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Webinar - 1st ENSREG Topical Peer Review on Ageing Management

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Background

- European Nuclear Safety Directive in 2014 mandates a Europe-wide Topical Peer Review (TPR) every 6 years starting in 2017
- First TPR is being run under the auspices of the European Nuclear Safety Regulators Group (ENSREG)
- Topic selected by ENSREG is Ageing Management of Nuclear Reactors
- The peer review was managed by an Organising Board with Chair from Finland, Deputy from France, Project Managers from UK, Slovakia, Spain, France and Austria, secretariat from EC
- Seventeen European countries participated

Overview of TPR Process

- Managed through European Nuclear Safety Regulators Group (ENSREG) with input from Western European Nuclear Regulators Association (WENRA)
 - Terms of Reference and Technical Specification subject to public consultation
- Organising Board (Chair from Finland, Deputy from France, Project Managers from UK, Slovakia, Spain, France and Austria, secretariat from EC)
 - Supported by 5 rapporteurs and 41 experts

- 19 participating countries

Belgium	Italy	Sweden
Bulgaria	Netherlands	United Kingdom
Czech Republic	Poland	Norway
Finland	Romania	Switzerland
France	Slovak Republic	Ukraine
Germany	Slovenia	
Hungary	Spain	

TPR process

2016 - Preparation

- Terms of Reference prepared by ENSREG
- Technical Specification prepared by WENRA based on its Safety Reference Levels

2017 - Production of a National Assessment Report by each country issued December 2017

2018 - Peer review

- Comments and questions on National Assessment Reports
- Peer review workshop
- TPR report issued by ENSREG October 2018

Ongoing - Follow up

- Action plans due September 2019

TPR Scope – plant and ageing processes

- Nuclear Power Plants and Research Reactors (with a power of 1MWth or more) in operation and under construction, but not final shutdown.
For UK:
 - Operating Reactors (EDF Energy Nuclear Generation Limited, NGL):
 - 14 Advanced Gas-cooled Reactors (AGR) at 7 sites
 - 1 Operating Pressurised Water Reactor (PWR)
 - Under construction (EDF Energy New Nuclear Build, NNB)
 - 2 PWR under construction on 1 site
 - UK has no research reactors within the scope
- Considers physical ageing of reactor plant, but not obsolescence.

TPR scope - content

- Overall Ageing Management Programme (AMP)
- AMP for example Systems, Structures and Components (SSC):
 - Electrical cables
 - Concealed pipework
 - Reactor pressure vessels
 - Concrete containment structures
 - AGR pre-stressed concrete pressure vessels



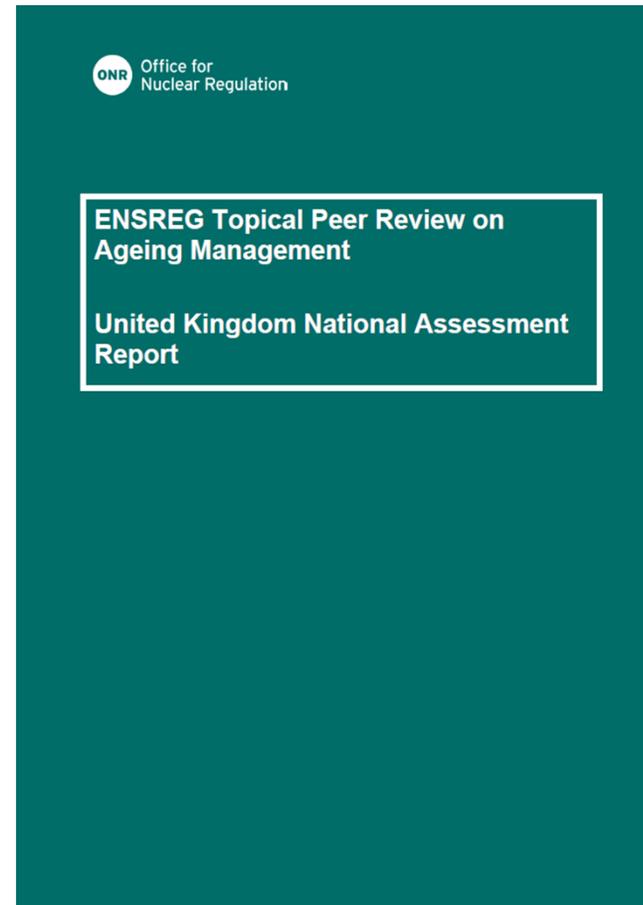
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UK National Assessment Report

