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| **REGULATORY OBSERVATION Resolution Plan** | |
|---|---|
| **RO Unique No.:** | RO-UKHPR1000-0058 |
| **RO Title:** | Justification of the Structural Integrity Classification of the UK HPR1000 Main Steam Line and Associated Major Valves in the Safeguards Buildings |
| **Technical Area(s)** | Structural Integrity |
| **Revision:** | 0 |
| **Overall RO Closure Date (Planned):** | 2021-05-31 |
| **Linked RQ(s)** | RQ-UKHPR1000-0918 – CM 2020/196451<br>RQ-UKHPR1000-0925 – CM 2020/156747<br>RQ-UKHPR1000-0969 – CM 2020/296991<br>RQ-UKHPR1000-0970 – CM 2020/219438<br>RQ-UKHPR1000-1033 – CM 2020/241872 |
| **Linked RO(s)** | RO-UKHPR1000-0008 – CM 2019/346343<br>RO-UKHPR1000-0046 – CM 2020/271394 |
| **Related Technical Area(s)** | Civil Engineering,<br>Fault Studies,<br>Fuel & Core,<br>Internal Hazards,<br>Mechanical Engineering,<br>Probabilistic Safety Analysis<br>Severe Accident Analysis |
| **Other Related Documentation** | |

**Scope of Work**

**Background**

ONR's safety assessment guidance expects that in accordance with UK health and safety law, risks are reduced So Far As Is Reasonably Practicable – (SFAIRP); for brevity, the term As Low As Reasonably Practicable (ALARP) will be used in this Regulatory Observation (RO) going forward. For the structural integrity (SI) discipline and other engineering disciplines, an important link between the engineering provision in a plant design and demonstration of safety, is the safety classification of Structures, Systems and Components (SSC).

ONR's SI assessment guidance covers two situations:

a) The approach that should be followed for highest reliability structures and components, where the duty holder (or Requesting Party - RP) argues that gross failures can be discounted; and

b) The approach for other components and structures, where robust consequence arguments are expected when gross failure is not discounted.

In the Reference Design for the UK version of the Hua-long Pressurised Reactor (UK HPR1000), namely, Fangchenggang Unit 3 (FCG-3), Leak Before Break (LBB) arguments are applied to the Main Steam Line (MSL). This effectively precludes the need to consider the consequences of postulated gross failure, thus physical protection is not necessary for the MSLs for FCG-3. However, to meet ONR's expectations for the UK HPR1000, LBB should be dealt with as a secondary argument, providing defence-in-depth in the design and safety case. The UK HPR1000 RP has developed an approach to SI classification founded on a systematic consideration of the direct and indirect consequences of postulated gross failures. The RP's approach allows for the identification of those structures and components that require a highest reliability claim. In the RP's SI classification scheme, highest reliability structures and components are referred to as High Integrity Components (HICs).

During Step 2 of the GDA for the UK HPR1000, the RP identified several SSCs, which in accordance with its SI classification approach, were considered as preliminary or 'candidate HICs'. These 'candidate HICs' were subject to further assessment to determine whether, either through consequence analyse or design provision, it was reasonably practicable to avoid a HIC claim for the 'HIC candidate' structures and components of the UK HPR1000. During the ONR SI Step 3 assessment, potential shortfalls concerned with the demonstration of HIC classification for the UKHPR1000 Main Cooling Loop (MCL) components were identified, resulting in the issue of RO-UKHPR1000-0008.

**Main Steam Line System and Components**

The MSL was initially identified by the RP as being a 'HIC candidate', on the understanding that the final SI safety classification would be subject to the results from an analysis of the direct and indirect consequences of failure. This work was undertaken by the RP and used to produce the 'Main Steam Line Component Safety Report'. In this report, the MSL is described as being "….*located at nuclear island and is divided into 3 trains. Each train of pipeline is connected with one SG steam nozzle. After passing through Steam Generator (SG) compartment, the main steam pipe is arranged to penetrate containment along reactor building annulus and enter the main steam valve station of Safeguard Building (BSX). Each train of steam lines are isolated zone by zone and are respectively located at 3 mutually independent valve stations. One steam valve station is located at Safeguard Building A* (BSA), while the other two are located at Safeguard Building B* (BSB) and are respectively located at both sides of Reactor Building (BRX).*"

(*Note – for clarification, future use of the term 'Safeguards Buildings' within this RO will refer to both BSA and BSB).

