



DECOMMISSIONING PROCESS OF THE IGNALINA NUCLEAR POWER PLANT

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SUMMARY

Relevance of the Audit

Under the Treaty of Accession to the European Union, Lithuania committed to decommissioning the Ignalina Nuclear Power Plant (INPP) and the European Union committed to providing adequate additional financial support to fund this process.

The Ignalina Nuclear Power Plant Decommissioning Project is an exceptionally important and significant project for the entire country, requiring special attention and financial capacity. The estimated decommissioning cost of the INPP is EUR 3.3 billion. By 31 December 2020, after the implementation of 49% of the planned works, EUR 1.3 billion, or 39% of the provided funds were used, 85% of which were funds allocated by the European Union.

One of the tasks to achieve the strategic goals provided for in the 2021–2030 National Progress Plan is to ensure the safe decommissioning of the Ignalina Nuclear Power Plant and to manage the generated radioactive waste in a way that does not endanger the environment.¹

The decommissioning of the Ignalina Nuclear Power Plant includes its final shutdown, installation of decommissioning infrastructure, dismantling of facilities, demolition of buildings and waste management. Besides, a deep geological repository is to be constructed for the final disposal of the long-lived radioactive waste. It is planned that the process of safe decommissioning of a nuclear facility, which started in 2000, will be completed by 2038. The beginning of one of the most complicated stages of decommissioning is scheduled for 2027: it is planned to begin the unique and technologically complex decommissioning works of the two nuclear reactor cores.

¹ Approved by the Resolution No. 998 of the Government of 9 September 2020, strategic goal 6.

A project of this scale is completely unique in Lithuania, with the largest and most important Ignalina Nuclear Power Plant decommissioning works still lying ahead. It is therefore essential to ensure a smooth and safe decommissioning process and preparation for the final disposal of the generated radioactive waste. Improper implementation of the process would impose an additional financial burden on Lithuania in the future and would have an impact on people and the environment.

Objective and Scope of the Audit

The objective of the audit is to assess whether the decommissioning process of the Ignalina Nuclear Power Plant is being carried out properly and effectively.

Key audit questions:

- whether the timely implementation of the Ignalina Nuclear Power Plant decommissioning project is ensured;
- whether adequate preparations are made for the installation of the deep geological repository.

Audited entities:

- Ministry of Energy organises the INPP decommissioning, radioactive waste management and disposal as well as other functions assigned to it in the field of nuclear energy.
- SE Ignalina Nuclear Power Plant plans, organises, manages and implements the process of decommissioning of nuclear facilities and radioactive waste management, as well as monitors and controls the implementation.

During the audit, we also collected data from the Central Project Management Agency, State Nuclear Energy Safety Inspectorate, and the Ministry of Finance.

As the process by measuring under the Earned Value Method² is still at the mid-way point, the projects to be implemented are not completed and the most complicated works still lie ahead, after 2027, we have not assessed the appropriateness of the use of the funds in line with the Plan.

The audited period is 2017–2019, however, in order to compare the data, in some cases, the data of previous years, as well as 2020 and 2021, was used to collect the audit evidence.

The audit has been performed in accordance with the Public Auditing Requirements and International Standards of Supreme Audit Institutions. The scope and methods of the audit are described in greater detail in Annex 2, Audit Scope and Methods (p. 37).

² The Final Decommissioning Plan, approved by the Order No. 1-248, of the Minister of Energy of the Republic of Lithuania of 11 August 2020, Section 4(4.7.).

Key audit results

The decommissioning of the Ignalina Nuclear Power Plant and the management of the generated radioactive waste are not yet carried out in such a way as to ensure the smooth implementation of the decommissioning works and the timely storage of long-lived radioactive waste in a deep geological repository. The results of the audit have shown that there is room for improvement as it is not always ensured that the decommissioning of a nuclear power plant is carried out on schedule. Although a financing mechanism has been created for the construction of a deep geological repository, it is necessary to ensure sufficient annual funding.

1. Decommissioning process of the Ignalina Nuclear Power Plant has room for improvement

The implementation of the decommissioning projects of the Ignalina Nuclear Power Plant faces delays

The involvement of all institutions participating in the process is crucial for the smooth decommissioning of the Ignalina Nuclear Power Plant, its compliance with safety requirements and the proper use of funds. Having compared the 2014 and 2020 versions of the Final Decommissioning Plan, we found that 43 (out of 98) of the projects in the Plan had their end date changed, i.e. the deadlines for 12 projects have been shortened, while the end date for 31 projects has been extended to 10 years. It is therefore important to ensure a smooth process of coordinating the documents required for the implementation of the decommissioning project with the responsible institutions, as the duration of the coordination process determines the start and end of specific works or continuous activities. The main reasons for delays of projects are as follows:

- Documents, required to obtain licenses, permits or documents related to other nuclear safety issues provided for in legal acts are to be coordinated with the State Nuclear Power Safety Inspectorate. Of the 37 documents submitted to the Inspectorate in 2017–2019 for the implementation of 8 (out of 17) projects selected for assessment, 22% were agreed within the deadlines at the first occasion and 78% were revised, amended, and resubmitted to the Inspectorate. As a result, the coordination process took between 9 and 1,275 days.
- Procurement documents funded by the Ignalina Programme are coordinated with the Central Project Management Agency. Of the 85 procurement documents prepared and submitted to the Agency for approval in 2017–2019, for 13 (out of 17) projects selected for assessment, 80% were approved or conditionally approved at the first occasion and 20% were not approved at the first occasion, as, according to the Agency, documents had to be revised or supplemented. As a result, the coordination process took between 35 and 432 days.

