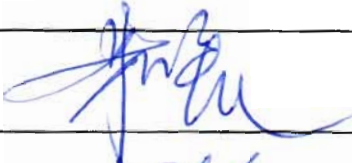



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| Preliminary Safety Report Chapter 1 Introduction | | |
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SENSITIVE INFORMATION RECORD

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1.1 List of Abbreviations and Acronyms

| | |
|----------------|--|
| ALARP | As Low As Reasonably Practicable |
| APG | Steam Generator Blowdown System [SGBS] |
| ARE | Main Feedwater System [MFS] |
| ASG | Emergency Feedwater System [EFWS] |
| ASP | Secondary Passive Heat Removal System [SPHRS] |
| ATE | Condensate Polishing System [CPS] |
| BAT | Best Available Technique |
| CRF | Circulating Water System [CWS] |
| CGN | China General Nuclear Power Corporation |
| DAC | Design Acceptance Confirmation |
| DBA | Design Basis Analysis |
| DBC | Design Basis Condition |
| DEC | Design Extension Condition |
| DEL | Safety Chilled Water System [SCWS] |
| EA | Environment Agency |
| ECS | Extra Cooling System [ECS] |
| EDF S. A. | Electricite de France |
| EHR | Containment Heat Removal System [CHRS] |
| EUF | Containment Filtration and Exhaust System [CFES] |
| EUH | Containment Combustible Gas Control System [CCGCS] |
| FCG Unit 3 | Fangchenggang Nuclear Power Plant Unit 3 |
| GCT | Turbine Bypass System [TBS] |
| GDA | Generic Design Assessment |
| GNI | General Nuclear International |
| GNS | General Nuclear System Limited |
| GSR | Generic Security Report |
| HPR1000 | Hua-long Pressurized Reactor |
| HPR1000 (FCG3) | Hua-long Pressurized Reactor under construction at Fangchenggang Nuclear Power Plant Unit 3 |
| HVAC | Heating, Ventilation and Air Conditioning System |
| KDA | Severe Accident I&C System [SA I&C] |
| NNSA | National Nuclear Safety Administration |
| ONR | Office for Nuclear Regulation |

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|------------|--|
| PCSR | Pre-Construction Safety Report |
| PCER | Pre-Construction Environment Report |
| PMC | Fuel Handling and Storage System [FHSS] |
| PTR | Fuel Pool Cooling and Treatment System [FPCTS] |
| PSA | Probabilistic Safety Assessment |
| PSR | Preliminary Safety Report |
| QA | Quality Assurance |
| RP | Requesting Party |
| RBS | Emergency Boration System [EBS] |
| RCV | Chemical and Volume Control System [CVCS] |
| REA | Reactor Boron and Water Makeup System [RBWMS] |
| REN | Nuclear Sampling System [NSS] |
| RIS | Safety Injection System [SIS] |
| RRI | Component Cooling Water System [CCWS] |
| SA | Severe Accident |
| SAPs | Safety Assessment Principles |
| SEC | Essential Service Water System [ESWS] |
| SFAIRP | So Far As is Reasonably Practicable |
| SFIS | Spent Fuel Interim Storage |
| SoDA | Statement of Design Acceptability |
| TEP | Coolant Storage and Treatment System [CSTS] |
| UK | United Kingdom of Great Britain and Northern Ireland |
| UK HPR1000 | The UK version of the Hua-long Pressurized Reactor |
| VDA | Atmospheric Steam Dump System [ASDS] |
| VVP | Main Steam System [MSS] |
| WENRA | Western European Nuclear Regulators Association |

System codes (XXX) and system abbreviations (YYY) are provided for completeness in the format (XXX [YYY]), e.g. Steam Generator Blowdown System (APG [SGBS]).

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1.2 Purpose and Scope of the PSR

The Requesting Parties (RPs) for the purpose of the UK HPR1000 GDA process are constituted jointly by China General Nuclear Power Corporation (CGN), Electricite de France (EDF S.A.) and General Nuclear International (GNI). The structure and roles of RPs are outlined in Chapter 20. This sub-section addresses the purpose and scope of Preliminary Safety Report (PSR). The fundamental objectives, supported by a number of high level objectives, are summarized.

