

REGULATORY OBSERVATION

REGULATOR TO COMPLETE

RO unique no.:	RO-UKHPR1000-0051
Revision:	0
Date sent:	02/10/20
Acknowledgement required by:	23/10/20
Agreement of Resolution Plan Required by:	18/12/20
CM9 Ref:	2020/291841
Related RQ / RO No. and CM9 Ref: (if any):	RQ-UKHPR1000-0498 RQ-UKHPR1000-0536 RO-UKHPR1000-021
Observation title:	Demonstration of BAT for the Examination, Maintenance, Inspection and Testing (EMIT) of Systems, Structures and Components (SSCs) that provide an Environmental Protection Function (EPF)
Lead technical topic:	Related technical topic(s):
21. Environmental	14. Mechanical Engineering 16. Radiological Protection 17. RadWaste, Decommissioning & Spent Fuel Management

Regulatory Observation

Background

The Pre-Construction Environmental Report (PCER) Chapter 3 submission (Ref. 1) discusses Examination, Maintenance, Inspection and Testing (EMIT) of Systems, Structures and Components (SSCs) that provide an Environmental Protection Function (EPF) including the development of appropriate arrangements, methodologies and processes for the development of EPFs and associated requirements as identified as a forward action plan (FAP-3-47). Also the 'Requirement Management Summary Report' submission (Ref. 2) mentions that EMIT requirements will be included in the engineering schedules and the process for the identification of environmental functions for systems and structures through the management of environmental requirements. The 'Methodology for Expected Events Identification for UK HPR1000' submission (Ref. 3) includes a definition of 'normal operations' that includes EMIT.

The Environment Agency has raised Regulatory Questions (RQs) concerning EMIT of SSCs that provide an EPF, namely RQ-UKPHR1000-0498 'BAT systems document request' (Ref. 4) and RQ-UKHPR1000-0536 'Qualification of equipment for its intended environmental protection function' (Ref. 5):

- RQ 0498 included a request for the 'List of SSCs and Engineered Controls that Contribute to the Application of BAT', which provided a useful insight into how these are being developed at the GDA stage
- RQ 0536 included a request for information on the general methodology of equipment qualification for equipment or instrumentation that provide an environmental protection function to include how a piece of equipment or instrument is shown to be fit for the intended purpose and kept in a state of maintenance and calibration consistent with its use. The response to the RQ refers to a forward action plan noted in the PCER Chapter 3 submission (Ref. 1) for delivery at the site-specific stage to ensure that environment protection measures are in place to deliver the environmental protection functions

In addition, ONR raised Regulatory Observation (RO) RO-UKHPR1000-0021 'Demonstration of the adequacy of Examination, Maintenance, Inspection and Testing (EMIT) of structures, systems and components important to safety' (Ref. 6). This RO is focused on SSCs important to safety and does not include the EMIT of SSCs that provide an EPF.

This RO has therefore been raised to:

- Explain the environmental regulator's expectations
- Ensure the RP provides a demonstration that EPF of SSCs can be maintained at all times under normal operations, commensurate to GDA stage and scope
- Obtain confidence that adequate evidence will be provided by the RP to support the claims and arguments made in the PCER

Relevant Legislation, Standards and Guidance

The Environment Agency Radioactive Substances Regulation - Environmental Principles (REPs) (Ref. 7) contains numerous principles of relevance to EMIT of SSCs that provide an EPF including:

- ENDP4 - Environment protection functions and measures
Environment protection functions under normal and fault conditions should be identified, and it should be demonstrated that adequate environment protection measures are in place to deliver these functions
- ENDP11 - Maintenance, inspection and testing
Structures, systems and components that are, or comprise part of, environment protection measures should receive regular and systematic examination, inspection, maintenance and testing

The Environment Agency Process and Information Document for Generic Assessment of Candidate Nuclear Power Plant Designs (Ref. 8) requires, "A detailed description of the radioactive waste management arrangements", which shall include, "A description of how the production, discharge and disposal of radioactive waste will be managed to protect the environment and to optimise the protection of people. In identifying techniques, address both the technology to be used and the way the facility is designed and will be built, maintained, operated and dismantled".

