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ENSREG 1st TOPICAL PEER REVIEW
NATIONAL ACTION PLAN
ON AGEING MANAGEMENT, update

stuk
SÄTEILYTURVAKESKUS
STRÅLSÄKERHETSCENTRALEN
RADIATION AND NUCLEAR SAFETY AUTHORITY

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Contents

Abbreviations

AMP	Ageing management programme
ENSREG	European Nuclear Safety Regulators Group
FLG	Fuel loading
IAEA	International Atomic Energy Agency
LO1	NPP unit Loviisa 1
LO2	NPP unit Loviisa 2
NAR	National Assessment Report
NPP	Nuclear Power Plant
OL1	NPP unit Olkiluoto 1
OL2	NPP unit Olkiluoto 2
OL3	NPP unit Olkiluoto 3
RPV	Reactor pressure vessel
SC	Safety class
SS	Stainless steel
SSC	System, Structure or Component important to safety
SSE	Safe shut-down earthquake
STUK	Radiation and Nuclear Safety Authority
TPR	Topical Peer Review

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1 OVERVIEW

Coordination of Topical Peer Review (TPR) process in Finland was done by the Radiation and Nuclear Safety Authority (STUK). For TPR preparation a cross-sectional working group was set up representing different disciplines, i.e., I&C, electrical, mechanical, and civil engineering, and having knowledge and experience also in the area of ageing management. This working group was responsible also for preparing the TPR and writing the National Action Plan (NAcP).

The licensees were invited to supply material first for the preparation of National Assessment Report (NAR) and later for the TPR process and preparation of NAcP. The NAR and the TPR were prepared on the basis of this material and the contributions from the members of the working group. Most of the material was already earlier delivered to STUK but also some new material was delivered by the licensees during the TPR process.

The writing of NAcP was coordinated by STUK and the plan was prepared after the TPR process was finished. The NAcP was subjected to commenting procedure and comments were asked from the licensees and STUK's staff members.

The NAcP was delivered to the ENSREG and published at the ENSREG's website after its finalization. This document defines Finland's response in the TPR process, by way of a National Action Plan, which follows a standard format across all participating countries.

The NAcP is intended to enable progress to be monitored against the range of findings emerging from the TPR and it will also inform future TPR follow-up activities by ENSREG.

This NAcP has been written in accordance with the Council Conclusions of the 18 March 2019 and the ENSREG decision of the 25 March 2019, stating that countries who participated in the 1st TPR process should deliver their NAcPs for Nuclear Power Plants and Research Reactors by the end of September 2019.

This update is the second revision of the original NAcP. The updating was performed in December 2023.The previous updating was performed in spring 2021. The reported status is presented in the Table below and it corresponds to the status of December 2023.

The original NAcP contains a comprehensive study with all findings from the first TPR process. These findings were classified either expected level of performance, good practices, areas for improvement or challenges. This updated NAcP concentrates on following the responses of Finnish utilities when they are working on and finalizing the required actions.

The original NAcP included five actions. Two of these actions are related to developing further ageing management in prolonged construction projects and maintenance outages. These actions are still in progress and they are expected to be finalized by the end of 2024. The other actions that were related to updating the overall ageing management programmes (OAMPs) and AMP for civil structures and electrical cables, have been finalized.

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2 REFERENCES

[1] European Nuclear Safety Regulator's Group - ENSREG - 1st Topical Peer Review Report - "Ageing Management" October 2018

[2] European Nuclear Safety Regulator's Group - ENSREG - 1st Topical Peer Review - "Ageing Management" – Country specific findings October 2018

[3] European Nuclear Safety Regulator's Group - ENSREG - 1st Topical Peer Review - National Action Plan on Ageing Management – September 2019

GUIDES AND STANDARDS RELATING TO AGEING MANAGEMENT

ASME Boiler & Pressure Vessel Code, Section III: Rules for Construction of Nuclear Facility Components-Division 2-Code for Concrete Containments

ASME Boiler & Pressure Vessel Code, Section XI: Rules for In-service Inspection of Nuclear Power Plant Components

IAEA Safety Reports Series No. 82, Ageing Management for Nuclear Power Plants: International Generic Ageing Lessons Learned (IGALL)

IAEA Safety Reports Series No.57, Safe Long Term Operation of Nuclear Power Plants, 2008

IAEA Safety Standards Series No. NS-G-2.6, Safety Guide, Maintenance, Surveillance and In-Service Inspection in Nuclear Power Plants, Vienna, 2002

IAEA Safety Standards Series No. NS-G-2.12 Ageing Management for Nuclear Power Plants

IAEA Safety Standards, Specific Safety Guide No. SSG-13, Chemistry Programme for Water Cooled Nuclear Power Plants

IAEA Nuclear Energy Series No. NP-T-3.13, Stress Corrosion Cracking in Light Water Reactors: Good Practices and Lessons Learned

NUREG-1801, Rev. 2, Generic Aging Lessons Learned (GALL) Report (Volumes 1 and 2), U.S. Nuclear Regulatory Commission, 2010

STUK Regulation on the Safety of a Nuclear Power Plant (STUK Y/1/2018)

