



**LIETUVOS RESPUBLIKOS APLINKOS MINISTERIJA**  
**THE MINISTRY OF ENVIRONMENT OF THE REPUBLIC OF LITHUANIA**

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September 2021 No.  
Re 1 July 2021 No. 5-01/653

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**ADDITIONAL INFORMATION ON DISMANTLING AND DECONTAMINATION OF  
EQUIPMENT FROM THE WORKING AREAS R1 AND R2 OF IGNALINA NUCLEAR  
POWER PLANT UNIT 2 REACTOR (PROJECT 2102)**

We would like to present our compliments to the Ministry of Environment Protection and the Regional Development of the Republic of Latvia and to the Latvian Environment State Bureau.

In response to the requests expressed in letter of Environment State Bureau of the Republic of Latvia, dated 1 July 2021 (No 5-01/653), please find attached additional information, related to environmental impact assessment of proposed economic activity – dismantling and decontamination of equipment from the working areas R1 and R2 of INPP Unit 2 reactor of Ignalina Nuclear Power Plant (Project 2102).

We would be very grateful if the Environment State Bureau of the Republic of Latvia could reply to this letter with an indication whether the provided information is sufficient and thus the procedure of transboundary consultations according to UNECE Convention on Environmental Impact Assessment in a Transboundary Context may be deemed to be completed.

**ATTACHMENTS**

1. Amended non-technical EIA summary.
2. Responses to the questions and comments of the Republic of Latvia.

Vice-minister

Raminta Radavičienė

**AMENDED NON-TECHNICAL ENVIRONMENTAL IMPACT ASSESSMENT  
SUMMARY FOR DISMANTLING AND DECONTAMINATION OF EQUIPMENT  
FROM THE WORKING AREAS R1 AND R2 OF IGNALINA NUCLEAR POWER  
PLANT UNIT 2 REACTOR (PROJECT 2102)**

**Information on the Proposed Activity**

**1. Information on the Specificity of the Proposed Activity**

In accordance with the National Energy Strategy adopted by the Seimas of the Republic of Lithuania [“On the approval of the National Energy Strategy” (Valstybės žinios (Official Gazette) 2002, No. 99-4397)], the State Enterprise Ignalina Nuclear Power Plant (INPP) completely ceased the production of electricity starting from 31 December 2009 due to the fulfilling of the obligations of the Republic of Lithuania, provided for in the Treaty of Accession to the European Union. The main INPP activity from 1 January 2010 is decommissioning. The legal basis for the INPP decommissioning is the Law on the INPP decommissioning [Law on the Ignalina Nuclear Power Plant Decommissioning, No. XII-914 (Register of legal acts, 16-06-2014 No. 2014-07639 1)].

The main normative document governing the activity of the Ignalina NPP in planning and implementation of the decommissioning process is the Nuclear Safety Requirements BSR-1.5.12019 “Decommissioning of Nuclear Facilities” developed by the State Nuclear Power Safety Inspectorate (VATESI) of the Republic of Lithuania.

All the Ignalina NPP decommissioning activity is:

- Spent nuclear fuel management;
- Waste management;
- Dismantling and decontamination (D&D) of equipment;
- Modification of existing facilities of infrastructure and the construction of the new ones;
- Demolition of buildings and structures.

INPP decommissioning activity is financed from the budget of the Republic of Lithuania and the European Union (EU).

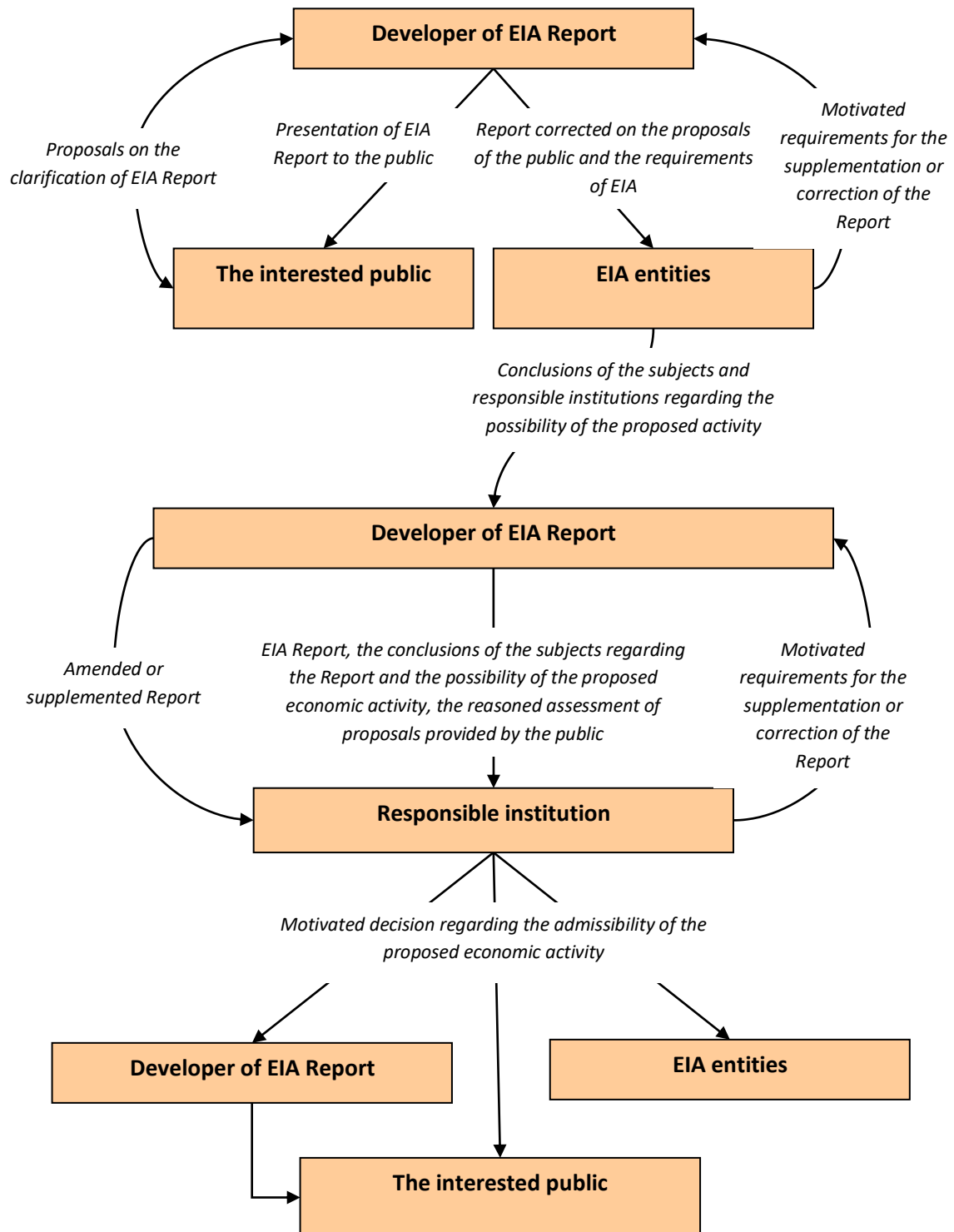
The proposed economic activity is assigned to D&D projects and is defined in the INPP Decommissioning Megaproject as “Dismantling and decontamination of equipment from the INPP Unit 2 Reactor working areas R1 and R2 (Project 2102)” is the first stage in the process of dismantling of Unit 2 reactor. In accordance with the Final Decommissioning Plan, the process of dismantling of Units 1 and 2 reactors is subdivided into several stages, each of which will be carried out according to a separate project.

Project 2102 applies to equipment located in the premises of Unit 2 Reactor working areas R1 and R2. The premises of the working areas R1 and R2 are located within the construction boundaries of block A-2, building 101/2. More detailed information on the boundaries of the 2102 project is presented in section 2 “Information on the spatial and temporal boundaries of the proposed activity”.