The report also identifies the following key boundaries:

a) Boundaries with Steam Generator (SG): the weld to SG steam outlet nozzle;

b) Boundaries with Conventional Island (CI): the first weld outside BSX;

According to the report, the classification for the MSL is "…founded on a systematic consideration of the direct and indirect failure consequences…" which is "based on the MSLs failure consequence analysis and potential design optioneering". As a result, "*….the MSLs inside the containment are classified as HIC and MSLs outside containment are classified SIC-2.*"

As part of the Step 4 SI assessment, ONR has sought clarification and finalisation of key SSC SI classifications, including the MSL. ONR has concluded that the RP has provided an adequate demonstration to show that it is not reasonably practicable to avoid a HIC classification of the MSL within the containment building. The scope of this RO is therefore refers to the SI classification of the MSL sections and associated major valves within the Safeguard Buildings.

ONR's preliminary review of the information provided to underpin the SI SIC-2 classification for the MSL outside containment concluded that there was insufficient information to demonstrate that a robust consequences analysis had been completed. The RP has since completed further consequence analyses and identified that the MSL will now be classified as HIC between the SG steam outlet nozzle weld and the first weld outside the BSX leading to the CI.

This is a significant change from the RP's previous position and has prompted some uncertainty in relation to the reasoning and implementation of the RP's approach to justify the SI classification of the MSL and major valves in the safeguard buildings. In addition, a corollary is that there would be a significant increase in the HIC boundary for the MSL, including HIC classified welds and subcomponents (including the Main Steam Isolations Valves - MSIVs). Based on the information received so far within the scope of the SI Step 4 assessment, there is a lack of robust information to justify the RP's HIC SI classification for the MSL and associated major valves in the safeguard buildings. This RO is therefore raised to:

- Gain confidence in the RP's approach and implementation of its methods and requirements for SI classification of the MSL and associated major valves in the safeguard buildings.
- Ensure that the SI classification of the MSL and associated major valves in the safeguard buildings is clearly defined, justified and aligned with the plant classification of SSCs and is commensurate with reducing relevant risks to ALARP.
- Ensure that the SI classification of the MSL has fully considered extant HIC claims and bounding/ranking methodologies already in place for the UK HPR1000.
- Clarify ONR's expectations for the structure and content of the MSL "structural integrity case", given the recent uncertainty and wider implications associated with assigning either a SIC-2 or HIC SI classification.

**Abbreviations and Acronyms**

| | |
|---|---|
| ALARP | As Low As Reasonably Practicable |
| BRX | Reactor Building |
| BSA | Safeguard Building A |
| BSB | Safeguard Building B |
| BSX | Safeguard Building |
| CI | Conventional Island |
| FCG 3 | Fangchenggang Unit 3 |
| GDA | Generic Design Assessment |
| HIC | High Integrity Component |
| LBB | Leak Before Break |
| MCL | Main Cooling Loop |
| MSIVs | Main Steam Isolations Valves |
| MSL | Main Steam Line |
| ONR | Office for Nuclear Regulation |
| OPEX | Operational Experience |
| PCSR | Pre-Construction Safety Report |
| PSA | Probabilistic Safety Assessment |
| RO | Regulatory Observation |
| ROA | Regulatory Observatory Actions |
| RP | Requesting Party |
| SFAIRP | So Far As Is Reasonably Practicable |
| SG | Steam Generator |

| | |
|---|---|
| SI | Structural Integrity |
| SSC | Structures, Systems and Components |
| UK | United Kingdom of Great Britain and Norther Ireland |
| UK HPR1000 | The UK Version of the Hua-long Pressurized Reactor |

**Scope of work**

In order to address RO-UKHPR1000-0058 and to achieve UK expectations, this resolution plan is developed to outline the programme of work. The work to address each action of the RO-UKHPR1000-0058 is detailed below.

In accordance with the regulatory observation actions of RO-UKHPR1000-0058, the scope of work in this resolution plan covers three (3) aspects:

a) Consequence analyses, design optioneering and identification of measures to reduce risk on MSL and major valves in the Safeguard Buildings;

b) Justification that the SI classification of the MSL and major valves in the Safeguard Buildings is commensurate with reducing risks ALARP, following the process which is established for the SI classification;

c) Demonstration of the adequacy of the SI safety case on MSL and major valves in the Safeguard Buildings.