STUK – Guide YVL A.8: Ageing management of a nuclear facility, 15 February 2019

STUK – Guide YVL E.4: Strength analysis of nuclear power plant pressure equipment, 17 March 2020

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STUK – Guide YVL E.5: In-service inspection of nuclear facility pressure equipment with non-destructive testing methods, 15 February 2019

STUK – Guide YVL E.6: Buildings and structures of a nuclear facility, 19 June 2020

STUK – Guide YVL E.7: Electrical and I&C equipment of a nuclear facility, 15 March 2019

US NRC Regulatory Guide 1.207, Guidelines for Evaluating Fatigue Analyses Incorporating the Life Reduction of Metal Components due to the Effects of the Light-Water Reactor Environment for New Reactors, U.S. Nuclear Regulatory Commission, 2007

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3 TABLE: SUMMARY OF THE PLANNED ACTIONS

This table contains the planned actions for each reactor in Finland, the associated deadlines and the monitoring process by the national regulator, STUK. The table should contain sufficient details to facilitate the follow-up process.

Installation	Thematics	Finding	Planned action	Original target	Regulator's Approach to Monitoring	Status, December 2023
LO1, LO2 OL1, OL2	Chapter 2.1 Self-assessment, Overall Ageing Management Programmes (OAMPs)	Ageing management of Finnish NPPs should be developed so that individual SSCs or SSC groups of NPP are itemized for ageing management purposes covering all safety classified SSCs, and that necessary actions to these individuals or groups are clearly specified, such as regular maintenance, condition monitoring, qualification, risk of obsolescence and spare part procurement.	Based on the previous mentioned scoping/grouping of SSCs, licensees should report on long-term trends in defects/failures, present operability, validity of qualifications etc. The revised ageing management programs of both Finnish licensees are to be issued by the end of 2019.	30.4.2020	The country action on the finding from the self-assessment is to review the updated ageing management programs of the licensees during the first third of 2020.	**Implemented** Fortum finalized their OAMPs for LO1 and LO2 in 2023. TVO finalized their OAMPs for OL1 and OL2 in 2022. STUK reviewed and approved the OAMPs of both licensees in 2023.

Installation	Thematics	Finding	Planned action	Original target	Regulator's Approach to Monitoring	Status, December 2023
OL3	Chapter 2.5 Self-assessment, Concrete containment structure and pre-stressed concrete pressure vessels	OL3 plant supplier's (AREVA) in-service inspection plan for civil structures is described in NAR chapter 7.1.3. The AMP and maintenance guides of the licensee (TVO) for OL3 were in development during NAR process.	Licensee (TVO) has finished the update of inspection and maintenance guide for civil structures, which now covers also OL3 NPP. These AMP guides have been submitted to STUK and a decision will be finalized before fuel loading.	Before fuel loading	STUK oversees the fulfillment of requirements through follow-up and periodic inspections.	**Implemented** STUK has approved the licensee`s (TVO) updated AMP guides for civil structures covering OL3 NPP. STUK has also performed commissioning inspections for OL3 NPP buildings, which include review of building operating and maintenance instructions. STUK oversees the fulfillment of requirements through follow-up and periodic inspections.

Installation	Thematics	Finding	Planned action	Original target	Regulator's Approach to Monitoring	Status, December 2023
LO1, LO2	Chapter 3.1 Overall Ageing Management Programmes (OAMPs), Delayed NPP projects and extended shutdown	In terms of ageing management Fortum has not provided for extended periods when his NPP unit is out of service.	Fortum shall identify SSCs which are exposed to various degrading mechanisms during long plant outages, and specify actions to monitor, prevent or mitigate ageing in such SSCs.	31.12.2021	Fortum to prepare for STUK's review an AMP dedicated to extended periods when his NPP unit is out of service.	**In progress** Fortum has not yet finalized the OAMP dedicated to extended periods when its NPP units are out of service. Presumably the OAMP will be completed by the end of 2024.
OL1, OL2	Chapter 3.1 Overall Ageing Management Programmes (OAMPs), Delayed NPP projects and extended shutdown	In terms of ageing management TVO has not provided for extended periods when his NPP unit is out of service.	TVO shall identify SSCs which are exposed to various degrading mechanisms during long plant outages, and specify actions to monitor, prevent or mitigate ageing in such SSCs.	31.12.2021	TVO to prepare for STUK's review an AMP dedicated to extended periods when his NPP unit is out of service.	**In progress** TVO has not yet finalized the OAMP dedicated to extended periods when its NPP units are out of service. Presumably the OAMP will be completed by the end of 2024.

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Installation	Thematics	Finding	Planned action	Original target	Regulator's Approach to Monitoring	Status, December 2023
OL1, OL2	Chapter 4.2 TPR expected level of performance: documentation of the cable ageing management program	Up to this date ageing management of electrical cables of OL1/OL2 NPP has been defined in the general AMP for all SSCs. TVO is preparing separate AMP document for cables.	TVO prepares separate AMP document for cables.	31.12.2019	STUK will review development progress or finished document at the latest by the end of 2019.	**Implemented** TVO finished the first version of the AMP for electrical cables of OL1/OL2 at the end of 2019. STUK reviewed the AMP and found it adequate and comprehensive.