

## Environmental Impact Assessment (EIA), scoping phase, on lifetime extension Loviisa 1&2

We welcome the EIA on the lifetime extension for Loviisa 1&2, especially in the light of the discussion in the framework of the Espoo Convention concerning a binding EIA for NPP lifetime extension projects.

The next step of the EIA procedure, the EIA Report, needs to cover the following issues:

### Alternatives:

The Espoo Convention and the EIA Directive require the assessment of alternatives of a project. We demand that the EIA report presents alternatives to the 50-year old nuclear power plant. In response to the climate crisis, energy efficiency and energy saving measures have to be the most important options for the alternative scenario, new electricity production should be based on renewable energies with its steadily decreasing costs.

A long-term prognosis of the Finnish energy needs should be part of the EIA Report.

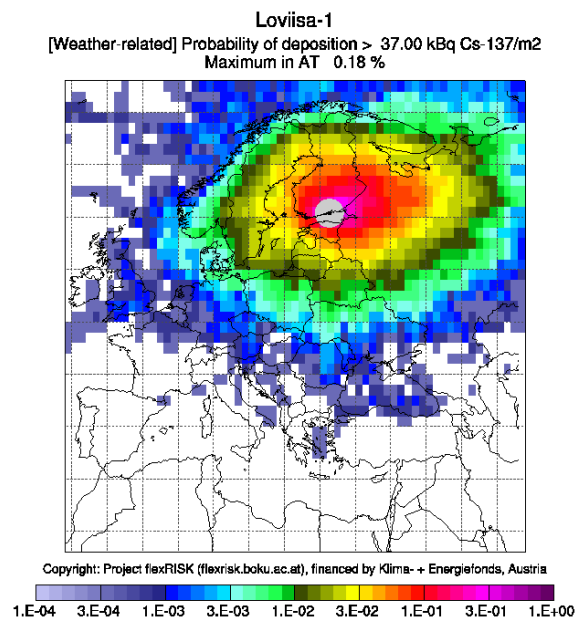
### Risk of severe accidents

The most important question is: Can an accident occur in the old NPPs that has significant impacts on the surrounding areas, and also on other countries?

Even if a severe accident has a very low probability, the risk is not eliminated. The EIA Report needs to provide more data on the assessment of severe accident consequences; it is insufficient to restrict calculations to a source term of 100 TeraBecquerel Caesium-137 and dispersion calculations up to a distance of 1,000 km.

The research project flexRISK shows that a steam generator tube rupture accident in Loviisa unit 1 or 2 could release up to 30% of the radioactive inventory, that is 31.5 PetaBecquerel Cs-137.

The following flexRISK figure shows the weather-related risk for Europe to be contaminated with Cs-137 above 37 KiloBecquerel Cs-137 per m<sup>2</sup> in case of such an accident happening.



## **Under unfortunate weather conditions, almost every country in Europe could suffer such a high Caesium contamination.,**

Safety standards for new NPPs cannot be implemented for the old plants. The risk of a severe accident is increasing with the age of a NPP. The irradiation embrittlement of the reactor pressure vessel increases the risk of a fracture. The outdated design of sharing of safety systems between the two units increases the risk of common-cause failures. When the units were built no regulatory requirements on seismic design were in place.

But not only material and design problems occur. The risk of terrorist attacks has increased and the old plants are not fit to withstand modern threats.

Due to climate change, the risk of flooding increased, which is of special importance for NPPs situated at the coast. The accident in Fukushima has shown what horrible impacts can occur when water intrudes in an old NPP. Also the risk of extreme weather events has increased.

The EIA Report shall include an assessment of how the risk changes with increasing age and due to new threats like terror and climate change phenomena.

The EIA Report shall also include accident calculations with the highest source term for which the risk is not zero, and dispersion calculations for all of Europe.

## **Spent fuel and radioactive waste**

The safe disposal of radioactive waste and spent fuel is a problem which has not been solved anywhere in the world, especially when it comes to final disposal technologies which are characterized by failures – see Asse (Germany) or the WIPP storage facility (U.S.). Infinite safety is an illusion under today's knowledge and technical possibilities.

Proof of safe disposal for the additional nuclear waste from the lifetime extension is not given yet. The necessary interim storage facility for the spent fuel is not available yet. Moreover, a wet storage system will be used that is no longer state-of-the-art.

The final repository in Onkalo will use copper canisters. However, research results have shown that copper may corrode even in an oxygen free environment. This, together with other corrosion mechanisms and mechanisms that can provide stress on the copper canister, means that the long-term integrity of the copper canister cannot be guaranteed. As a result, Sweden has so far not approved the KBS-3 method but are awaiting more research. The Swedish Radiation Safety Authority is presently evaluating what appears to be severe anoxic corrosion, including pitting, in 20-year old experimental packages from the LOT experiment in the Äspö Hard Rock Laboratory. Thus, the question arises how Finland intends to handle this massive contradiction and using an unproven technology.

In the EIA Report, the results of the copper research shall be assessed in detail and compared to the Swedish developments.

**Organisation: FoE Finland**

**Date: 22.10.2020**