

Richard Kristoffersson/Naturvårdsverket
richard.kristoffersson@naturvardsverket.se

Review of FOI-2023-1190:1. NV-05002-23, Ignalina kärnkraftverk

The report FOI-2023-1190:1 was read, with the comments below.

A general conclusion is that the report is written in a high-level fashion. Further details about the various processes and techniques to be applied during the dismantling process are not presented. This particular review concerns environmental impacts in neighbouring countries following a dismantling of the Ignalina units. These kind of impacts are not only dependent on *what* steps are taken, but also on *how* the steps are taken. Thus, as the report does not include any further level of detail about the various processes and techniques to be implemented, it is not fully possible to evaluate the environmental impact of the dismantling. However, the anticipation is that it will be negligible or none on a more distant country like e.g. Sweden, but that anticipation is not based on the content of this report.

Comment #	Chapter, page	Comment
1	Overall	The expression "representative person" should be defined somewhere in the report.
2	§2.2, page 10	In relation to bullet number three it would be interesting to read what the State Enterprise Ignalina Nuclear Power Plant estimates to be a reasonable operation time for a concrete repository that makes use of existing underground structures.
3	§2.3.3, page 16	In relation to bullet number three it would be interesting to find examples of what the State Enterprise Ignalina Nuclear Power Plant would classify as a "unproperly maintained SRW found on the territory of Lithuania."
4	§2.3.3, page 18	In Figure 2-4 "hot trials" is used but the expressions is not explained anywhere in the report. An explanation should be added to the report.
5	§2.5, page 20	In the first sentence in the section "Risk Assessment" the experiences from already completed dismantling projects is used as a grant for that "the only possible insignificant negative impact could be on personnel". References to official material reporting on these past experiences should be added to this section.
6	§3, page 20	In relation to the sentence "As the nearest settlements are more distantly located from the place of the proposed economic

		activity, thus it is not expected an impact on the health of the population either in the INPP region or in other regions of Lithuania.”, it should be noted that airborne releases are discussed in this section. The nearest residential area is located 3.5 km from the Ignalina site, and from a dispersion of radioactive particles perspective, it cannot be ruled out that particles could travel such distances or longer. This should be evaluated and commented on.
7	§3, page 20	In relation to the sentence “The records on implementation of the previous INPP D&D projects prove the absence of such impact which is confirmed by the annual reports of the Radiation Protection Centre [24]. The Radiation Protection Centre, in order to assess the impact of the INPP activities on the external exposure dose to the population of Lithuania, has been carrying out equivalent dose assessments in the Ignalina district for many years and compares it with equivalent dose in other regions significantly distant from the INPP region.”, it should be noted that historical periods of regular power operation as well as the so far executed steps within the dismantling process, represent states with other characteristics than the upcoming dismantling phases do (they are going to handle radioactive material), and thus cannot be compared in this sense. In the last section on page 19 it is mentioned that the dismantling successively will enter phases where buildings with radioactive contamination will be handled. The past experiences from the Ignalina dismantling project, handling non-contaminated buildings, thus cannot per se alone guarantee a non-existing impact on the population and environment in future dismantling phases.
8	§3, page 20	In the last section dose constraints are discussed. This section could be formulated in a more clear way. Reading it gives the understanding that the annual effective dose constraint is 0.2 mSv when considering both airborne and waterborne discharges, but is reduced to half, 0.1 mSv, when only dealing with the forementioned. The derivation behind this 50/50 split is expected to be found in the given reference, [25], but is not – the only time the limit 0.2 mSv is mentioned in [25] is in relation to section 24.4 [25]. Thus, it should be clarified where the dose constraint is taken from and why it is assumed appropriate to split it into half when one of the discharge ways is disregarded.
9	§3, page 21	The values/units in Table 3-1 do not seem to match. The assessed exposure dose of the representative person (said to be given in mSv in the table) divided by the dose constraint (said to be 0.1 mSv) gives percentages that are $1E^4$ times smaller than the ones tabulated in Table 3-1. The assessed exposure doses in the table are too small to be likely measurable in mSv. Instead, the values in the column is most likely in Sv, despite the heading stating the unit mSv. Assuming this correction, the percentages are still 10 times smaller than the ones tabulated in Table 3-1.

