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| **REGULATORY OBSERVATION Resolution Plan** | |
|---|---|
| **RO Unique No.:** | RO-UKHPR1000-0052 |
| **RO Title:** | Design and Safety Case for Class 1 and 2 Human Machine Interfaces Employed in the Main Control Room and Remote Shutdown Station |
| **Technical Area(s)** | Control & Instrumentation |
| **Revision:** | Rev 0 |
| **Overall RO Closure Date (Planned):** | 30/04/2021 |
| **Linked RQ(s)** | - |
| **Linked RO(s)** | - |
| **Related Technical Area(s)** | - Human Factors |
| **Other Related Documentation** | Refer to Appendix A |
| **Scope of Work** | |

**Background**

A number of documents have been submitted to describe the Human-Machine Interface (HMI) design and safety case for the UKHPR1000 in the Main Control Room (MCR) and Remote Shutdown Station (RSS), including Pre-Construction Safety Report Chapter 8, Reference [1], Strategy for the use of HMIs, Reference [2], Overall Scheme for Control Room System, Reference [3], etc. ONR has assessed these submissions and sought further information through Regulatory Queries (RQs): RQ-UKHPR1000-0231, Reference [4], RQ-UKHPR1000-0354, Reference [5], RQ-UKHPR1000-0812, Reference [6] and RQ-UKHPR1000-0817, Reference [7]. Furthermore, at the Level 4 meetings held on 15 July 2020, Reference [8] and 5 August 2020, Reference [9], the presence of third party software in the Class 1 and Class 2 HMI and results of the HMI optioneering were discussed between the RP and ONR.

Following these interactions, ONR still has a number of concerns regarding the adequacy of the Class 1 and Class 2 HMI design and safety case. These are summarised below as:

- There is a lack of a suitable and sufficient safety case for the Class 1 and Class 2 HMI design;

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- There is a lack of specific PE demonstration and ICBM strategy for the Class 1 and Class 2 HMI;

- There is a lack of design documentation for the HMI, specifically with regard to functional and performance requirements;

- It is unclear to what extent the analysis of C&I spurious actuation has considered spurious actuation due to HMI, and what the sensitivity of the safety systems is to HMI mal-operation;

- It is unclear how Human Factors have been considered in the design of the HMI;

- The presence of third party software in the Class 1 and Class 2 HMI is unclear;

- The rationale behind the selection of HMI technology has not been demonstrated;

- The presence of touchscreen technology in the current design reference has not been justified;

- It is unclear if flexibility has been incorporated into the design for future expansion and modification;

- It is unclear how the communication flow from lower class to higher class HMI will be justified.

This Regulatory Observation (RO) was therefore raised to:

- Explain ONR's regulatory expectations for the use of HMI devices for Class 1 and Class 2 systems;

- Ensure that the safety functional and performance requirements of the Class 1 and Class 2 HMI technologies are clearly defined;

- Ensure that the technologies chosen to meet the safety functional and performance requirements are appropriate;

- Ensure that a suitable and sufficient safety case is presented during GDA.

Based on the relevant ONR Safety Assessment Principles (SAPs), standards such as IEC 61513, IEC 60880 and other Relevant Good Practice (RGP), this resolution plan has been produced which provides the response to each of the three Regulatory Observation (RO) actions and sets out the plan to address them.

**Scope of work**

In response to this RO, the following work will be undertaken:

- Determination of safety, functional and performance requirements for the computer-based Class 1 and Class 2 HMI;

- Explanation of how the safety requirements flow through the design;

- Optioneering analysis for the computer-based Class 1 and Class 2 HMI technologies, especially for the touch screen technology of the Class 1 and Class 2 HMI;

- Identification of any third party software in the computer-based Class 1 and Class 2 HMI and justification of the use of this software;

- Explanation of the extent to which the analysis of spurious actuation of I&C systems has been considered and the potential for spurious actuation initiated by HMI faults or mal-operation;

- Justification for the interconnection of the Class 3 KIC [PCICS] to the Class 2 SAS HMI;

- Justification for the Class 1 and Class 2 HMI design in the MCR and RSS to reduce risk ALARP.

