Safety Case Development Plan – Wylfa Newydd Power Station
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1 Introduction

1.1 About this Plan

1. This Safety Case Development Plan (SCDP) presents a high level plan for the development of the site-specific Safety Case for the Wylfa Newydd Power Station, which is planned to include two United Kingdom Advanced Boiling Water Reactor (UK ABWR) units.

2. Wylfa Newydd Power Station (the Power Station) is a term used to refer to the proposed new nuclear power station to be built at the Wylfa Newydd site, and comprises two UK ABWRs, and the related structures, systems and components, including off-site facilities identified within the Safety Case.

3. Horizon Nuclear Power Wylfa Limited (Horizon) is applying for a Nuclear Site Licence (NSL) to install and operate the Power Station on Anglesey in North Wales. This SCDP forms part of the Site Licence Application (SLA) package and is required by the Horizon Safety Case Strategy. This SCDP meets the requirements of the Office for Nuclear Regulation (ONR) guidance on Licensing Nuclear Installations [RD1] and presents an indicative plan for the development of the site Safety Case.

4. The applicant for the SLA is Horizon. The Requesting Party (RP) for the Generic Design Assessment (GDA) is Hitachi-GE Nuclear Energy, Ltd., (Hitachi-GE).

5. GDA is a process jointly used by the ONR, the Environment Agency (EA) and Natural Resources Wales (NRW) to ensure that any new nuclear power stations built in the UK meet high standards of safety, security, environmental protection and waste management.

6. The GDA process has four steps, with the assessments becoming increasingly detailed. On successful completion of the GDA process, the ONR will issue a Design Acceptance Confirmation (DAC) approving the generic reactor design from a safety and security perspective. Additionally, the Environment Agency will grant a Statement of Design Acceptability (SoDA) to confirm the acceptability of the reactor design from an environmental perspective.

7. This SCDP presents a plan to move from the GDA Pre-Construction Safety Report (PCSR) (GDA-PCSR) to the site-specific PCSR and additional safety submissions for future stages of the Wylfa Newydd project. Further Safety Case submissions are required for regulatory permission for further activities such as commissioning and operations for the site, and this is presented within this plan.

1.2 Purpose and Scope

8. The purpose of this SCDP is to communicate the planned production and delivery of fit-for-purpose Safety Case documentation, safety submissions and Safety Reports, to support every key stage of the project up to and including the Generation Phase of both units under a single Station Safety Report (SSR). The submission of Safety Reports at defined stages (e.g. Hold Points) for regulatory permissioning of activities will allow the project to progress through the stages from construction to generation.

9. More specifically, this SCDP will:
   • identify all key Safety Reports required to support the site as currently envisaged for the purposes of construction, commissioning and operation, with appropriate consideration of the logic and plan for their production;
• seek to address the particular requirements for procurement of Long Lead Items (LLI) in advance of DAC and SoDA;
• provide visibility of the activities required to support the timely development of the site Safety Case documentation to key stakeholders;
• be part of the evidence provided to demonstrate, in the SLA, Horizon’s suitability as a prospective Licensee;
• identify the key activities and milestones linked to the development of Safety Cases in support of the site; and
• present a high level, indicative plan that is not to scale, as shown in Appendix A, Figures A.1, A.2 and A.3, and provide a narrative (Sections 2 and 4) to support the Figures and to describe the key transitions and future work.

