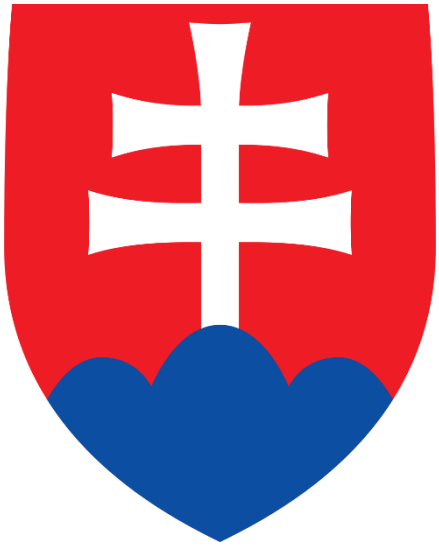
ENSREG 2nd Topical Peer Review

NATIONAL ACTION PLAN OF THE SLOVAK REPUBLIC ON FIRE PROTECTION IN NUCLEAR FACILITIES



UJD SR, Bratislava, Slovak Republic, March 2026

Contents

0. Acronyms

AFI	- area for Improvement
CRR	- country's review report
ENSREG	- European Nuclear Safety Regulators Group
EU	- European Union
FDPS	- fire detection and protection system
HVAC	- heat ventilation and air conditioning system
ISFS	- interim spent fuel storage facility
JAVYS, a. s.	- Jadrova a vyradovacia spolocnost, a. s. (Nuclear and Decommissioning Company)
NAcP	- national action plan
NAR	- national assessment report
NPP	- nuclear power plant
NPP EBO3&4	- NPP Bohunice
NPP MO1&2	- NPP Mochovce (Units 1&2)
NPP MO3&4	- NPP Mochovce (Units 3&4)
NSD	- Nuclear Safety Directive
RAW	- radioactive waste
SE, a. s.	- Slovenske elektrarne, a. s.
SR	- Slovak Republic
TPR	- topical peer review
UJD SR	- Urad jadroveho dozoru SR (Nuclear Regulatory Authority of the Slovak Republic)
WENRA	- Western Nuclear Regulator's Association
WWER	- water-water energy reactor

1. Introduction

There are currently five WWER 440/V213 nuclear units in operation in Slovakia, two units at the Bohunice site and three units at the Mochovce site. In addition, one more WWER 440/V213 unit is in the commissioning phase at the Mochovce site. Slovenske elektrarne, a. s. (SE, a. s.) is the owner and holder of the operating licence for all the above units in Slovakia. The licensee for the decommissioning of nuclear power plants and the operation of facilities for the handling and processing of radioactive waste and the operation of facilities for the handling of spent nuclear fuel is the state-owned company JAVYS, a. s.

The UJD SR issued Decisions No. 235/2022 and No. 236/2022, in which the obligation is imposed on the licensees to participate in the Topical Peer Review (TPR) process, carry out a self-assessment of fire protection according to the prescribed methodology, and develop and implement action plan based on TPR findings.

The UJD SR has determined that representative nuclear installations – Unit 3 of the Mochovce NPP and – Interim Spent Fuel Storage (ISFS) facility, where spent nuclear fuel with significant activity is disposed – are subject to assessment as a part of the TPR.

This national action plan (NAcP) has been prepared in the frame of second TPR, which arises from the European Union's Nuclear Safety Directive 2014/87/EURATOM of 8th July 2014 amending Directive 2009/71/EURATOM on the establishment of Community framework for the nuclear safety of nuclear installations of the European Union. The directive requires Member States of the European Union to conduct the TPR every six years with the first evaluation in 2017. The second evaluation occurred in 2023. The "Fire protection" has been selected as the topic for the second TPR, recognising fire as a significant risk to many nuclear installations in the European Union (EU).