According to the Law of the Republic of Lithuania on Environmental Impact Assessment (EIA) [Law of the Republic of Lithuania on the Assessment of the Impact on the Environment of the Proposed Economic activity (Official Gazette 1996, No. 82-1965, new redaction TAR 2017-0705, No. 2017-11562)], the proposed economic activity – dismantling and decontamination of

equipment from the INPP Unit 2 reactor working areas R1 and R2 (Project 2102), refers to the kinds of the activity for which the EIA procedure is obligatory.

The procedure for the preparation, review and approval of the EIA Report for the proposed economic activity is presented in Figure 1.



**Figure 1. Procedure for the preparation, review and approval of the EIA Report**

The EIA process entities reviewing the prepared Environmental Impact Assessment Report of the proposed economic activity are as follows:

- VATESI;
- Fire and Rescue Department;
- Radiation Protection Centre;
- Utena Health Care Centre;
- Department of Cultural Heritage;
- Municipality of Visaginas.

The main stages and technological operations of the proposed economic activity are the following:

- preparatory works, including the establishment of buffer zones, areas of initial treatment of waste (decontamination, packaging) and organization of transportation ways of waste and equipment;
- dismantling of equipment;
- transportation of waste of the dismantled equipment in accordance with the requirements to their initial treatment to the areas of fragmentation, decontamination and packaging;
- initial treatment of dismantling waste;
- radiation measurements of waste and waste packages;
- transfer of waste and/or waste packages to the interim storage, disposal depending on the different classes waste acceptance criteria for each storage facility and the requirements of the normative documents of the Republic of Lithuania;
- final works, including dismantling of equipment installed during preparatory works, restoration of building infrastructure systems, decontamination of premises and other works necessary to be conducted for compliance of the building to the requirements set in the design documents for the final state of the dismantled object.

The main objectives of the proposed activity under the “Project 2101” are the following::

- performance of D&D of equipment from Unit 2 reactor working areas R1 and R2; handling of all types of waste generated during the performing of the proposed economic activity by applying such methods that are safe for personnel and the environment;
- assurance of integrity and normal functioning of the systems remaining in operation;
- assurance of maintaining of the radiological status of the equipment, components and building structures that will not be dismantled at the level not higher than prior to the start of D&D work.

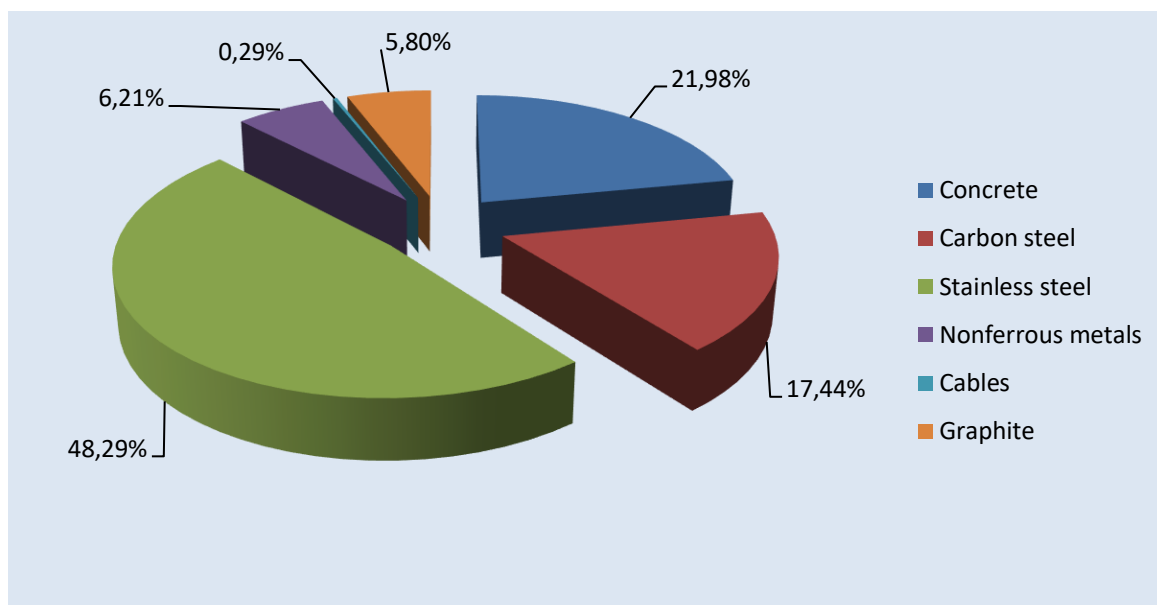
As a result of work performance within the scope of 2102 project Unit 2 reactor working areas R1 and R2 will be emptied of the equipment that is not needed any more, thus providing conditions for performance of the following stage of the reactor dismantling “Dismantling and decontamination of equipment from the Reactor R3 zone (project 2103)”. Other D&D of Bld. A-2 equipment will also be performed in parallel with the dismantling works of equipment from Unit 2 reactor working areas R1 and R2 located within the scope of construction boundaries of Bld. A-2 with the major part of Bld. A-2 equipment to be dismantled within the scope of the project “Dismantling and decontamination of Units A-2 and V-2 equipment (project 2210)”.

Dismantling of equipment from Unit 2 reactor working areas R1 and R2 within the scope of Project 2102 will be implemented by application of disassembly, mechanical and thermal cutting methods. The thermal cutting includes oxygen-acetylene and plasma cutting.

The goal of the selection of D&D technology of the Project 2102 is to reduce the collective and individual doses to the personnel in accordance with the ALARA principle, reduce the volume of secondary waste and release of harmful substances into the environment, reduce the amount of radioactive waste and reclassify radioactive waste to the lower class during initial treatment.

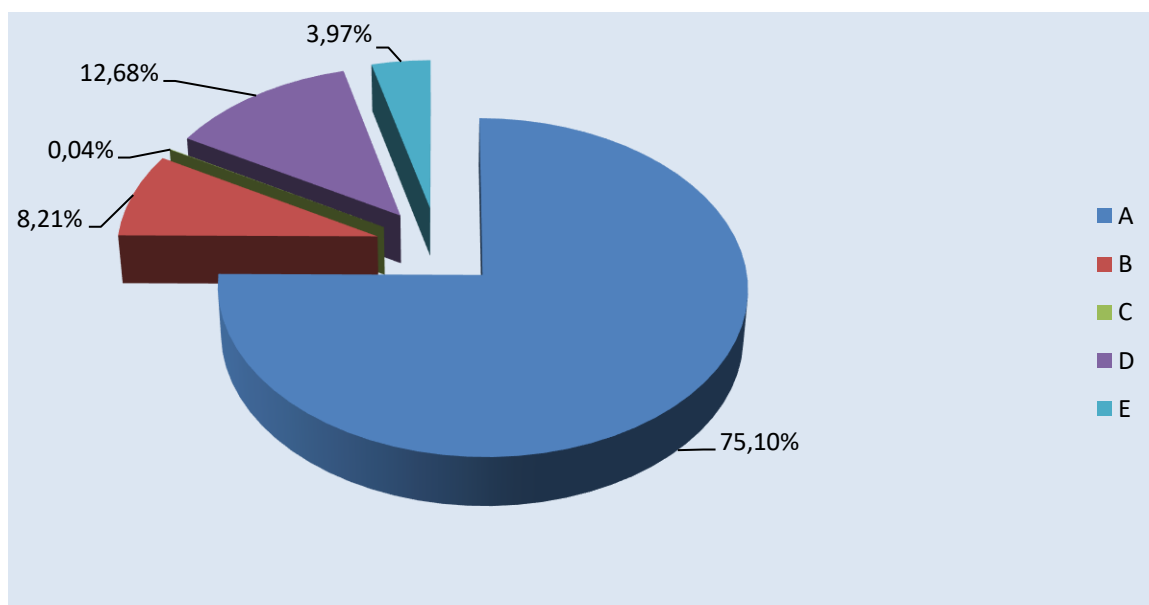
When choosing DD technologies, preference will be given to remotely operated methods, if their feasibility and safety are justified.