On the basis of the documentation submitted, taking cognisance of the regulatory expectations, the following documents may need to be reviewed and updated to meet the UK expectations. However, as the work develops, it may be necessary to adjust or update this plan to align with the latest review schedule in agreement with the regulators:

***a) MSLs SI Classification Approach;***

***b) MSLs SI Classification Analysis Report;***

***c) High level ALARP Assessment for Main Steam Lines Structural Integrity Classification;***

***d) Main Steam Lines Component Safety Report;***

***e) ALARP Demonstration Report of PCSR Chapter 17 (if necessary);***

***f) PCSR Chapter 17 (if necessary).***

This resolution plan is specific to justifying the Structural Integrity classification of the MSL and major valves in the Safeguard Buildings. It is not expected that the Structural Integrity classification of other HIC candidate components is addressed to close this RO.

**Deliverable Description**

**RO-UKHPR1000-0058.A1 – MSL Safeguard Buildings Consequence Analyses, Design Optioneering and Identification of Measures to Reduce Risk.**

The Regulatory Observation Action 1 states that:

*In response to this ROA, the RP should provide:*

- *Robust consequence analyses (direct and indirect) used to inform the SI classification of the MSL.*

- *ONR considers that the response to this action should include information on:*
  - *The scope of the consequence analyses (direct and indirect);*
  - *initiating event frequencies;*
  - *key assumptions; and*
  - *subsequent comparison with relevant design basis criteria.*

*ONR anticipates that exisiting or planned consequence analyses may provide useful information for the RP to address this action. However, the intent of this action is for the RP to demonstrate that the scope of the analyses is sufficient to inform the SI classification of sections of the MSL and associated major valves in the Safeguards Buildings.*

**Resolution Plan**

The ***MSLs SI Classification Analysis Report***, Reference [1], is intended to respond to ROA1 and covers the following important information:

a) Defines the scope of the consequence analysis, including direct and indirect consequences and boundary of the SSC covered by the analysis (i.e. MSL and associated major valves in the Safeguards Buildings);

b) Presents and justifies the relevant key assumptions, including initiating event frequencies, principles of postulated break locations identification, bounding case selection and analysis related to the suitability of the selected bounding case;

c) Presents the process of consequence analysis, in a proportionate way (taking the role of this assessment within the overall Structural Integrity safety case into account);

d) Presents the key conclusions, including the outcome of the comparison with the design basis criteria (covers both direct and indirect consequence analysis), and relevant demonstration on the sufficiency for the SI analysis on the defined working scope;

e) Informs and provides the basis for potentially implementing design improvements to avoid a HIC and to reduce the identified risks to ALARP.

Reference [1] has previously been submitted for GDA assessment. However, according to the latest outcome of the GDA progress, this report will be updated to reflect the important information to support the safety demonstration, including the combined load condition considered during the consequence analysis. Therefore, ***MSLs SI Classification Analysis Report, GHX44100005DNHX00GN, revision C***, will be submitted by the 15th January 2021.

After the analysis on the SI classification of the MSLs and major valves in the Safeguard Buildings is finished, the ALARP assessment will then be progressed under the guidance of the ***MSLs SI Classification Approach*** to present the design optioneering process and identification of measures to reduce risks to ALARP. The arrangement for this safety case is presented in the response for RO-UKHPR1000-0058.A2.

**RO-UKHPR1000-0058.A2 – Justification that the Structural Integrity Classification of the MSL and Major Valves in the Safeguard Buildings is Commensurate with Reducing Risks ALARP**

The Regulatory Observation states that:

*In response to this ROA, and based on the responses to ROA 1, the RP should:*

- *Provide a demonstration that the SI classification of the MSL is commensurate with reducing risk ALARP, with a balanced consideration of the: benefits, detriments and application of gross*

*disproportion i.e. ALARP optioneering.*

- *Provide a demonstration that an effective process for the SI classification has been implemented, including multi-discipline involvement, to ensure that all SSCs likely to be affected by, or with the potential to affect, the HIC MSL and that the necessary technical disciplines have been engaged and consulted in this process.*
    - *ONR considers that the response to this action should include information on:*
    - *The implementation of the process for the SI classification of the MSL and associated major valves in the Safeguard Buildings.*
    - *The design optioneering to identify measures to limit the consequences (direct and indirect) of postulated gross failures to within the design basis, including world-wide OPEX, e.g. piping restraints, blast/jetting diverter plates, building layout etc. so as to avoid a highest reliability claim for the MSL and associated major valves within the Safeguard Buildings.*
    - *A clear demonstration of how the disbenefits/burden of assigning a HIC classification to the MSL and associated major valves within the Safeguards Buildings has been considered, and how factors such as through-life burden of avoidance of fracture demonstration and high quality inspection have been inlcuded in the comparison.*
    - *A demonstration that the SI classification of the MSL in the Safeguards Buildings is aligned to the UK HPR1000 plant classification of SSCs and if appropriate, that the relevant expectations of RO-UKHPR1000-0046 (Ref. 11) will be addressed.*