### 1.3 Table of Abbreviations and Acronyms

<table>
<thead>
<tr>
<th>Term or Abbreviation</th>
<th>Definition</th>
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<tbody>
<tr>
<td>ALARP</td>
<td>As Low As Reasonably Practicable</td>
</tr>
<tr>
<td>BAT</td>
<td>Best Available Techniques</td>
</tr>
<tr>
<td>COD</td>
<td>Commercial Operation Date</td>
</tr>
<tr>
<td>COD1</td>
<td>Commercial Operation Date for unit 1</td>
</tr>
<tr>
<td>COD2</td>
<td>Commercial Operation Date for unit 2</td>
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<tr>
<td>DA</td>
<td>Design Authority</td>
</tr>
<tr>
<td>DAC</td>
<td>Design Acceptance Confirmation</td>
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<tr>
<td>DRP</td>
<td>Design Reference Point</td>
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<tr>
<td>EA</td>
<td>Environment Agency</td>
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<tr>
<td>FNC</td>
<td>First Nuclear Concrete</td>
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<tr>
<td>FNC1</td>
<td>First Nuclear Concrete for unit 1</td>
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<tr>
<td>FNC2</td>
<td>First Nuclear Concrete for unit 2</td>
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<tr>
<td>GDA</td>
<td>Generic Design Assessment</td>
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<tr>
<td>GDA-PCSR</td>
<td>Generic Design Assessment Pre-Construction Safety Report</td>
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<tr>
<td>Hitachi-GE</td>
<td>Hitachi-GE Nuclear Energy, Ltd.</td>
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<td>HMS</td>
<td>Horizon Management System</td>
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<tr>
<td>IAEA</td>
<td>International Atomic Energy Agency</td>
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<td>IDR</td>
<td>Independent Document Review</td>
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<td>JSCO</td>
<td>Joint Safety Case Office</td>
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<tr>
<td>LLI</td>
<td>Long Lead Item</td>
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<td>LLISP</td>
<td>Long Lead Item Safety Pack</td>
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<tr>
<td>MDL</td>
<td>Master Document List</td>
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<tr>
<td>NORA</td>
<td>Nuclear Oversight and Regulatory Affairs</td>
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<tr>
<td>NPS</td>
<td>National Policy Statement</td>
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<tr>
<td>Term or Abbreviation</td>
<td>Definition</td>
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<tr>
<td>NRW</td>
<td>Natural Resources Wales</td>
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<td>NSC</td>
<td>Nuclear Safety Committee</td>
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<td>NSL</td>
<td>Nuclear Site Licence</td>
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<tr>
<td>NSSEPs</td>
<td>Nuclear, Safety, Security and Environmental Principles</td>
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<tr>
<td>ONR</td>
<td>Office for Nuclear Regulation</td>
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<td>OPEX</td>
<td>Operational Experience</td>
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<td>PCmSR</td>
<td>Pre-Commissioning Safety Report</td>
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<td>PCSR</td>
<td>Pre-Construction Safety Report</td>
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<td>POSR</td>
<td>Pre-Operational Safety Report</td>
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<tr>
<td>Pre-NSC</td>
<td>Preliminary Nuclear Safety Committee</td>
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<tr>
<td>RP</td>
<td>Requesting Party</td>
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<td>RPV</td>
<td>Reactor Pressure Vessel</td>
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<td>SCDP</td>
<td>Safety Case Development Plan</td>
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<td>SCSR</td>
<td>Safety Case Status Report</td>
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<td>SLA</td>
<td>Site Licence Application</td>
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<td>SLG</td>
<td>Site Licence Grant</td>
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<td>SoDA</td>
<td>Statement of Design Acceptability</td>
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<td>SSA</td>
<td>Strategic Siting Assessment</td>
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<tr>
<td>SSC</td>
<td>Systems, Structures and Components</td>
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<td>SSR</td>
<td>Station Safety Report</td>
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<tr>
<td>UK ABWR</td>
<td>United Kingdom Advanced Boiling Water Reactor</td>
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<tr>
<td>WENRA</td>
<td>Western European Nuclear Regulators Association</td>
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<tr>
<td>WN-PCSR</td>
<td>Wylfa Newydd Pre-Construction Safety Report</td>
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<tr>
<td>WN-PCmSR</td>
<td>Wylfa Newydd Pre-Commissioning Safety Report</td>
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<td>WN-POSR</td>
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<tr>
<td>WN-PSR</td>
<td>Wylfa Newydd Preliminary Safety Report</td>
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<tr>
<td>WN-SJR</td>
<td>Wylfa Newydd Site Justification Report</td>
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<tr>
<td>WN-SSR</td>
<td>Wylfa Newydd Station Safety Report</td>
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See the Glossary for full definitions of the above terms [RD2]. The Glossary also contains the definitions of additional technical terms that are presented as capitalised words within this document.
2 Assumptions for SCDP production

10. This SCDP provides an indicative plan and timeline, providing the timings and summary content of each of the Safety Case reports necessary to underwrite the activities to design, procure materials, manufacture, construct, install, commission, and operate two UK ABWRs at the site.

11. This SCDP refers to Hold Points and regulatory permissions. Hold Points are internal to Horizon and are used to enable control of the project. Hold Points are points in the schedule where activities are prohibited from proceeding beyond, until assurance has been achieved in demonstrating that the business is ready to do so. Hold Points are then released by an authorised person. The term regulatory permission is used to identify where Horizon will seek regulatory permission to proceed (subject to agreement), prior to specified activities being carried out. Horizon are expected to be required to issue a safety submission to the regulators prior to regulatory permission being granted for defined activities.

