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| **Rolls-Royce SMR RO Resolution Plan** |

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| RO unique Number: | RO-RRSMR-004 |
| RO Title: | Site Autonomy Following Extended LOOP |
| Lead Technical topic: | Fault Studies |
| Related Technical topic(s): | Electrical Engineering  Probabilistic Safety Analysis  Severe Accident Analysis |

# Regulatory Observation

## Background

Great Britain’s electricity transmission system is reliable and is the preferred source of electrical supply for all UK nuclear power plants. When the electricity system is lost, through either a major failure of the system or its connection points, this is typically referred to as Loss Of Offsite Power (LOOP). During a LOOP event, nuclear power plants rely on onsite equipment to provide resilience and support fundamental safety functions until off-site power is restored. Without proper consideration of the onsite measures required to maintain safety functions for an appropriate mission time, a LOOP has the potential to lead to damage of the nuclear fuel and a large or early release of radioactivity.

Since licensees have limited influence over the reliability of their connections to the GB electricity transmission system, typically only modest safety case claims have been made on the failure frequencies related to LOOP. In recent years there has been a significant increase in the use of smart devices and a dependency on renewable energy to support the electricity transmission system. This, coupled with potential impacts of climate change, means that newer power plants should place even less reliance on GB’s electricity transmission system than what has been claimed previously.

Dialogue between the National Energy System Operator (NESO) (formally known as National Grid Electricity System Operator), licensees and ONR has resulted in reviews of previous assumptions and ONR asked all licensees to demonstrate on-site resilience to LOOP events. These discussions were summarised in [1] and take note of government policy [2], learnings from Fukushima and developments in the electricity transmission system.

In the most recent revision of the Rolls-Royce SMR E3S case (ref. [3] and [4]), the Requesting Party defines a 72 hour frequent LOOP and a 168 hour infrequent LOOP. The justification for the frequencies and durations appears to be based on information set out in RO-ABWR-0009 (ref. [5]), which pre-dates the developments described above. Refs. [3] and [4] do not set out any further justification for the selection of event durations and frequencies, although they do note that these are subject to change following future discussions with NESO.

This Regulatory Observation has been raised as ONR judges that there is a gap in the safety case for the demonstration that the generic site considered in GDA with a single Rolls-Royce SMR unit has autonomy i.e. does not need off-site intervention, for an appropriate duration for a range of faults. Based on the submissions received to date, ONR judges that appropriate site autonomy times have not been set out, and there is insufficient information regarding which SSCs will be claimed to support faults in which there is a prolonged loss of offsite power, including their classification, required mission times and consumables.

**Relevant Legislation, Standards and Guidance**

ONR’s SAPs provide the main source of guidance for ONR inspectors. The main SAPs relevant to this Regulatory Observation are:

**ONR SAPs SC.4** – ‘A safety case should… support claims and arguments with appropriate evidence, and with experiment and/or analysis that validates performance assumptions; … To demonstrate that risks have been reduced to ALARP, the safety case should… justify the options chosen in terms of meeting relevant good practice, and discard any options as being either less effective than the chosen option(s) or grossly disproportionate.’ (ref. [6]).

**ONR SAP EES.1** - Essential services should be provided to ensure the maintenance of a safe plant state in normal operation and in fault and accident conditions. (ref. [6]).

**ONR SAP EES.3** - Each source should have the capacity, duration, availability, resilience and reliability to meet the maximum demands of its dependent systems. (ref. [6]).

**ONR SAP FA.1 – FA.9, FA.15 and FA.16** – Design basis, beyond design basis, and severe accidents should be identified, and fault tolerance be demonstrated.