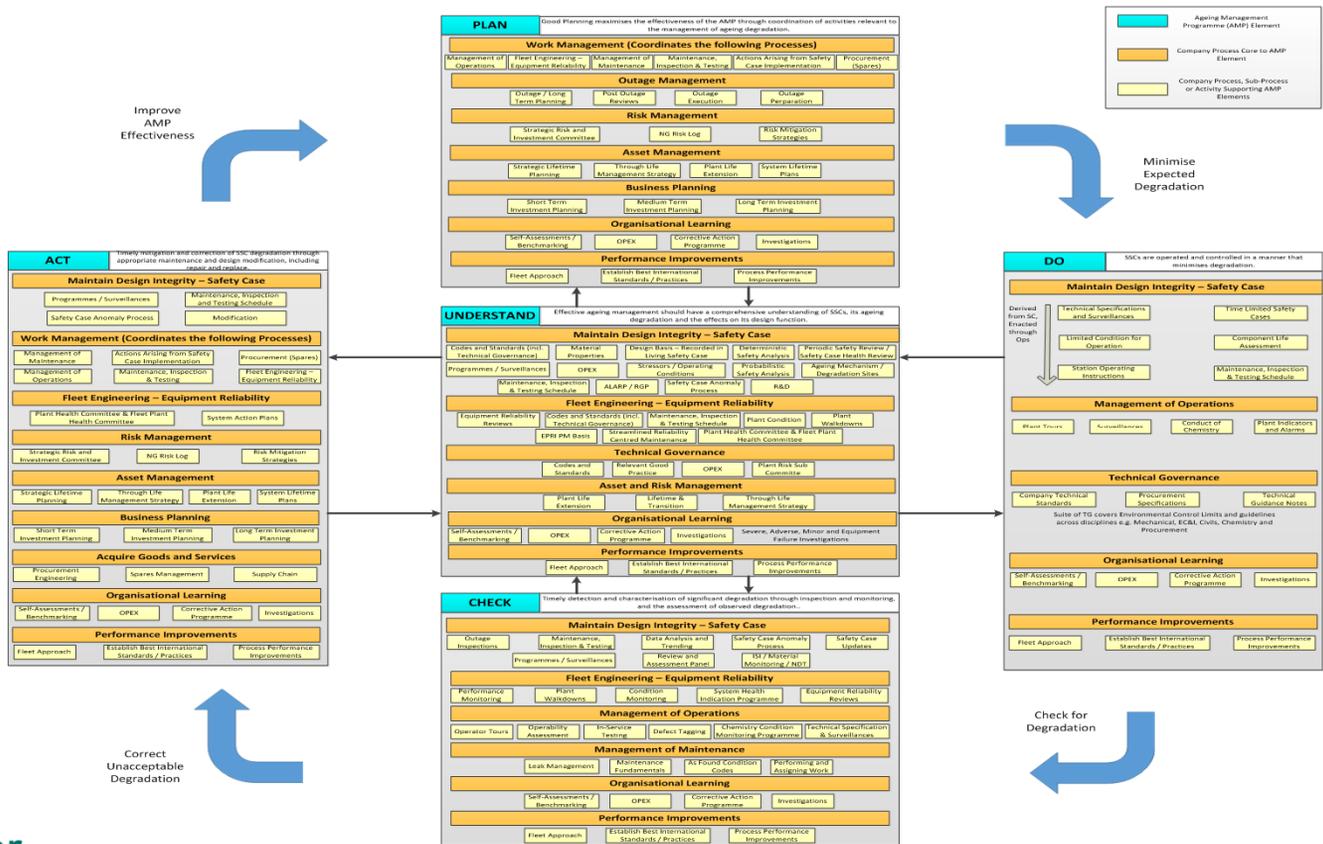
UK National Assessment Report

Available on the ONR
website.