1.2.1 Purpose of the PSR

The PSR is the first major submission of the Generic Design Assessment (GDA) process. To present the PSR in context, the GDA process is briefly outlined. This outline is based on the ONR and EA guidance to requesting parties in Reference [1] and [2]:

- a) Step 1 is the preparatory part of the design assessment process. Mostly this will involve the RP setting up its project management and technical teams and arrangements for GDA, and writing and preparing submissions for Step 2, including the PSR. It also involves discussions between the RP and ONR to ensure a full understanding of the requirements and processes that will be applied.
- b) Step 2 is an overview (by ONR and EA) of the acceptability, in accordance with the UK regulatory regime, of the design fundamentals, including review of key safety and security claims. Step 2 of the GDA process requires the RPs to submit a PSR providing an outline description of the reactor equipment and structures, the design and safety philosophy, the codes and standards applied in the design and the quality management systems applied by the designers. The aim is to give the ONR and EA confidence that UK safety standards could be met by the proposed reactor design and that the claimed principles and design criteria are likely to be achievable.
- c) Step 3 is a primarily review by ONR of the arguments (or ‘reasoning’) supporting the RP’s claims regarding the safety and related security aspects of the proposed design. The intention in this step is to move from the fundamentals of the previous step to an analysis of the design, primarily by examination at the system level and by analysis of the RP’s arguments that support the safety claims. Parallel to this the EA will begin its assessment which will converge with the ONR at the end of step 4. Step 3 of the GDA process requires the RPs to provide a more detailed Pre-Construction Safety Report (PCSR) including more detailed descriptions of system architectures, their safety functions and reliability and availability requirements, descriptions of the design codes used, and a description of Fault Analysis including Design Basis Analysis (DBA), Severe Accident analysis and Probabilistic Safety Assessment (PSA).
- d) Step 4 is an in-depth assessment of the safety case evidence, security case evidence and the generic site envelope. The general intention of this step is to move from the safety arguments and system level assessment of Step 3 to a fully detailed examination of the available evidence, on a sampling basis, given in the safety and security submissions. Step 4 of the GDA process requires the RPs to provide further detailed information, including arrangements for ensuring construction quality, justification of operating limits, arrangements for developing plant operational, maintenance and testing procedures, and a description of how the design reference configuration would be maintained.

After Step 4 there may be a period of GDA Issue close-out, the scope and time of which will depend on the nature of any outstanding issues and the RP’s resolution plans for

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those GDA Issues. Upon completion of these GDA steps, a Design Acceptance Confirmation (DAC) and Statement of Design Acceptability (SoDA) are expected to be issued by the ONR and EA respectively.

As outlined above the GDA process requires the RP to submit a PSR to enter Step 2. The aim of the PSR is to give the ONR and EA confidence that UK requirements could be met by the proposed reactor design and that the claimed principles and design criteria are likely to be achievable. Therefore, the PSR is an initial, but important, safety case document which sets out at a high level the fundamental overview of safety, environment and security claims for the proposed nuclear reactor design. This document contains:

An explanation of the outline design for Hua-long Pressurized Reactor under Construction at Fangchenggang nuclear power plant Unit 3 (HPR1000 (FCG3)) which is the starting basis for the design of the UK version of the Hua-long Pressurized Reactor UK HPR1000;