ONR’s SAPs are benchmarked against IAEA standards and guidance. The most relevant IAEA requirements and guidance are:

**SSR2/1 Requirement 53** - The capability to transfer heat to an ultimate heat sink shall be ensured for all plant states. (ref. [7])

**SSR2/1 Requirement 61** - The design of the nuclear power plant shall include an emergency power supply capable of supplying the necessary power in anticipated operational occurrences and design basis accidents, in the event of a loss of off-site power. The design shall include an alternate power source to supply the necessary power in design extension conditions. (ref. [7])

ONR also look to industry guidance and standards when determining relevant good practice. The European Utility Requirements (EURs) (ref. [8]) have been applied to inform the design of reactors that have previously undergone GDA. Moreover, Rolls-Royce SMR Ltd. identify the EURs as relevant good practice. For this reason, the following EURs have been identified as relevant to this RO.

**EUR 2.1/6.7.2.A** - The design shall ensure heat removal under all Operational States, Accident Conditions\*, Design Basis External Hazards and Rare and Severe External Hazards for 7 days without off-site support for each Unit. \*[‘Accident Conditions’ includes design basis conditions and design extension conditions] (ref. [8])

**EUR 2.1/6.7.3.A** - The plant shall be independent from the off-site electrical power supplies at least for 7 days in all Plant States\* and Rare and Severe External Hazards. \*[‘Plant States’ includes normal operation, anticipated operational occurrences, design basis conditions and design extension conditions] (ref. [8]).

**Regulatory Expectations**

ONR expects that faults are identified with an appropriate frequency, and that those faults are demonstrated to be tolerated by the design. LOOP events are dependent on regional differences in the electricity transmission system, and therefore the frequency and duration may be site specific. Given a specific site location is unknown ONR expects a suitably bounding set of assumptions for the generic site envelope.

The Grid Code sets requirements to facilitate restoring power to 60 % of regional demand within 24 hours, and 100 % of national demand within 5 days, as set out in the ESRS. As a future licensee will have limited influence over this, ONR considers that a conservative approach should be taken when making assumptions on the electricity transmission system restoration times.

The EURs (ref. [8]) set ‘autonomy objectives’. Of particular relevance to this Regulatory Observation is that no-offsite support should be required for 7 days for all accident conditions (referred to hereon as site autonomy). This includes ‘design basis conditions’ and ‘design extension conditions’. This terminology is commonly used internationally.

ONR’s expectations for demonstration of protection for both the principal and diverse means of protection (both to be treated with design basis techniques), and beyond design basis accidents (including severe accidents) broadly aligns with this terminology. However, ONR’s guidance does not set out explicit site autonomy objectives.

ONR does not expect that independent on-site consumables are provided for each level of defence in depth where there is sufficient time to provide these by alternate means on-site (for example, it may be appropriate to credit realignment of plant configuration, move fuel across site and replenish water tanks etc. which can be shared by multiple levels of defence in depth).

ONR expects that a safety case is presented for LOOP. The safety case should provide a justification for the chosen duration and frequencies. It should summarise the permanent and non-permanent equipment on site that provide support during a LOOP event, the available consumables (incl. Fuel, oil, water, etc,) on site, and provide a demonstration that there is sufficient capacity to maintain the fundamental safety functions over the appropriate timescales.

**References**

[1] ONR Letter, Information on Extended Loss of Grid scenarios, RRSMR-REG-0017N, 09 May 2023, (CM9 Ref. 2023/27454)

[2] UK Government, Policy Paper: Introducing a new ‘Electricity System Restoration Standard’: policy statement, 2021.

[3] Rolls-Royce SMR Limited, E3S Case Chapter 15: Safety Analysis, SMR0003977, Issue 3, May 2024. (Record ref. ONRW-2019369590-9923).

[4] Rolls-Royce SMR Limited, Rolls-Royce SMR Definition of Postulated Initiating Events and Derivation of Initiating Event Frequencies, SMR0001389 Issue 4 (Record ref. ONRW-2019369590-7003).

[5] ONR, RO-ABWR-0009, “Analysis of loss of offsite power event,” 2017.