		<p>As mentioned in comment #8 it is not clear where the dose constraints 0.1 mSv and 0.2 mSv were taken from. 0.2 mSv is mentioned in section 24.4 [25], but in section 3.4.1 [25] yet another criteria of 10 µSv is given as a maximum annual effective dose to a member of the public, due to artificial radionuclides. Using this latter limit and assuming that the assessed exposure doses in fact are given in Sv, gives the values tabulated to the right in Table 3-1.</p> <p>Based on the above comments, this table and the related text sections and limits need to be looked over and explained/corrected.</p>
10	§3, page 21	<p>The disposition in §3 beginning with “Biodiversity” should preferably be improved in order to better communicate what impacts and consequences that the State Enterprise Ignalina Nuclear Power Plant expects to see. Biodiversity is dependent on both “Water” and “Environmental Air and Climate” which is why it is unexpected to see them separated into different subsections. It is surprising to read the following, “The proposed economic activity will be carried out within the INPP industrial site where no species of flora and fauna that are protected under the legal acts of Lithuania and the European Union are found. The impact of the proposed economic activity on biodiversity outside the INPP industrial site will be very insignificant and will only be related to motor vehicle exhaust gas, noise, and light signals.”. It is important to regard the fact that biodiversity outside the industrial site may be affected through dispersion from the site by wind and water. Thus, it is not only the flora and fauna within the industrial site that should be considered. It is also not correct to disregard all other impacting sources but the ones relating to motor vehicle activities. The analysis should be extended or better summarized in this report.</p>
11	§3, page 22	<p>In relation to the sentence “The comparison of the multi-year average concentrations of water quality indicators in the period before the start of the power plant operation (1979-1983) [26] and after the start of the INPP operation [27-29] leads to the conclusion that the water quality indicators of Lake Drūkšiai comply with the established standards [31-33] and that the lake is regenerating normally. According to the conclusions of the report [26] based on the water quality Lake Drūkšiai can be assigned to the Class of a very good ecological condition [27].”, it should be noted that past measurements and conclusions only tell about the current status of the lake, but nothing about the impact from future dismantling steps. The historical periods of regular power operation as well as the so far executed steps within the dismantling process, represent states with other characteristics than the upcoming dismantling phases do (they are going to handle radioactive material), and thus cannot be compared in this sense. Therefore a separate evaluation of the</p>

		impact of the upcoming dismantling phases on the water quality should be performed and summarized in this report.
12	§3, page 22	It is recommended that a clarification is added that explains in which sense the surface run-off from the INPP territory due to precipitation is monitored. Is it, like the groundwater, monitored for concentrations of radionuclides?
13	§3, page 22	In relation to the seventh bullet, are the sources of drinking water located on a higher geographical elevation than the PEA? In this section only distance from the wells is discussed. However, elevation is sometimes at least as relevant as distance and should therefore be considered and mentioned.
14	§3, page 23	In relation to the sentence “The INPP has sufficient production resources, qualified personnel and experience gained from already implemented decommissioning projects to successfully complete all decommissioning.”, it should again be noted that the so far executed steps within the dismantling process, represent states with other characteristics than the upcoming dismantling phases do (they are going to handle radioactive material). Therefore, it is not self-evident that the experience gained from the already implemented decommissioning projects is enough to guarantee a successful completion of upcoming decommissioning phases. A separate evaluation for the upcoming steps should be considered.
15	§3, page 24	In the section “Soil” a description of the soil at and around the site would be expected. On page 22 artesian water is mentioned. Is the Ignalina site located on a soil that enables the right conditions for such water? It is recommended that this is commented on in the section “Soil”.
16	§3, page 25	The sentences “Besides, the implementation of the necessary measures to avoid or reduce significant adverse impact which will be analysed in detail and justified during the subsequent design and safety justification stages is also envisaged. The EIA Report will include the analysis of potential transboundary environmental impact and the grounded conclusion on the transboundary environmental impact will be provided.” indicate that the analyses necessary to evaluate the transboundary environmental impact was not performed yet. Until those investigations were performed and documented, and the results communicated, a proper evaluation of the impact on more distant neighbouring countries cannot be completed.

Kind regards,

Karolina Brynjell-Rahkola, researcher CBRN defence and security



Per Lind, acting head of division