Published December 2017



What is an Ageing Management Programme (AMP)?



Production - UK National Assessment Report

- UK licensees drafted sections of the report describing their AMPs in accordance with the Technical Specification
- UK licensees did a self-assessment of their contributions to identify beneficial improvements that could be made to enhance ageing management
- An ONR multi-disciplinary team assessed the licensees' Ageing Management Programmes taking into account:
 - The content of the National Assessment Report
 - Its experience from routine regulatory assessment and inspection activities
- ONR concluded that the Ageing Management Programmes were adequate and identified a limited number of further beneficial improvements

Beneficial improvements

Beneficial improvements are not shortfalls, but opportunities to enhance ageing management further:

- EDF – 14 beneficial improvements including
 - Produce formal guidance on ageing management
 - Review processes against international guidance & experience
 - Include ageing management within annual governance & oversight
 - Review some of the guidance documentation for electrical cables
 - Review the existing pipework corrosion strategy
 - Provide guidance on the ageing of concrete strain gauges
- NNB – 3 beneficial improvements including
 - Formalising ageing management arrangements by producing a Corrosion and Ageing Management Strategy report
 - Formalising ageing management arrangements for concrete structures

Main Conclusions - UK National Assessment Report

- The licensee determines the scope of the AMP from its safety case
- AMP is integrated into the licensees' management systems
- The licensees review and update the AMP regularly
- ONR's assessment of the TPR report supplements its regulatory assessment and inspections activities
- NGL has active processes within their management system

Main Conclusions - UK National Assessment Report

- EDF-NG does not have a standalone ageing management process, but ONR judges that it has an adequate AMP
- NNB is at the “Understand and Plan” stage of the IAEA ageing management model, which is appropriate for the early construction phase
- NNB gives due consideration during design
- National and International expectations for ageing management programmes are met and both licensee’s have adequate AMPs for the specific stages of their plant lifetimes



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Peer review

Written peer review

- Written peer review is an opportunity to:
 - Seek clarification of how other countries manage ageing
 - Challenge claims by other countries
 - Get further information on information that could be useful to UK
- UK sent 146 questions and comments
- UK received 137 questions and comments

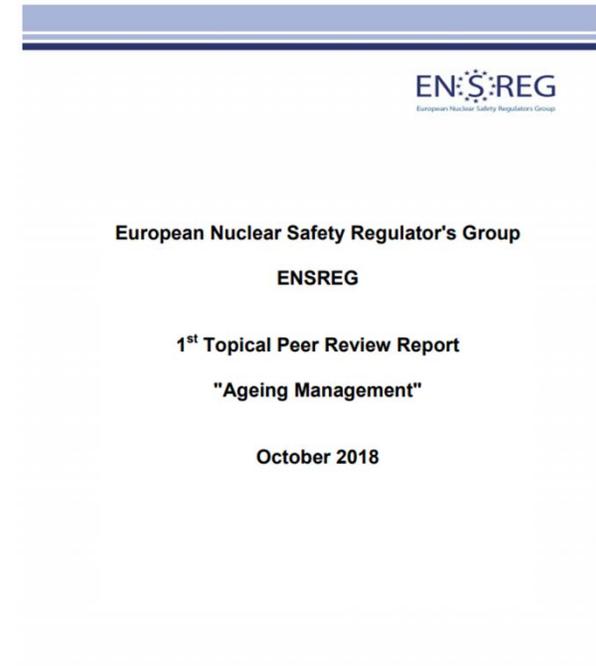
Peer Review Workshop (May 2018)

