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<b>REGULATORY OBSERVATION Resolution Plan</b>	
<b>RO Unique No.:</b>	RO-UKHPR1000-0025
<b>RO Title:</b>	Vital Area Identification and Categorisation
<b>Technical Area(s)</b>	Security
<b>Revision:</b>	000
<b>Overall RO Closure Date (Planned):</b>	31 <sup>st</sup> December 2020
<b>Linked RQ(s)</b>	Nil
<b>Linked RO(s)</b>	Nil
<b>Related Technical Area(s)</b>	2. Civil Engineering 6. Cross Cutting 8. External Hazards 9. Fault Studies 12. Internal Hazards 16. Radiological Protection 19. Severe Accident Analysis 20. Structural Integrity
<b>Other Related Documentation</b>	HPR-GDA-REPO-0107 Vital Area Report Rev000 [R1]
<b>Scope of Work</b>	
<p><b><u>Background</u></b></p> <p>GNS, on behalf of the Requesting Parties (RP), has a regulatory requirement to develop and apply suitable arrangements to deliver a fit for purpose Vital Area Identification (VAI) and Categorisation Methodology for the UK HPR1000. This work will identify and categorise the Vital Areas (VAs) and inform the Security Architecture &amp; Security Infrastructure (SA&amp;SI) as well as the Security Regime Concept of Operations (CONOP) submissions in Step 4. By its very nature, VAI requires analysis of all Plant Operating States (PoS) in line with the maturity of the GDA design.</p> <p>GNS' initial VAI submission in Step 3 included HPR-GDA-REPO-0107 Vital Area Report v0 Rev000 [R1], which identified the associated VAs with PoS A. At this stage in Step 3, the analysis against PoS A was only 60% complete. The submission also included GDA-REC-EDF-SEC-000006 Annex G - Vital Areas [R2]. On 30<sup>th</sup> September 2019 the RP submitted HPR-GDA-REPO-0121 the Vital Area Categorisation &amp; Classification Methodology [R3] and an update to GDA-REC-EDF-SEC-000006 Annex G - Vital Areas [R2] with PoS A (60% system analysis) categorised. The purpose of classifying VAs is to support the development of the graded approach to security. In addition to categorisation, GNS included classification directly linked to the Security Outcomes as described in the ONR's Security Assessment Principles (SyAPs) [R4].</p>	

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During October 2019 ONR provided feedback on the Vital Area Categorisation & Classification Methodology [R3] and HPR-GDA-REPO-0107 Vital Area Report v0 [R1], which highlighted a number of gaps and resulted in RO-UKHPR1000-0025 [R5] being raised.

In responding to this RO, ONR expects the RP to:

- Further develop their arrangements for Vital Area Identification (VAI) [4] throughout the remainder of Step 3 and into Step 4 of GDA, on timescales commensurate with delivering suitable and sufficient VAI and categorisation work for the generic UK HPR1000 design. These arrangements, when implemented, must be able to accurately identify the Systems, Structures and Components (SSCs) and areas within and around the generic UK HPR1000 design which are potential VAs.
- Provide suitably categorised VAs, in accordance with regulatory expectations. The RP's Vital Area Categorisation and Classification methodology [1] was submitted with the Annex G Phase 5: Identification of Vital Areas [4]. The methodology stated that "*In accordance with the requirements of SyAPS all VAs are categorised based on the potential radiological consequence*". This categorisation has not yet been presented to ONR for assessment, but this is required.
- As part of the VAI and Categorisation, provide the basis upon which the radiological consequences have been determined and the assumptions which have been applied as a result of the limits of the information available at this stage of the GDA.

### **Abbreviations and Acronyms**

CONOP	Concept of Operations
CNS	Civil Nuclear Security
FSF	Fundamental Safety Function
HCVA	High Consequence Vital Area
IEMO	Initiating Event of Malicious Origin
KIT	Keep In Touch
NM/ORM	Nuclear Material / Other Radioactive Material
ONR	Office for Nuclear Regulation
PoS	Plant Operating State
RGP	Relevant Good Practice
RO	Regulatory Observation
SA&SI	Security Architecture & Security Infrastructure
SSCs	Structures, Systems and Components
SINS	Security Informed Nuclear Safety
SyAPS	Security Assessment Principles
UK HPR1000	The UK version of the Hua-long Pressurised Reactor
URC	Unacceptable Radiological Consequences
VA	Vital Area
VAI	Vital Area Identification

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### Scope of work

This Resolution Plan describes the current plan to address RO-UKHPR1000-0025 [R5]. It contains the strategy and route map for the resolution of Actions 1 and 2 to RO-UKHPR1000-0025 [R5] for the VAI and Categorisation of the UK HPR1000.