[6] ONR, Safety Assessment Principles for Nuclear Facilities, 2014 Edition, Revision 1, January 2020

[7] IAEA, Safety of Nuclear Power Plants: Design, Specific Safety Requirements, No. SSR 2/1. Rev. 1, February 2016

[8] European Utility Requirements, Volume 2, Revision D, December 2016

## Regulatory Observation Actions and Resolution Plan

**RO-RRSMR-004.A1 – Site Autonomy**

In response to this Regulatory Observation Action, Rolls-Royce SMR Ltd should:

Determine autonomy times for:

* Design basis faults,
* Design basis sequences including failure of the principle means of protection,
* Beyond design basis faults; and
* Severe accidents.

Justification for the derivation of the site autonomy time should be provided, and should be based on a combination of relevant good practice, operational experience, discussions with NESO and any relevant analysis, as appropriate.

Resolution required by '*to be determined by Rolls-Royce SMR Limited Resolution Plan*'

**Rolls-Royce SMR Ltd. Resolution Plan RO-RRSMR-004.A1**

Autonomy Times

The E3S Design Principles [9] identify mission times for safety measures to deliver their functions without reliance on on-site mobile equipment for 72 hours (Design Basis Conditions (DBC), including DBC-4 where the first means of protection fails) and 24 hours (Design Extension Conditions A & B); and without reliance on off-site services for 7 days.

In summary, autonomy is required without reliance on on-site mobile equipment for:

* Design basis faults – 72 hours,
* Design basis sequences including failure of the principle means of protection – 72 hours,
* Beyond design basis faults (DEC-A) – 24 hours,
* Severe accidents – 24 hours.

Autonomy is required without reliance on off-site services for 7 days, for all fault and severe accident conditions.

The timeline of this is shown below in Figure 1.

A screen shot of a computer screen

AI-generated content may be incorrect.

**Figure 1: Autonomy Times**

The E3S Design Principles (and the non-functional requirements placed on Structures, Systems and Components (SSC) derived from them) will be discussed in Chapter 3 of the E3S Case: General Design Aspects [20]. The basis of the principles against Relevant Good Practice, including autonomy times, is presented in the E3S Design Principles [9]. A new Autonomy of Safety Functions report [15] will be produced which will provide the justification of these autonomy times.

The E3S Design Principles [9] also identify a requirement for safety measures to operate without human intervention for at least 30 minutes from within the Main Control Room (MCR), and at least 1 hour outside the MCR. Justification of human actions demonstrates meeting an E3S claim which will be substantiated in Chapter 18 of the E3S Case [10]. Operator actions will be presented and discussed in the E3S Case as discussed in the resolution plan for Action 2.

Beyond the timeframes above, some operator action may be claimed, and some on-site and off-site services may be claimed. This could include transfer of consumables, such as fuel oil and water, from onsite storage to the appropriate system. The resolution plan for Action 2 discusses where specific information will be presented in the E3S Case.

Relevant Faults

The E3S requirements above apply to all faults, and compliance evidence will be developed throughout design development (see Action 2). The limiting faults, and justification for selection of these, will be discussed in the Autonomy of Safety Functions report [15]. This may, in turn, refer to decision records.

The RR SMR design facilitates autonomy for up to 7 days. The design is constrained by the requirement for up to 7 days autonomy. Whilst these requirements apply to all fault categories, it is noteworthy that they will be demonstrated to be consistent or enveloping of Loss Of Offsite Power Postulated Initiating Event (PIE) durations provided in Issue 5 of the PIE Definition Report [12].

Summary

The resolution of Action 1 will be supported by the following documentation:

* Issue 5 of the PIE Definition report [12],
* E3S Design Principles [9],
* Reactor Plant Performance Fault Study Analysis Summary [11],
* E3S Case Chapter 3 [20],
* KAX System Design Description [23].