12. This SCDP has interfaces with a number of other Horizon departments, e.g. security for the site security arrangements, and permitting for major permissions. These interfaces will be managed outside this SCDP. The assessment and plan for demonstrating use of Best Available Techniques (BAT) is presented in the BAT strategy.

13. The Safety Case structure will be enduring. That is to say that although certain sections may be superseded and held as records as the lifecycle phases are completed (e.g. the construction chapter), those chapters which will be required in future lifecycle phases, (e.g. Generation and Decommissioning) should be prepared as far as practicable, even at this early stage.
3 Safety Case Production – Arrangements

14. This section identifies a number of activities, processes, arrangements and steps that are significant to the production of a fit-for-purpose site Safety Case.

3.1 Horizon Management System

15. Horizon controls the activities of the company through the implementation of the management arrangements as contained within its integrated Horizon Management System (HMS). The HMS is developed to support the policy framework and contains the processes, procedures and controls that Horizon requires to carry out its operations safely and efficiently.

16. The HMS provides the hierarchical framework of Horizon’s policies, systems, processes, procedures, interfaces and forms used to control and deliver all activities for the appropriate lifecycle phase. It forms a key part of Horizon’s overall governance structures and capability by which the organisation is able to achieve its objectives with regard to its legal obligations for nuclear and radiological safety, environmental protection, security and safeguards in all lifecycle phases.

17. Further information regarding the HMS is presented in the Management Prospectus [RD3].

3.2 Nuclear, Safety, Security and Environmental Principles


19. An assessment against the nuclear safety sections of the NSSEPs will be described in the Wylfa Newydd Pre-Construction Safety Report (WN-PCSR) for the site, and then updated for subsequent Safety Case reports.

3.3 GDA-PCSR Development

20. Hitachi-GE is the Requesting Party for the UK ABWR and is progressing the design of the UK ABWR (single unit at a generic site) through the GDA process with the ONR, EA and NRW. The end of this process will be a DAC and SoDA issued by the ONR, and EA and NRW respectively for the GDA reference design. The high level plan for the GDA reference design is:

- GDA-PCSR Step 1 – complete;
- GDA-PCSR Step 2 – complete;
- GDA-PCSR Step 3 – complete; and
- GDA-PCSR Step 4 – planned completion by the end of 2017 with formal DAC and SoDA issued.

21. The GDA will only be considered complete with the issue of the DAC and SoDA, which will be conditional upon the satisfactory assessment of the Step 4 GDA-PCSR and the closure of any GDA issues raised by ONR, EA and NRW.
22. Where material is extracted from the GDA and used in the same context in the site-specific Safety Case, it is assumed that no further regulatory assessment is required. The Safety Case report will clearly denote GDA and site-specific data to optimise ONR assessment.

23. Work on the site-specific elements and chapters of the Safety Case will be in parallel with the development of the GDA-PCSR.

3.4 Joint Safety Case Office

24. The Joint Safety Case Office (JSCO) is a joint collaboration between Horizon and Hitachi-GE. The JSCO has the following immediate objectives:
   - to deliver a fit-for-purpose GDA-PCSR, (i.e. a clear DAC and SoDA); and
   - to deliver a WN-PCSR that enables regulatory permission for First Nuclear Concrete (FNC) to be obtained.

25. The JSCO, through joint working, will assist in the long term achievement of the JSCO objectives and facilitate knowledge transfer between Horizon and Hitachi-GE as the Requesting Party. It is intended that the JSCO will improve confidence in the GDA process and Horizon Safety Case production.

26. The JSCO led the production of WN-PCSR individual chapter specifications to establish the extent of GDA scope, and where this will be supplemented with additional site-specific data to assist in the production of the site specific elements required in the WN-PCSR. This process required a collaborative approach between Horizon and Hitachi-GE to understand the scope of GDA, the documentation expected and further work required to underpin the WN-PCSR. The Horizon representatives covered a range of disciplines and departments, and included Nuclear Oversight and Regulatory Affairs (NORA).

27. Toward the end of GDA the JSCO arrangements may be reviewed to ensure the suitability for the production of the WN-PCSR and beyond (preserving good practices and collaborative working).