During the proposed activity approximately 2121,8 tons of equipment will be dismantled. The general composition of to be dismantled waste is shown in Figure 2. The main materials are carbon steel, stainless steel and concrete (iron-barium serpentinite concrete with cast iron powder). The presence of non-ferrous metals and graphite is due to the design of the reactor channels, which include the middle zirconium parts and graphite sets (sleeves and rings).



**Figure 2. General composition of dismantling waste**

In the process of performing of D&D works of the equipment from working areas R1 and R2, radioactive waste of classes A, B, C, D, E will be generated. The classification of radioactive waste is established by the Nuclear Safety Requirements BSR-3.1.2-2017 "Pre-disposal Management of Radioactive Waste at Nuclear Installations", (TAR, 2017-07-31, No. 12866). In accordance with this document, classes A, B and C include short-lived very low-level, low-level and intermediate-level radioactive waste, and classes D and E are long-lived low-level and intermediate-level radioactive waste. The distribution of primary radioactive waste by classes according to BSR-3.1.2-2017 before pre-treatment is shown in Figure 3.



**Figure 3. Distribution of primary radioactive waste by classes**

Part of the radioactive waste of classes A and B will be subject to decontamination in order to meet the acceptance criteria established for disposal in the Landfill repository (project B19). Decontamination of waste of classes C, D, E will not be performed.

Upon completion of the proposed activity, all dismantled equipment (primary waste), as well as the secondary waste generated during the work will be removed from Building 101/2 for further processing, storage and disposal in the appropriate waste management facilities. Further waste management will be carried out in accordance with the provisions of the documents valid at the INPP, in accordance with their classes:

- Class A waste - disposal in the Landfill facility for short-lived very low-level waste (project B19);
- Class B and C waste - processing and intermediate storage at the SWTSF (project B3/4), followed by disposal in a Near-Surface Repository (project B25);
- Class D graphite waste - intermediate storage in building 158/2 (safety feasibility study was carried out according to the B38 project);
- Class D, E metal waste - processing and intermediate storage at the SWTSF (project B3/4).

In the future, according to the current Radioactive Waste Management Strategy at the INPP, waste of classes D and E will be transported to a Deep Geological Repository. Information on existing and constructed facilities within the framework of projects B19, B3/4, B25 is presented in detail in the presentation “Ignalina Nuclear Power Plant decommissioning” located on the website of the Ministry of the Environment of the Republic of Lithuania.

## 2. Information on the Spatial Boundaries and Timeframes of the Proposed Activity

Ignalina Nuclear Power Plant is located in the north-eastern part of Lithuania on the shore of Lake Drūkšiai, approximately 140 km from Vilnius – the capital city of Lithuania, near the state borders with Latvia and Belarus at the distance of approximately 8 and 4 km respectively, and approximately 260 km from the state border with Poland (Figure4). The distance to the borders of other states is even greater.



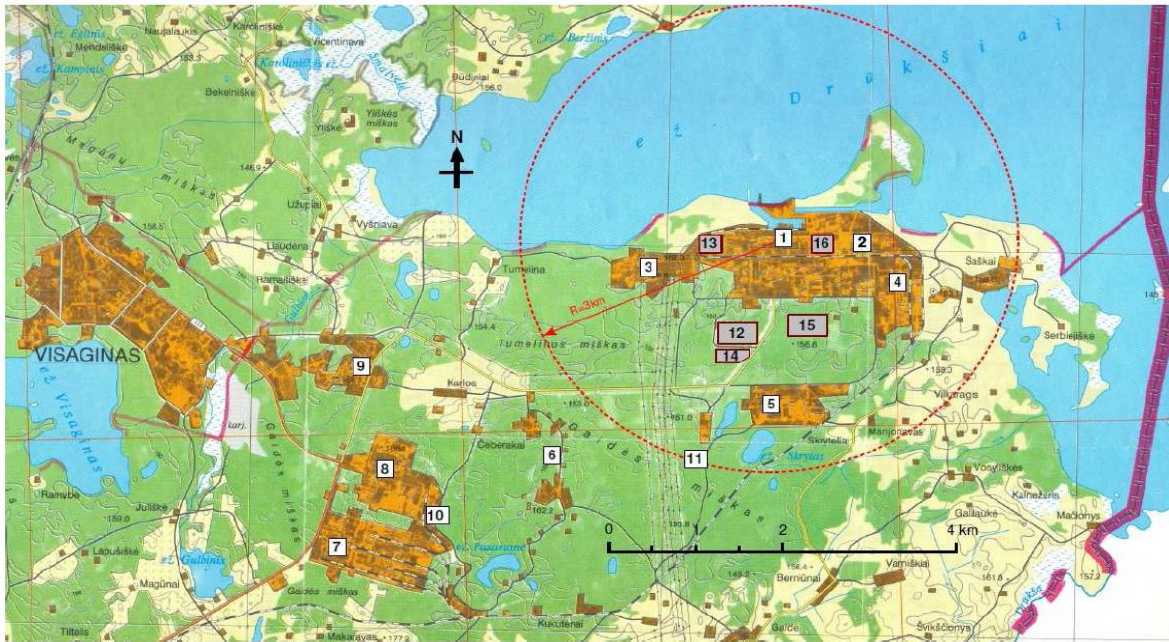
**Figure 4. Location of Ignalina Nuclear Power Plant**

INPP consists of two power units with RBMK-1500 type reactors (electrical power – 1500 MW). The first power unit was operated from the year 1983 until 31 December 2004, and the second power unit – from the year 1987 until 31 December 2009.

The territory of INPP and its premises are divided into the controlled and observation areas. The impact of radiation on the personnel is possible only in the controlled area, access to which is organized through the sanitary inspection facilities and is limited by administrative means or physical barriers. The radiation hazard factors in the observation area do not exceed the levels defined for the category of persons “Population”, that is practically do not exist.

The Sanitary Protection Zone (SPZ) in the radius of 3 km is defined around the INPP site. There are no permanent residents within the SPZ, as well as the economic activity is limited. The nearest settlement is located at the distance of approximately 3.5 kilometres to the south-west of the site. The boundaries of the INPP SPZ and facilities which are located nearby are shown in Figure 5. The proposed economic activity would not require revision or clarification of SPZ boundaries defined by INPP.