The TPR process was intended to:

a) Enable participating countries to review their provisions for fire protection to identify strengths and weaknesses;
b) Undertake a European peer review to share operating experience and identify findings: common issues or challenges at EU-level, good practices, areas of good performance and areas for improvement;
c) Provide an open and transparent framework for participating countries to develop appropriate follow-up measures to address areas for improvement.

The TPR process consisted of three phases:

a) In the first phase, national self-assessments were conducted against the WENRA Technical Specification. Results of the self-assessments were documented in the National Assessment Reports (NARs) and published in November 2023;
b) In the second phase, NARs review was performed and subsequently two workshops were organised to discuss the results of the self-assessments, the questions and comments on the NARs, the replies to the questions, as well as the findings from the experts with a view to identifying and discussing both generic and country-specific findings on fire protection. Draft reports (Topical Peer Review Summary Report and Country's Review Reports) were issued.
c) In the third and final phase of the TPR, the Topical Peer Review Summary Report was compiled addressing the generic findings of the review process. The Country's Review Reports document country-specific findings that provide an input for the National Action Plans (NAcPs).

The third phase of the TPR is the development of the NAcP. The NAcP provides explanations for the individual findings identified within the TPR process and, where further action is needed to eliminate these findings, these are described below.

The current Slovak NAcP has been prepared in accordance with ENSREG recommendations in the following structure and with the following content: The introduction describes in general the preliminaries and the structure of the NAcP. Chapter 2 contains the country-specific findings of the EU TPR Country's Review Report (CRR) for Slovakia, a brief description of the situation in the area and measures taken. Chapter 3 follows-up of other findings resulting from the peer review which are based on the fire-protection thematises as per the TPR Technical Specification. Chapter 4 includes other findings dedicated to the good practices identified on EU-level, and areas of good performance/areas for improvement for other countries

mentioned in the TPR Summary Report. Chapter 4 is optional. Chapter 5 contains overall conclusions and a summary table of the decided actions.

2. Follow-up of findings from the peer review – national areas for improvement

This section of the NAcP is dedicated to the country-specific findings resulting from the peer review as reported in § 4 of the country's review report (CRR) – Slovakia. It is structured by installations and covers national areas for improvement (AFI).

2.1 AFI (1) – Nuclear installation: Mochovce 3&4
The intervention time of the intervention units may be delayed due to restricted access to certain rooms

2.1.1 Identified action(s) and implementation progress

The self-assessment revealed a weakness in the fire protection of the nuclear installations – Intervention routes, which, due to other legal and technical constraints, may cause delays for the intervening units (fire brigade). This issue is gradually being identified and addressed by appropriate technical solutions. The finding was acknowledged as area for improvement by the TPR Team. In order to address the identified finding, the licence holder, SE, a. s., adopted the corrective measures summarised in the consequent text.

1) Prepare a list of:
   a) Entrance doors of technological objects and parts of technological objects of the SE-EBO/SE-EMO site (building number, door number, location, door closing method, method of ensuring door opening for emergency services, contact person ensuring door opening).
   b) Entrance doors to rooms in technological objects (building number, door number, door closing method, method of ensuring door opening for emergency services, contact person ensuring door opening).

   Deadline: 31.06.2026
2) Verify the accuracy of the data, information and information listed in the "entry list" of SE-EBO/SE-EMO sites (fire inspections, patrols, exercises).

   Deadline: 30.09.2026
3) Develop a proposal for a "technical and organizational solution" for unifying the provision of entrances to the buildings of the SE-EBO and SE-EMO sites, including entrances (doors) to individual rooms of the relevant buildings of the given site.

   Deadline: 30.11.2027
4) Approve the "technical and organizational solution" for unifying the provision of entrances to the buildings of the SE-EBO and SE-EMO sites, including entrances to individual rooms of the relevant buildings of the given site.

   Deadline: 31.12.2027

2.1.2 Applicability to represented installations

The finding and adopted corrective measures are relevant to all WWER-440/V213 nuclear units in operation and units under construction in Slovakia, to whom the licence holder is the SE, a. s., and are listed in the national assessment report (NAR) – NPP EBO3&4, NPP MO1&2 and NPP MO3&4.