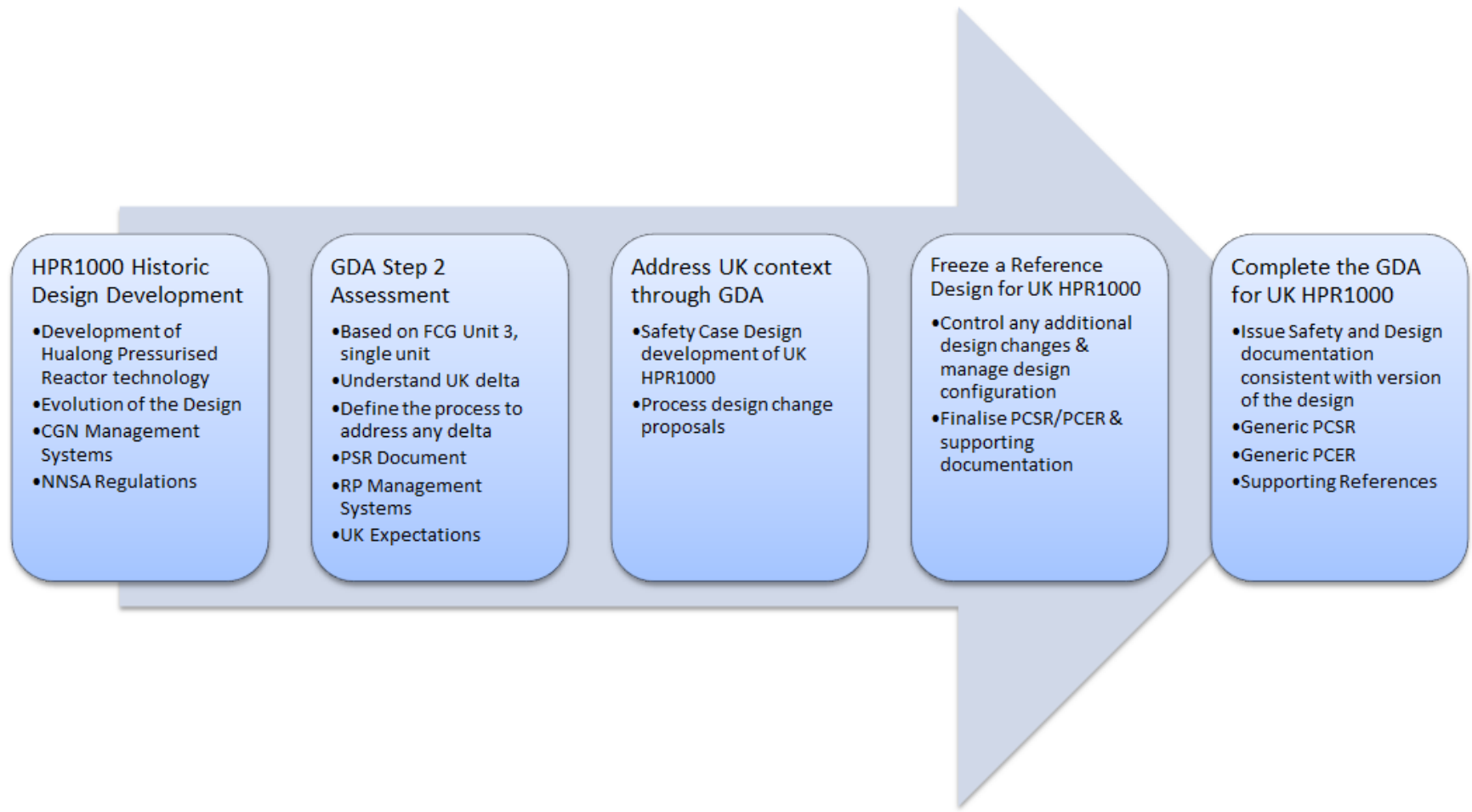
Acknowledgement that there is (or may be) a difference in expectations between the UK regulatory approach and prescriptive nature of the Chinese regulator (the UK-delta);

As the GDA process progresses, the PSR will be followed by a generic Pre-Construction Safety Report (PCSR), a generic Pre-Construction Environment Report (PCER) and a Generic Security Report (GSR). The PCSR will be focused on nuclear and conventional safety and will be submitted to the ONR for review. The PCER will be focused on the environmental protection aspects and will be submitted to the EA for review. The GSR will be focused on security issues and will be submitted to the ONR. The PSR includes elements of all of these areas providing an overview of the complete set of design development requirements for safety (nuclear and industrial), environmental and security issues.

As addressed in Reference [1], ONR's preferred approach to the development of safety case documentation for submission, is for the RP to adopt the claims-arguments-evidence (CAE) chain of reasoning. CAE structure will be considered appropriately in UK HPR1000 GDA process.

HPR1000 is advanced pressurized reactor developed by CGN, FCG Unit 3 is the first reactor adopting the technology of HPR1000, and the UK HPR1000 will refer to FCG Unit 3. The HPR1000 (FCG3) is the starting point for the PSR. The GDA Reference Design will be declared at a later stage, and will incorporate lessons learned during the construction of the HPR1000 (FCG3). F-1.2-1 shows the progression of the design through various stages of maturity.

The objectives, identified throughout the PSR, have been developed to provide a clear basis for establishing the safety of the design. However at this stage of the development of the safety case the arguments and underlying evidence to support the objectives have not yet been assembled. This will be completed as the GDA process progresses and this may necessitate some adjustment of the objectives during the subsequent phases of GDA.



Note: UK delta is the general name for the differences between the existing HPR1000 (FCG3) and UK context.

F-1.2-1 Overview of key stages in the design development

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1.2.2 Scope of the PSR

As described above, the main aim of the PSR is to provide sufficient information for the UK regulators to carry out Step 2 of the GDA process. The PSR involving the different aspects of safety (including nuclear safety and industrial safety), environmental protection and security, is divided into 27 chapters, covering the topics that collectively constitute a broad-ranging review of the key aspects of the UK HPR1000.

The PSR has been written based on the assumption of a reactor of single-unit design built on a generic UK site that bounds all suitable locations. This assumption will be reviewed and adjusted, where necessary, in subsequent phases of the project. The following topics are not presented in detail in this document, as they are operator specific decisions and therefore have not been considered in the PSR.

- Commissioning;
- Operational Management;
- Emergency Preparedness.

