

National Action Plan

Topical Peer Review on Fire Protection

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1. Introduction

According to Article 8e of Directive 2014/87/EURATOM amending Directive 2009/71/EURATOM, EURATOM Member States are obliged to review the nuclear safety of relevant nuclear installations on their territory, at least every six years based on a specific topic related to nuclear safety. This provision is included in § 51 of the Austrian Radiation Protection Act 2020 (Strahlenschutzgesetz 2020).

The initial step of the second Topical Peer Review (TPR II) took place in November 2020, when the European Nuclear Safety Regulators Group (ENSREG), a high-level advisory group to the European Commission, agreed on “Fire Protection” as the topic. The scope of TPR II covers – among other nuclear installations – research reactors regardless of their type and thermal power.

The only nuclear installation in operation in Austria is a research reactor. The licensee of the pool type TRIGA Mark II research reactor which is located in Vienna is TU Wien. It has a maximum continuous thermal power output of 250 kW and pulsing capabilities of up to 250 MW. This research reactor, which is the only nuclear installation in operation in Austria,

is subject to oversight of the Federal Ministry of Agriculture and Forestry, Climate and Environmental Protection, Regions and Water Management (BMLUK) and falls within the scope of the second Topical Peer Review on Fire Protection.

Austria participated throughout the whole peer review process by submitting a National Assessment Report, posing and answering questions and finally by participating and presenting its findings during the review workshops that were held in autumn 2024. During the process one Area for Improvement was identified for Austria. As recommended by the TPR II team, Austria addresses it as part of the National Action Plan.

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

Reference number: AT-AFI-1

Absence of fire extinguishing blankets that could prevent fires from developing and causing damage to the infrastructure.

Status: Fully implemented

One Area for Improvement (AFI) was identified for the TRIGA Mark II research reactor during the peer review process. It is referred to as reference number AT-AFI-1.

This area of improvement was identified during the self-assessment phase of the TPR II. The Austrian National Assessment Report stated *‘With regard to fire suppression provisions, fire extinguishing blankets could be provided and distributed throughout the building in addition to the hand-held fire extinguishers as further improvement. Even though fire blankets are not required by law, it could help the institute’s personnel to extinguish developing fires with as little damage to the infrastructure as possible.’*

TU Wien, the licensee of the research reactor, has purchased a number of fire extinguishing blankets and placed them at strategic locations throughout the institute building, where the reactor is located. This allows employees to select the fire-fighting method best suited to each situation, thereby reducing the risk of fire-fighting measures that could additionally damage the infrastructure. Therefore, this AFI has been fully implemented.

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

No findings were identified for this category.

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

This section of the National Action Plan considers AFIs and Areas of Good Performance (AGP) of other research reactors that were taking part in the peer review. However, it should be noted that the findings concern different types of research reactors with varying power outputs, safety requirements and national legislations. Austria's reflections on these specific findings are provided in the "Response" column of the tables below.

Ref. No.	Area for Improvement (AFI)	Response
HU-AFI-1	The site conditions create conflicting responsibilities between the site owner and reactor operator organisation, which complicates the approval processes for certain modifications or corrective actions.	BIG as the building owner and TU Wien as the licensee of the research reactor have established approval processes for modifications, upgrades and corrective actions.
HU-AFI-2	No inventory of the flammable materials transported into the facility (e.g. packaging materials, paints).	Due to the small size of the facility, having a formalized inventory of flammable materials is not required. All personnel are trained and sensitized to not leave flammable materials in the reactor hall.
HU-AFI-6	Insufficient physical separation between redundant safety-related components (i.e. diesel generators, ventilators).	Does not apply.
IT-AFI-1	Based on the FHA results, the fire protection system for RSV TAPIRO has to be improved, in particular with regard to the fire compartmentation and to the ventilation system.	Does not apply.
NL-AFI-5	Inadequate management and qualification of isolation valves in the reactor building.	Does not apply.
NL-AFI-6	In the reactor building fire detectors are located only in the ventilation ducts.	The fire alarm system is comprised of approximately 600 fire detectors, whereby individual detector identification is possible via the fire alarm control panel. In detail, there are 8 heat detectors, 567 smoke detectors, 25 push-button detectors, 2 linear smoke detectors and 6 ventilation duct detectors. Ventilation duct detectors were installed to monitor