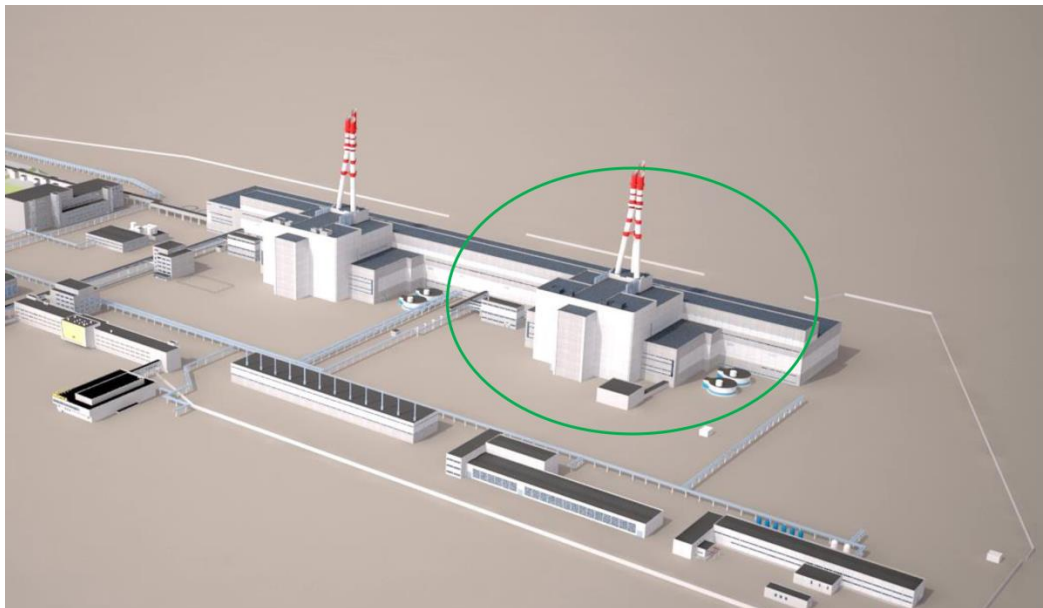




**Figure 5. SPZ of Ignalina NPP and the objects located nearby:**

1 - INPP Power Units, 2 - Existing Dry type Interim Spent Nuclear Fuel Storage Facility – DISFSF, 3 - Open Switchgear, 4 - Equipment Depot, 5 – Water Treatment Facilities of Visaginas, Transport Department, 6 – Water Intake Facilities for Visaginas, 7 - Construction Base, 8 - Construction Industrial Base, 9 - Former Military Base, 10 - Heat Boiler Station for Visaginas, 11 – Dumping of Household Waste of Visaginas, 12 – New Interim Spent Fuel Storage Facility – ISFSF (B1), and SWTSF (B3/4), 13 – Site of Solid Radioactive Waste Retrieval facility – SWRF (B2), 14 – Site of Landfill Facility for Short-lived Very Low-Level Waste, 15 – Site of Near Surface Repository for Low and Intermediate Level Short-lived Radioactive Waste, 16 – Site of Landfill Buffer Storage and Site of Free Release Measurement Facility. There are shown also the existing SPZ with the radius of 3 km.

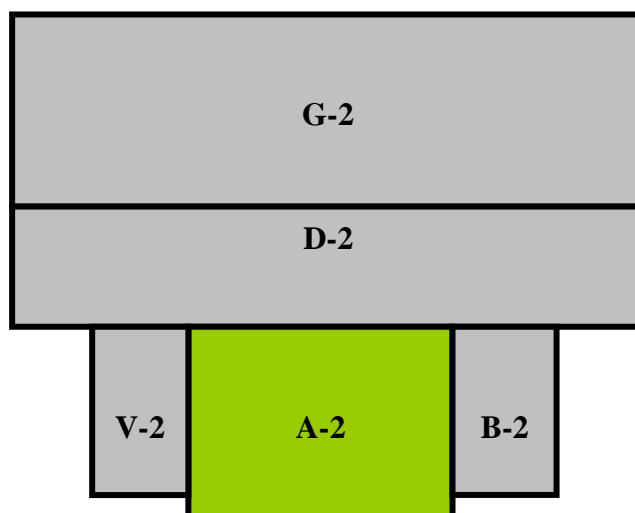
The reactor equipment to be dismantled according to this project is located within construction boundaries of Bld. A-2. Unit A-2, together with Units B-2, V-2, D-2 and G-2, is part of Building 101/2 - the main building of INPP Unit 2. The location of Building 101/2 at the INPP site is shown in Figure 6.



**Figure 6. Location of Building 101/2 at the INPP site**

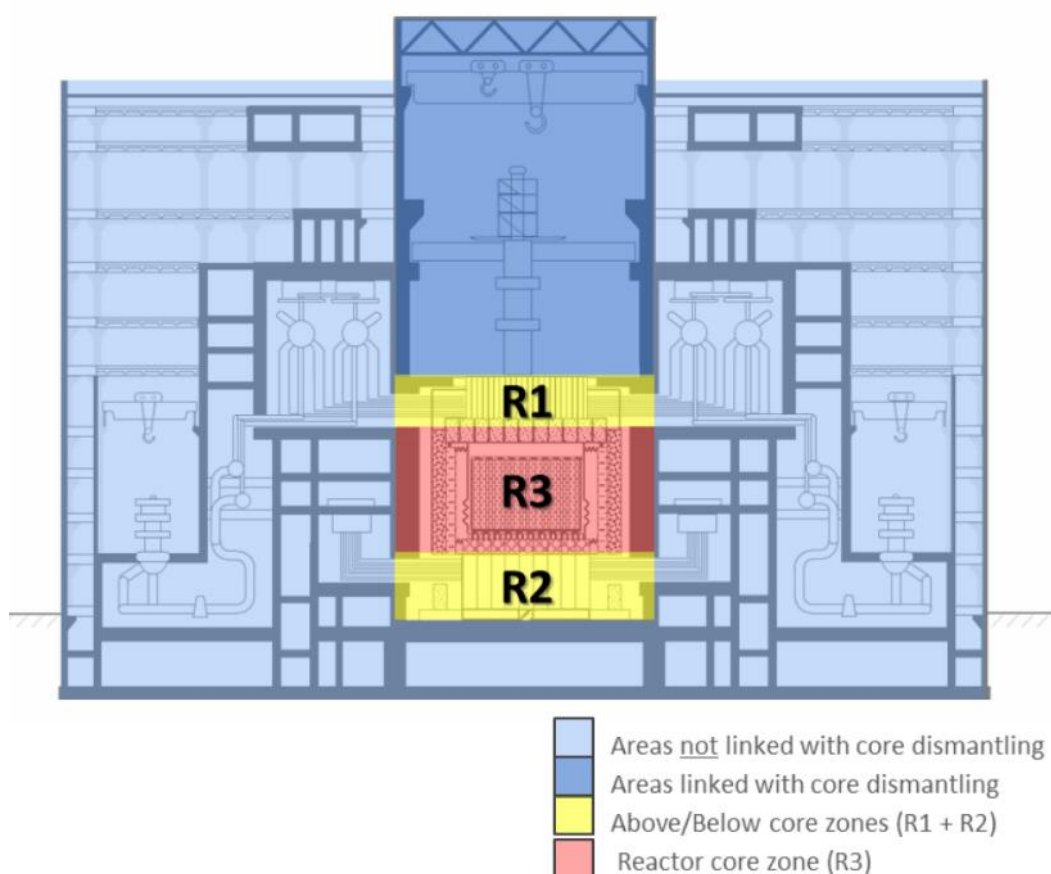
The mutual arrangement of units in Building 101/2 is shown in Figure 7.





**Figure 7. Mutual arrangement of units in building 101/2**

Taking into account the design features of the reactor, three zones with radioactive contaminated structures, components and materials were selected - zones R1, R2 and R3. A general view of the working areas R1, R2 and R3 is shown in Figure 8.



**Figure 8. General view of the working areas R1, R2 and R3**

Zone R1 - zone in the reactor shaft, room 210 and in part in room 506/1,2 of unit A-2, located above the elevation + 20.70.

Zone R2 - zone in the reactor shaft, room 125 of unit A-2 and in part in room 209/1,2 of unit A-2, located from the elevation + 0.9 m to + 5.95 m.

Zone R3 - the zone in the reactor shaft between the elevations + 5.95 m and + 20.70 in room 210 of unit A-2.

Within the framework of the project 2102, the equipment from the working areas R1, R2 will be dismantled and, thus, conditions for the dismantling of the reactor equipment from the working area R3 will be prepared. The main equipment located in the working areas R1, R2 is the fuel channels, channel paths, steam-water and lower water communications, cables and other smaller equipment located in rooms 125, 209/1,2, 210, 506/1,2 of unit A-2.

Work performance places are equipped with the existing special ventilation systems or mobile filtering units containing highly efficient aerosol filters with the cleaning efficiency not lower than 99.9%. This allows to almost completely prevent the ingress of nuclide-contaminated aerosols into the environmental air.

The preliminary assessment assumes that the proposed economic activity will continue for 6 years – during the period from the year 2023 to 2028.

