Fennovoima's plant not threatening the well-being of Austrian citizens remains unchanged.