**Resolution Plan**

Informed by the outcome of the consequence analyses on the MSL and associated major valves in the Safeguard Buildings, risks are identified. The report ***MSLs SI Classification Approach***, Reference [2], is developed in order to aid the working progress to meet the UK expectations. This report takes the ALARP methodology into account, and therefore presents a risk based proportionate approach to support the demonstration that the relevant good practice has been taken to reduce the risk to ALARP. The important information below is covered by this report:

a) MSLs SI classification strategy, such as the SI classification methodology, the overall MSLs SI classification process, and the key steps;

b) Organisation and management, including the relationships with multiple technical areas, design activity and risk management;

c) Time schedule to present the key submission data of relevant important safety documents.

Based on the ALARP methodology and MSLs SI classification approach developed by the RP, the SI classification analysis and ALARP assessment on the MSL and associated major valves is carried out following the ALARP principles, under the concept of tolerability of risk at nuclear power stations.

The ALARP assessment is carried out under the guidance of the ***MSLs SI Classification Approach***. Relevant outcomes are reported in the ***High level ALARP Assessment for Main Steam Lines Structural Integrity Classification***, Reference [3]. This latter report is intended to respond to action RO-UKHPR1000-0058.A2 and provides the following important information:

a) Risk identification, including clear demonstration/explanation of the risk level;

b) Design option description to clearly explain the potential design options for reducing nuclear safety risks;

c) Feasibility study of design options, including the consideration of benefits and disbenefits;

d) Application of gross disproportion under the guidance of the ***MSLs SI Classification Approach***. The

approach will also consider whether it is reasonably practicable to either avoid a HIC claim or to reduce risk;

e) Presents the conclusion related to the design modification.

Reference [3] has been previously submitted for GDA assessment. According to the latest outcome of the GDA progress, this report will be updated to reflect the important information to support the ALARP demonstration, including the detailed information on the design modification feasibility analysis. The information regarding the design modification feasibility analysis will cover the potential mitigation measures such as restraints, jetting blast shields, strengthening barriers/civil structures and the relevant feasibility studies, to support the justification of the SI classification of the MSL for the full length within the Safeguard Buildings, including sections downstream of the MSIV. The report ***High level ALARP Assessment for Main Steam Lines Structural Integrity Classification, GHX44100005DNHX00GN, revision D***, will be submitted by the 15th January 2021.

Regarding the relationship with ***Demonstration that the Risks to HIC Components from Internal Hazards are Reduced to ALARP***, RO-UKHPR1000-0046, the outcome of the SI Classification of the MSL and major valves in Safeguard Buildings provides a boundary and basis to carry out the substantiation analysis on the HIC SSCs against the internal hazards. The safety case ***High level ALARP Assessment for Main Steam Lines Structural Integrity Classification*** will be updated based on the latest outcome of the SI classification of the MSL and major valves in Safeguard Buildings and clearly indicate the impact to the substantiation analysis. The impacted RO-UKHPR1000-0046 internal hazards assessment reports will be managed, controlled and updated in a timely manner, within the Internal Hazard area.

**RO-UKHPR1000-0058.A3 – Demonstration of the Adequacy of the Structural Integrity Safety Case for the MSL and major valves within the Safeguards Building**

The Regulatory Observation states that:

*In response to this ROA, and based on the responses to ROAs 1-2, the RP should:*

- *Produce a strategy for providing an adequate "structural integrity safety case" for the entire length of the MSL and major valves within the Safeguards Buildings in a timely manner.*
- *ONR considers that the response to this action should include information on the:*
  - *Proposed "structural integrity case" and provisions to underpin any non-HIC structural integrity claims; and/or*
  - *Proposed "structural integrity case" and provisions to underpin a HIC structural integrity claim;*
  - *Demonstration that the consequences of failure of the NC classified section of the MSL outside of the Safeguards Buildings will not challenge the HIC clasification of the MSL or major valves within the Safeguards Buildings;*
  - *Provision for updating the fault analysis taking cognisance of the MSL SI classification; and*
  - *Provision for updating the hazard schedule(s) taking cognisance of the MSL SI classification.*

**Resolution Plan**

The RP has developed the strategy related to the Structural Integrity safety cases and takes all the feedback from the UK into account, during GDA. The strategy is reported in ***Safety Case Methodology for HIC and SIC Components***, Reference [4]. This important information is provided in this reference, as below:

a) Provides an adequate arrangement on the safety cases to present a golden thread that supports a high quality of ALARP demonstration on the Structural Integrity area;

b) Clearly and systematically identifies the need for Structural Integrity safety cases along with the relevant provisions for HIC or non-HIC components.