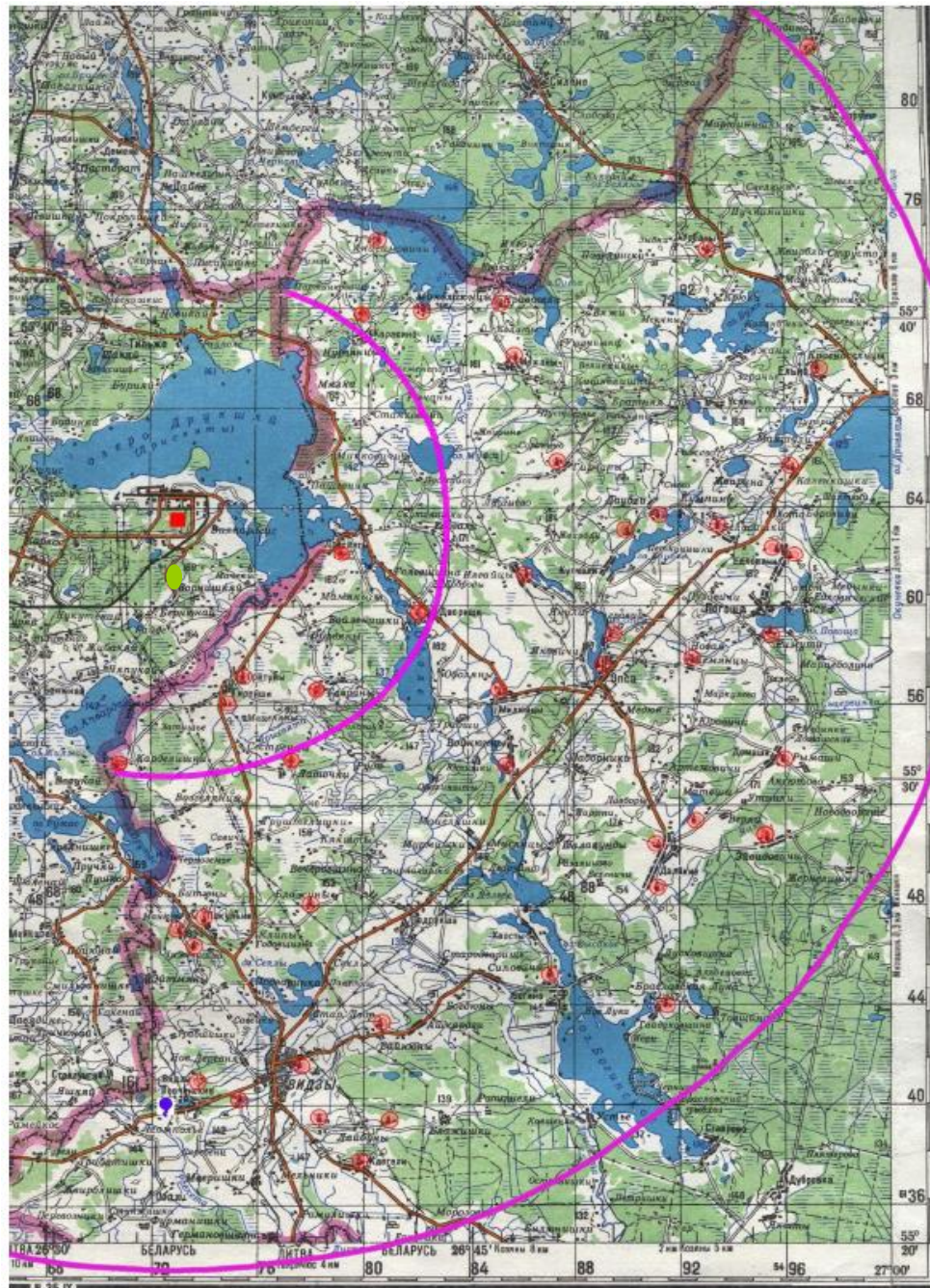
### **3. Information on the Expected Impact on the Environment and the Proposed Measures to Mitigate its Consequences**

#### ***Water Components***

The impact of the proposed economic activity on the surface and underground water of the INPP region and neighbouring countries is not expected due to the fact that:

- the proposed economic activity will be carried out in the controlled area of the INPP industrial site;
- it is not planned to increase the consumption of underground and surface water, therefore an impact on the hydrology of the region will not occur;
- the ingress of uncontrolled water discharges to the environment during the proposed economic activity under the normal operating conditions is excluded;
- industrial water discharges will be treated as potentially radioactive discharges in order to completely eliminate the possibility of radionuclides ingress into the environment. For this purpose, the water discharges will be pumped to the INPP Liquid Radioactive Waste Treatment Facility. Thus, the possibility of environmental pollution will be eliminated;
- sewage water will be collected by the wastewater collection system and pumped for the treatment to the Water Treatment Facilities of SE “Visagino energija”. As the work will be performed by the INPP existing staff, the increase in the amount of discharges from INPP is not expected if compared with the existing situation;
- surface water from the INPP territory will be discharged into the environment (Lake Drūkšiai) through the industrial-surface water drainage channels equipped with mechanical oil retaining devices;
- the proposed activity will be performed outside the SPZ of the Water Intake Facilities and Boreholes of Visaginas town located approximately 3 km to the south-west from the INPP site. The drinking water sources of the Daugavpils district of Latvia and the Braslav district of Belarus are located at much greater distance (Figure 9);
- INPP assures continuous monitoring of ground water, monitoring of the surface and industrial water discharges into Lake Drūkšiai, monitoring of Lake Drūkšiai.

Measures on the impact reduction from the proposed economic activity are not envisaged due to absence of such impact.



**Figure 9. Settlements and drinking water sources in the territory of the Republic of Belarus, at 10 km and 30 km distances from INPP**

### ***Environmental Air***

#### **Non-radiological Impact**

During performance of the proposed economic activity the air pollutants will originate due to cutting of dismantled equipment and during transportation of dismantling and decontamination materials. The emissions from cutting of equipment (in the form of aerosols) will almost completely be caught by the existing highly efficient cleaning systems of emissions with the exception of only gaseous emissions of CO and NO<sub>x</sub> which are not trapped by the cleaning system. However, their amount will be insignificant. The concentration of pollutants in the environmental air as a result of implementation of the proposed activity neither will exceed the air pollution threshold values established by the requirements of normative documents, but will also be significantly below the established limit values.

The motor vehicles carrying dismantling and decontamination materials will not cause any significant impact on the environmental air quality. The transport traffic will be carried out only within the boundaries of the INPP industrial site.

Therefore, the proposed economic activity on D&D of the Project 2102 will not have negative impact on the environment of the Braslav district of Belarus and Daugavpils region of Latvia.

No special measures to mitigate the impact to the environmental air in addition to the measures that will be scheduled in the technological project of D&D.

### Radiological Impact

The possible radiological impact of the proposed economic activity on the environment components outside of SPZ is estimated as very low. Based on the completed assessment, the maximum annual effective dose to the representative (the member of the critical group of population) will be  $7.47\text{E-}06$  mSv for the normal operating conditions which will amount to  $7.47\text{E-}03\%$  of the dose constraint for airborne discharges –  $0.1$  mSv. In case of the INPP, the representative is assumed as the residents who live or undertake activity on the boundary of the SPZ and the INPP monitoring zone.