Nuclear Industry Safety Directors Forum, Best Available Techniques (BAT) for the Management of the Generation and Disposal of Radioactive Wastes (Ref. 9) includes guidance on the maintenance of all equipment needed to maintain BAT.

IAEA guidance documents relevant to EPF and EMIT includes The Management System for the Processing, Handling and Storage of Radioactive Waste (Ref. 10) which provides detail on the management systems for the pre-treatment (collection, segregation, chemical adjustment and decontamination), treatment (volume reduction, removal of radioactive material and change of composition), conditioning (immobilization, packaging and overpacking) and storage of radioactive waste. Safety Guide GS-G-3.3 (Ref. 10) and associated Safety Guide GS-G-3.4 (Ref. 11) are proposed to be combined and superseded by a safety guide under development with the proposed title, "The Management System for the Predisposal and Disposal of Radioactive Waste" and working ID DS477 (Ref. 12).

Regulatory Expectations

Environment Agency expects the claims and arguments presented in the PCER to be adequately substantiated by suitable and sufficient evidence. Based on the expectations from the standards and guidance listed above, Environment Agency expects the environment case to include a demonstration that the EPF of SSCs can be maintained at all times under normal operations, which is currently not demonstrated in the claims and arguments presented in the PCER.

References

1. UK HPR1000, Pre-Construction Environmental Report Chapter 3 - Demonstration of BAT, GHX00510003KPGBO2GN, Revision 001, January 2020.
2. UKHPR1000, Requirement Management Summary Report, GHX00100127DOZJ03GN, Revision A, April 2020.
3. UKHPR1000, Methodology for Expected Events Identification for UK HPR1000, GHX00500001DNHX02GN, Revision B, March 2019.
4. UK HPR1000, RQ0498, BAT systems document request, October 2019.
5. UK HPR1000, RQ0536, Qualification of equipment for its intended environmental protection function, November 2019.
6. UK HPR1000, RO 021, Demonstration of the adequacy of Examination, Maintenance, Inspection and Testing (EMIT) of structures, systems and components important to safety, September 2019.

7. Environment Agency, RSR1 – Radioactive Substances Regulation - Environmental Principles (REPs), Version 2, April 2010.
8. Environment Agency Process and Information Document for Generic Assessment of Candidate Nuclear Power Plant Designs, v3 October 2016.
9. Nuclear Industry Safety Directors Forum, Best Available Techniques (BAT) for the Management of the Generation and Disposal of Radioactive Wastes, Issue 1, December 2010.
10. IAEA, The Management System for the Processing, Handling and Storage of Radioactive Waste, Safety Guide No. GS-G-3.3, June 2008.
11. IAEA, The Management System for the Disposal of Radioactive Waste, Safety Guide No. GS-G-3.4, June 2008.
12. IAEA, The Management System for the Predisposal and Disposal of Radioactive Waste (safety guide under development), working ID DS477, <https://www.iaea.org/resources/safety-standards/draft-standards>

Regulatory Observation Actions

RO-UKHPR1000-0051.A1 – A demonstration in the environment case that the environment protection function of structures, systems and components, identified as having an environmental protection function in the Pre-Construction Environmental Report Chapter 3 ‘Demonstration of BAT’, can be maintained at all times under normal operations

In response to this Regulatory Observation Action, GNSL should:

- Provide a demonstration of BAT for the methodology to be used to develop an EMIT regime for SSCs that provide an EPF under normal operations
- Provide a demonstration of BAT for how the design enables an appropriate EMIT regime to be defined
- Provide a clear statement of underpinning assumptions made when defining the methodology used for developing the EMIT regime
- Provide clarity on where a future operator may need to expand on the BAT case for EMIT made for GDA

Resolution required by 'to be determined by General Nuclear System Resolution Plan'

REQUESTING PARTY TO COMPLETE

Actual Acknowledgement date:	
RP stated Resolution Plan agreement date:	