Further, the following documents or reports will be developed or updated to address this RO:

- *PS-SCID Requirements Specification*, which will define the safety functional and performance requirements for the computer-based Class 1 HMI of RPS [ PS];

- *Design Specification of Protection System RPS [PS]*, which will be updated to present the design PS-SCID;

- *SAS-SCID Requirements Specification*, which will define the safety functional and performance requirements for the computer-based Class 2 HMI of SAS;

- *Design Specification of Safety Automation System (SAS),* which will be updated to present the design SAS-SCID;

- *Class 1 and Class 2 Hardwired HMI Requirements Specification,* which will define the safety functional and performance requirements for the hardwired HMI of Class 1 RPS [PS] and Class 2 SAS;

- *Class 1 and Class 2 Hardwired HMI Design Specification,* which will present the design of the hardwired HMI of Class 1 RPS [PS] and Class 2 SAS;

- *Optioneering Analysis Report for Class 1 Computer-based HMI of RPS [PS]*, which will present a suitable and sufficient optioneering process for the Class 1 HMI of RPS [PS];

- *Optioneering Analysis Report for Class 2 Computer-based HMI of SAS*, which will present a suitable and sufficient optioneering process for the Class 2 HMI of SAS;

- *Analysis Report for Class 1 and Class 2 Hardwired HMI,* which will demonstrate that the Class 1 and Class 2 hardwired HMI design in the MCR and RSS, reduces the risk ALARP;

- *PIE list of Spurious Actuation for I&C Systems,* which will be updated to present the analysis on the impact of initiation event due to spurious operation initiated by HMI faults or mal-operation;

- *Independence Analysis of I&C Systems,* which will be updated to present the justification for the data link from Class 3 KIC [PCICS] to Class 2 SAS-SCID.

**Deliverable Description**

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**RO-UKHPR1000-0052.A1 – HMI Requirements for Class 1 and Class 2 HMI in the MCR and RSS**

The RO action states that:

In response to this Regulatory Observation Action, GNSL should provide documentation that defines:

- The safety functional and performance requirements for both I&C and Human Factors aspects of the Class 1 and Class 2 HMI (Action1.1);
- How these safety requirements are implemented in the design (Action1.2); and
- How these safety requirements will be validated (Action1.3).

Resolution Plan

In the current design, the PS-SCID uses the SCID 200 and SAS-SCID uses the SCID 200 and SCID 300 as the computer-based HMI, which are respectively used to perform the control and monitoring functions of the RPS [PS] and SAS.

Since the *RPS [PS] System Requirements Specification*, Reference [10] and the *SAS System Requirements Specification*, Reference [11] have not explicitly detailed the safety functional and performance requirements for the computer-based HMI, two new documents, the *PS-SCID Requirements Specification* and the *SAS-SCID Requirements Specification* will be developed as a supplement to the system requirements specification. These specifications wil linclude:

- Classification requirements;

- Functional requirements;

- Performance requirements;

- Testing, diagnostics and maintenance requirements;

- Environmental condition requirements;

- Qualification requirements;

- Human factor consideration.

The *Design Specification of Protection System RPS [PS]*, Reference [12] and the *Design Specification of Safety Automation System (SAS)*, Reference [13] will be updated to address the safety requirements flow through the design of the PS-SCID and SAS-SCID. The following information will be presented:

- Safety classification;

- Function description;

- Performance description;

- Testing, diagnostics and maintenance;

- Environmental condition;

- Qualification;

- Human factor consideration.

For the Class 1 and Class 2 hardwired HMI in the MCR and RSS that is not covered by PS-SCID and SAS-SCID, e.g. alarm windows, switches, etc., a new document, the *Class 1 and Class 2 Hardwired HMI Requirements Specification* will be developed to define their safety functional and performance requirements. A new document, the *Class 1 and Class 2 Hardwired HMI Design Specification* will be also developed to address the safety requirements flow through the design.

