

ROMANIA



**National Action Plan
based on the first EU Topical Peer Review on
Ageing Management for Nuclear Installations**

Revision 2

February 2024

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1. INTRODUCTION

In 2014, the European Union (EU) Council adopted directive 2014/87/EURATOM amending the 2009 Nuclear Safety Directive, to incorporate lessons learned following the accident at the Fukushima Daiichi nuclear power plant in 2011. Recognizing the importance of peer review in delivering continuous improvement to nuclear safety, the revised Nuclear Safety Directive introduced a European system of Topical Peer Reviews (TPR) commencing in 2017 and every six years thereafter. The purpose is to provide a mechanism for EU Member States to examine topics of strategic importance to nuclear safety, to exchange experience and to identify opportunities to strengthen nuclear safety.

The first peer review focused on the Ageing Management Programmes (AMPs) at Nuclear Power Plants (NPPs) and Research Reactors (RRs) above 1 MWth. In addition to reviewing the programmatic part of ageing management, the peer review process examined the application of the AMPs to the selected systems, structures and components (SSCs) in four thematic areas, namely: electrical cables, concealed piping, reactor pressure vessels, or equivalent structures, and concrete containment structures.

The main objective of the first Topical Peer Review was to examine how well Ageing Management Programmes in participating countries meet international requirements on ageing management (in particular WENRA Safety Reference Levels – (SRLs) and the IAEA Safety Standards). All participating countries made a self-assessment and reported results in their National Assessment Reports. Most countries identified themselves a number of areas for improvement, good practices and challenges. In the course of the Topical Peer Review, national results have been evaluated through the peer review process, complementing the national assessments.

In accordance with the provisions of the Nuclear Safety Directive, the National Action Plans established by the Member States are required to address the results of the self-assessment and respond to the country specific findings allocated to them for reaching the Topical Peer Review expected level of performance. Furthermore, the countries have been encouraged to explore all generic findings of this peer review and to study their applicability to improve the regulation and implementation of Ageing Management Programmes at each Nuclear Power Plant and Research Reactor.

The present document outlines the National Action Plan (NACp) of Romania, updated in February 2024. The action plan addresses improvements of the regulatory framework and of the ageing management programmes for Cernavoda NPP and for the TRIGA Research Reactor. The first NACp for Romania was issued in 2019 (https://www.ensreg.eu/sites/default/files/attachments/ro_nacp_tpr1.pdf) and updated in 2021 (https://www.ensreg.eu/sites/default/files/attachments/ro_nacp_tpr1_update_2021.pdf). The information contained in these reports is not repeated in this update.

All the actions resulted from the 1st TPR on Ageing Management have been implemented.

Ageing management will be subject to continuous improvement, in accordance with the international standards and good practices, European legislation and national regulations, taking into account operational and regulatory experience, as well as any new relevant information resulting from reviews, inspections and research and development activities.

2. UPDATES ON AGEING MANAGEMENT FOR THE PERIOD 2021-2024

Updates to the regulatory framework

CNCAN has issued specific regulatory requirements and guidance for the ageing management of nuclear installations and is verifying compliance through the routine regulatory processes of review and assessment and inspection.

The regulations and guides most relevant to ageing management are the following:

- NSN-17 (rev.1) - Nuclear safety requirements on ageing management for nuclear installations (first issued in 2016, revised and republished in 2021);
- NSN-16 (rev.1) - Nuclear safety requirements on surveillance, maintenance, testing and in-service inspections for nuclear installations (first issued in 2018, revised and republished in 2020);
- GSN-10 - Nuclear Safety Guide on the time limited ageing analyses (2020);
- GSN-07 - Nuclear safety guide for the preparation of nuclear facilities refurbishment (2019).

The main regulation on ageing management (NSN-17) has been revised, updated, supplemented and republished in 2021, taking into account the results and recommendations from the TPR and the latest IAEA Safety Standards. Specific provisions have been introduced on ageing management during long construction periods or extended shutdown of NPPs, to ensure that relevant ageing mechanisms are identified and appropriate measures are implemented to control any incipient ageing or other effects. Based on the new provisions, the ageing management programs for Cernavoda NPP Units 1 and 2 and of the TRIGA Research Reactor have been revised and updated and an ageing management program has been developed and implemented also for Cernavoda NPP Units 3 and 4.