**RO-RRSMR-004.A2 – Fault Analysis to Support Site Autonomy Claims**

In response to this Regulatory Observation Action, Rolls-Royce SMR Ltd should:

In supporting claims related to site autonomy times, for each accident category listed in A1:

* Identify relevent safety measures and supporting equipment (this needn’t duplicate the fault schedule, but summarise claims related to site autonomy for each accident category),
* Identifiy the categorisation and classification of the equipment,
* The required mission times of the safety measures and supporting equipment,
* Provide a demonstration that the safety functions are maintained for the required duration and
* Demonstrate that sufficient consumables are available on site to support the above safety functions.

This should be based on the most limiting cases for each category, as appropriate.

Resolution required by '*to be determined by Rolls-Royce SMR Limited Resolution Plan*'

**Rolls-Royce SMR Ltd. Resolution Plan RO-RRSMR-004.A2**

The resolution plan for Action 2 is presented in a series of subsections, each subsection discussing one of the bullet points from the Action text above.

The focus of the resolution plan is to identify where in the E3S Case the demonstration will be provided that autonomy requirements are met. At a high level, this is in the Tier 1 chapters, but drawing on arguments and evidence from Tier 2 design documentation and tier 3 detailed documents including decision records.

Autonomy requirements are flowed down onto the individual SSC, and these are managed using the DOORS database software tool.

Therefore, the resolution plan for Action 2 presented in the following subsections includes background information on design development and requirements.

**Identification of Relevant Safety Measures and Supporting Equipment**

The fault schedule identifies the safety measures which provide defence against design basis faults and mitigation for design extension conditions. The measures identified in the fault schedule become requirements on safety measures, managed in the DOORS database.

In addition, the Autonomy of Safety Functions [15] report will include a plan for defining Non-Permanent Equipment (NPE) which will be required in order to meet the autonomy requirements. This will list any relevant GDA submissions related to NPE.

An example of the steps through the DOORS databse, for the Passive Decay Heat Removal (PDHR) [JN02] safety measure is as follows:

* The fault schedule makes claims on PDHR to protect against certain faults – these requirements will be extracted from the DOORS database into the PDHR [JN02] System Design Specification (SDS) [13], which forms part of the E3S Case at Tier 2.
* The safety measures claimed in the fault schedule are designed in line with the E3S Principles to provide the required autonomy times as discussed in Action 1. These E3S Design Principles are decomposed into Non-Functional System Requirements (NFSRs) onto the safety measures.
* The fault schedule also defines the categorisation of the safety functions in accordance with the E3S Categorisation and Classification Methodology [14]. This categorisation flows down into safety measure requirement modules, managed in the DOORS database, ensuring the designers identify which E3S NFSRs are relevant to the delivery of a function and are taken into account during design development and optioneering.
* Safety measures decompose their requirements into design definitions (or allocated requirements) in their D-Modules. These definitions retain appropriate safety categorisation and define the response needed from SSCs needed to deliver safety functions. In systems design, component requirements are also decomposed into a Functional Bill of Materials (FBoM) for standard parts (valves, pumps, heat exchangers etc). The FBoM includes an autonomy time attribute that appropriately constrains the design of commodity components to uphold parent safety functions.
* Safety functional requirements are linked through the product breakdown structure (Fault Schedule to Safety Measure, to Systems, to Components/Structures/Layout) to provide requirement traceability. Below system level, safety classifications are also introduced.

This example is provided to illustrate how claims and arguments relating to site autonomy times are managed through the flow of design requirements and presented in the E3S Case as design artifacts for safety measures and the SSC they claim. Evidence for site autonomy times being met is delivered through design definitions and appropriate Verification & Validation (V&V) activities.

**The Required Mission Times of the Safety Measures and Supporting Equipment**

The specific example shown above relates to the PDHR [JN02] heatsink autonomy time for the first 72 hours of a fault sequence. The new Autonomy of Safety Functions report [15] will be produced, which will present further examples and specific design artifacts where Claims, Arguments and Evidence can be found relating to plant autonomy times.