The analysis of incidents that may arise during the implementation of the proposed activity of the Project 2102 proved that their possible negative effects will impact only the personnel directly performing the works at the workplaces within the premises of the main building of Unit 2 – Building 101/2. Considering that all workplaces in Unit A-2 premises are equipped with highly efficient cleaning systems of emissions, in case of any incidents the increased impact to the environment will not be originated. The maximum impact to the personnel in case of incidents during the radiation-hazardous work will be the following: due to radioactive substances contact with the skin – the maximum exposure dose to the skin amounts to  $1.46$  mSv, which is  $0.3\%$  of the permissible annual values ( $500$  mSv). The works associated with transportation of RAW packages generated during the proposed economic activity by the inner INPP site roads – from Building 101/2 to the RAW treatment facilities are not included into the scope of the Project 2102. The analysis of the incidents related to damage of RAW packages during their transportation by the internal INPP site roads is performed for specific classes of RAW in the previously prepared documents approved in accordance with the established procedure: EIA Reports and SAR for the RAW treatment and storage facilities in B10, B3/4, B19, B25, bld. 158/2. In relation to this project, it can be noted that in case of the most severe incident associated with the drop and damage of the transport container G-2 filled with waste of Class B and C, the potential impact to the representative (the members of the critical group) at the borders with the Republic of Latvia and the Republic of Belarus will be the following:

- the effective exposure dose at the border with the Republic of Latvia –  $7.67\text{E-}04$  mSv;
- the effective exposure dose at the border with the Republic of Belarus –  $1.03\text{E-}03$  mSv.

In order to protect the personnel, residents of the Republic of Lithuania and neighbouring states against the consequences of the potential radiological accidents outside the SPZ boundary, INPP is continuously planning and developing the emergency preparedness measures. In case of exceeding of radioactive substances dispersion norms established for the normal conditions of nuclear facility operation outside the SPZ, the INPP Emergency Preparedness Plan will enter into force and the radiological situation survey within the SPZ and outside its boundaries will be performed. Based on the current state of affairs, measures dedicated for protection of the inhabitants outside of the SPZ shall be performed, as well as the measures related to limitation of the personnel exposure doses.

Considering that the radiological impact due to the proposed economic activity to the environment is significantly below the radiological impact estimated in case of beyond design basis accidents in the INPP Emergency Preparedness Plan, it can be stated that the proposed



economic activity will not have effect on the environment components of the Braslav district of Belarus and Daugavpils region of Latvia, which are located at a more distant location from the source of possible emissions.

The proposed project solutions include the concept of different barriers for localization, containment and collection of airborne radioactivity in order to prevent any significant radioactive releases into the industrial environment and/or atmosphere.

During the implementation of the proposed activity the monitoring of the actual radioactive emissions into the working premises and the environmental air will be carried out.

### ***Soil***

The proposed economic activity of the Project 2102 will be performed within the INPP industrial area, so the impact to the soil and the geological structure of the subsoil of the Braslav district of Belarus and the Daugavpils region of Latvia is not considered. In the absence of any impact due to the proposed economic activity no additional measures to reduce that impact are considered.

INPP Environmental Safety Division provides the continuous monitoring of the soil, groundwater, monitoring of the water discharges into Lake Drūkšiai, monitoring of Lake Drūkšiai.

### ***Underground (Geology)***

As any construction works, new foundations, refilling and ground movement will not be performed during the implementation of the proposed economic activity, no additional impact on the geological ground structure is expected. No hazardous materials or water discharges will be discharged directly (without seepage through the soil or subsoil) or indirectly (seepage through soil or subsoil). The underground cavities will not be used for storage or disposal of any toxic materials.

The proposed economic activity of the Project 2102 will not impact on the underground geology of the Braslav district of Belarus and the region of Daugavpils region of Latvia.

### ***Biological Diversity***

The proposed economic activity of the Project 2102 will be carried out in the territory of the INPP industrial site, where no species of flora and fauna that are protected by the relevant legal acts of the Republic of Lithuania and the EU are found. The impact from the proposed economic activity on the biological diversity outside of the INPP industrial site territory will be quite small and only associated with the exhaust fumes, noise and light signals of motor vehicles. The movement of machinery is expected only at the daytime and it will not change the existing traffic intensity.

In the territories of the Braslav district of the Republic of Belarus and the Daugavpils region of Latvia the originated noise will not be heard, as these regions are at the distance not less than 5 km from the INPP site.

INPP Environmental Safety Division provides continuous monitoring of radionuclide content in samples of vegetation, vegetables and food products selected in the INPP region.

### ***Landscape***

The proposed economic activity will be carried out within the INPP industrial site and do not include any construction or demolition works, as well as other works which may affect the landscape of the INPP site and outside of the site. There will be no impact on residential areas and recreation areas.

### ***Social and economic environment***

The proposed economic activity will be carried out within the industrial area in a distant location

from places of permanent residence in Latvia and Belarus. Impact on the population of Latvia and Belarus or apparent changes in the social economic conditions is not predicted.

D&D work of the Project 2102 will be carried out in strict accordance with the national normative documents consistent with the legal basis of the EU, the requirements of international organizations such as the IAEA, established recommendations and conventions, and in addition, under the supervision of the regulating institutions of the Republic of Lithuania.

INPP possesses sufficient industrial resources, qualified personnel and experience in implementing similar D&D projects in order to be able to perform D&D work of the Project 2102.

D&D work of the Project 2102 will be carried out in accordance with the latest environmental requirements, by applying the state-of-the-art technology, the principles of radioactive waste management defined by the IAEA, and the existing good practices of the European Union countries.

### ***Cultural Heritage***

The proposed economic activity will be carried out within the INPP industrial site and will not affect the objects and the zone of cultural heritage of Latvia and Belarus.

### ***Public Health***

#### Non-radiological Impact

The proposed economic activity will be carried out within the INPP industrial site. The SPZ with the radius of 3 km is defined around the INPP. There are no permanent residents in this zone. The nearest settlements are at a considerable distance from INPP, therefore the impact from D&D work or transportation of freights on the site will be insignificant.

The potential impact from the proposed economic activity will be minimized using high efficiency filters; in addition, good conditions for the dispersion of pollutants will be assured. Considering the fact that the nearest settlements are at a more distant location from the site of the proposed economic activity, the impact on the health of the population in the INPP region is not expected.

Other important factors that may affect the health of the population in the INPP region during the implementation of the proposed economic activity is not expected.

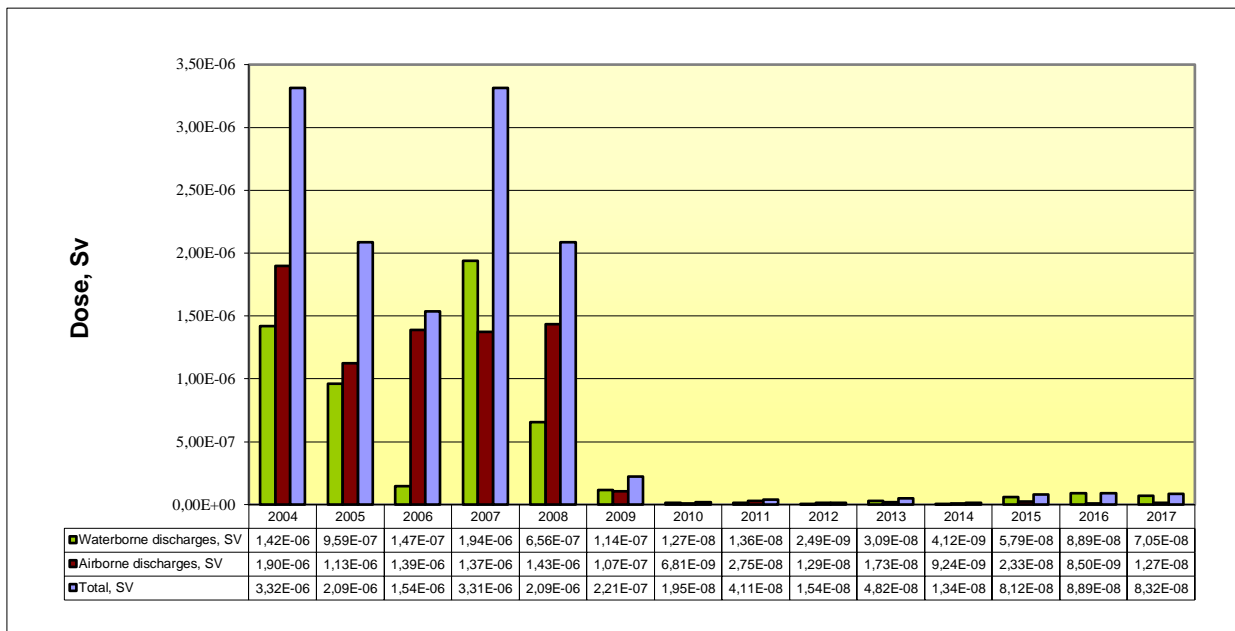
Therefore it could be stated that the proposed economic activity will not have a significant negative impact on the health of the population of the Braslav district of Belarus and the Daugavpils region of Latvia.