### **Deliverable Description**

#### **RO-UKHPR1000-0025.A1 – Vital Area Identification (VAI) and Categorisation for Operating State A**

The RO action 1 states that:

*In response to this Regulatory Observation Action, GNS should:*

- *Provide a revised VAI and Categorisation methodology.*
- *Develop and apply suitable arrangements to deliver a VAI and Categorisation submission for Operating State A, in line with the maturity of the generic UK HPR1000 design.*
- *ONR considers that the response to this Action should:*
  - *Identify each Vital Area (VA) and accurately categorise them for sabotage, in line with the regulatory expectations described in this RO.*
  - *Be subject to an appropriate internal peer review by the RP and be subject to an assurance and governance process prior to issue to ONR.*

#### **Resolution plan of Action 1:**

In order to meet the expectations of ONR CNS & SINS this resolution plan has been divided into the following actions:

- **RO Action 1 text:** *'Provide a revised VAI and Categorisation methodology'.*
- **Deliverable 1:** The RP will merge the current VA Categorisation methodology with the VAI methodology in order to develop and deliver suitable arrangements. This will be submitted in the form of GSR Vital Area Identification (VAI) & Categorisation Methodology HPR- GDA-REPO-0062 Rev001.
  - The updated methodology will remove the GNS GSR VA Classification element from the VAI Categorisation & Classification Methodology [R3]. Classification will now be addressed in the GNS GSR Security Architecture & Security Infrastructure.

The VAI & Categorisation Methodology will be updated to provide a clear process to identify and categorise VAs. The categorisation of VAs will be made in accordance with the dose levels that could be released if a URC occurs, using the categories stated in SyAPs [R4]. The levels of dose that could be released will be determined in the VAI & Categorisation Assessment Analysis document, together with any assumptions made in determining the dose levels.

- **RO Action 1 Text:** *Develop and apply suitable arrangements to deliver a VAI and Categorisation*

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*submission for Operating State A, in line with the maturity of the generic UK HPR1000 design.*

- *ONR considers that the response to this Action should:*
  - *Identify each vital area and accurately categorise them for sabotage, in line with the regulatory expectations described in this RO.*
  - *Be subject to an appropriate internal peer review by the RP and be subject to an assurance and governance process prior to being issued'.*
- **Deliverable 2:** The RP will deliver a Vital Area Identification and Categorisation submission for reactor PoS A DR1 (GSR Vital Area Identification (VAI) & Categorisation PoS A (DR1) HPR-GDA-REPO-0107 Rev001) based on the early version of the Fault Schedule.

GSR Vital Area Identification (VAI) & Categorisation PoS A (DR1) HPR-GDA-REPO-0107 Rev001, using the early Fault Schedule as a baseline to inform the Initiating Events of Malicious Origin (IEMO), will identify and categorise the VAs identified against PoS A operations. This will provide a proof of concept of the application of all phases of the VAI & Categorisation methodology.

VAs for all other PoS, and VAs for the Nuclear Material (NM) / Other Radioactive Material (ORM) located in the Spent Fuel Pool and during fuel route operations, will be included in the subsequent report (UK HPR1000 VAI & Categorisation Report PoS A-F Rev002 (DR2) to be submitted 6<sup>th</sup> August 2020 (Step 4) prior to the next iteration based on DR2.2 later in 2020.

The PoS A VAI & Categorisation report will follow the revised VAI & Categorisation Methodology. The report will address PoS A (at power) and all of the systems identified that, if compromised directly or indirectly, would lead to an URC. The analysis will also consider the key SSCs associated with the identified safety systems that could also lead to a URC if compromised. The report will identify the function of each safety system assessed, and the Fundamental Safety Function (FSF) that it supports. Each compromise event is reviewed to determine whether a design change could mitigate the potential compromise and in doing so support the 'secure by design' approach adopted by the project. Where the detail is available in the design, the analysis will identify co-location, segregation and convergence of systems, in order to influence the design by recognising vulnerabilities and proposing design solutions.