The new documents *PS-SCID Requirements Specification*, *SAS-SCID Requirements Specification* and *Class 1 and Class 2 Hardwired HMI Requirements Specification* will define the safety functional and performance requirements for both I&C and Human Factors aspects of the Class 1 and Class 2 HMI, as the response to Action1.1.

The *Design Specification of Protection System RPS [PS]*, Reference [12], *Design Specification of Safety Automation System (SAS)*, Reference [13] and *Class 1 and Class 2 Hardwired HMI Design Specification* will show how the safety requirements are implemented in the design and how the safety requirements will be validated, as the response to Action1.2 and Action1.3.

**RO-UKHPR1000-0052.A2 – Class 1 and Class 2 Computer-Based HMI Technology Optioneering**

The RO action states that:

In response to this Regulatory Observation Action, GNSL should:

- Present a suitable and sufficient optioneering study for the Class 1 and Class 2 touchscreen systems (PS-SCID and SAS-SCID). The information presented should include, but not be limited to:
  a) options considered;
  b) criteria applied;
  c) analysis of options;
  d) selection of a preferred option; and
  e) a program of work for incorporating any modification to the current design.

ONR expects that the optioneering will consider the impact of any modification to the HMI on the overall justification of the MCR design. Specific consideration should be given to the Human Performance aspects of including multiple interface types within the MCR versus the benefits of maintaining a small plant footprint.

ONR also expects that the optioneering and technology selection will consider human factors

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requirements, and how these will be balanced with C&I requirements to achieve the optimal design.

The CIM optioneering paper provided to ONR recently provides an example of what is expected.

Resolution Plan

Two new documents, the *Optioneering Analysis Report for Class 1 Computer-based HMI of RPS [PS]* and the *Optioneering Analysis Report for Class 2 Computer-based HMI of SAS* will be developed to describe the optioneering process and will present the preferred options for the Class 1 and Class 2 computer-based HMI.

The following information will be included in the two optioneering analysis reports:

- Definition of potential issues;

- Description of the options for Class 1/Class 2 computer-based HMI;

- Option assessment against criteria, including nuclear safety, technology, cost, human factors, etc.

- Selection of optimised options;

- Decision-making;

- Conclusion and further implementation plan (if required).

*The Optioneering Analysis Report for Class 1 Computer-based HMI of RPS [PS]* and the *Optioneering Analysis Report for Class 2 Computer-based HMI of SAS* will be produced using the *Optioneering Analysis Report for CIM Improvement*, reference [17] as a template, as the response to Action 2.

**RO-UKHPR1000-0052.A3 –Suitable and sufficient Safety Case for Class 1 and Class 2 HMI in the MCR and RSS**

The RO action states that:

In response to this Regulatory Observation Action, GNSL should provide a suitable and sufficient safety case justifying selected design for the Class 1 and Class 2 HMI in the MCR and RSS. The safety case should address the following in particular:

- Justification of how the technologies will meet the HMI safety functional and performance requirements identified in the resolution of RO-UKHPR1000-0052.A1, and how interfaces to other C&I systems will be demonstrated to be adequately safe (Action 3.1).

- Identification of the presence of any third party software in the Class 1 and Class 2 HMI, justification for the use of this software and a description of how the required integrity will be demonstrated. Specific consideration should be given to the demonstration of PE and the selection of suitable ICBM to demonstrate the fitness for purpose of the HMI (Action 3.2).

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- Explanation of the extent to which the analysis of spurious actuation of C&I systems has considered the potential for spurious actuation to be initiated by HMI faults or mal-operation (Action 3.3).

- Justification for the interconnection of the Class 3 KIC to the Class 2 SAS HMI, including how fault propagation from a lower class to a higher class system will be prevented and how the delivery of the SAS safety functions will not be compromised by a failure of the KIC (Action 3.4).

- Justification that the Class 1 and Class 2 HMI design in the MCR and RSS reduces risk ALARP (Action 3.5).