2.2 AFI (2) – Nuclear installation: Interim Spent Fuel Storage facility (wet) There is a need to complete the replacement of external underground fire hydrants with external over-ground fire hydrants

2.2.1 Identified action(s) and implementation progress

The self-assessment revealed a weakness in the fire protection of the nuclear installations – There is a need to complete the replacement of external fire hydrants on the fire water distribution system in the premises of JAVYS, a. s. The finding was acknowledged as area for improvement by the TPR Team. In order to address the identified finding, the licence holder, the JAVYS, a. s., adopted the corrective measure summarised in the consequent text.

1) Replace external underground hydrants with external above-ground fire hydrants. Deadline: 31.12.2028

2.2.2 Applicability to represented installations

The finding and adopted corrective measure are relevant to the represented NPP A1 (under decommissioning). At the NPP A1, the replacement of hydrants is being carried out gradually. In the following period, another stage of hydrant replacement is planned based on the supply contract.

The replacement of hydrants at the NPP V1 (under decommissioning) has already been carried out at all strategic objects.

The ISFS facility has already equipped with above-ground hydrants.

2.3 AFI (3) – Nuclear installation: Interim Spent Fuel Storage facility (wet) Additional work is needed to review the components and replace the cable connections of the fire detection and protection system

2.3.1 Identified action(s) and implementation progress

The self-assessment revealed a weakness in the fire protection of the nuclear installations – Additional work is needed to review the components of the fire detection and protection system (FDPS) in terms of their durability and market availability and replace the cable connections of the FDPS control panels by creating redundancy (one cable contains cores that are redundant, so that redundancy becomes meaningless when the cable breaks). The finding was acknowledged as area for improvement by the TPR Team. In order to address the identified finding, the licence holder adopted the corrective measure summarised in the consequent text.

1) Implement investment projects to ensure the reliability and functionality of fire detection and protection system.
   Deadline: 31.12.2028

2.3.2 Applicability to represented installations

The finding and adopted corrective measure are relevant to nuclear facilities operated by the JAVYS, a. s., listed in the NAR – NPP A1(under decommissioning), NPP V1 (under decommissioning), and ISFS facility (wet).

2.4 AFI (4) – Nuclear installation: Interim Spent Fuel Storage facility (wet) – There is a need to re-evaluate the use of voice alarm in the civil structure

2.4.1 Identified action(s) and implementation progress

The self-assessment revealed a weakness in the fire protection of the nuclear installations – There is a need to re-evaluate the use of voice alarm in the civil structures. The finding was acknowledged as areas for improvement by the TPR Team. In order to address the identified finding, the licence holder adopted the corrective measure summarised in the consequent text.

1) Maintain and improve the use of voice alarms in the civil structures. When implementing new actions, use voice alarms of an appropriate technical level.
   Deadline: 31.12.2028

2.4.2 Applicability to represented installations

The finding and adopted corrective measure are relevant to nuclear facilities operated by the JAVYS, a. s., listed in the NAR – NPP A1 (under decommissioning), NPP V1 (under decommissioning), and ISFS facility (wet).

2.5 AFI (5) – Nuclear installation: Interim Spent Fuel Storage facility (wet) – There is a need to re-evaluate the possibility of controlling important fire equipment (HVAC equipment, ventilation of protected escape routes, fire doors, power shutdown) via the FDPS

2.5.1 Identified action(s) and implementation progress

The self-assessment revealed a weakness in the fire protection of the nuclear installations – There is a need to re-evaluate the possibility of controlling important fire equipment (HVAC equipment, ventilation of protected escape routes, fire doors, power shutdown) via the fire detection and protection system (FDPS). The finding was acknowledged as areas for improvement by the TPR Team. In order to address the identified finding, the licence holder adopted the corrective measure summarised in the consequent text.

1) Gradually implement control of key fire-fighting equipment through integrated fire protection systems (FDPS) during the reconstruction of original and construction of new buildings.