These omissions will be reviewed and adjusted, where necessary, in subsequent phases of the GDA.

Further to these omissions detail on security has been omitted as it will be included in later GDA submissions. Additional information on this point is provided in Chapter 27.

1.2.3 Fundamental Objective

The fundamental objective, that will be demonstrated, through GDA, is:

The Generic UK HPR1000 could be constructed, operated, and decommissioned in the UK on a site bounded by the generic site envelope in a way that is safe, secure and that protects people and the environment.

This fundamental objective is supported by a number of high level objectives which are summarised below. The chapters supporting each objective have been identified in F-1.2-2.

Site characteristics: The design characteristics of the UK HPR1000 reflect a generic UK site that bounds suitable locations;

Design development & organisational arrangements: The UK HPR1000 design will be developed in an evolutionary manner, using a robust design process, building on relevant good international practice, to achieve a strong safety and environmental performance;

Nuclear safety - protection of the workers and the public: The design and intended construction and operation of the UK HPR1000 will protect the workers and the public by providing multiple levels of defence to fulfil the fundamental safety functions;

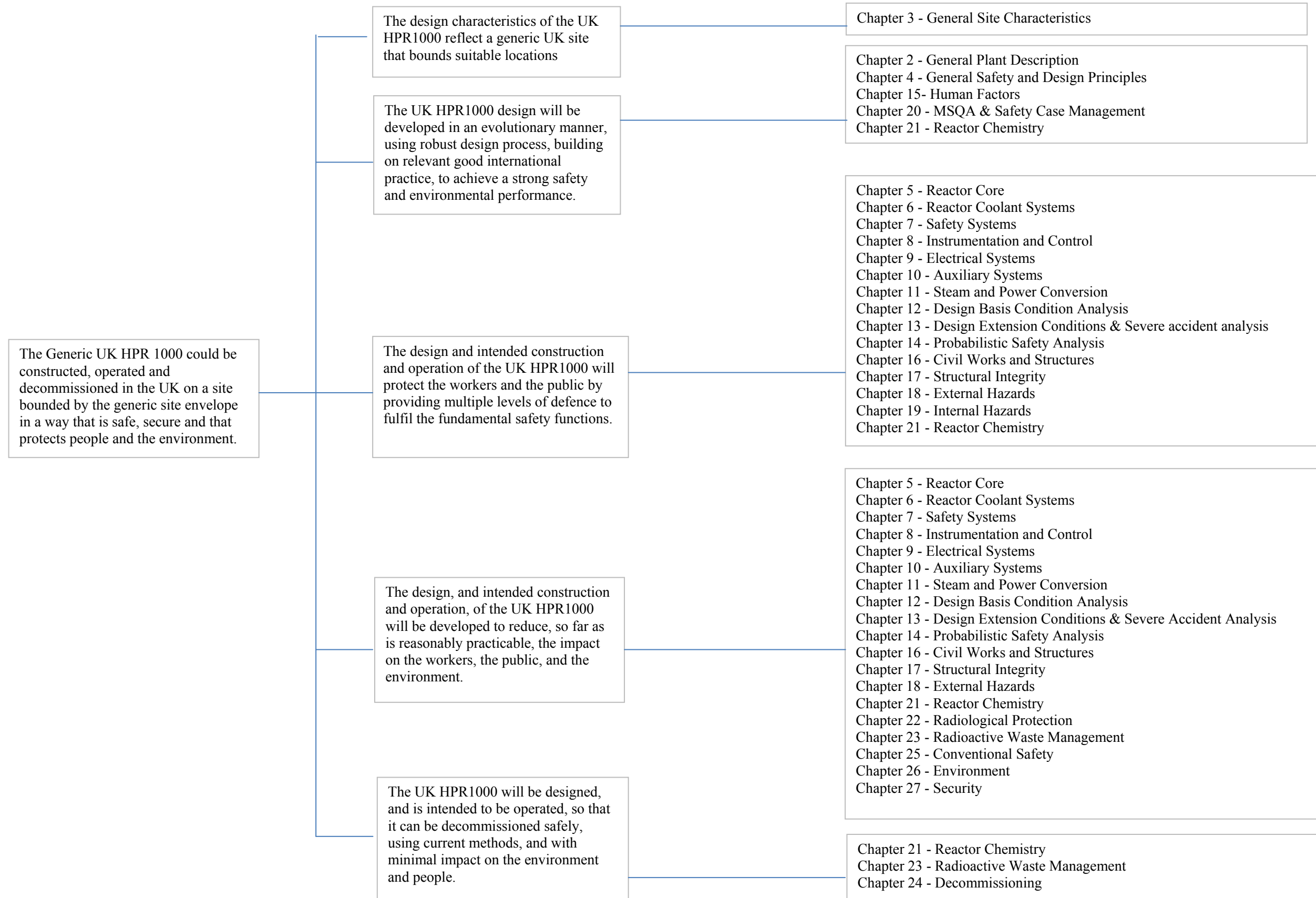
Radiological & environmental protection, security and industrial safety: The design, and intended construction and operation, of the UK HPR1000 will be developed to reduce, so far as is reasonably practicable, the impact on the workers, the public, and the environment;

