

**European Nuclear Safety Regulators Group  
ENSREG**

**2<sup>nd</sup> Topical Peer Review – ‘Fire Protection’**

**Country Review Report**

**Lithuania**

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## 1. Brief overview of the candidate installations

The following installations were finally selected and included in the national assessment report (NAR).

Installation category	Number of installations	Name of candidate installations
Nuclear power plant		-
Research reactor		-
Fuel reprocessing facility		-
Fuel fabrication facility		-
Fuel enrichment facility		-
Dedicated spent fuel storage	2 (dry)	Dry type spent nuclear storage facilities SNFSF – 1 and SNFSF - 2
Installations under decommissioning	1	Ignalina NPP (1 and 2 Units)
On-site radioactive waste storage	5	Solid Waste Retrieval Facility (B2-2 project) Solid Waste Management and Storage Facilities (B3/4 project, SWMSF) Liquid Waste Storage Facilities (Building 151) Bituminized waste Storage facility (Building 158, BWSF) Cemented waste Storage facility (Building 158/2)
<b>Total</b>	<b>8</b>	

## 2. Regulatory framework

The NAR mentions that “The general fire safety requirements for nuclear facilities are set out in the Law on Fire Safety, as well as in its sub-legislation. The specific fire safety requirements for nuclear facilities are set in nuclear safety and nuclear energy laws and VATESI regulations. In particular, “Nuclear Safety Requirements BSR-1.7.1-2014 “Fire Safety of Structures, Systems and Components Important to Safety of Nuclear Installation” establish requirements for fire safety of SSCs important to safety of NI.” The main goals of the requirements are:

1) to establish the applicable criteria and requirements for the protection against fires of SSCs important to safety of NI, including the commissioning and decommissioning stages, and aims to prevent or to limit the consequences of such fires;

2) to establish the requirements to apply defense in depth principle for the design fire safety assurance measures of SSCs important to safety of NI;

3) to establish the requirements for subdivision of the NI buildings into fire compartments and fire cells.

The NAR does not clearly state if the WENRA SRLs are binding. In response to the question of the TPR Team<sup>1</sup>, Lithuania's response was *"The majority of SRLs for NPPs (2014 version), including 20 S - Protection against internal fire, have been transfer to the national safety requirements (308 from 342), the remaining 34 SRLs have not been transfer as were not relevant for final shutdown Ignalina NPP. WENRA SRLs for RRs are not relevant for Lithuania."*

The NAR mentions that *"VATESI follows the EU directives, IAEA safety standards, best practice of other countries and transposes them into national legislation. The main internationally adopted standards, guides and other documents, used in the development of fires safety of NIs, are the ones from" IAEA and WENRA (WGWD).*

### 3. Findings and significant improvements of approaches on the installations from the national self-assessment

#### All facilities

The following **strengths** related to fire protection have been reported in the NAR for **all facilities**:

- Fire safety adequacy at Ignalina NPP NIs is also achieved by Integrated Management System (IMS) and Safety Culture. According to IMS, a fire safety management process is implemented to assure fire safety at NIs taking into account organizational and technical measures.
- Periodic inspections on fire safety are performed by VATESI at nuclear installations (NIs) in accordance with annual plans, based on five-year inspection program and they address both the organizational issues and technical aspects. VATESI also has resident inspectors at the Ignalina NPP site, who conduct regular walkdowns across the site and supervise as well as how fire safety is ensured in the NIs.

The following **lessons learned** related to fire protection have been reported in the NAR for **all facilities**:

- All fires at the Ignalina NPP NIs, including false alarms of the active fire protection system, are analysed. At present, there is a tendency to reduce the number of false activations after implementing corrective measures.

#### Dedicated spent fuel storage

##### **SNFSF – 1 and SNFSF - 2**

No **strengths** and **weaknesses** related to fire protection were reported in the NAR specifically for **SNFSF – 1** and **SNFSF – 2**.