Deadline: 31.12.2028

2.5.2 Applicability to represented installations

The finding and adopted corrective measure are relevant to nuclear facilities operated by the JAVYS, a. s., listed in the NAR – NPP A1 (under decommissioning), NPP V1 (under decommissioning), and ISFS facility (wet).

2.6 AFI (6) – Nuclear installation: Interim Spent Fuel Storage facility (wet) – There is a need to elaborate procedures for the repair, the operability and the identification of fire protection system components

2.6.1 Identified action(s) and implementation progress

The self-assessment revealed a weakness in the fire protection of the nuclear installations - There is a need to

a) Elaborate procedures for the repair of damage to fire protection measures (coating, spraying, lining) applied to fire structures,
b) Develop operational cards for intervention in the facility construction and
c) Develop a clear system of marking of fire closures.

The finding was acknowledged as areas for improvement by the TPR Team. In order to address the identified finding, the licence holder adopted the corrective measure summarised in the consequent text.

1) Supplement the internal JAVYS, a. s., directive BZ/KB/SM-07 “Fire Protection” with rules for the repair, operation and identification of fire protection system components.
   Deadline: 31.12.2025

2.6.2 Applicability to represented installations

The finding and adopted corrective measure are relevant to nuclear facilities operated by the JAVYS, a. s., listed in the NAR – NPP A1 (under decommissioning), NPP V1 (under decommissioning), and ISFS facility (wet).

3. Follow-up of other findings resulting from the self-assessment

This section of the NAcP is dedicated to the findings from the self-assessment, as reported in § 3 of the CRR, which contains the weaknesses identified in the self-assessment. It is based on the fire-protection thematises as per the Technical Specification.

The weaknesses in fire protection at the nuclear facilities of SE, a. s., listed in § 3 of the CRR and identified during the self-assessment and peer review, are essentially the same as the negative findings summarized in § 4 of the CRR. The summary corrective measures resulting from them are already included in the previous chapter of the NAcP, and are therefore not repeated in this Chapter 3.

The weaknesses in fire protection at the nuclear facilities of JAVYS, a. s., listed in § 3 of the CRR and identified during the self-assessment and peer review, are essentially the same as the negative findings summarized in § 4 of the CRR. The summary corrective measures resulting from them are already included in the previous chapter of the NAcP, and are therefore not repeated in this Chapter 3.

4. Consideration of the other findings from the peer review to enhance fire protection

This section of the NAcP is dedicated to the good practices identified at EU-level, and areas of good performance/areas for improvement for other countries mentioned in the TPR Summary Report with the aim to increase the fire protection. The aim is to use the lessons learned and experience from other countries to enhance the fire protection. Reporting under this section is encouraged, but is voluntary.

The licence holders for the operation and decommissioning of nuclear facilities in Slovakia and regulatory body evaluated the findings compiled in the Annexes IV and VI of the TPR Summary Report. Some examples of good practice and good performance have been assessed as specific to the given nuclear power plant or to the approach used to protect against fires and therefore not relevant for nuclear installations in Slovakia; other measures that would result from the presented examples of good practice and good performance are not assessed as high priority measures for increasing nuclear safety in Slovakia, and are therefore not included in this NAcP. They will serve as a source of incentives for increasing safety of nuclear installations in Slovakia in the future and for the purposes of mutual comparison; they will also serve as an example for continuous improvement, which the operator of a nuclear facility must carry out in accordance with Slovak legislation.

5. Overall conclusions

This National Action Plan (NAcP) of the Slovak Republic contains a list of weaknesses and consequential actions to resolve weaknesses and enhance safety in the area of fire protection of nuclear facilities in Slovakia. The safety improvement measures are based on the findings revealed in the frame of the second topical peer review (TPR), which arises from the European Union's Nuclear Safety Directive 2014/87/EURATOM of 8th July 2014 amending Directive 2009/71/EURATOM on the establishment of Community framework for the nuclear safety of nuclear installations of the European Union. The findings of the TPR are documented in the ENSREG's Slovakia Country Review Report issued in January 2025 and the ENSREG's TPR Summary Report "Fire Protection" issued in May 2025.