Decommissioning: The UK HPR1000 will be designed, and is intended to be operated, so that it can be decommissioned safely, using current methods, and with minimal impact on the environment and people;

This PSR document provides a framework that will demonstrate compliance with these

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objectives through the GDA process.



F-1.2-2 Fundamental Objectives Chapter Mapping

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1.3 Structure and Contents of the PSR

1.3.1 Contents of the PSR Chapters

This PSR contains 27 chapters, divided into six areas. Titles, contents and areas of each chapter are presented in T-1.3-1.

T-1.3-1 Contents of PSR

| Chapter | Title | Content Summary | Chapter Area |
|----------------|--------------------------------------|--|---------------------|
| 1 | Introduction | <ul style="list-style-type: none"> • Purpose and Scope of the PSR • Structure and Contents • Quality Assurance Process followed during the Production of the PSR | N/A |
| 2 | General Plant Description | <ul style="list-style-type: none"> • Evolution of the HPR1000 (FCG3)Design • Main Technical Characteristics • Layout of the Main Civil Structures | Plant Design |
| 3 | Generic Site Characteristics | <ul style="list-style-type: none"> • Regulatory Content • Site Parameters for HPR1000 (FCG3) | Plant Design |
| 4 | General Safety and Design Principles | <ul style="list-style-type: none"> • General Safety Principles • Principles of Classification for SSCs • Codes and Standards • Principles of Equipment Qualification | Plant Design |
| 5 | Reactor Core | <ul style="list-style-type: none"> • Fuel System Design • Nuclear Design • Thermal Hydraulic Design | Plant Systems |
| 6 | Reactor Coolant System | <ul style="list-style-type: none"> • Reactor Coolant System Description • Reactor Components • Reactor Coolant System Components | Plant Systems |

| Chapter | Title | Content Summary | Chapter Area |
|---------|----------------------------|--|---------------|
| 7 | Engineered Safety Features | <ul style="list-style-type: none"> • Safety Injection System(RIS [SIS]) • Emergency Boration System (RBS [EBS]) • Atmospheric Steam Dump System (VDA [ASDS]) • Emergency Feedwater System (ASG [EFWS]) • Secondary Passive Heat Removal System (ASP [SPHRS]) • Containment Heat Removal System (HER [CHRS]) • Containment Filtration and Exhaust System (EUF [CFES]) • Containment Isolation • Containment Combustible Gas Control System (EUH [CCGCS]) • Extra Cooling System (ECS [ECS]) | Plant Systems |

| Chapter | Title | Content Summary | Chapter Area |
|----------------|----------------------------|---|---------------------|
| 8 | Instrumentation & Controls | <ul style="list-style-type: none"> • Design Principles for I&C • General Architecture of the Instrumentation and Control Systems • General Description of FC1 Instrumentation and Control Systems • General Description of FC2 Instrumentation and Control Systems • General Description on the FC3 & NC Instrumentation and Control Systems • Severe Accident I&C System (KDA [SA I&C]) • General Description on Diversity Actuation System | Plant Systems |
| 9 | Electric Power | <ul style="list-style-type: none"> • Safety Principles • General Architecture of Electrical Systems • Offsite Electric Power System • Onsite Electric Power System | Plant Systems |
| 10 | Auxiliary Systems | <ul style="list-style-type: none"> • Chemical and Volume Control System (RCV [CVCS]) • Reactor Boron and Water Makeup System (REA [RBWMS]) • Coolant Storage and Treatment System (TEP [CSTS]) • Nuclear Sampling System (REN [NSS]) | Plant Systems |