The delayed coordination procedure has an impact on the ongoing and planned projects as the repeated revision of documents delays the execution of works, the start of related activities which leads to falling behind the planned schedule of project implementation. Failure to take decisions to improve and accelerate the process of the coordinated

documentation may in the future affect the completion of the entire decommissioning process within the set deadlines (Sub-section 1.1., p. 14).

Timely execution of critical path activities needs to be ensured

The critical path of activities of the Ignalina Nuclear Power Plant decommissioning projects consists of a series of related works with no time reserve. At the end of 2020, there were 5 projects on the list of critical path activities. The completion date of one of them – Dismantling of A-2 Unit Equipment – was postponed for more than 8 years (from 31 December 2026 to 21 August 2035) and the completion term of another project – Site Reclamation – coincides with the end of the entire project and can be launched only after the completion of other ongoing projects. The execution of projects on this list has a direct impact on the final date of the decommissioning project, therefore, failure to take measures to ensure the smooth implementation of projects may delay the entire project for the period of delayed implementation of critical activities (Sub-section 1.2., p. 21).

Not all indicators in the Annual Work Programme are achieved on time

Each year, SE Ignalina Nuclear Power Plant prepares an Annual Work Programme. The Programme is one of the annual decommissioning planning documents and is submitted to the European Commission. It is based on the Final Decommissioning Plan and is a link in the process of planning and monitoring the decommissioning activities at the Ignalina Nuclear Power Plant, providing information on the actual decommissioning schedule and estimated costs, describing the results to be obtained, phases of implementation, target dates, and indicators of performance. The 2014–2019 Annual Work Programmes set 127 indicators for the 11 (out of 17) projects selected for assessment, of which 54% were achieved and 46% were not achieved on time, due to failure to start or incomplete implementation of activities, as well as due to other reasons. The planning of decommissioning activities and their corresponding indicators are hampered by the lack of information on the exact scope of works. It is therefore necessary to strengthen the planning of indicators and their achievement, as it can be one of the elements demonstrating the smooth implementation of the decommissioning process (Sub-section 1.3., p. 23).

Risk management needs to be improved

In 2017, SE Ignalina Nuclear Power Plant developed and implemented a corporate risk management system, established risk management registers, which include 211 identified risks, 91% of which with identified risk mitigation measures. As the risk registers do not always provide information on the implementation of the measure, there is no traceability of the implementation of these measures, therefore, we could not verify that all planned risk mitigation measures were implemented and what impact they had on risk management (Sub-section 1.4., p. 25).

2. Adequate Preparation for the Final Management of Long-lived Radioactive Waste Needs to Be Ensured

Preparatory works for the installation of a deep repository have been started

By 2038 all radioactive waste generated during the decommissioning of the Ignalina Nuclear Power Plant will have to be placed in appropriate storage facilities and repositories and stored there. Long-lived radioactive waste is stored in temporary storage facilities. At the end of the service life of storage facilities, the long-lived radioactive waste should be transferred to a deep geological repository, which is planned to be installed by 2067; the estimated preliminary cost of its installation is EUR 2.5 billion. The Development Program for Decommissioning of Nuclear Power Facilities and Radioactive Waste Management for 2021–2030, approved in 2021, outlines the stages for the repository construction. In case of the failure to complete the deep geological repository by 2067 and at the end of the service life of temporary storage facilities, its transfer to new temporary containers may cost an additional EUR 1.1 billion, i.e. almost half of the total amount allocated for the construction of the deep geological repository. It is therefore necessary to ensure proper monitoring of the ongoing works in order to ensure their timely implementation (Sub-section 2.1., p. 29).

Failure to collect sufficient funds for the construction of the deep geological repository on time will incur additional costs for the storage of the generated waste

In order to ensure the funding for the installation of the deep geological repository and radioactive waste management, the Reserve (Stabilisation) Fund started to accumulate the proceeds from the sale of the assets of the SE Ignalina Nuclear Power Plant as from 1 December 2020. It is planned to raise at least EUR 3 million every year, however, the average annual demand is approximately EUR 42.7 million. This may therefore require additional sources of funding in the future (Sub-section 2.2., p. 30).

Recommendations

To the Government

1. In order to ensure proper preparation for the construction of the deep geological repository, actions to collect the necessary funds for waste disposal in the repository need to be coordinated (2 key audit result).

To the Ministry of Energy

2. In order to ensure Ignalina NPP decommissioning projects are implemented in a timely manner, the Ministry should propose solutions to facilitate the preparation of the necessary documentation and coordination with the State Nuclear Power Safety Inspectorate and the Central Project Management Agency within the deadlines (1 key audit result).

To SE Ignalina Nuclear Power Plant

3. In order to improve the project management process, proper execution of projects and works that have a direct impact on the decommissioning should to be ensured, as well as the project management process needs to be improved (1 key audit result).

Measures and deadlines for the implementation of recommendations are provided in the Section Recommendation Implementation Plan of the report (p. 34).