- 1 week, 140 participants
- Presentations of results from national assessments and detailed discussions on ageing management processes and specific themes (cables, concealed pipework, RPV, containment structures)
- ONR resource:
 - 5 inspectors to present the UK position, supported by a licensee representative
 - 1 inspector to act as a project manager chair a technical session
 - 5 inspectors to act a specialists in the technical sessions
- Preliminary findings discussed and allocated to countries

TPR Report and Findings

Available on ENSREG website

Published October 2018



TPR findings

Three categories of findings:

- Good practice - Goes beyond international expectation
- Expected level of performance - Level that ensures consistent and acceptable ageing management throughout Europe
- Challenges - Common to many or all countries and requires action at a European level

UK good practices

- Shielding in the core of PWRs is implemented to reduce degradation due to neutron irradiation
- Sections of pipework using novel materials are removed after a period of operation and inspected to confirm the properties are as expected.

In Summary

- UK performance considered good in 13 specific areas and no action required
- 13 areas where UK needs to review its practices to determine whether it is reasonably practicable to make improvements
- 5 areas where it is considered UK needs to do further work to demonstrate it meets expected level of performance

UK performance more than comparable to counterparts elsewhere in Europe

Areas for improvement to demonstrate TPR expected level of performance

- **Methodology for scoping the SSCs subject to ageing management:** The scope of the OAMP for NPPs is reviewed and, if necessary, updated, in line with the new IAEA Safety Standard after its publication.
- **Delayed NPP projects and extended shutdown:** During long construction periods or extended shutdown of NPPs, relevant ageing mechanisms are identified and appropriate measures are implemented to control any incipient ageing or other effects.
- **Inspection of safety-related pipework penetrations:** Inspection of safety-related pipework penetrations through concrete structures are part of ageing management programmes, unless it can be demonstrated that there is no active degradation mechanism.
- **Non-destructive examination in the base material of beltline region:** Comprehensive NDE is performed in the base material of the beltline region in order to detect defects
- **Suitable and sufficient irradiation specimens:** For new reactors, suitable and sufficient irradiation specimens and archive materials are provided to support the reactor through its full operational life



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Next steps

Action plan development

- ONR and the licensees are:
 - Reviewing the positions on the areas for improvement
 - Assessing whether beneficial improvements can be made in the light of good practices of other countries
- Along with the other countries, an action plan will be produced and submitted to ENREG by September 2019



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Public engagement

Public engagement

- Public consultation was held for:
 - Terms of reference
 - Technical specification
- All National Assessment Reports are available on:
 - The national regulators' website
 - ENSREG website

(Action plans will also be published on these sites)
- The National Assessment Reports were available for public input to the written peer review
- At a European level, public meetings were held:
 - Before the workshop
 - Following publication of the TPR Report and Findings
- ONR holding this webinar



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Main outcomes of the TPR process

Main UK outcomes

- UK is managing an ageing AGR fleet through to planned closure
- TPR has been an opportunity to review ageing management and subject it to international peer review
- ONR concluded that the AMPs were adequate, but beneficial improvements could be made
- The TPR identified additional areas for improvements and UK is also reviewing against other countries' good practices

Main international outcomes

- **For Nuclear Power Plants (NPP)** – Ageing Management Programmes exist in all countries, they are in line with the IAEA Safety Standards and WENRA Safety Reference Levels and no major deficiencies were identified
- **Improvement areas** were identified for the Ageing Management Programmes as well as for the thematic areas (cables, concealed pipework, RPVs, containment)
- **Research Reactors** Ageing Management Programmes are neither regulated nor implemented as systematically and comprehensively as they are for NPPs, and therefore require further attention from both regulators and licensees
- There is evidence based on the National Assessment Reports and their peer review that **improvements have already been made or are on-going** as a result of the Topical Peer Review
- **Countries will establish National Action Plans** to address findings resulting from their self-assessment and the peer review by September 2019



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Q&A



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