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LAUSUNTO LOVIISAN YDINVOIMALAITOSTA KOSKEVASTA YMPÄRISTÖVAIKUTUSTEN ARVIOINTIOHJELMASTA

Greenpeace kiittää mahdollisuudesta lausua Loviisan ydinvoimalaitoksen ympäristövaikutusten arviointiohjelmasta.

Keskeisimpinä seikkoina haluaisimme nostaa esiin nämä kohdat:

1) On tärkeää, että Suomi noudattaa Espoon ja Aarhusin sopimuksia sekä direktiiviä ympäristövaikutusten arvioinnista ja osallistaa ympäristövaikutuksille mahdollisesti altistuvia kansainvälisiä sopimuksia noudattaen ja läpinäkyvästi.

2) Vaihtoehtojen tarkastelussa (1, 0 ja 0+) olisi syytä ottaa ympäristövaikutusten lisäksi huomioon myös kokonaistaloudelliset vaikutukset.

3) On tärkeää valmistella skenaariot myös esimerkiksi sen varalta, että Loviisan voimaloissa ilmenee vika, jonka vuoksi voimalat sulkeutuvat etuajassa tai sen tilanteen varalta, jossa Fortum ei jatka Loviisan voimaloiden käyttämistä vuosien 2027 ja 2030 jälkeen. Skenaariotarkastelussa tulee ottaa huomioon Suomen tavoite hiilineutraaliudesta 2035 sekä EU:n päästövähennystavoite vuodelle 2030 ja varmistaa, että näissäkin tilanteissa kyseiset tavoitteet saavutetaan.

4) Tarvitaan realistinen arvio Loviisan voimaloiden toimintavarmuudesta haettavan jatkoajan päättymiseen asti. Arviossa olisi syytä ottaa huomioon muiden muassa reaktoreiden ikääntymisen, luonnonolosuhteiden muutoksen sekä sähkömarkkinoiden muutoksen vaikutukset toimintaan.

5) Vakavan ydinvoimaonnettomuuden mallintaminen sekä varautumissuunitelma osana ympäristövaikutusten arviointia.

Lisätietoja liitteessä 1 ” SUBMISSION from Greenpeace reacting on the notification for a transboundary consultation under the obligations under the Espoo and Aarhus Conventions and relevant EU Directives and the EIA Programme Report from Fortum for the life-time extension of the Loviisa nuclear power plant, Finland”

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GREENPEACE

SUBMISSION from Greenpeace

reacting on the notification for a transboundary consultation under the obligations under the Espoo and Aarhus Conventions and relevant EU Directives and the EIA Programme Report from Fortum for the life-time extension of the Loviisa nuclear power plant, Finland

by
Ir. Jan Haverkamp
22 October 2020

commissioned by Greenpeace Nordic

List of abbreviations

ACCC	Aarhus Convention Compliance Committee
EIA	Environmental Impact Assessment
EIA Directive	EU Directive 2011/92/EU as amended by EU Directive 2014/52/EU
LTO	Long Term Operation
NPP	Nuclear Power Plant
PRA = PSA	Probabilistic Risk Assessment = Probabilistic Safety Assessment
PSR	Periodic Safety Review
SEA	Strategic Environmental Assessment

About the author

My name is Jan Haverkamp. I have a candidate degree (equivalent to Bachelors) and an academic engineering degree (Ir. - equivalent to a Masters degree) in Environmental Hygiene from the Agricultural University in Wageningen, as well as a candidate degree (equivalent to Bachelors) in Biochemistry from the State University in Leiden, both in the Netherlands. I studied also nuclear physics and energy policy at the State University in Leiden.

I work as senior expert nuclear energy and energy policy for the World Information Service (WISE) in Amsterdam and for different Greenpeace entities, while based at Greenpeace Netherlands.
I have participated in the Environmental Impact Assessment (further: EIA) procedures for the first two untis of the Temelín nuclear power plant (NPP) in the Czech Republic, the Belene NPP in Bulgaria, the Cernavoda 3,4 NPP in Romania, the Visaginas NPP in Lithuania, the Mochovce 3, 4 NPP in Slovakia, the blocks 3, 4 of the Temelín NPP in the Czech Republic, the Paks II NPP in Hungary, the Hinkley Point C NPP in the UK, and the Strategic Environmental Assessment (SEA) of the Polish Nuclear Energy Programme, the transboundary scoping phase of the EIA for the first Polish nuclear power station, the scoping for the EIA of plant life-time extension of the Zaporyzhe and Southern Ukraine NPPs, as well as the SEA for the Belgian nuclear waste strategy. I have advised different stakeholders in the EIA procedures for Borssele 2 in the Netherlands, Hanhikivi in Finland and EIA procedures relating to nuclear plant lifetime extension in Hungary, Ukraine, Belgium, Sweden, Spain, Slovakia, Slovenia, the Czech Republic, Finland, France, Switzerland and the Netherlands. I have participated as expert for the complainant, or as adviser in court procedures concerning public participation in Bulgaria, Slovakia, Lithuania, Poland, the Netherlands and Belgium, and in procedures for the Aarhus Convention Compliance Committee in complaints against Slovakia, the Czech Republic, the United Kingdom, Germany and the Netherlands. I am one of the participants in the civil society reflection group of the ad-hoc Working Group nuclear life-time extension under the Espoo Convention.
I am a vice-president of the organisation Nuclear Transparency Watch, based in Paris.