The limits of design maturity will also be explained. A key example of immature design at DRP2 is the definition of on-site equipment that will be claimed after 72 hours to make-up water to the Local Ultimate Heatsink System (LUHS) [JNK]. However, where design maturity is incomplete, requirements on SSC will be in place to ensure that autonomy requirements will be met by the design.

For each accident category, the Autonomy of Safety Functions [15] report will:

* Identify relevent safety measures and supporting equipment,
* Identifiy the categorisation and classification of the equipment,
* Present the required mission times of the safety measures and supporting equipment,
* Provide a demonstration that the safety functions are maintained for the required duration,
* Demonstrate that sufficient consumables are available on site to support the above safety functions,
* Identify and provide links to justification of any human actions required to ensure continued availability of safety functions.

The E3S claim on SSCs is that they are designed to meet their requirements. The requirements are managed in the DOORS database, and extracted into SDS documents. The SDS documents form part of the E3S Case at tier 3 and will be submitted into GDA as per the Step 3 submissions schedule.

Non-Permanent Equipment (NPE) may be called upon to support the delivery of the safety functions. The Autonomy of Safety Functions report [15] will identify any NPE which will be claimed, and will discuss how it will be used. On-site NPE can only be claimed after 72 hours for DBC or after 24 hours for DEC-A and DEC-B. Therefore, NPE is not relied upon to provide the initial response to fault or accident conditions. However, NPE is generally used to extend the operation of safety measures to meet the autonomy requirements through the provision of consumables.

The Safety Measure Supply System [KAX] incorporates such NPE, and will reach DR1 maturity in October 2025 at which point the first issue of the System Design Description will be issued. At this point, viable design options will be available which will be taken forward for further development.

**Demonstration that the Safety Functions are Maintained**

Chapter 6: Engineered Safety Features [16] discusses the requirements and design of safety measures, including a summary discussion on how each safety measure meets its autonomy times.

The Design Basis Analysis (DBA) Methodology [17] discusses the approach to modelling Loss of Electrics faults, considering a fault lasting up to 168 hours as discussed in Item 1. This is considered to demonstrate the limiting fault type for plant autonomy, as it assumes that onsite power sources are required for the maximum time period before off-site services may be claimed. This means that, in addition to topping up water to plant systems, diesel fuel oil may also need to be topped up in the Diesel Generators (DGs).

The bounding loss of electrics fault for Control of Fuel Temperature (CoFT) with protection from both PDHR [JN02] and ECC [JN01] is complete loss of pumped primary flow with the additional failure of one train of DGs while the other is unavailable for maintenance, leading to a station blackout. In the PDHR [JN02] sequence, CoFT is delivered via the passive variation of PDHR (v3). This will be assessed deterministically for a duration up to 5 days as a frequent fault, and up to 7 days as an infrequent fault.

The output of this analysis will be presented in the tier 2 DBA Summary [11] (tier 2), and summarised in Chapter 15: Safety Analysis [19] (tier 1).

The analysis and E3S Case is based on inputs from the design of the safety measures, and the SSC that support the safety measures by providing and delivering supplies of consumables.

**Demonstration that Sufficient Consumables are Available On Site**

The plant provides safety functions for 72 hours without reliance on on-site mobile supplies following bounding loss of electrics faults:

* A minimum of 72 hours cooling is provided using stored water in either the Local Ultimate Heatsink System [JNK], fuel pools or Essential Service Water System [PBD], or a combination of these coolant sources,
* The Standby AC Diesel Generators have integrated fuel tanks that can provide backup power to pumps, valves, C&I etc for a minimum of 72 hours.

The safety measure System Design Specifications and Safety Measure Design Descriptions (Tier 2) summarise the claims, arguments and evidence for how pre-72 hour autonomy is provided.