This methodology is used to guide the RP in constructing adequate, reasonable arguments and evidence to underpin the Structural Integrity claim of the MSL and the major valves within the Safeguard Buildings.

A high level simplified flow diagram presented in Appendix B is used to show how the relevant affected Structural Integrity document submissions (detailed in section 'Impact on the GDA Submissions' below) are linked. The flow diagram shows the logic, main steps and input/output relationship between the various safety case documentation:

a) Starting from **Step 0**, the overall Structural Integrity classification within the Structural Integrity area is carried out in accordance with the two (2) methodology reports listed;

b) **Step 1** - A systematic approach for MSLs Structural Integrity classification is developed which covers items such as the working strategy, defined process, control of risk and the teamwork communications. This information is reported in the report ***MSLs SI Classification Approach***;

c) **Step 2** - Under the working process management, the MSLs Structural Integrity classification will be analysed. This includes the risk identification, the analysis of direct and indirect consequences and the risk assessment. The risk insight gained from this is then used as an output to carry out further ALARP demonstrations. This information is recorded and reported in the report ***MSLs SI Classification Analysis Report***;

d) **Step 3** - Once the risk insight is received, the ALARP demonstration will be carried out. The potential options, cost and benefit will be comprehensively analysed and then a decision made for the final option. Relevant information is reported in the report ***High Level ALARP Assessment for Main Steam Lines Structural Integrity Classification***.

During the Step 3, various disciplines such as Fault Analysis, Probabilistic Safety Assessment (PSA), Hazard Analysis, SSCs and Layout Design, Civil Structure Design, etc. are involved. Through this interdisciplinary working, numerous potential options are generated and assessed. The outcome of the MSLs Structural Integrity classification will be shared with the various design teams to support their ALARP demonstrations and/or design;

e) **Step 4** - Once the decision is made, the design modification(s) will then be implemented. All the impacted documents are identified and an appropriate plan made to update. The consolidated design measure is then integrated into the design reference and reflected into the impacted reports, e.g. the PCSR Chapter 17, ALARP Demonstration Report of PCSR Chapter 17, etc. The overall summary for the MSLs Structural Integrity classification is reported in the ***Main Steam Lines Component Safety Report***;

f) If any optimisations are identified during this process relating to the general methodology and the requirements (i.e. the reports which are listed in Step 0), these will be reflected in the latest version of the methodology documents if applicable. The simplified flow diagram presents the "close-circuit" relationship among the submissions and/or the work within the various disciplines, to ensure the risk assessment is systematic and adequately robust enough to reduce the risk to ALARP.

For each main Structural Integrity submission which has been affected, the arrangement is introduced below following the logic and the input/output relationship that is presented in the Appendix B:

Based on the safety case methodology for the MSLs SI classification topic, the relevant claims, arguments and evidence are clearly introduced and appropriately referenced in the safety case ***Main Steam Lines Component Safety Report***, Reference [5]. The safety case ***Main Steam Lines Component Safety Report, GHX44100007DNHX00GN, Revision C***, will be submitted by the 15th January 2021, after the MSLs SI classification is completed to capture the important information related to the outcome of this SI classification process.

The relevant provisions for updating the fault schedule and hazard schedule after completing the MSLs Structural Integrity classification is presented in the report ***MSLs SI Classification Approach***, Reference [2].

It's aimed to inform relevant technical areas/disciplines to ensure consistency between Structural Integrity classification and the fault and hazard schedule. The key information provided by this report is introduced in the response to the RO-UKHPR1000-0058.A2. The report ***MSLs SI Classification Approach, GHX44400001DNHX00GN, Revision B***, will be submitted by the 15th January 2021, after the MSL's SI classification is completed. This will indicate the list of important submissions which play the key role within the MSL SI classification, and highlight the important reports which are impacted by the outcome of the MSLs SI classification.