#### Radiological Impact

Based on the performed assessment of radiological exposure of the population due to the potential emissions of radioactive substances into the atmosphere during the proposed economic activity, the maximum annual effective dose to the representative (the member of the critical group of population) will be  $7.47\text{E-}06$  mSv, which will amount to  $7.47\text{E-}03\%$  of the annual dose constraint set for the emissions – 0.1 mSv, i.e. half of the dose constraint of 0.2 mSv. The potential radiation exposure of the population in neighbouring states will be even lower due to the more distant location of it from the source of emission.

A comparative evaluation of the negative impact of the INPP activity on the environment during the operation period and during the period after the final shutdown of the power units and the transition period to the decommissioning is presented in the diagram evaluating the exposure dose to the representative due to gas-aerosol discharges and waterborne discharges from INPP (Figure 10).





**Figure 10. Annual effective dose to the representative due to airborne and waterborne discharges from the INPP for 2004-2017 years**

It is obvious that since 2010, when the main activity of the INPP became the decommissioning process, the radiation exposure to the representative significantly decreased. During the period since 2010, several projects on D&D of INPP Units 1 and 2 equipment either have been implemented or are continued to be implemented (Building 117/1, Building 117/2, Units G-1, G2, V-1, D-1, D-2, D-0) and have not caused or do not cause currently any noticeable increase in the negative impact on the environment.

The analysis of expected changes in radionuclide releases allows to conclude that the proposed economic activity do not worsen the existing radiological situation outside of the INPP site.

Since no additional radiological impact on the population of the neighbouring states due to the implementation of the proposed economic activity will occur, no measures to mitigate this impact are required.

#### ***The Impact of the Proposed Economic Activity on the Environment AS Compared to the Impact from All Nuclear Facilities (NF) on the INPP Site***

Estimation of the annual effective dose to the representative due to the radiological impact of airborne and waterborne discharges from the existing INPP NFs for the period of years 2019-2029, is presented (in mSv) in Table 1.

The total annual effective dose to the representative from all NFs on the INPP site does not exceed the annual dose constraint for airborne and waterborne discharges – 0.2 mSv, which is established by the normative documents for the NF, and the maximum estimated value for the year 2020 is about 0.0021 mSv which is 94.9 times less than the annual dose constraint.

The maximum estimated annual dose of the representative due to the proposed economic activity impact for the year 2024 will be equal to 7.47E-06 mSv, that will amount to 4.61E-02 % of the total annual effective dose to the representative due to radioactive exposure (airborne and waterborne discharges) on the environment from existing NFs on the INPP site – 0.0162 mSv in the year 2024.

Therefore, it can be stated that the impact of the proposed economic activity to the environment within the INPP SPZ is negligible. Consequently, the additional radiological impact on the population of the neighbouring states as a result of the implementation of the proposed economic activity will not occur.

Explanations to the Table 1:

- U1DP0 - Decommissioning Project for INPP Unit 1 Defueling Phase (includes all kinds of activity, except D&D of equipment and construction of new facilities);
- U2DP0 - Decommissioning Project for INPP Unit 2 Defueling Phase (includes all kinds of activity, except D&D of equipment and construction of new facilities);
- Project 2207 - D&D of Unit G-1 equipment;
- Project 2208 - D&D of Unit G-2 equipment;
- Project 2214 - D&D of Units D-1 and D-2 equipment;
- Project 2203 - D&D of Unit A-1 equipment;
- Project 2101 - D&D of lower and upper communications of the reactor systems of Unit 1;

Projects on construction of new facilities – B1, B2, B3/4, B19, and B25 (information on existing and under constructed facilities within the framework of projects B1, B2, B3 / 4, B19, B25 is presented in detail in the presentation “Ignalina Nuclear Power Plant decommissioning” located on the website of the Ministry of the Environment of the Republic of Lithuania.)

### Table 1

[illegible]

Transboundary environmental impact assessment carried out for the new INPP nuclear facilities that the Republic of Latvia and Republic of Belarus participated:

- B1 project – Interim spent fuel storage facility. In 2007 the Republic of Latvia and the Republic of Belarus participated in the transboundary environmental impact assessment process, comments and proposals were provided, public hearing was held in Daugavpils on 13 March 2007 and in Vidzy, on 19 April, 2007, respectively.
- B2/3/4 project – Solid radioactive waste management and storage facilities. In 2008 the Republic of Latvia and the Republic of Belarus participated in the transboundary environmental impact assessment process, public hearing of the EIA report was held in Daugavpils on 13 March 2008 and in Vidzy, on 17 May, 2008, respectively, comments and proposals were provided, transboundary consultations with experts of the Ministry of Environment and the Radiation Protection Centre of the Republic of Latvia were held in Vilnius on 4 June 2008 and on 06 June 2008 the transboundary consultations with the experts concerned of the Republic of Belarus was held in Vilnius.
- B19 project – Very-low-level short-lived radioactive waste Landfill facility. In 2008 the Republic of Latvia and the Republic of Belarus participated in the transboundary environmental impact assessment process, the EIA programme was presented for analysis and comments and proposals were provided by the parties concerned. Later, in 2009 the EIA Report was provided, public hearing of the EIA report was held in Daugavpils on 22 April 2009, no comments were provided. No comments from the Republic of Belarus were received also.
- B25 project – Low- and intermediate-level short-lived radioactive waste near surface repository. In 2005 the Republic of Latvia participated in the transboundary environmental impact assessment process, public hearing of the EIA report was held in Daugavpils on 9 June 2005, public hearing of the updated EIA report was held in Daugavpils on 12 December 2006 and comments were provided; concluding transboundary consultations with experts of the Ministry of Environment and other institutions of the Republic of Latvia were held in Vilnius on 16 March 2007, provided comments and the state position were overviewed.

Since the Republic of Belarus joined the Espoo convention only at the end of 2005, the information on the propose activity was provided on a good neighbourhood basis. The meeting on this issue was held in May 2005, on 21 December 2006 the updated EIA Report was presented to the public in Braslav. On 5-7 February 2007 the meeting of the working groups was held in Visaginas and on 19 April 2007 the concluding transboundary consultations with the experts of the Republic of Belarus was held, the provided comments and the state position were overviewed.

#### **4. The Initiator**

The organizer of the proposed economic activity is **the State Enterprise Ignalina Nuclear Power Plant**:

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## **Responses to the Questions and Comments of the Republic of Latvia regarding transboundary environmental impact assessment procedure for the project 2102 “Dismantling and decontamination of equipment from Ignalina Nuclear Power Plant Unit 2reactor R1 and R2 zones”**

Find below the explanations and responses to the questions and comments of the institutions of the Republic of Latvia to the information provided within the frame of the transboundary environmental impact assessment procedure for the project 2102 “Dismantling and decontamination of equipment from Ignalina Nuclear Power Plant Unit 2reactor R1 and R2 zones”. The responses are provided in the same sequence as the questions and comments have been provided.

1. Since the entire Ignalina NPP decommissioning process is extended over the long period of time (2004-2038) and is subdivided into numerous projects (equipment dismantling and decontamination, construction of new radioactive waste treatment and storage facilities, spent nuclear fuel storage facility, demolition of redundant building, etc.) having their own time schedule, scope, planned activities and their safety analyses and environmental impact assessments, interrelations to other decommissioning activities and each of which is subject to the EIA procedure, during development of the EIA Programme (agreed in 2004) it was decided to develop a separate EIAR for each of such of the decommissioning project by taking into consideration the potential cumulative impact of all the activities carried out on the INPP site within the analysed period of time. Thus, such evaluation of the cumulative impact is always made and included into the EIAR while assessing the impact to the human health (see Table 1 in the Non-Technical Summary).