3.5 Hold Points and Regulatory Permissions

28. Horizon have defined Hold Points for the Power Station. There are a number of Hold Points, some of which will be informed by the submission of site Safety Reports to support key activities, e.g. WN-PCSR submission for FNC.

29. A number of the Horizon defined Hold Points align with expected regulatory permissions. The following regulatory permissions are a sub set of the Horizon Hold Points and are currently assumed to be (for each unit on the Wylfa Newydd site):
   - FNC;
   - start of Pre Operational Testing;
   - first nuclear fuel on site;
   - start of Start Up Testing;
   - nuclear fuel load;
   - first criticality;
   - Commercial Operation Date (COD); and
   - commencement of Normal Operation.

30. The clearance of Hold Points and/or grant of regulatory permissions and the approval for work to proceed may require additional safety submissions to support the site Safety Case. This will be considered on a case by case basis.
3.6 Design Reference Points

31. A Design Reference Point (DRP) is used to provide a fixed reference point, to establish a baseline design and position from which changes can be controlled and managed. Design Reference Points are applicable to the GDA and site-specific Safety Case development.

32. A GDA DRP was established at the end of GDA step 3 (DRP GDA step 3). Further changes to the design during GDA Step 4 are controlled via a design change process within Hitachi-GE.

33. The site-specific Safety Case information, supporting documents and WN-PCSR chapters will be produced in parallel with GDA step 4. There is a site-specific DRP planned for 2018 (site-specific DRP) which will encompass the GDA design at that point. The DRP will be used for the purposes of developing the WN-PCSR further, based on a fixed reference point. The site-specific DRP may require an update to incorporate potential design changes resulting from the resolution of assessment findings provided with the issue of the DAC and SoDA at the end of GDA step 4.

34. The DRPs contribute to the demonstration of a safety led design. The design development within GDA and the links to the site will be closely monitored, to be taken into account along the various stages in the evolution of the site Safety Case.

3.7 Safety Case Deliverables

35. This section discusses the development of the site Safety Case and the expected Safety Case reports, summarising the wider Safety Case.

3.7.1 Safety Case Reports

36. The production of safety documentation, potential safety submissions for Hold Point release and the Safety Reports, summarising the Safety Case information is linked to the planned activities and lifecycle phases. A Safety Case strategy has been produced and will be updated as the project develops.

37. The planned site Safety Reports, summarising the site Safety Case are:

- Wylfa Newydd Preliminary Safety Report (WN-PSR) - Completed June 2015;
- WN-PCSR;
- Wylfa Newydd Pre-Commissioning Safety Report (WN-PCmSR) (which will cover both the Pre Operational and Start Up Testing activities);
- Wylfa Newydd Pre-Operational Safety Report (WN-POSR); and
- Wylfa Newydd Station Safety Report (WN-SSR).

38. A Safety Case Status Report (SCSR) will be the top level document that will reflect the site, the Safety Case development progress, Safety Reports submitted, regulatory permissions provided and those expected and planned, Hold Points cleared and expected, and the differences between the units and how these apply to site facilities.

39. The details of the structure of the Safety Case evolution for the WN-SSR and beyond will be defined in future work, as the Safety Case develops through the lifecycle phases. These Safety Case submissions and the significant interim evolutions, e.g. site justification and LLIs, are discussed in detail in Sections 3.8 onwards.

3.7.2 Wylfa Newydd Power Station Safety Case Production

40. The site will include two UK ABWRs and common facilities e.g. the spent fuel store. The Safety Case structure will recognise two UK ABWRs at different stages in the lifecycle.
process, e.g. unit 1 leading unit 2. A Safety Case reflecting the site will be produced, and a Safety Report will be submitted to the ONR covering the site, seeking permission for specific work (e.g. WN-PCSR seeking permission for unit 1 and site activities, reflecting the site status at that point in time, with a later update or refresh to reflect the site prior to seeking permission for unit 2 specific work).

41. Figure 3.1 presents a high level overview of how Horizon expects the site Safety Case will be developed at this early stage in the project. Figure 3.1 presents detail of which safety submission (report) the site will operate under and an indication of at which future Hold Point or regulatory permission an update or new submission will be provided.