One of the important points for an ALARP option means no new significant risks are introduced by the new option adopted for the UK HPR1000 that might challenge the fundamental safety of the plant. It's therefore important to analyse the consequences of failure of the NC section of the MSL outside of the Safeguard Buildings. The analysis is intended to confirm that there are no challenges to the HIC section of the MSL or major valves within the Safeguard Buildings. The latest outcome of the analysis will be reflected into the report ***MSLs SI Classification Analysis Report***. The report ***MSLs SI Classification Analysis Report, GHX44100005DNHX00GN, Revision C***, will be submitted by the 15th January 2021.

**Impact on the GDA Submissions**

The outcome of the ROAs may lead to additional demand to update the existing safety cases. The main submissions reports (i.e. which play the key roles on the ALARP demonstration on the MSL and associated major valves in the Safeguard Buildings) that are potentially impacted are as follows:

*a) MSLs SI Classification Approach;*

*b) MSLs SI Classification Analysis Report;*

*c) High level ALARP Assessment for Main Steam Lines Structural Integrity Classification;*

*d) Main Steam Lines Component Safety Report;*

*e) PCSR Chapter 17 (if necessary);*

*f) ALARP Demonstration Report of PCSR Chapter 17 (if necessary).*

The documents will be identified and revised in accordance with the corresponding actions as the RO progresses during GDA phase, in a timely manner.

The resolution plan of the RO-UKHPR1000-0046 is also impacted by the resolution plan of the RO-UKHPR1000-0058. This will be managed within the Internal Hazard area.

According to the information above, the important impacted submissions and the arrangement is summarised as below:

| GDA Submission Document | Related ROAs | Planned schedule for submission |
|---|---|---|
| MSLs SI Classification Analysis Report | ROA1 | 15th January 2021 |
| High level ALARP Assessment for Main Steam Lines Structural Integrity Classification | ROA2 | 15th January 2021 |
| MSLs SI Classification Approach | ROA3 | 15th January 2021 |
| MSLs SI Classification Analysis Report | ROA3 | 15th January 2021 |
| MSLs Steam Line Component Safety Report | ROA3 | 15th January 2021 |

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

See attached APPENDIX A.

**Reference**


[1] CGN, MSLs SI Classification Analysis Report, GHX44100005DNHX00GN, Revision B, May 2020.

[2] CGN, MSLs SI Classification Approach, GHX44400001DNHX00GN, Revision A, July 2019.

[3] CGN, High level ALARP Assessment for Main Steam Lines Structural Integrity Classification, GHX44100006DNHX00GN, Revision C, May 2020.

[4] CGN, Safety Case Methodology for HIC and SIC Components, GHX00100001DPFJ44DS, Revision E, June 2020.

[5] CGN, Main Steam Lines Component Safety Report, GHX44100007DNHX00GN, Revision B, May 2020.

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## APPENDIX A RO-UKHPR1000-0058 Gantt Chart

| | Task and Schedule | 2020 | | 2021 | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Nov | Dec | Jan | Feb | Mar | Apr | May |
| **RO Action 1** | | | | | | | | |
| 1 | Development of deliverable - [MSLs SI Classification Analysis Report] | | | | | | | |
| 2 | Submission of deliverable - [MSLs SI Classification Analysis Report] | | | | | | | |
| | Target ROA1 Closure | | | | | | | |
| **RO Action 2** | | | | | | | | |
| 3 | Development of deliverable - [High level ALARP Assessment for Main Steam Lines Structural Integrity Classification] | | | | | | | |
| 4 | Submission of deliverable – [High level ALARP Assessment for Main Steam Lines Structural Integrity Classification] | | | | | | | |
| | Target ROA2 Closure | | | | | | | |
| **RO Action 3** | | | | | | | | |
| 5 | Development of deliverable - [MSLs SI Classification Approach] | | | | | | | |
| 6 | Submission of deliverable – [MSLs SI Classification Approach] | | | | | | | |
| 7 | Development of deliverable - [MSLs SI Classification Analysis Report] | | | | | | | |
| 8 | Submission of deliverable – [MSLs SI Classification Analysis Report] | | | | | | | |
| 9 | Development of deliverable - [Main Steam Lines Component Safety Report] | | | | | | | |
| 10 | Submission of deliverable – [Main Steam Lines Component Safety Report] | | | | | | | |
| | Target ROA3 Closure | | | | | | | |
| **Assessment** | | | | | | | | |
| 11 | Regulatory Assessment | | | | | | | |
| 12 | Target RO Closure Date | | | | | | | |

## APPENDIX B Simplified Flow Diagram for the Affected SI Safety Cases