The key documentation includes:

* Safety Measure Design Description for ECC [JN01] [21], due to be submitted on 30/05/25,
* Safety Measure Design Description for PDHR [JN02] [22], due to be submitted on 30/05/25,
* Safety Measure Design Description for Low Temperature Decay Heat Removal [JN04] [26], due to be submitted on 30/05/25,
* Safety Measure Design Description for Faulted Containment [JM01] [27], due to be submitted on 30/05/25,
* Safety Measure Design Description for Severe Accident Containment [JM02] [28], due to be submitted on 30/05/25,
* Safety Measure Design Description for Fuel Pool Heat Removal [FA01] [FA02] [29], due to be submitted on 30/05/25,
* Safety Measure Design Description for High Temperature Heat Removal [JN03] [30], due to be submitted on 29/08/25,
* Safety Measure Design Description for Alternative Shutdown Function [JD02] [31], due to be submitted on 30/05/25,
* System Design Description [23] and System Design Specification [24] for the Safety Measures Consumables Supply System [KAX], due to be submitted on 31/10/25,
* System Design Specification [25] for the 11kV Essential AC Standby Generation System [BDV], due to be submitted on 30/09/25.

Submission dates are correct on the date of issuing this resolution plan. Following issue, the E3S Case Deliverables Plan should be taken as the live listing of deliverable dates.

The design for post-72 hour autonomy is ongoing, with two key decision records being produced:

* Decision for on-site storage of water to support safety systems,
* Decision for on-site storage of diesel fuel.

These decision records provide tier 3 supporting evidence into the tier 2 safety case documentation including SMDDs, SDDs and SDSs. The tier 1 summary of Engineered Safety Features is presented in E3S Case Chapter 6 [16].

The decisions unlock further design work to be undertaken during detailed safety measure design, such as defining where water and fuel make-up is required, when in a fault sequence and how it will be transferred from the stores identified.

Some examples of consumables that require top-up action include Local Ultimate Heat Sink (LUHS) [JNK] tanks, diesel fuel stores and fluid containing pressurised systems that may experience leakage across closed valves.

Detailed design scope is also planned that will investigate site chemical stores to support the long term operation of safety systems. For example, boron stores to mitigate potential long term dilution issues (in faults where Scram [JD01] may have failed) or biocides to mitigate potential long term fouling issues in heat removal fluid systems.

The “Autonomy of Safety Functions” report will specify the location of the claim, arguments and evidence for post-72 hour autonomy and will identify any gaps in the claims, arguments and evidence and the plan to resolve.

The delivery of these activities is expected to continue beyond GDA timescales. On 30/06/25, the Autonomy of Safety Functions report [15] will be provided to support resolution of this RO, with reference to design documentation that presents how safety measures satisfy autonomy requirements with suitably classified equipment.

## Schedule 1 and Impacted Submissions

Schedule 1 below shows the delivery schedule for upcoming documentation which will support resolution of this RO. The *References* section below lists these along with documents which have previously been submitted which also support resolution of this RO.



**New Submission: Autonomy of Safety Functions [15]**

The points listed below are a summary of points which will be included in The Autonomy of Safety Functions report [15] to support resolution of this RO:

* Identify safety functions (and aspects of the design which contribute to delivery of safety functions) which are required to achieve meet the autonomy requirements.

For each accident category, the Autonomy of Safety Functions [15] report will:

* Identify relevent safety measures and supporting equipment,
* Identifiy the categorisation and classification of the equipment,
* Present the required mission times of the safety measures and supporting equipment,
* Provide a demonstration that the safety functions are maintained for the required duration,
* Demonstrate that sufficient consumables are available on site to support the above safety functions,
* Identify and provide links to justification of any human actions required to ensure continued availability of safety functions.