Ref. No.	Area for Improvement (AFI)	Response
		specific ventilation systems in order to enable the earliest possible detection of smoke in the ventilation ducts or, under certain circumstances, in the ventilation control centres.
PL-AFI-1	Lack of automatic extinguishing systems.	Due to the low hazard potential of the research reactor, the inherent safety of the fuel, as well as the low hazard posed by the other uses of the institute building, no automatic extinguishing system and no plant fire brigade is required. Instead, the Vienna Professional Fire Brigade handles firefighting at the research reactor. Every fire alarm activation is automatically forwarded to the Vienna Professional Fire Brigade.
PL-AFI-2	Lack of compartmentation or compensatory measures between redundant SSCs (UPS, diesel generators).	The reactor hall is designed as a separate fire compartment. The laboratory rooms (if not directly connected) and the lecture hall of the institute are designed as separate fire compartments as well. All components forming fire compartments are solid constructions consisting of reinforced concrete with the prescribed classification (90 minutes fire resistance).
RO-AFI-2	The fire hazard analysis performed in 2013 has not been revised and updated yet. It should be updated as part of Periodic Safety Review of the RR which is currently under development. According to the TPR Team, FHA should be revised at least every 10-years as part of the PSR.	The fire hazard analysis is in the process of being updated following the results of this topical peer review as well as the latest periodic safety review.
TR-AFI-1	Need for review and upgrading of the fire safety-related systems in order to adapt to the design requirements in the new regulation on fire safety of nuclear facilities.	Since the reactor was built in 1962 a number of measures to improve fire safety have been implemented. Major updates have been described in the Austrian NAR p. 23 and following.
TR-AFI-2	Due to the new regulation on fire safety, the licensee will have to perform a fire safety analysis and hazard assessment. It should include justification of the acceptability of the fire protection measures including the seismic robustness of fire protection equipment.	Does not apply.

Table 1 Areas for Improvement of other research reactors

Ref. No.	Area of Good Performance	Response
FR-AGP-5	Use of a semi-quantitative fire risk assessment methodology for each of the 600 rooms of the reactor building.	Does not apply.
FR-AGP-6	Modernisation of the facility with significant improvements (both on passive and active components) including the ones in the frame of the PSR.	Since the reactor was built in 1962 a number of measures to improve fire safety have been implemented. Major updates have been described in the Austrian NAR p. 23 and following. They concern active and passive fire protection components.
HU-AGP-2	A significant number of the staff and reactor operator personnel are certified fire safety engineers.	Licensee staff do regular (fire) safety training. In addition, one third of staff have been trained as fire protection wardens by TU Wien.
NL-AGP-2	A systematic approach for combination of hazards is applied.	The safety analysis report for the licensee covers many potential hazards, including fire hazards.
PL-AGP-1	Implementation of new and modern provisions, in particular to meet the current fire protection regulations.	Does not apply. In Austria it is mandatory to fulfil the obligations at the time the building was built or updated.
TR-AGP-2	Formalised arrangements between the reactor facility and the city fire brigade contributes to an effective response in case of a fire.	BMLUK as the competent authority for research reactors, the licensee as well as the Professional Fire Brigade of the City of Vienna responsible for fire protection have been working collaboratively for many years. During inspections representatives of the City of Vienna are formally invited and have been participating actively and improved fire safety at the reactor for many years. Additionally, the Professional Fire Brigade have yearly exercises at the reactor facility.

Table 2 Areas of Good Performance of other research reactors

5. Conclusion

TPR II has shown that Austria maintains high standards when it comes to implementing fire safety requirements, which are consistently complied with by the operator of Austrias only research reactor.

During the review process, one AFI was identified for Austria, namely to provide fire extinguishing blankets as an additional means of fire suppression alongside hand-held fire extinguishers. TU Wien as the operator of Austrias only research reactor has purchased a number of fire extinguishing blankets and placed them at strategic locations throughout the building. Therefore, this AFI has been fully implemented.

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Annex A -Summary table of the actions planned/implemented

Section of NAcP	Reference no. of the finding	Installation type/name	Thematic	Finding	Action	Deadline	Regulatory authority comment on progress
2	AT-AFI-1	Research Reactor/TRIGA II Vienna	Active fire protection	Absence of fire extinguishing blankets that could prevent fires from developing and causing damage to the infrastructure.	Procuring and distributing fire extinguishing blankets	31 th December 2025	Fully implemented