Since year 2000, when the works related to the decommissioning of the Ignalina NPP were started, the INPP has performed 15 environmental impact assessments of the planned economic activity, and the responsible agency have adopted 15 positive decisions on the permissibility of such activity. Part of these decisions (construction of all new NFs) was adopted in accordance with the provisions of the UN Convention on Environmental Impact Assessment in a Transboundary Context (Espoo) following the transboundary consultations with the exception of the equipment dismantling and decontamination activities. Since only on 23 October 2017, upon the entry into force of the amendment to the Convention on Environmental Impact Assessment in a Transboundary Context (hereinafter referred to as the Espoo Convention), the list of activities subject to a transboundary environmental impact assessment has changed, therefore, when planning to start carrying out an activity specified in Article 1(2)(b) of the Espoo Convention (nuclear power stations and other nuclear reactors, including the dismantling or decommissioning of such power stations or reactors (except research installations for the production and conversion of fissionable and fertile materials, whose maximum power does not exceed 1 kilowatt continuous thermal load) or projects, which are an integral part of such activity, the transboundary environmental impact assessment procedures shall be performed in accordance with the procedure established by the Law on Environmental Impact Assessment of Proposed Economic Activities of the Republic of Lithuania. Therefore, the environmental impact assessment of the aforementioned D&D projects is subject to be conducted in the transboundary context.

2. It should be explained that the works related to the equipment D&D will be finished by the end of 2027. In 2028 only the final works related to the project implementation will be carried out (cleaning of the rooms, dismantling of scaffolds, etc.). Any impact on the representative of the general public will be excluded during performance of these works.

3. *(See answer to the previous comment 1)*

Potential risks in case of an accident were analysed in detail in Chapter 8 of the EIAR „Risk Analysis and its Assessment“. Risk analysis was performed following the requirements of the Republic of Lithuania stated in the Procedure for Drafting of the Environmental Impact Assessment Programme and Report. In compliance with this document all potentially probable to occur incidents during the



planned economic activity in the scope of the project 2102 were analysed and classified and the potential risk was screened and rated. The classification was carried out taking into account the following factors:

- Consequences to the health and life;
- Consequences to the environment;
- Consequences to the property;
- Accident development speed;
- Probability of occurrence of the accident;
- Priority of the consequence.

As a result, all potential consequences were analysed, as well as preventive measures and the measures mitigating the impact to the acceptable level were also analysed. Taking into account the above mentioned, the bounding scenarios (the most severe incidents for the given type of the risk) were selected and the detailed analysis of these scenarios was performed, including the impact assessment. The following incidents were selected for the project 2102:

- Incident related to the personnel exposure due to impact of the radioactive material to the skin;
- Incident related to the drop of container G2 filled with the waste of classes B and C inside the Bld. 101/2;
- Incident related to the failure of the ventilation in the working areas R1 and R2 of the reactor;
- Incident related to the drop, damage and spill out of waste of class A during the container transportation on the INPP site following the set route of the transportation;
- Incident related to the drop, damage and spill out of waste of classes B and C during the container transportation on the INPP site following the set route of the transportation;
- Incident related to the drop, damage and spill out of waste of classes D and E during the container transportation on the INPP site following the set route of the transportation.

The analysis of incidents associated with the damage of containers filled with corresponding class of waste during their transportation along the internal roads of the INPP site has been performed in the following documents earlier developed and approved in the prescribed order: EIAR and SAR of radioactive waste management and storage facilities - B3/4, B19, B25. The transboundary assessment of these projects with the participation of the Republic of Latvia was conducted strictly following the Espoo convention. In the EIAR and SAR of the projects B3/4, B19, B25) the effective dose is calculated for a representative of the population considering the following external and internal exposure pathways:

External exposure:

- Exposure due to radiation of the exhaust air plume (air submersion);
- Exposure due to ground radiation of the radioactive fallout and washout (ground radiation).

Internal exposure:

- Exposure due to radioactive intake by respiration (inhalation);
- Exposure due to radioactive intake by consumption of foodstuffs (ingestion) such as milk, meat, green vegetables and other plant products (grain, grain products, root vegetables, potatoes, fruit, fruit juice).

Risks related to the external initiating events due to complicated meteorological conditions and natural phenomena (e.g., earthquake, flooding, extreme weather conditions, etc.), as well as human activity (e.g., external fire, plane crash, etc.) were not analysed in the present EIA report, since such risks related to the external initiating events were analysed for the entire INPP in the Safety Analysis Report of Unit 2 for the final shutdown and defueling stage. The document was agreed with the regulatory body of the Republic of Lithuania (VATESI) following the established procedure.

## DETALŪS METADUOMENYS

|  |   |
|--|---|
| Dokumento sudarytojas (-ai)  | Lietuvos Respublikos aplinkos ministerija, A. Jakšto g. 4, 01105 Vilnius  |
| Dokumento pavadinimas (antraštė)   | ADDITIONAL INFORMATION ON DISMANTLING AND DECONTAMINATION OF EQUIPMENT FROM THE WORKING AREAS R1 AND R2 OF IGNALINA NUCLEAR POWER PLANT UNIT 2 REACTOR (PROJECT 2102) |
| Dokumento registracijos data ir numeris  | 2021-09-06 Nr. (10)-D8(E)-5652  |
| Dokumento specifikacijos identifikavimo žymuo  | ADOC-V1.0, GEDOC  |
| Parašo paskirtis   | Pasirašymas   |
| Parašą sukūrusio asmens vardas, pavardė ir pareigos  | RAMINTA RADAVIČIENĖ, Viceministrė   |
| Parašo sukūrimo data ir laikas   | 2021-09-03 16:35:13   |
| Parašo formatas  | Parašas, pažymėtas laiko žyma   |
| Laiko žymoje nurodytas laikas  | 2021-09-03 16:35:29   |
| Informacija apie sertifikavimo paslaugų teikėją  | ADIC CA-A   |
| Sertifikato galiojimo laikas   | 2021-01-28 - 2024-01-28   |
| Parašo paskirtis   | Registravimas   |
| Parašą sukūrusio asmens vardas, pavardė ir pareigos  | Regina Žemaitienė, Vyr. specialistė   |
| Parašo sukūrimo data ir laikas   | 2021-09-06 08:17:29   |
| Parašo formatas  | Trumpalaikis skaitmeninis parašas, kuriame taip pat saugoma sertifikato informacija   |
| Laiko žymoje nurodytas laikas  |   |
| Informacija apie sertifikavimo paslaugų teikėją  | RCSC IssuingCA  |
| Sertifikato galiojimo laikas   | 2021-01-07 - 2023-01-07   |
| Pagrindinio dokumento priedų skaičius  | 2   |
| Pagrindinio dokumento pridedamų dokumentų skaičius   | 0   |
| Programinės įrangos, kuria naudojantis sudarytas elektroninis dokumentas, pavadinimas                | Elektroninė dokumentų valdymo sistema VDVIS, versija v. 3.04.02   |
| El. dokumento įvykius aprašantys metaduomenys  |   |
| Informacija apie elektroninio dokumento ir elektroninio (-ių) parašo (-ų) tikrinimą (tikrinimo data) | El. dokumentas atitinka specifikacijos keliamus reikalavimus. Visi dokumente esantys elektroniniai parašai galioja. Tikrinimo data: 2021-09-06 08:19:58               |
| Elektroninio dokumento nuorašo atspausdinimo data ir ją atspausdinęs darbuotojas                     | 2021-09-06 atspausdino Regina Žemaitienė  |
| Paieškos nuoroda   |   |