The following **lesson learned** related to fire protection was reported in the NAR for **SNFSF – 2**:

- The last Lithuanian regulatory body's (VATESI) inspections were carried out in 2019 and in 2022 at SNFSF – 2. A non-conformity with the design documentation was identified. The fire extinguisher was not found in the Gate House room, where cask with spent nuclear fuel are brought by train. As a corrective measure, the fire extinguisher was brought and placed in the adjacent heated room.

No **improvement** related to fire protection was reported for **SNFSF – 1** and **SNFSF – 2**:

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<sup>1</sup> 'The NAR in §1.2 presents the regulatory framework. If not yet clearly mentioned in the NAR, could you indicate whether the WENRA SRLs for NPPs, and RRs (if relevant for your country), which are used as reference for this topical peer review on 'fire protection' (as per the Technical specification) are binding or not in your country? If they are not binding, what is the status of the SRLs (non-binding, guidance, advisory..)?'

## **On-site radioactive waste storages**

No **strengths** and **weaknesses** related to fire protection were reported in the NAR for the **on-site radioactive waste storage facilities**.

The following **lessons learned** related to fire protection were reported in the NAR for the **on-site radioactive waste storage facilities**.

- During the inspection, which was carried out in 2021 at Solid Waste Storage Facility (SWTSF), VATESI inspectors found that the fire departments penetration, through which pass the technological system, is not properly sealed. After receiving VATESI remark, SWTSF employees immediately eliminated this deficiency and checked the entire SWTSF to see if there were any more similar problems.
- In the framework of PSR 2018 FHA for Liquid Waste Storage Facilities (LWSF) was not performed. Under regulatory requirement the licensee prepared and submitted LWSF FHA to VATESI in 2020. It was confirmed that the summary conclusions presented by FHA are acceptable.

The following **improvements** related to fire protection were reported in the NAR for the **on-site radioactive waste storage facilities**:

- Recommendations for improving the fire safety provided in the FHA report and all appropriate safety improvement measures were implemented.
- After performing FHA for SWTSF, it was recommended to prepare accident liquidation plan of the facility and perform functional training including elements of fire fighting and liquidation of radiological accident in the facility. Appropriate safety improvement measures were implemented.

## **Installations under decommissioning**

### **Ignalina NPP (1 and 2 Units)**

No **strength** related to fire protection was reported in the NAR specifically for **Ignalina NPP 1 and 2 Units**.

The following **weaknesses** related to fire protection were reported in the NAR for **Ignalina NPP 1 and 2 Units**:

- False activations of the sections of the stationary fire extinguishing systems were caused by external impacts on the equipment of the stationary fire extinguishing systems (partly due to erroneous actions of personnel when organizing work in the area of operation of the systems).
- For dismantling activities, different types of hot works are used and those activities are performed on different places at the same time. Planning and implementing of decommissioning projects requires an additional resource for properly fire safety (hazards) analysis and surveillance in comparison with normal operation of NIs. SE Ignalina NPP during planning and implementing of decommissioning projects ensure all required resources for fire safety.

The following **lessons learned** related to fire protection were reported in the NAR for **Ignalina NPP 1 and 2 Units**:

- After OSART mission (2006), recommendations and suggestions provided by the OSART team have been thoroughly analyzed and consequently corrective measures have been developed.
- As a result of the WANO partner assessment (2007), corrective measures were developed.
- All fires at the Ignalina NPP NIs, including false alarms of the active fire protection system, are analysed. The implementation of corrective measures is monitored. At present, there is a tendency to reduce the number of false activations after implementing corrective measures.