Resolution Plan

For the Class 1 and Class 2 computer-based HMI in the MCR and the RSS, justification of how the proposed technologies will meet the HMI safety functional and performance requirements will be described in *Suitability Analysis Report of the Selected Platform Applicability to the RPS [PS]* and the *SAS System Requirements*, Reference [19] and for the hardwired HMI, justification will be included in the *Class 1 and 2 Hardwired HMI Design Specification* as the response to Action 3.1.

In the current design, the Class 1 computer-based HMI device is the SCID200 which has no third party software. However, the Class 2 computer-based HMI device includes the SCID300 which contains a third party operating system which is used for file system support, communication protocol support, graphic user interface support, etc. The optioneering of the Class 2 computer-based SAS HMI technologies will also consider the use of the third party software. If the conclusion of this optioneering analysis indicates that third party software is necessary to support the Class 2 SAS HMI, the *Demonstration of Production Excellence for FirmSys Platform*, Reference [14], and the *Demonstration of Production Excellence for the SAS*, Reference [15] will be updated to cover the demonstration of PE. The *Strategy for Conducting ICBMs Activities for SAS*, Reference [16] will also be updated to cover its ICBM strategy as the response to Action 3.2.

The possibility of the HMI causing spurious operation is recognised. As the response to Action 3.3, the requirement for spurious operation will be described in the *PS-SCID Requirements Specification* and the *SAS-SCID Requirements Specification* and the mitigation measures will be specified in the *Design Specification of Protection System RPS [PS],* Reference [12] and the *Design Specification of Safety Automation System (SAS),* Reference [13]. In the *PIE list of Spurious Actuation for I&C Systems,* Reference [17], we will present the analysis on the impact of initiation event due to spurious operation and justify whether the current design is acceptable.

With respect to the interconnection of the Class 3 KIC [PCICS] to the Class 2 SAS HMI, the *Independence Analysis of I&C Systems,* Reference [19], will be updated as the response to Action 3.4 to justify this interconnection. This amendment will include:

- How propagation of failure from the Class 3 system to the Class 2 system will be prevented;

- How the integrity of the interconnection will be ensured;

- The determination that there are no reasonably practicable alternatives that will further reduce the risk of CCF.

With respect to the Class 1 and Class 2 computer-based HMI in the MCR and RSS, the new reports *Optioneering Analysis Report for Class 1 Computer-based HMI of RPS [PS]* and *Optioneering Analysis Report for Class 2 Computer-based HMI of SAS* will include how to reduce the risk ALARP, as part of the response to Action 3.5. With respect to the Class 1 and Class 2 hardwired HMI in the MCR and RSS, the new report *Analysis Report for Class 1 and Class 2 Hardwired HMI* will be developed to demonstrate that the Class 1 and Class 2 hardwired HMI design in the MCR and RSS reduces the risk ALARP, as part of the response to Action 3.5.

In addition, the *BSC of Protection System*, Reference [20] and the BSC of *Safety Automation System*, Reference [21] will be updated to present the CAE structure for Class 1 and Class 2 HMI.

## Impact on the GDA Submissions

The submissions that are impacted by this resolution plan include (to be confirmed by the optioneering result):

a) CGN, Design Specification of Protection System RPS [PS], GHX56100018GSNS44TR, Rev.A, September 12, 2019

b) CGN, Design Specification of Safety Automation System (SAS), GHX56100026GSNS44TR, Rev.A, March 12, 2020

c) CGN, PIE list of Spurious Actuation for I&C Systems, GHX00100003DIYK03GN, Rev.D, July 22, 2020

d) CGN, Independence Analysis of I&C Systems, GHX06002020DIYK03GN, Rev.B, Jun 28,2020

e) CGN, Demonstration of Production Excellence for FirmSys Platform, GHX56100036GSNS44TR, Rev.B, May 25, 2020

f) CGN, Demonstration of Production Excellence for the SAS, GHX56100038GSNS44TR, Rev.B, May 26, 2020

g) CGN, Strategy for Conducting ICBMs Activities for SAS, GHX06100001DIYK03GN, Rev.B, August 28, 2020

h) CGN, Suitability Analysis Report of the Selected Platform Applicability to the RPS [PS] &SAS System Requirements, Rev.A, May 22, 2020