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| Chapter | Title | Content Summary | Chapter Area |
|----------------|----------------------------------|---|-------------------------|
| | | <ul style="list-style-type: none"> • Fuel Handling and Storage System (PMC [FHSS]) • Fuel Pool Cooling and Treatment System (PTR [FPCTS]) • Component Cooling Water System (RRI [CCWS]) • Essential Service Water System (SEC [ESWS]) • Heating, Ventilation and Air Conditioning System(HVAC) • Fire Fighting Systems • Heavy Load Lifting System • Safety Chilled Water System (DEL [SCWS]) | |
| 11 | Steam & Power Conversion System | <ul style="list-style-type: none"> • Main Steam System (VVP [MSS]) • Steam Generator Blowdown System (APG [SGBS]) • Main Feedwater System (ARE [MFS]) • Circulating Water System (CRF [CWS]) • Turbine Bypass System (GCT [TBS]) • Condensate Polishing System (ATE [CPS]) | Plant Systems |
| 12 | Design Basis Conditions Analysis | <ul style="list-style-type: none"> • Fault Identification and Fault Grouping Methodology • Fault Schedule Methodology • DBC Analysis Methodology and Assumptions • Assessment of Representative Events | Nuclear Safety Analysis |

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| Chapter | Title | Content Summary | Chapter Area |
|----------------|--|---|-------------------------|
| 13 | Design Extension Conditions and Severe Accident analysis | <ul style="list-style-type: none"> • DEC-A Analysis Methodology • SA Analysis Methodology | Nuclear Safety Analysis |
| 14 | Probabilistic Safety Assessment | <ul style="list-style-type: none"> • PSA Methodology • PSA Results of HPR1000 (FCG3) | Nuclear Safety Analysis |
| 15 | Human Factors | <ul style="list-style-type: none"> • Human Factors Analysis Methodologies • Safety Objectives on Human Factors | Nuclear Safety Analysis |
| 16 | Civil Works & Structures | <ul style="list-style-type: none"> • Design Methodology • Design of Seismic Class I Structures • Material, Quality Control and Construction • Test and In-Service Inspection Requirements | Plant Integrity |
| 17 | Structural Integrity | <ul style="list-style-type: none"> • Structural Integrity Methodologies • Situation of FCG Unit 3 • General Description of Work Plan | Plant Integrity |
| 18 | External Hazards | <ul style="list-style-type: none"> • Identification of External Hazards • External Hazards Protection and Assessment | Plant Integrity |
| 19 | Internal Hazards | <ul style="list-style-type: none"> • Identification of Internal Hazards • Assessment Methodologies • Internal Hazards Protection and Assessment | Plant Integrity |

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| Chapter | Title | Content Summary | Chapter Area |
|----------------|---|--|--|
| 20 | MSQA & Safety Case Management | <ul style="list-style-type: none"> • MSQA Description • Safety Case Management • Principles of ALARP & BAT | Management Systems |
| 21 | Reactor Chemistry | <ul style="list-style-type: none"> • Design Principles on Reactor Chemistry • Design objectives on Reactor Chemistry | Plant Systems |
| 22 | Radiological Protection | <ul style="list-style-type: none"> • Design Principles and Methodology • Source Terms • Radiation Protection Design Features • ALARP Principles | Nuclear Safety Analysis |
| | | <ul style="list-style-type: none"> • Dose Assessment | |
| 23 | Radioactive Waste Management & Fuel Storage | <ul style="list-style-type: none"> • Outline of Radioactive Waste Management Strategy • Design Principles for Radioactive Waste Management • Identification of Radioactive Waste Streams • General Description on Radioactive Waste Treatment Systems • BAT assessment for Radioactive Waste Management • Fuel Route Operations • SFIS Operations | Industrial safety, Security and Environmental Protection |

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| Chapter | Title | Content Summary | Chapter Area |
|----------------|---------------------|---|--|
| 24 | Decommissioning | <ul style="list-style-type: none"> • Decommissioning strategy • Stages of decommissioning • Considerations facilitating decommissioning | Industrial safety, Security and Environmental Protection |
| 25 | Conventional Safety | <ul style="list-style-type: none"> • Conventional Safety Design Principle • Introduction of the HPR1000 (FCG3) Practice • Conventional Fire Protection Design Criteria | Industrial safety, Security and Environmental Protection |
| 26 | Environment | <ul style="list-style-type: none"> • Assumptions on Radiological Discharges and Limits • Approach to Radiological Sampling and Monitoring Radiological Assessment • Conventional Impact Assessment | Industrial safety, Security and Environmental Protection |
| 27 | Security | <ul style="list-style-type: none"> • Statement on security approach | Industrial safety, Security and Environmental Protection |

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1.3.2 ONR Expectations

ONR has published technical guidance covering the purpose, scope and content of safety cases, Reference [3], which includes expectations on a Preliminary Safety Case. This guidance is relevant to the PSR, which is similar in nature to a Preliminary Safety Case, and is cross-checked in T-1.3-2.