I have been asked by the independent legal entity Greenpeace Nordic to prepare a submission reacting on EIA Programme report for the lifetime extension of the Loviisa nuclear power plant in Finland.

This submission may be considered public.

Ir. Jan Haverkamp

1 **Need for EIA for the period starting in 2017**

The Loviisa nuclear power plant (NPP) already functions since 2017 in Long Term Operation (LTO), the year that Unit 1 received a license renewal for operation after its 40st anniversary. Fortum already should have prepared a (transboundary) EIA for the period after 2017 for unit 1, respectively 2020 for unit 2. By not providing this, all current decisions, as well as the license renewal of 2017 and related decisions from the nuclear regulator STUK to allow, by approving the outcomes of the periodic safety review, further operation after 2017 (unit 1) and 2020 (unit 2), and other operational decisions in the period from 2017 until now, have not been informed by an up-to-date and relevant EIA. The existing EIAs for the Loviisa NPP implicitly were based upon the initially expected technical lifetime of 40 years (though for VVER 440 reactors, generally, even a technical lifetime of 30 years is presumed).

For instance, no EIA was carried out for the extensive refurbishments carried out between 2014 and 2018 in preparation for the 10 year license renewal in 2017 and 2020 respectively. These considerable measures of 500 Million Euro (see page 8 of the EIA Programme Report) were taken without being informed by an EIA.

Also, for allowing Loviisa 1 and 2 to operate beyond their 40 year operation time and the related refurbishments, no public participation took place concerning the environment.

The European Court of Justice found Belgium in breach with the EU Directive 2011/92/EU as amended by EU Directive 2014/52/EU (further: EIA Directive) and the EEC Directive 92/43/EEC (Habitat Directive) for the similar case of Doel 2, where an extension of lifetime of 10 years was granted beyond the technical lifetime of 40 years.[1]

Furthermore, the Aarhus Convention Compliance Committee (ACCC) in its findings on case ACCC/C/2014/104 the Netherlands,[2] on the lifetime extension of the nuclear power station Borssele, found that public participation concerning the environment should have taken place before decisions to allow a further 20 years of operation after 2013 had taken place.

The Meeting of Parties of the Espoo Convention found Ukraine in non-compliance when it extended the lifetime of the Rivne 1 and 2 VVER 440 reactors beyond their initial technical lifetime of 30 years without carrying out a transboundary EIA.[3]

Taking this together, it is clear that by not carrying out an EIA before *de facto* granting an extended lifetime of 10 years beyond the technical lifetime of 40 years, **Finland is already in non-compliance with the Espoo Convention, the Aarhus Convention and the EIA and Habitat Directive**.

For that reason, this EIA should not only cover the period after 2027, but also the already running operation period after 2017, and findings from the EIA procedure should be taken into due account in all decisions concerning the reactors from 2017 (unit 1), respectively 2020 (unit 2).

It has to be noted that Finland is in similar non-compliance concerning the reactors Olkiluoto 1 and 2 and that an EIA by their operator TVO for the ongoing operation of those two reactors is also long overdue.

2 Alternatives

The EIA report should include a full comparison between the three mentioned Alternatives (Alternative 1, Alternative 0 and Alternative 0+), including all environmental issues, but also economic issues, so that a proper justification can be given for the final choice of alternative.

3 The EIA report should include in the comparison of these alternatives the environmental impacts and economic impacts of production of the by Loviisa 1 and 2 planned deliveries of electricity in case of direct closure, closure in 2027, respectively 2030, or operation until 2047,

1 http://curia.europa.eu/juris/documents.jsf?num=C-411/17

2 https://www.unece.org/fileadmin/DAM/env/pp/compliance/CC-63/ece.mp.pp.c.1.2019.3.en.pdf

3 https://www.unece.org/fileadmin/DAM/env/documents/2014/EIA/MOP/ECE_MP.EIA_20_Add.1%E2%88%92ECE_MP.EIA_SEA_4_Add.1_e.pdf paragraphs 68 to 70.

respectively 2050. These alternative scenarios should include a comparison to all reasonable alternative options of needed energy service delivery. This should be a comparison on the basis of different energy mix development scenarios, and include the current Finnish policies to reach carbon neutrality in 2035 as well as the European obligations for a reduction of emissions in 2030.
The alternatives 0, 0+ and 1 currently described by the operator give too little information to come to complete justification of choice.