GSR Vital Area Identification (VAI) & Categorisation PoS A (DR1) HPR-GDA-REPO-0107 Rev001 (S), was submitted to 24<sup>th</sup> January 2020 for assessment in the standard 3 month period.

### **RO-UKHPR1000-0025.A2 – Completion of Vital Area Identification & Categorisation for all PoS**

#### **RO Action 2 Text:**

*In response to this Regulatory Observation Action, GNS should:*

- *Provide the VAI and Categorisation for all remaining reactor Operating States (B to F), based upon the arrangements developed in response to Action 1. The output is to be a submission which, for each of those operating states, identifies the vital areas and accurately categorises them for sabotage in line with the regulatory*

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*expectations given in this RO.*

### **Resolution Plan Action 2:**

**Deliverable 3** Incorporating any feedback from the ONR on RO Action 1 submissions, the GNS GSR team will apply the methodology and scope of analysis as outlined in the UK HPR1000 PoS A VA & Categorisation Rev001 (DR1) report to the UK HPR1000 VAI & Categorisation Report PoS A-F Rev002 (DR2) using Fault Schedule V1 (issued on 31<sup>st</sup> December 2019). This deliverable will be submitted on 6<sup>th</sup> August 2020 (Step 4).

### **Impact on the GDA Submissions**

<b>GDA Submission Document</b>	<b>Related ROAs</b>	<b>Schedule for Submission</b>
VAI & Categorisation Methodology	ROA1	20 <sup>th</sup> December 2019
VAI & Categorisation PoS A (DR1)	ROA1	24 <sup>th</sup> January 2020
VAI & Categorisation PoS A-F (DR2)	ROA2	6 <sup>th</sup> August 2020

### **Timetable and Milestone Programme Leading to the Deliverables**

Below is a list of the key milestones and deliverables to meet in order to close RO-UKHPR1000-0025 [R5]:

#### **RO Action 1:**

- GNS will submit the updated GSR Vital Area Identification (VAI) & Categorisation Methodology HPR-GDA-REPO-0062 Rev001 by the 20<sup>th</sup> December 2019.
- Week commencing 20<sup>th</sup> January 2020 GNS will courier GSR Vital Area Identification (VAI) & Categorisation PoS A (DR1) HPR-GDA-REPO-0107 Rev001.


#### **RO Action 2:**

- GNS will submit GSR Vital Area Identification (VAI) & Categorisation PoS A-F (DR2) HPR-GDA-REPO-0107 Rev002 on or by the 6<sup>th</sup> August 2020.

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**References**

- [1] General Nuclear Systems, Vital Area Report v0, HPR-GDA-REPO-0107.
- [2] General Nuclear Systems, Annex G to Vital Area Report v0, HPR-GDA-REPO-0107 (GDA-REC-EDF-SEC-000006 Annex G - Vital Areas).
- [3] General Nuclear Systems, Vital Area Categorisation and Classification Methodology, HPR-GDA-REPO-0121 Rev000.
- [4] ONR, Security Assessment Principles for the Civil Nuclear Industry, 2017 Edition, Version 0.
- [5] ONR, Regulatory Observation, RO-UKHPR1000-0025

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APPENDIX A RO-UKHPR1000-0004 Gantt Chart

Task and Schedule	2019	2020												2021				
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Development of ROA1 – GSR Vital Area Identification (VAI) & Categorisation Methodology Rev001																		
Submission of ROA1 - GSR Vital Area Identification (VAI) & Categorisation Methodology Rev001		▲																
Development of ROA2 – GSR Vital Area Identification (VAI) & Categorisation PoS A (DR1) Rev001																		
Submission of ROA2 - GSR Vital Area Identification (VAI) & Categorisation PoS A (DR1) Rev001			▲															
Development of ROA3 – GSR Vital Area Identification (VAI) & Categorisation PoS A-F (DR2) Rev002																		
Submission of ROA3 - Submit GSR Vital Area Identification (VAI) & Categorisation PoS A-F (DR2) Rev002										▲								
<b>Assessment</b>																		
Regulatory Assessment																		
Target RO Close Date														▲				