It is expected that, having presented the design and assessment information in a UK context during the process of GDA, it will be possible to demonstrate consistency with the Safety Assessment Principles (SAPs), Reference [4], on the basis that:

- The high level objectives structure has been put together reflecting the requirements of the SAPs;
- The PSR and subsequently the PCSR/PCER/GSR, will present the arguments and evidence that are necessary to support the contention that the plant design achieves the high level objectives, in a manner consistent with the SAPs, and the ONR guidance (T-1.3-2).

T-1.3-2 PSR Expectations

| No. | Preliminary Safety Report Expectations (ONR NS-TAST-GD-051 Rev4) | Expectation Addressed | Key Chapters |
|-----|--|---|-----------------|
| 1 | Statement of design philosophy, the consideration of design options and a description of the resultant conceptual design sufficient to allow identification of main nuclear safety hazards, control measures and protection systems. | <ul style="list-style-type: none"> • The HPR1000 (FCG3) design was developed in an evolutionary manner, building on good international practice, using robust design processes to optimize the safety and environmental performance. • A clearly defined set of design principles are documented and will be used for the design development during UK HPR1000 GDA. | 2 4 |
| 2 | Description of the process being adopted to demonstrate compliance with the legal duty to reduce risks to workers and the public So far as is reasonably practicable(SFAIRP). | The design and intended construction and operation of the UK HPR1000 will ensure that during normal operation (at power, shutdown, refuelling and maintenance) and under fault and accident conditions, the radiation dose to people is reduced as low as is reasonably practicable (ALARP). | 22 |
| 3 | Details of the safety principles and criteria that have been applied by the licensee (or Requesting Party) in its own assessment processes, including risks to workers and the public. | A clearly defined set of safety principles are documented and will be used for the design development. | 20, 4 |
| 4 | To broadly demonstrate that the principles and criteria are likely to be achieved. | Demonstration that the principles and criteria are likely to be met is discussed in this Chapter of the PSR. | 1 |
| 5 | To provide an overview statement of the approach, scope, criteria, and output of the deterministic safety analyses. | Design Basis Analysis (DBA), undertaken as part of the engineering design, provides a robust demonstration of the fault tolerance of the engineering design and the effectiveness of the safety measures. | 12,13 |
| 6 | To provide an overview statement of the approach, scope, criteria, and output of the probabilistic safety analyses. | Probabilistic Safety Analysis (PSA) has been, and will continue to be used to assist the designers in achieving a balanced and optimized design and for understanding the strengths and weaknesses of the design | 14 |

| No. | Preliminary Safety Report Expectations (ONR NS-TAST-GD-051 Rev4) | Expectation Addressed | Key Chapters |
|-----|--|---|--------------|
| 7 | Specify the site characteristics to be used as the basis for the safety analysis. | A key objective that will be addressed through GDA is that the site characteristics of the generic design will be clearly identified and will bound the UK sites that are considered suitable for the construction of the UK HPR1000. | 3 |
| 8 | To provide explicit references to standards and design codes used, justification of their applicability and a broad demonstration that they have been met. | The standards and codes used in the development of HPR1000 are defined in this PSR. The standards and codes used during the design development will be clearly defined in the PCSR. | 4 |
| 9 | To provide information on the quality management arrangements for the design, including design controls; control of standards; verification and validation; and the interface between design and safety. | <ul style="list-style-type: none"> • CGN had robust quality management arrangements for the design and safety case development for the HPR1000 (FCG3). • The RP has robust quality management arrangements for the development of the design changes and the safety case for the UK HPR1000. • The Designer has robust configuration management arrangements for design control. | 20 |
| 10 | Statement giving details of the safety case development process, including peer review arrangements, and how this gives assurance that the nuclear risks are identified and managed | A robust process has been documented and will be followed for the production of the safety case. | 20 |
| 11 | To provide information on the quality management system for the safety case production. | Robust quality management arrangements will be put in place during the design development and safety case development. | 20 |
| 12 | To identify and explain any novel features, including their importance to safety. | Novel features will be clearly explained in the safety case, including their importance to safety and environmental protection. An initial view of these features is presented in the PSR. | 2 |