4 Waste management

Waste management measures should include not only immediate measures and interim storage, but also give a proper picture of final deposition, including an in-depth analysis of uncertainties and related options. This should include uncertainties concerning the viability of the chosen deep geological disposal option in Onkalo, including issues concerning the expected corrosion of the to be used containers.
The use of Posiva material for this EIA report should be extended by an update since 2008 (see page 7, EIA Programme) and a critical assessment of uncertainties.

5 Reliability of operation

Fortum needs to make a realistic assessment of reliability of operation of both units in the period from 2017 to 2030 and for the period from 2027 to 2050. This includes a realistic assessment of unexpected outages or reductions of capacity due to technical factors (including ageing), natural factors (including weather) and market factors (including necessary load-following). This also needs to include a truthful assessment of the historical reliability of the power plant, including an assessment of all unexpected outages and reductions of capacity and related conclusions for future operation.

6 Facts and uncertainties, not beliefs

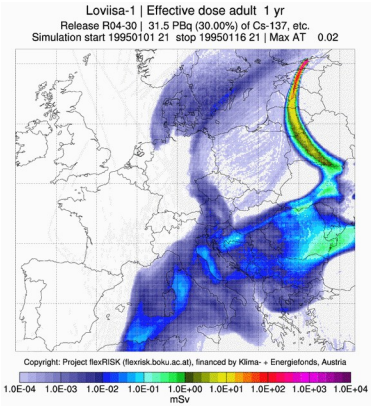
The EIA should not be based on "beliefs" ("*At Fortum, we believe that this new world…"*), but on facts. One point where Fortum makes belief overshadow fact is by stating that nuclear power is clean. Each energy generation technology has a footprint and that from nuclear power is in the form of the impacts of uranium mining, uranium processing and fuel production, the footprint of the nuclear power station itself during operation and decommissioning, the impacts of the waste the nuclear power station is producing, and impacts of potential accidents during the entire fuel chain. This includes full-chain greenhouse gas emission assessments, analysis of other environmental impacts, and a full comparison to other reasonable alternatives.

Another example where beliefs overshadow fact can be found in the statement: *"In due course, the spent nuclear fuel from Loviisa power plant is taken to the spent nuclear fuel encapsulation plant and fnal disposal facility operated by Posiva Oy at Olkiluoto in Eurajoki, Finland."* (page 8 of the EIA Programme report). As long as Onkalo has not been licensed for operation and final closure, this is a wish, but not a certainty. Still existing uncertainties have to be acknowledged in the EIA report.

7 Assessment of severe accidents

The assessment of emissions of and radiation from radioactive substances should include an assessment of impacts of severe design based and beyond design based accidents, including an assessment of emergency preparedness and response, as well as post-accident recovery needs. As far as such assessments exist from the past, these should be updated to include reasonable adaptations for the period of proposed extended operation from 2017 (see point 1 above) to 2047.

Modelling of a fictional severe accident with a release of 100 TBq into the atmosphere is insufficient. The Fukushima and Chernobyl accidents led to emission of several tens of percent of the volatile content. The Institute for Safety and Risk Studies in Vienna therefore postulated in the early 2000s in its FlexRISK calculations justifiably a severe accident based on the PRA (probabilistic risk assessment) of Loviisa triggered by a tube rupture in the steam generator with a release of 30% of the volatile content, resulting in emissions of 31.5 PBq of Cs-137 and 405 PBq of I-131 (see picture).[4] For a reasonable overview of potential impacts, also modelling of such a severe accident should be part of the EIA, including an assessment of potential transboundary impacts and the necessary emergency preparedness and response.



8 **Climate change**

Assessment of effects on and of climate change should also include the latter: inclusion of effects of climate change (incl. sea-level rise, changes in (extreme) weather patterns) on the assessment of the performance of the Loviisa nuclear power plant and the entire fuel chain including proposed and/or chosen radioactive waste management options – influence on down-time, influence on the risk of technical failure, influence on dispersion of radioactive material in the case of a severe accident with substantial emissions, influence safety of disposal facilities, etc..

9 **Transparency and public participation**

The EIA programme states that *"The environmental impact assessment procedure can be participated in by everyone whose conditions and interests, such as accommodation, work, transport, leisure activities or other living conditions, may be affected by the project to be implemented."* We would like to underline that because of the ultra-hazardous character of nuclear power plants, on the basis of the Aarhus Convention this definition has to be interpreted widely and should not be used to exclude anyone from participation from countries participating in the transboundary procedure, nor anyone in the UNECE area or within a circle of 1000 km.

10 Given the COVID-19 situation and related travel restrictions, it is advisable that the proposed public events will take place in a hybrid fashion – both live and on-line.

4 http://flexrisk.boku.ac.at/en/index.html