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i) CGN, BSC of Protection System, GHX06002002DIYK03GN, Rev.C, June 28, 2020

j) CGN, BSC of Safety Automation System, GHX06002003DIYK03GN, Rev.A, July 24, 2019

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

| No. | Document No. | Document Title | Rev | Submission Time |
|---|---|---|---|---|
| 1 | GHX00100002DIKX00GN | PS-SCID Requirements Specification | Rev.A | 2021/01/04 |
| 2 | GHX00100003DIKX00GN | SAS-SCID Requirements Specification | Rev.A | 2021/01/04 |
| 3 | GHX00100004DIKX00GN | Class 1 and Class 2 Hardwired HMI Requirements Specification | Rev.A | 2021/01/04 |
| 4 | GHX56100018GSNS44TR | Design Specification of Protection System RPS [PS] | Rev.C | 2021/01/22 |
| 5 | GHX56100026GSNS44TR | Design Specification of Safety Automation System (SAS) | Rev.C | 2021/01/22 |
| 6 | GHX56100174GSNS44TR | Class 1 and Class 2 Hardwired HMI Design Specification | Rev.A | 2021/01/22 |
| 7 | GHX00100005DIKX00GN | Optioneering Analysis Report for Class 1 Computer-based HMI of RPS [PS] | Rev.A | 2021/01/04 |
| 8 | GHX00100006DIKX00GN | Optioneering Analysis Report for Class 2 Computer-based HMI of SAS | Rev.A | 2021/01/22 |
| 9 | GHX56100052GSNS44TR | Suitability Analysis Report of the Selected Platform Applicability to the RPS [PS] &SAS System Requirements | Rev.B | 2021/01/30 |
| 10 | GHX56100036GSNS44TR | Demonstration of Production Excellence for FirmSys Platform | Rev.D | 2021/01/22(if necessary) |
| 11 | GHX56100038GSNS44TR | Demonstration of Production Excellence for the SAS | Rev.C | 2021/01/22(if necessary) |
| 12 | GHX06100001DIYK03GN | Strategy for Conducting ICBMs Activities for SAS | Rev.C | 2021/01/22(if necessary) |
| 13 | GHX00100007DIKX00GN | Analysis Report for Class 1 and Class 2 Hardwired HMI | Rev.A | 2021/01/22 |
| 14 | GHX00100003DIYK03GN | PIE list of Spurious Actuation for I&C Systems | Rev.E | 2021/01/04 |
| 15 | GHX06002020DIYK03GN | Independence Analysis of I&C Systems | Rev.D | 2021/01/30 |

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| 16 | GHX06002002DIYK03GN | BSC of Protection System | Rev.E | 2021/01/30 |
|---|---|---|---|---|
| 17 | GHX06002003DIYK03GN | BSC of Safety Automation System | Rev.C | 2021/01/30 |

The Gantt Chart is provided in APPENDIX A.

## References

[1] HPR/GDA/PCSR/0008, Pre Construction Safety Report Chapter 8 Instrumentation and Control, Rev 001, 10 January 2020, CM9 Ref. 2020/13661

[2] CGN, Overall Scheme for Control Room System, GHX06001009DIKX03GN, Rev.F, September 27, 2020

[3] CGN, Strategy for the use of HMIs, GHX06100012DIKX03GN, Rev.B, September 27, 2020

[4] RQ–UKHPR1000-0231, Use of touchscreen displays for class 1 system

[5] RQ-UKHPR1000-0354, Further queries on the justification of touch screen displays for class 1

[6] RQ-UKHPR1000-0812, UK HPR1000 Interconnection between I&C Systems

[7] RQ-UKHPR1000-0817, Further queries on the justification of touch screen displays for class 1

[8] ONR-NR-CR-292, Level 4 Meeting, Control & Instrumentation Independent Confidence Building Measures (ICBMs) Strategy, 15 July 2020, CM9 Ref. 2020/218852