Updates on safety reviews

In accordance with the current regulations and license conditions, the licensees have to maintain updated the final safety analysis report (FSAR). The FSAR is therefore a living document and is updated on a continual basis. For Cernavoda NPP, an updated FSAR for each unit is submitted to the CNCAN every two years. The updated FSAR contains the safety demonstration for the plant, taking into account the physical status of the installation, the impact of ageing, the safety upgrades performed and the current safety requirements, among other factors. In addition, Periodic Safety Reviews (PSRs) are required every 10 years and the results of the PSRs are used to improve the design, operation and safety documentation.

The first PSR for Cernavoda NPP Unit 2 was finalized in 2020, and the second PSR for Unit 1 was finalized in 2021.

Updates on the plans for long term operation

The licensee is preparing to extend the life of Unit 1 of Cernavoda NPP by undertaking a comprehensive refurbishment project capable of ensuring the safe long-term operation of the plant up to an additional 30-year cycle. The licensee is implementing a detailed safety review of the standards, comprehensive review of component and equipment health condition and is improving plant design and operation using internal and external operating experience.

The key milestones for the refurbishment project (applicable for a CANDU nuclear power plant) are as follows:

Phase 1

- Defining the project scope;
- Developing the required nuclear safety documentation;
- Determining refurbishment project feasibility.

Phase 2

- Setting up project financing and signing contracts;
- Obtaining necessary authorizations required for the refurbishment project;
- Preparing engineering packages/detailed design changes documentation;
- Developing Technical Specifications and contracting long lead time equipment;
- Contracting and executing preliminary works (refurbishment before outage or refurbishment support activities, conservation, where applicable);
- Contracting and executing infrastructure works;
- Scope fine tuning (preparing detailed refurbishment outage plans).

Phase 3

- Shutting down the unit for refurbishment;
- Completing refurbishment scope of work;
- Performing tests;
- Commissioning.

Phase 1 of the refurbishment project has been completed at the end of February 2022. Phase 2 has started in April 2022 and is expected to last until December 2026. Phase 3 is scheduled for 2027-2029.

CNCAN performs regulatory oversight for the whole duration of the preparation and implementation of the refurbishment project, including the re-commissioning of the nuclear power plant unit after refurbishment. The main licensing basis document submitted to the CNCAN to justify operation post-refurbishment will be the updated FSAR.

Updates on peer reviews

At the invitation of the license holder for Cernavoda NPP, the IAEA conducted a Pre-SALTO mission in the period 11 - 19 February 2020. CNCAN was informed of the preparation, progress and results of the pre-SALTO mission and received officially the review report in April 2020. In addition to verifying compliance with the national regulatory requirements on ageing management, CNCAN monitored the implementation of the action plan issued by the licensee based on the findings from the pre-SALTO review.

A second pre-SALTO mission is in progress in the period 27 February - 7 March 2024. CNCAN will receive the mission report and will use the findings and recommendations to monitor the improvement of the licensee's ageing management program, as well as for enhancing the regulatory framework and practices for review, assessment and inspection.

3. TABLE: SUMMARY OF THE ACTIONS RESULTING FROM THE 1ST TPR

No	Installation	Thematics	Finding	Planned action / Progress	Deadline / Status	Regulator's Approach to Monitoring
1	Cernavoda NPP U1&U2	OAMP	Finding 2 from Self-assessment: <i>Documenting the strategies to keep alignment of PIP Program with the recent Code Standard editions</i>	Revision of PIP Program Manual to comply with the recent Code Standard editions	Implemented	Annual inspections
2	Cernavoda NPP U1&U2	OAMP	Finding 3 from Self-assessment: <i>Continuous alignment to the international OPEX (EPRI, IGALL)</i>	Assess the applicability of the latest guidelines for Ageing Management, in accordance with EPRI Report 3002013053 – 2018 Update to EPRI Product Mapping to IAEA IGALL.	Implemented Continuous action Reports have been updated in 2021 CHMR/ SHMR	Annual inspections
3	Cernavoda NPP U1&U2	OAMP	Finding 3 from Self-assessment: <i>Continuous alignment to the international OPEX (EPRI, IGALL)</i>	Revision of Cernavoda AMPs as resulted from compliance assessment against IGALL AMPs and EPRI Report 3002013053	Implemented The latest revisions have been performed in 2023	Annual inspections
4	Cernavoda NPP U1&U2	OAMP	Finding 1 from TPR – Area for improvement: <i>Methodology for scoping the SSCs subject to</i>	Verify if the equipment resulted from PSA level 1& 2 and from Stress Tests are included in the	Implemented	Annual inspections

