Ispettorato nazionale
per la sicurezza nucleare
e la radioprotezione

ENSREG 1st TOPICAL PEER REVIEW
NATIONAL ACTION PLAN ON AGEING MANAGEMENT - ITALY

Update of December 2023

Summary

1. INTRODUCTION

The Italian National Assessment Report (NAR) for the Topical Peer Review 2017 on Ageing Management provided an overview on the national regulatory framework applicable only to research reactors and in particular described the ageing management approach for two reactors, the **TRIGA RC-1** reactor (1MWth), operated by ENEA (Italian National Agency for New Technologies, Energy and Sustainable Economic Development), located in the Research Centre of Casaccia in Rome, and the **TRIGA MARK II** (0,250 MWth), operated by the Applied Nuclear Energy Laboratory (LENA), University of Pavia.

The **TRIGA MARK II** reactor has been selected on voluntary basis, being its power below the reference level of 1 MWth established in the Technical Specifications as the threshold power value for a research reactor to be included in the TPR.

2. FINDINGS RESULTING FROM THE SELF - ASSESSMENT

The findings for Italy concerned some areas for improvement regarding the Overall Ageing Management Programme (OAMP) of the two research reactors and electric cables, reactor pressure vessel, concrete containment structure and pre-stressed concrete pressure vessel for TRIGA RC –I.

3. STATUS OF THE REGULATION AND IMPLEMENTATION OF AMP

The National Action Plan (NAcP) of Italy elaborated in 2019 contained some actions based on this country specific finding in the ENSREG report.

The situation of the implementation of these actions as reported in the updated NAR in ***2023*** is described in the following paragraph.

- **TRIGA Mark II.**

  The licensee has performed all the activities, listed in the first road map in 2017, necessary to incorporate ageing in the integrated management system (IMS) that was in force. At the moment the licensee continues to monitor and improve the OAMP. With reference to the table of the NAcP (2019), about the monitoring, testing, sampling and inspection activities, the plant implemented the actions indicated by assigning to the various competent services the tasks of verification and registration. Where

required, the video inspection was carried out as planned for the SSCs identified and listed in the NAcP. The checks provided for the electrical, electronic and mechanical components of the SSCs were carried out by the plant maintenance services, according to deadline, also with the help of qualified external companies.

In addition, particular attention was paid to the aging aspects relating to the plant documentation with the identification of areas for improvement and the planning of improvement interventions.

Following the experience gained in the first revisions of the results acquired and in anticipation of a staff turnover phase, an update of the procedures for recording and carrying out the tests listed in the table mentioned in the above-mentioned table was initiated in order to guarantee continuity and effectiveness. of the planned controls.

No other actions to be implemented are foreseen.

- **TRIGA RC – 1**.

ISIN asked the licensee in 2019 and in 2021 to update the information on the implementation of the activities to be carried out on infrastructures of the reactor building, on the electrical power supply and on the instrumental control, as described in the Italian NAcP (2019). For all these activities, the licensee had planned the design phase to be completed in 2020 and it had been postponed in 2022 due to the pandemic situation. In 2021 ENEA had planned to carry out the administrative procedure for the realization of the interventions, to start the realization phase in 2023 to be completed in 2024. The first inspection activities identified in the Ageing Management Programme for Electrical Cables, Hydraulic Circuit and Container were foreseen to start in 2022 to be continued in connection with the envisaged prolonged shutdown phase (2023 – 2024). As described in the Italian National Assessment Report, in 2021 the operator had foreseen the conclusion of the implementation the Ageing Management Program of the TRIGA RC-1 research reactor at the end of the program of interventions, scheduled for 2024.

In ***2023*** ISIN has asked to ENEA to update information about the implementation of the Ageing Management Program for the **TRIGA RC-1** research reactor.

ENEA replied with the information described below.

The Ageing Management Program for the TRIGA RC1 research reactor, as described in the document "ENSREG 1st Topical Peer Review Template National Action Plan on Aging Management" of 04/05/2019 (AMP), was stopped in 2020, due to the pandemic emergency and partially implemented starting from 2021.

The measures that were carried out concerned the electrical power supply system of the cooling system pumps. Investigations of the cables of the different electrical systems resulted in their replacement in a section of the supply line to the primary cooling system pumps. The non-destructive investigations conducted on the piping and on the pumping system of the cooling circuit, carried out by the thickness measurement, did not highlight significant variations compared to nominal values.

The implementation of the AMP was stopped again starting from June 2021 due to the anomalous presence of radioactivity in the water and to the need for searching the source of the release (presence of cracking on fuel element).

After that, ENEA has informed ISIN that it is expected to carry out the completion of the actions included in the AMP according to the following update timetable:

1. the *verification of the vessel* through thickness measurement assessments, as described in the Chapter 5 of the document "ENSREG 1st Topical Peer Review Template National Action Plan on Aging Management" of 04/05/2019 (AMP): it will be carried out **starting from 15th January 2024**;

2. the *verification of the cooling system piping* will be carried out using thermographic techniques as described in paragraph 5.1.5.1.4 of the AMP in the period **01st May 2024 – 30th June 2024**;

3. the *verification of the console power system and that relating to the signal cables*: these checks will be carried out with priority over all the others **by the first half of 2024.** In particular, the quantities to be verified are:
    - impedance measurement;
    - measurement of electrical insulation;
    - screening verification;
    - check the state of the coating;
    - check all electrical connections and contacts.