- On October 8, 2016, combustion of exhaust fumes was discovered in the exhaust pipe diesel generator 7 of the backup diesel power station. Corrective measures (development of a procedure for inspecting and cleaning the exhaust gas pipeline and muffler; analysis of operational documentation and maintenance repair documentation for compliance with factory and project requirements, considering operational experience) were developed and implemented.
- On April 23, 2017, due to the overheating of the power supply transformer in the electrical cabinet on Ignalina NPP Unit 2, smoke was generated in the room, which was detected by the fire alarm system. Corrective measures (modification of the procedure for performing technical maintenance work.) were developed and implemented.
- On April 1, 2022, a fire occurred in the turbine hall of Ignalina NPP Unit 2 due to improper organization of welding works during the dismantling of metal structures, resulting in the ignition of the covering film of containers containing operational waste, Corrective measures (personnel re certification; conducting additional briefings; training for event participants on safety culture) were developed and implemented.
- A general lesson learned from a fire protection point of view decommissioning and dismantling activities the risk of fire and the need to give more attention to these issues: constantly changing environment, more frequent assessment of fire protection risks and increased implementation of their control measures requires to take more attention and resources.

The following **improvement** related to fire protection was reported in the NAR for **Ignalina NPP 1 and 2 Units**.

- Fire resistance improvement of separate structural elements (building constructions, doors, air ducts, valves, gates, cables), with installation of automatic fire alarm in the most important SSCs rooms, with fire safety improvement in footway corridors, in staircases, cable tunnels and shafts.

## 4. Peer-review conclusions

### 4.1 Attributes of the NAR and the information provided

The candidate installations are the ones which were the subject of the Board's review prior to the national self-assessment. The recommendation of the Board to consider additional facilities (spent fuel storage SNFSF – 1) was taken into account in the NAR.

In general, the national report responds to the technical specifications, however specific descriptions provided therein are sometimes unclear or lacking in detail or context to allow to draw conclusions about their safety significance. Consequently, the identification of peer review findings based on the information in the NAR was not straightforward.

There are no comments on the structure of the NAR.

The outcomes of the self-assessment appropriately mentioned the findings, which were well-illustrated and clearly described.

Adequate information was provided in reply to the written questions.

Additional information and updates provided in reply to written questions and in the national presentations in the country review workshop were taken into account in the definition of the findings below in section 4.2.

## 4.2 Peer review findings

The self-assessment did not reveal any weaknesses in the fire protection of the nuclear installations. However, during its national presentation, Lithuania identified areas for improvement, which were discussed at the country workshop and acknowledged by the TPR Team:

Areas For Improvement proposed by the country and acknowledged as such by the TPR Team	
<b>Nuclear installation: Spent fuel storage facility SNFSF-1</b>	
<b>AFI (1)</b>	A need to install additional equipment that would allow remote monitoring of the situation in SNFSF-1 from INPP main control room.
<b>Nuclear installation: On-site radioactive waste storage facilities</b>	
<b>AFI (2)</b>	A need to implement solutions to improve the reliability of fire detectors that are operating in hard conditions (for instance, high radiation, humidity) in Solid waste treatment and storage facilities (B3/4 project) and Solid waste storage buildings 157, 157/1.
<b>Nuclear installation: All facilities</b>	
<b>AFI (3)</b>	A need for standardisation of inspections and functionality testing procedures for fire dampers. Fire dampers must be visually inspected on site for actuation condition and such a method shall be properly addressed in relevant Ignalina NPP operating and maintenance procedures.

**The TPR team recommends that Lithuania addresses these areas for improvement in the National Action plan.**

The TPR team noted that Lithuania during its national presentation identified a need for improvement of regulatory requirements regarding new types of ignition sources (for instance, lithium-ion batteries), and which address the responsibility of licensee to control of activities which are based on justified fire loads.

No additional findings were proposed during the peer review phase.

## **Definition of the types of findings**

According to the TPR II Terms of Reference, the country group workshop discussions should lead to conclude on the findings categorised as an 'area of good performance' or 'area for improvement'. These are defined therein as follows:

*A National area of good performance which should be understood as an arrangement, practice, policy or programme related to fire protection that is recognized by the TPR Review Team as a significant accomplishment for the country and has been undertaken and implemented effectively in the country and is worthwhile to commend.*

*A National area for improvement which should be understood as an aspect of fire protection identified by the TPR Peer Review Team where improvement is expected, considering the arrangement, practice, policy or programme generally observed in other participating countries. It may also be self-identified by the country itself (i.e. self-assessment) where improvement is appropriate.*