![Figure 3.1 Safety Case production](image)

42. The following figure identifies the expected inputs into the SCSR during on-site activities following regulatory permission for First Nuclear Concrete for unit 1 (FNC1), requested with the submission of the WN-PCSR. The SCSR will then monitor the Safety Case documentation following Safety Report submission, and the documentation and records produced following submission will be incorporated into the next update to the site Safety Report.
43. It is expected that:
   - the SCSR will be a short report that will provide a guide to the live status of the Safety Case at a particular point in time, e.g. which modifications are applicable, and to which unit. The SCSR will also provide a link between safety documentation, regulatory permissions provided and those expected and planned, Hold Points cleared and expected and differences between site facilities that may not apply across the site, e.g. modifications to one unit only;
   - the site Safety Report issued to support regulatory permissions for activities will reflect developments during on-site activities;
   - any progress or developments to the Safety Case will be managed through the relevant arrangements, e.g. Modifications; and
   - each revision of a Safety Report will be based on the previous iteration.

44. The logic for the approach presented in this Section and Figure 3.1 and Figure 3.2 was agreed during an optioneering process.

### 3.8 Wylfa Newydd Preliminary Safety Report

45. A WN-PSR has been produced and the WN-PSR:
   - achieved the purposes set out in Table 1 of ONR NS-TAST-GD-051 [RD5] for a Preliminary Safety Report;
   - identified design and Safety Case issues that will need to be addressed in the WN-PCSR;
• was applicable to two UK ABWRs on the site;
• referenced the available GDA safety documentation and site-specific information (external hazards data for the GDA site envelope and characterisation of the Wylfa site);
• was produced, verified, Approved for Use and is owned by Horizon (as part of knowledge transfer, working towards the development and demonstration of its ownership of the design and Safety Case); and
• exercised HMS and the relevant Safety Case management processes.

46. The WN-PSR (Revision A) has received formal concurrence from Independent Document Review (IDR) and was presented to the Preliminary Nuclear Safety Committee (Pre-NSC) on 20 May 2015. The GDA process and UK ABWR design has moved on significantly since this PSR was approved and as such, it is now used as a historical record.

3.9 Long Lead Items (LLIs)

47. In order to meet the planned construction schedule the procurement process for certain safety significant plant items (e.g. the Reactor Pressure Vessel (RPV)) must begin in advance of the issue of the DAC, SoDA and the WN-PCSR. Horizon has developed arrangements to support the procurement of Long Lead Items (LLIs).

48. Reports to support procurement of LLIs are termed Long Lead Item Safety Packs (LLISPs). These LLISPs will be valid for the period leading up to the formal issue of the WN-PCSR.

49. The purpose of the LLISPs is:

• to provide confidence in the design and procurement of the LLI, so that a case can be made for the component in the Safety Case and associated Safety Report(s); and
• to form the basis of a safety justification to procure key components.

3.10 Site Justification Report

3.10.1 Background

50. To support the granting of a NSL it is necessary to provide justification on the adequacy of the site to support two UK ABWRs. This justification and supporting information is to be presented in the Wylfa Newydd Site Justification Report (WN-SJR), planned for mid-2017. The WN-SJR will be an extension of the information presented within Chapter 3 (site characterisation and justification) of the WN-PSR, and will be updated to reflect the work completed to characterise the site. The WN-SJR will also consider the GDA generic site envelope data and assess where additional site specific data is required, and consider any cases where the GDA does not bound the Wylfa Newydd site.

51. The WN-PSR provides background and reference to the UK Government’s National Policy Statement (NPS) in relation to new nuclear build projects [RD6]. The NPS identifies sites within section 4, based on the UK Government’s Strategic Siting Assessment (SSA):

"that the Government has determined are potentially suitable for the deployment of new nuclear power stations in England and Wales before the end of 2025",

52. The definition of potentially suitable sites for deployment of new nuclear power stations in England and Wales within the NPS includes Wylfa on Anglesey.

53. The WN-PSR described the work that has been completed, and continues in order to characterise the site, with a view to defining the relevant external hazards criteria.
54. The WN-PSR and WN-SJR recognise that the site is well characterised from an external hazards and environmental characterisation perspective, due to the existing Magnox plant and the presence of the Royal Air Force (base) Valley near to the site, providing valuable evidence. A number of site characteristics have been identified and further work is planned for site characterisation, including comparisons with the surrounding areas for relevant data and trending.

3.10.2 Scope and Content

55. In applying for a NSL, it is incumbent upon the applicant to demonstrate that the site is suitable for the proposed development in terms of the engineering and infrastructure requirements of the facilities. The WN-SJR document that is in production sets out the approach to justifying the site, however the ‘main aspects to be considered’ are defined in [RD1] as:

- the location and characteristics of the population around the site, and the physical factors affecting the dispersion of released radioactivity that might have implications for the radiological risk to people;
- external hazards that might preclude the use of the site for its intended purpose; and
- the suitability of the site for the engineering and infrastructure requirements of the facility.