## References

### [1] ONR Letter, Information on Extended Loss of Grid scenarios, RRSMR-REG-0017N, 09 May 2023 (CM9 Ref. 2023/27454)

### [2] UK Government, Policy Paper: Introducing a new “Electricity System Restoration Standard”, policy statement, 2021

### [3] Rolls-Royce SMR Limited, E3S Case Chapter 15: Safety Analysis, SMR0003977, Issue 3, May 2024, (Record ref. ONRW-2019369590-9923)

### [4] Rolls-Royce SMR Limited, Rolls-Royce SMR Definition of Postulated Initiating Events and Derivation of Initiating Event Frequencies, SMR0001389 Issue 4, (Record ref. ONRW-2019369590-7003)

### [5] ONR, RO-ABWR-0009, “Analysis of loss of offsite power event”, 2017

### [6] ONR, Safety Assessment Principles for Nuclear Facilities, 2014 Edition, Revision 1, January 2020

### [7] IAEA, Safety of Nuclear Power Plants: Design, Specific Safety Requirements, No. SSR 2/1. Rev. 1, February 2016

### [8] European Utility Requirements, Volume 2, Revision D, December 2016

### [9] SMR0001603/2 E3S Design Principles, issue 2, July 2024.

[10] SMR0004520/4 E3S Case Chapter 18 Version 3, to be submitted 28/08/2025.

[11] SMR0007538/2 Reactor Plant Performance Fault Study Analysis Summary, issue 2, February 2025.

[12] SMR0001389/5 Definition of Postulated Initiating Events and Derivation of Initiating Event Frequencies, issue 6, October 2025.

[13] SMR0011296/2 System Design Specification for PDHR, issue 2, February 2025.

[14] SMR0006518/2 Rolls-Royce SMR Environment, Safety, Security And Safeguards Categorisation And Classification Method, issue 2, October 2024.

[15] SMR0021773/1 Autonomy of Safety Functions, issue 1, to be submitted 30/06/2025

[16] SMR0003771/4 E3S Case Chapter 6: Engineered Safety Features Version 3, to be submitted 28/08/2025.

[17] SMR0012935/1 Design Basis Analysis Methodology, issue 1, December 2024.

[18] Not used.

[19] SMR0003977/4 E3S Case Chapter 15: Safety Analysis Version 3, to be submitted 28/08/2025.

[20] SMR0004589/3 E3S Case Chapter 3: General Design Aspects Version 3, to be submitted 28/08/2025.

[21] Safety Measure Design Description for ECC [JN01], to be submitted 30/05/2025.

[22] Safety Measure Design Description for PDHR [JN02], to be submitted 30/05/2025.

[23] System Design Description for the Safety Measures Consumables Supply System [KAX], to be submitted 31/10/2025.

[24] System Design Specification for the Safety Measures Consumables Supply System [KAX], to be submitted 31/10/2025.

[25] System Design Specification for the 11kV Essential AC Standby Generation System [BDV], to be submitted 30/09/2025.

[26] Safety Measure Design Description for Low Temperature Decay Heat Removal [JN04], due to be submitted on 30/05/25

[27] Safety Measure Design Description for Faulted Containment [JM01], due to be submitted on 30/05/25

[28] Safety Measure Design Description for Severe Accident Containment [JM02], due to be submitted on 30/05/25

[29] Safety Measure Design Description for Fuel Pool Heat Removal [FA01] [FA02], due to be submitted on 30/05/25

[30] Safety Measure Design Description for High Temperature Heat Removal [JN03], due to be submitted on 29/08/25

[31] Safety Measure Design Description for Alternative Shutdown Function [JD02], due to be submitted on 30/05/25

## Record of Change

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| --- | --- | --- |
| **Date** | **Revision Number** | **Reason for Change** |
| 22/05/2025 | 1 | Issue of resolution plan |
| 15/07/2025 | 2 | Format and consistency update and alignment |

## Approvals

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Author | Sign | Print | Role | Date |
| See Teamcenter | {REDACTED} | {REDACTED} | See Teamcenter |
| Reviewer | Sign | Print | Role | Date |
| See Teamcenter | {REDACTED} | {REDACTED} | See Teamcenter |
| Approver | **Sign** | **Print** | **Role** | **Date** |
| See Teamcenter | {REDACTED} | {REDACTED} | See Teamcenter |