[9] ONR-NR-CR-392, Level 4 Meeting, Control and Instrumentation Smart Devices Qualification Strategy, 05 August 2020, CM9 Ref. 2020/250441

[10] CGN, RPS [PS] System Requirements Specification, GHX06002018DIYK03GN, Rev.B, April 20, 2020

[11] CGN, SAS System Requirements specification, GHX06100005DIYK03GN , Rev.B, August 25, 2020

[12] CGN, Design Specification of Protection System RPS [PS], GHX56100018GSNS44TR, Rev.A, September 12, 2019

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[13]   CGN, Design Specification of Safety Automation System (SAS), GHX56100026GSNS44TR, Rev.A, March 12, 2020

[14]   CGN, Demonstration of Production Excellence for FirmSys Platform, GHX56100036GSNS44TR, Rev.B, May 25, 2020

[15]   CGN, Demonstration of Production Excellence for the SAS, GHX56100038GSNS44TR, Rev.B, May 26, 2020

[16]   CGN, Optioneering Analysis Report for CIM Improvement, GHX6002024DIYK03GN, Rev.B, September 26, 2020

[17]   CGN, PIE list of Spurious Actuation for I&C Systems, GHX00100003DIYK03GN, Rev.D, July 22, 2020

[18]   CGN, Independence Analysis of I&C Systems, GHX06002020DIYK03GN, Rev.B, Jun 28,2020

[19]   CGN, Suitability Analysis Report of the Selected Platform Applicability to the RPS [PS] &SAS System   Requirements, GHX56100052GSNS44TR, Rev.A, May 22, 2020

[20]   CGN, BSC of Protection System, GHX06002002DIYK03GN, Rev.C, June 28, 2020

[21]   CGN, BSC of Safety Automation System, GHX06002003DIYK03GN, Rev.A, July 24, 2019

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## APPENDIX A RO-UKHPR1000-0052 Gantt Chart

| Task and Schedule | | 2020 | | | | 2021 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun |
| **RO Action 1** | | | | | | | | | | | |
| 1 | Development of deliverable 1 - PS-SCID Requirements Specification (Rev.A) | ■ | ■ | ■ | ■ | | | | | | |
| | Submission of deliverable 1 - PS-SCID Requirements Specification (Rev.A) | | | | | ▲ | | | | | |
| 2 | Deliverable 2 - SAS-SCID Requirements Specification (Rev.A) | ■ | ■ | ■ | ■ | | | | | | |
| | Submission of deliverable 2 - SAS-SCID Requirements Specification   (Rev.A) | | | | | ▲ | | | | | |
| 3 | Deliverable 3 - Class 1 and Class 2 Hardwired HMI Requirements Specification (Rev.A) | ■ | ■ | ■ | ■ | | | | | | |
| | Submission of deliverable 3 - Class 1 and Class 2 Hardwired HMI Requirements Specification (Rev.A) | | | | | ▲ | | | | | |
| 4 | Deliverable 4 - Design Specification of Protection System RPS [PS] (Rev. C) | ■ | ■ | ■ | ■ | | | | | | |
| | Submission of deliverable 4- Design Specification of Protection System RPS [PS] (Rev. C) | | | | | ▲ | | | | | |