56. At the current stage of the project, Horizon is confident that the information required to produce the WN-SJR will be available as required. The WN-SJR will form part of the evidence required to support the granting of the Nuclear Site Licence.

3.11 Wylfa Newydd Pre-Construction Safety Report

57. The WN-PCSR will, as a minimum:

- achieve the purposes set out in Table 1 of ONR NS-TAST-GD-051 [RD5] for a Pre-Construction Safety Report (Case);
- be based on the GDA-PCSR, with clearly identified site-specific information, and possible evolution from the GDA;
- record the management and closure of the assessment findings emanating from the GDA (applicable to the WN-PCSR). It is assumed that the closure of any GDA assessment findings for FNC1 will take approximately twelve months;
- recognise any modifications or concessions raised;
- recognise the development of the design and the increased level of detail;
- be applicable to the site;
- combine the GDA-PCSR post-DAC with the site-specific information developed in parallel; and
- demonstrate overall site risk has been reduced to comply with the As Low As Reasonably Practicable (ALARP) principle.

58. A WN-PCSR specification will provide the outline structure and content of the WN-PCSR and will be complemented with dedicated chapter specifications and a Master Document List to identify the underpinning evidence.

59. For unit 1, a minimum period of twelve months (three months of IDR review and nine months of regulatory assessment) is planned between the submission of the WN-PCSR and regulatory permission for FNC1. A reduced period has been assumed for unit 2. Early regulatory engagement will be undertaken to allow for the most efficient assessment and avoid duplicated work. Clear identification of unit 2 specific data in the
updated WN-PCSR for unit 2, and the use of the SCSR is expected to minimise the potential for regulatory re-assessment following FNC1.

60. The key site-specific topics required to supplement the GDA-PCSR are:
   - plant outside GDA scope;
   - site characterisation and external hazard definition (with a comparison to the GDA defined generic site envelope);
   - two UK ABWRs;
   - construction safety, including issues surrounding an operating unit and a unit under construction;
   - operations;
   - commissioning;
   - spent fuel storage; and
   - demonstrate that the overall site risk has been reduced to comply with the As Low As Reasonably Practicable (ALARP) principle.

61. The WN-PCSR will cover construction activities, including the Construction Testing. The wider system based commissioning will be covered in the WN-PCmSR.

### 3.12 Wylfa Newydd Pre-Commissioning Safety Report

62. A WN-PCmSR will be produced for the site and will cover Pre Operational and Start Up Testing (which is equivalent to inactive and active commissioning respectively). During Pre Operational Testing, a series of commissioning reports will be produced to take account of the results of inactive commissioning and support the application for regulator permission to progress to Start Up Testing.

63. Early engagement with IDR and the ONR is essential to achieve the timescales in Appendix A, Figures A.1 to A.3.

64. The WN-PCmSR will, as a minimum:
   - achieve the purposes set out in Table 1 of ONR NS-TAST-GD-051 [RD5] for a Pre-Commissioning Safety Report (Case);
   - be based on the WN-PCSR;
   - record the management and closure of the assessment findings emanating from the GDA (applicable to WN-PCmSR); and
   - recognise any modifications or concessions raised.

65. The key commissioning topics required to develop the WN-PCSR into the WN-PCmSR are:
   - demonstrate the suitability of the as-built facility; and
   - information to enable the production of the commissioning schedules and activities.

66. Commissioning Reports will be produced for the site to report the output of Pre Operational Testing and Start-Up Testing activities.

67. The commissioning report(s) will include, but not be limited to:
   - outcome of the Pre Operational tests and on-going fitness for purpose of the inactively commissioned facility; and
• demonstration that the active commissioning and defined activities (e.g. first nuclear fuel on site and first criticality) can be carried out safely, with the commissioning schedule and procedures defined.

68. It is assumed that unit 1 of the two unit site will enter a period of Commissioned Operational Service under the Wylfa Newydd Pre-Commissioning Safety Report (WN-PCmSR). The completion of the warranty run as part of the commissioning tests, and with the plant running at power, signifies the start of commercial operations, i.e. COD, which is further defined as Commercial Operation Date (unit 1) (COD1).