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| No. | Preliminary Safety Report Expectations (ONR NS-TAST-GD-051 Rev4) | Expectation Addressed | Key Chapters |
|------------|---|---|---------------------|
| 13 | To identify and explain any deviations from modern international good practices. | The design and safety case are in line with relevant modern, international good practice. Exceptions to this are clearly identified. | 2, 4,8, 14,17 |
| 14 | To provide sufficient detail for ONR to satisfy itself that SAPs and WENRA reference levels are likely to be satisfied. | The design, and intended construction and operation, of the UK HPR1000 ensure that the fundamental safety functions are delivered for all permitted operating modes. | 1 |
| 15 | To provide, where appropriate, information about all the assessments completed by other (including overseas) nuclear safety regulators. | The HPR1000 (FCG3) design has been reviewed and approved by the regulators in China. | 20 |
| 16 | To identify outstanding information that remains to be developed and its significance. | Consistent with this stage of the GDA process, there is a large volume of work to be undertaken in the development of a comprehensive final submission. Individual chapters will highlight the process of identifying and addressing the areas of work required in each topic area. | All |
| 17 | To provide any information about any long-lead items that may need to be manufactured. | The long-lead items will not be procured during GDA phase, so no safety case will be developed on this point | None |

| No. | Preliminary Safety Report Expectations (ONR NS-TAST-GD-051 Rev4) | Expectation Addressed | Key Chapters |
|-----|---|---|--|
| 18 | To provide information on radioactive waste management and decommissioning. | <ul style="list-style-type: none"> • The design, and intended operation of the UK HPR1000 will be developed to minimize the creation of radioactive waste, and the best available techniques are justified for managing the handling, storage and disposal of radioactive waste, and to minimize the associated impact on people and the environment. • The UK HPR1000 will be developed to manage spent nuclear fuel to reduce risks to people so far as is reasonably practicable and to minimize the impact on the environment. • The UK HPR1000 will be developed so that it can be safely decommissioned using current methods, with decommissioning intended to be carried out after final shutdown. | <p>6, 21, 22, 23, 26</p> <p>23, 26</p> <p>24</p> |

1.3.3 EA Expectations

EA has outlined their expectations in Reference [4]. Compliance with these expectations, for the initial assessment is provided as follows:

- The management arrangements are presented in Chapter 20;
- The impact of proposed discharges is discussed in Chapter 26.

The starting point for the EA's initial assessment is the information provided by the requesting party. The key items to be addressed in the submission at this stage are shown in T-1.3-3.

T-1.3-3 Items to be addressed to support the EA's Initial Assessment

| Item to be addressed during Initial Assessment (i.e. Step 2) | PSR Chapter(s) where addressed |
|---|-------------------------------------|
| Plant and process descriptions. | 2 |
| The management arrangements for the development of the design and production of the submission (detailed case required). | 20 |
| How best available techniques will be used throughout the lifecycle of the plant (design, construction, commissioning, operation and decommissioning) to minimise the arising and impact of radioactive wastes. | 20, 23, 26 |
| The quantities and types of radiological waste (gaseous, liquid and solid) and spent fuel that are likely to arise, and the disposability of any solid radioactive waste arising. | 23 (solid) 26 (liquid & gaseous) |
| The likely impact on people and the environment of any proposed discharges of gaseous and liquid radioactive wastes (detailed case required). | 26 |
| The environmental impact of "conventional" aspects of the design. | 26 |

1.4 QA Process for PSR Production

The PSR has been developed within a rigorous Quality Assurance (QA) regime by CGN, EDF and GNS. The process is as follows:

- CGN Authoring of the PSR
- GNS Gatekeeper review of PSR
- EDF Review of the PSR
- Management of comments
- Plan for resolution of comments including independent review
- Final acceptance of the PSR by GNS
- Regulatory Review
- Post Regulatory Review PSR Update (if necessary)

| | | | |
|---------------------------|---|---|---------------|
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The detailed QA programme for the development of the PSR is outlined in Reference [5].

1.5 Conclusions

The PSR has been written to outline the HPR1000 (FCG3) design to the regulator, to give them confidence that the UK HPR1000 could meet UK requirements. The PSR is the initial safety case and outlines the Fundamental Objective for the UK HPR1000 design:

The Generic UK HPR1000 could be constructed, operated, and decommissioned in the UK on a site bounded by the generic site envelope in a way that is safe, secure and that protects people and the environment.

Further to this, the PSR was developed under a robust QA regime and has been benchmarked against the UK regulatory requirements to ensure completeness.

As such the PSR provides a good basis for regulatory assessment in GDA step 2.

1.6 Reference

- [1] ONR, New nuclear reactors: Generic Design Assessment Guidance to Requesting Parties, ONR-GDA-GD-001, Revision 3, September 2016.
- [2] EA, Process and Information Document for Generic Assessment of Candidate Nuclear Power Plant Designs, Revision 3, October 2016.
- [3] ONR, The Purpose, Scope and Content of Safety Cases, NS-TAST-GD-051, Revision 4, July 2016.
- [4] ONR, Safety Assessment Principles for Nuclear Facilities, Revision 0, 2014.
- [5] GNS, Preliminary Safety Report Guidance Note, Revision 0, October 2016.