			<i>ageing management</i>	list of critical systems, respectively in the list of critical components, to ensure that they are subject to AM programs.		
5	Cernavoda NPP U1&U2	OAMP	Finding 1 from TPR – Area for improvement: <i>Methodology for scoping the SSCs subject to ageing management</i>	A comprehensive assessment of the SSCs selection methodology will be performed during PSR Project, launched in April 2019, for U2 (1 st PSR), followed by U1 (2 nd PSR).	Implemented PSR for U2 finalized in 2020 PSR for U1 finalized in 2021	Annual inspections
6	Cernavoda NPP U1&U2	OAMP	Finding 1 TPR – Area for improvement: <i>Methodology for scoping the SSCs subject to ageing management</i>	Independent assessment of the methodology for scoping of SSCs subject to Ageing Management was performed during the Pre-SALTO Mission in 2020.	Implemented during the period 11-19 February 2020	Annual inspections A second Pre-SALTO mission is being conducted in the period 27 February-7 March 2024.
7	Cernavoda NPP U1&U2	OAMP	Finding 4 from TPR - Generic Challenge: <i>Effectiveness of the OAMP and use of performance Indicators</i>	Define a set of specific OAMP Performance Indicators, in line with IAEA SSG-48 and NEI Bulletin 14-12 Ageing Management Program Effectiveness, used by USA NPPs	Implemented	Annual inspections
8	Cernavoda NPP U1&U2	Cables	Finding 1 from Self-assessment:	Contract complete external services (CR 21052) for	Implemented	

			<i>Implement a proactive AMP for cables</i>	advanced aging testing methodologies. Obtain Condition Assessment reports, as a prerequisite for program enhancement actions needed for LTO		Annual inspections
9	Cernavoda NPP U1&U2	Concrete Containment Structure	Finding 1 from Self-assessment: <i>Enhance RB AMP Program based on Unit 1 Life Assessment study recommendations</i>	Implement Unit 1 and Unit 2 Life Assessment study recommendations, as detailed in the action plans, in order to ensure long term health of Cernavoda Reactor Buildings. This action will cover also “Acceptance criteria for the degradation mechanisms” – Generic Challenge.	Implemented	Annual inspections
10	Cernavoda NPP and ICN TRIGA Research Reactor	OAMP	Finding 2 from TPR: <i>During long construction periods or extended shutdown of NPPs, relevant ageing mechanisms are identified and appropriate measures are implemented to control any</i>	CNCAN will revise the regulation NSN-17, in order to include explicit provisions Additional requirements will be included based on IAEA SSG-48 and on the ENSREG 1 st Topical Peer Review Report "Ageing Management"	Implemented	-

			<i>incipient ageing or other effects.</i>	from October 2018.		
11	ICN TRIGA Research Reactor	OAMP	<p>Finding 3 from TPR:</p> <p><i>A systematic and comprehensive OAMP is implemented for research reactors, in accordance with the graded approach to risk, the applicable national requirements, international safety standards and best practices.</i></p>	<p>Actions have been taken for improving the overall AMP for the TRIGA Research Reactor, considering all the applicable requirements and good practices.</p> <p>The AMP for the research reactor has been revised and updated in 2019.</p> <p>Replacements for components with nuclear safety functions have been implemented.</p> <p>The in-service inspections are performed in accordance with the requirements.</p> <p>The preventive maintenance program is fully integrated in the AMP.</p>	Implemented	Annual inspections

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