3.13 Wylfa Newydd Pre-Operational Safety Report

69. The WN-POSR will, as a minimum:

• achieve the purposes set out in Table 1 of ONR NS-TAST-GD-051 [RD5] for a Pre-Operational Safety Report (Safety Case); and

• demonstrate that there are no aspects of safety that remain to be demonstrated after active commissioning.

70. The WN-POSR will include the results of all commissioning tests, including Start Up Testing, prior to start of the Generation Phase (which is equivalent to the most developed unit commencing Normal Operation). The WN-POSR will seek regulatory permission for unit 1 Normal Operation, and will then be updated/refreshed to seek regulatory permission to start unit 2 Normal Operation.

3.14 Safety Case Status Report

71. The SCSR will, as the Safety Case and Safety Reports do, apply to the site. The SCSR will be a short report that will be regularly updated to identify the site Safety Case documentation that has been produced, where it applies, any anomalies or differences between the units, and the forward plan for release of Hold Points and expected regulatory permissions (including status of previous submissions).
4 Deliverable Plan

Section 3 outlined the Safety Case documents and reports required to support the planned activities. This section addresses when such deliverables must be produced, and outlines the current dependencies. A diagram for the Safety Case development is provided in Appendix A, Figures A.1 to A.3. These figures are based on the assumptions defined and the available information.

4.1 Safety Case Production Overview

The overview summarised below (and presented in Appendix A) is focussed on the production of the Safety Case documentation for the site.

Appendix A shows the significant project milestones and indicates those items which are Safety Case deliverables (reports) i.e. Horizon’s responsibility. The following points are considered significant:

I. The WN-PSR has been issued and represents Horizon’s first site-specific Safety Case, it was based on the GDA-PCSR (Revision A) for the UK ABWR. The WN-PSR was used primarily to identify issues to be subsequently addressed in the WN-PCSR, test Horizon’s management and committee arrangements, production and review processes, and resources to prepare the WN-PCSR.

II. Safety justifications for LLI procurement started in 2015 and it is assumed they will continue until WN-PCSR submission for IDR.

III. It is envisaged that the majority of the WN-PCSR will consist of GDA material augmented by site-specific information.

IV. The production of the SLA package documentation started in 2015 to support a SLA submission date in 2017 and anticipated granting of the Site Licence in 2018.

V. The submission of a WN-SJR is a step towards the development of the WN-PCSR (Chapter 3) and will also support the meeting of defined requirements for the granting of a NSL. This site justification document will be produced in line with the timings stated above (anticipated submission date mid 2017).

VI. The WN-PCSR Specification has been issued to the Horizon Pre-NSC in November 2015 and subsequently approved.

VII. Following the publication of the WN-PCSR Specification, the development of the WN-PCSR will continue in 2017 and beyond. Dedicated chapter specifications have been developed to detail the objectives and inputs of each chapter, related supporting documents and cross-cutting issues. The development of the WN-PCSR was initially based upon the Step 3 GDA-PCSR structure and will be revised, if necessary, once Step 4 of the GDA-PCSR is complete.

VIII. In support of regulator permissions to support the project the relevant GDA assessment findings will be addressed and included in the supporting Safety Case and summary Safety Report. The first GDA assessment findings resolution work will be integrated into the WN-PCSR in support of FNC1. Further Assessment Findings will be addressed in future stages where they apply.

IX. Prior to issue of the WN-PCSR for FNC1, the DRP will be updated to identify a post-GDA DRP to take account of the potential design changes identified from assessment findings resolution and WN-PCSR production.

X. Once the application is made for regulatory permission for FNC1, the WN-PCSR submission as supporting evidence for regulatory assessment will be effectively frozen. Further information relevant to the site and the units that arise will be tracked
using the Safety Case Status Report and included in the update or refresh to the WN-PCSR to support First Nuclear Concrete for unit 2 (FNC2), and this information will be controlled. It is expected that differences specific to unit 2 will be limited. The unit 2 specific items are expected to be restricted to Operational Experience (OPEX), and reflection of differing plant statuses between unit 1 and unit 2.

XI. It is currently assumed that unit 2 activities after FNC 1 will lag behind the equivalent unit 1 activities by between 6 and 16 months depending on the stage of the project.

XII. The Safety Case Status Report will be available following the submission of the WN-PCSR to the regulators. The SCSR will be regularly updated throughout the construction and commissioning stages as required to reflect any developments at the site prior to the next Hold Point and/or regulatory permissions.