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| | **Task and Schedule** | 2020 | | | | 2021 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun |
| 5 | Deliverable 5 - Design Specification of Safety Automation System (SAS) (Rev. C) | ▩ | ▩ | ▩ | ▩ | ▩ | | | | | |
| | Submission of deliverable 5 - Design Specification of Safety Automation System (SAS) (Rev. C) | | | | | ▲ | | | | | |
| 6 | Deliverable 6 - Class 1 and Class 2 Hardwired HMI Design Specification (Rev.A) | ▩ | ▩ | ▩ | ▩ | ▩ | | | | | |
| | Submission of deliverable 6 - Class 1 and Class 2 Hardwired HMI Design Specification (Rev.A) | | | | | ▲ | | | | | |
| **RO Action 2** | | | | | | | | | | | |
| 1 | Deliverable 1 - Optioneering Analysis Report for Class 1 Computer-based HMI of RPS [PS] (Rev.A) | ▩ | ▩ | ▩ | ▩ | | | | | | |
| | Submission of deliverable 1 - Optioneering Analysis Report for Class 1 Computer-based HMI of RPS [PS] (Rev.A) | | | | | ▲ | | | | | |
| 2 | Deliverable 2 - Optioneering Analysis Report for Class 2 Computer-based HMI of SAS (Rev.A) | ▩ | ▩ | ▩ | ▩ | ▩ | | | | | |
| | Submission of deliverable 2 - Optioneering Analysis Report for Class 2 Computer-based HMI of SAS (Rev.A) | | | | | ▲ | | | | | |
| **RO Action 3** | | | | | | | | | | | |
| 1 | Deliverable 1 - Suitability Analysis Report of the Selected Platform Applicability to the RPS [PS] &SAS System Requirements (Rev.B) | ▩ | ▩ | ▩ | ▩ | ▩ | | | | | |

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| | Task and Schedule | 2020 | | | | 2021 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun |
| | Submission of deliverable Suitability Analysis Report of the Selected Platform Applicability to the RPS [PS] &SAS System Requirements (Rev.B) | | | | | ▲ | | | | | |
| 2 | Deliverable 2 - Demonstration of Production Excellence for FirmSys Platform (Rev.D) (if necessary) | █ | █ | █ | █ | █ | | | | | |
| | Submission of deliverable 2 - Demonstration of Production Excellence for FirmSys Platform (Rev.D) (if necessary) | | | | | ▲ | | | | | |
| 3 | Deliverable 3 - Demonstration of Production Excellence for the SAS (Rev.C) (if necessary) | █ | █ | █ | █ | █ | | | | | |
| | Submission of deliverable 3 - Demonstration of Production Excellence for the SAS (Rev.C) (if necessary) | | | | | ▲ | | | | | |
| 4 | Deliverable 4 - Strategy for Conducting ICBMs Activities for SAS (Rev.C) (if necessary) | █ | █ | █ | █ | █ | | | | | |
| | Submission of deliverable 4 - Strategy for Conducting ICBMs Activities for SAS (Rev.C) (if necessary) | | | | | ▲ | | | | | |
| 5 | Deliverable 5- PIE list of Spurious Actuation for I&C Systems (Rev.E) | █ | █ | █ | █ | █ | | | | | |
| | Submission of deliverable 5 - PIE list of Spurious Actuation for I&C Systems (Rev.E) | | | | | ▲ | | | | | |
| 6 | Deliverable 6- Independence Analysis of I&C Systems (Rev.D) | █ | █ | █ | █ | █ | | | | | |
| | Submission of deliverable 6 - Independence Analysis of I&C Systems (Rev.D) | | | | | ▲ | | | | | |

| | REGULATORY OBSERVATION RESOLUTION PLAN<br>RO-UKHPR1000-0052 | Rev. 0 | Page： **15 / 15** |
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| **CGN eDF**<br>General Nuclear System | | | GDA-REC-GNSL-008071 |

| | | 2020 | | | | 2021 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Task and Schedule** | | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun |
| 7 | Deliverable 7- BSC of Protection System (Rev.E) | 🟩 | 🟩 | 🟩 | 🟩 | 🟩 | | | | | |
| | Submission of deliverable 7 - BSC of Protection System (Rev.E) | | | | | ▲ | | | | | |
| 8 | Deliverable 8- BSC of Safety Automation System (Rev.C) | 🟩 | 🟩 | 🟩 | 🟩 | 🟩 | | | | | |
| | Submission of deliverable 8 - BSC of Safety Automation System (Rev.C) | | | | | ▲ | | | | | |
| **Assessment** | | | | | | | | | | | |
| 1 | Regulatory Assessment | | | | | | 🟧 | 🟧 | 🟧 | | |
| 2 | Target RO Closure Date | | | | | | | | ▲ | | |