Furthermore, the NAcP has responded to the UJD SR's Decisions No. 235/2022 and No. 236/2022, in which the obligations are imposed on the licensees to participate in the TPR process, carry out the self-assessment of fire protection and develop and implement action plan based on TPR findings.

The NAcP was prepared by the UJD SR in close cooperation with licensees – SE, a. s., and JAVYS, a. s., and their technical support organisations. Partial action plans for individual nuclear installations have been approved by their top management and notified to ÚJD SR. The measures in the NAcP are structured according to individual nuclear installations. They cover NPPs in operation, NPPs in decommissioning, RAW processing and management facilities and spent nuclear fuel management facilities.

UJD SR will monitor the implementation of the NAcP and check the fulfilment of corrective measures through inspections.

Annex A – Summary table of the actions planned/implemented

Section of NAcP	Reference No of the finding	Installation type/name	Thematic	Finding	Action (specify if planned/underway/completed)	Deadline	Regulatory authority's comment on progress
2	AFI 1	NPP EBO3&4, NPP MO1&2, NPP MO3&4		The intervention time of the intervention units may be delayed due to restricted access to certain rooms	1) Prepare a list of: - Entrance doors of technological objects and parts of technological objects of the SE-EBO/SE-EMO site (building number, door number, location, door closing method, method of ensuring door opening for emergency services, contact person ensuring door opening). - Entrance doors to rooms in technological objects (building number, door number, door closing method, method of ensuring door opening for emergency services, contact person ensuring door opening). 2) Verify the accuracy of the data, information and information listed in the "entry list" of SE-EBO/SE-EMO sites (fire inspections, patrols, exercises). 3) Develop a proposal for a "technical and organizational solution" for unifying the provision of entrances to the buildings of the SE-EBO and SE-EMO sites, including entrances (doors) to individual rooms of the relevant buildings of the given site. 4) Approve the "technical and organizational solution" for unifying the provision of entrances to the buildings of the SE-EBO and SE-EMO sites, including entrances to individual rooms of the relevant buildings of the given site.	30.06.2026 30.09.2026 30.11.2027 31.12.2027	In progress

Section of NAcP	Reference No of the finding	Installation type/name	Thematic	Finding	Action (specify if planned/underway/completed)	Deadline	Regulatory authority's comment on progress
2	AFI 2	NPP A1		There is a need to complete the replacement of external underground fire hydrants with external over-ground fire hydrants	Replace external underground hydrants with external above-ground fire hydrants.	31.12.2028	In progress
2	AFI 3	NPP A1, NPP V1, ISFS (wet) facility		Additional work is needed to review the components and replace the cable connections of the fire detection and protection system	Implement investment projects to ensure the reliability and functionality of fire detection and protection system.	31.12.2028	In progress
2	AFI 4	NPP A1, NPP V1, ISFS (wet) facility		There is a need to re-evaluate the use of voice alarm in the civil structure	Maintain and improve the use of voice alarms in in the civil structures. When implementing new actions, use voice alarms of an appropriate technical level.	31.12.2028	In progress
2	AFI 5	NPP A1, NPP V1, ISFS (wet) facility		There is a need to re-evaluate the possibility of controlling important fire equipment (HVAC equipment, ventilation of protected escape routes, fire doors, power shutdown) via the FDPS	Gradually implement control of key fire-fighting equipment through integrated fire protection systems (FDPS) during the reconstruction of original and construction of new buildings.	31.12.2028	In progress
2	AFI 6	NPP A1, NPP V1, ISFS (wet) facility		There is a need to elaborate procedures for the repair, the operability and the identification of fire protection system components	Supplement the internal JAVYS, a. s., directive BZ/KB/SM-07 "Fire Protection" with rules for the repair, operation and identification of fire protection system components.	31.12.2025	In progress