XIII. The WN-PCSR update to support FNC2 will be developed in parallel with the production of the WN-PCmSR. Similarly, it is expected that the update/refresh of the site Safety Reports to support regulatory permissions related to unit 2 activities will be relatively limited. It is anticipated that early engagement with the regulators could allow for efficient assessment of the unit 2 update to the Safety Report.

XIV. The assessment duration for safety submissions after the WN-PCSR are yet to be defined, but are assumed to be less than nine months.

XV. Where IDR and ONR assessment is not explicitly defined as a specific activity within the Safety Case plan in Appendix A, Figures A.1 to A.3, the IDR and ONR assessment is an activity within the larger Safety Case production activity.

XVI. It is assumed that IDR and ONR assessment of the updated or refreshed unit 2 Safety Reports will be for unit 2 data only, or the difference between units, when compared to the Safety Report submitted for release of unit 1 regulatory permission.

XVII. Hold Points for Pre Operational and Start Up Testing commissioning activities exist and a single regulatory permission is assumed, on the basis of the WN-PCmSR submission. Further safety submissions to release additional Horizon Hold Points may be required to support the commissioning activities.

XVIII. The results of Pre Operational Testing, when available, will be presented within Commissioning Reports to seek further regulatory permission for Start Up Testing.

XIX. Following the completion of the Start Up Testing commissioning activities the unit will enter a period of Commissioned Operational Service at power, supplying to the grid.

XX. A WN-POSR to permission a period of Normal Operation of the first unit is anticipated in the second half of the 2020s.

XXI. The WN-POSR will be updated to permission a period of Normal Operation for unit 2.

XXII. The WN-POSR will cover a period of Normal Operation, including the activities associated with the first outage for refuelling activities, and return to Normal Operation. This will allow for lessons learned associated with an outage to be incorporated. Further safety submissions to release additional Horizon Hold Points are expected to support the return to Normal Operation.

XXIII. The need for periodic review and assessment of the Safety Case is recognised. This SCDP presents how this expectation is met prior to submission of a site Safety Report (Station Safety Report (SSR)) to support Normal Operation for two units on the Wylfa Newydd site. It is expected that once the WN-SSR is issued the 10 year maximum period for periodic review will start.
5 Conclusions

75. This SCDP, as required by the Horizon Safety Case Strategy provides the plan for delivery of fit-for-purpose Safety Case documentation to support every key stage of the Power Station development.

76. This SCDP also meets the requirement for early licensing identified in [RD1], to define the development of the Safety Reports (specifically the WN-PCS) for the site. The planned WN-SJR will provide additional information to support the characterisation of the site in support of Site Licence Grant.
### 6 Schedule of References

#### Table 6.1 Schedule of references

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<tr>
<th>Ref. No.</th>
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<th>Title</th>
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<td>[RD2]</td>
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<td>Nuclear Site Licence Application – Glossary</td>
<td>Rev 1.0 March 2017</td>
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<td>[RD3]</td>
<td>WN01.10.01-S3-DA-PLN-00001</td>
<td>Management Prospectus</td>
<td>Rev 2.0 March 2017</td>
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Figure A.2 Safety Case Development Plan – Detail view to FNC1

Development Lifecycle Phase


GDA
- DRP GDA step 3
- DAC, SoDA, AF

LLIs and LLISP production phase
- SLA
- SJR
- SLG
- Assessment Finding resolution
- Site specific DRP
- U1 PCSR
- FNC1

U1 PCSR
- U1 PCSR spec
- ONR Ast
- Reg permission And SCSR

WN-PCSR
- Early Engagement
Figure A.3 Safety Case Development Plan – Plan beyond FNC1

Main Construction

Commissioning and Operation of Unit 1

Commissioning and Operation of Unit 2

WN-PCnSR

Early Engagement

WN-P2OSR

Early Engagement

WN-POS

Early Engagement

WN-SSR

Early Engagement

Normal Operation

Restart after first outage

Dashed line denotes issue of the Station Safety Report (SSR) and end of use of the POSR.

Formal report, package, letter
- Master Document List
- Site Licence Application
- Site Justification Report
- Site Licence Granting
- Regulatory Permission
- Safety Case Status Report (SSSR) update

Hold Point/regulatory permission (unit number)
- First Nuclear Concrete (FNC)
- Beginning of Pre-Operational Testing
- Beginning of Start Up Testing
- Commercial Operation Date (COD)