Nuclear Site Licence Application – Overview Document
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## Contents

1 Introduction .................................................................................................................. 1  
1.1 Ownership of Horizon ............................................................................................ 1  
1.2 Purpose of this Overview Document ....................................................................... 1  
1.2.1 The Proposed Nuclear Licensed Site ................................................................ 1  
1.2.2 Safety .................................................................................................................. 2  
1.2.3 Other Information ............................................................................................... 2  

2 Table of Abbreviations and Acronyms .......................................................................... 3  

3 Nuclear Site Licence Application .................................................................................. 5  
3.1 What is a Nuclear Site Licence? .............................................................................. 5  
3.2 Nuclear Site Licence Application Development .................................................... 5  
3.3 Licensable Activities ............................................................................................... 6  
3.4 Application Structure ............................................................................................. 6  
3.5 Timing of the Site Licence Application .................................................................... 7  

4 Description of the Applicant .......................................................................................... 9  
4.1 Organisation Structure and Capability .................................................................. 9  
4.2 Key Relationships .................................................................................................. 10  

5 Technical Overview ...................................................................................................... 11  
5.1 Nuclear Power in the UK ..................................................................................... 11  
5.2 Boiling Water Reactors ......................................................................................... 11  
5.3 The UK Advanced Boiling Water Reactor ............................................................ 12  
5.3.1 Safety Case ....................................................................................................... 13  
5.4 Lessons Learned from Fukushima ....................................................................... 14  
5.5 Proposed Nuclear Licensed Site Layout .................................................................. 14  

6 Additional Information .................................................................................................... 17  
6.1 Location of the Proposed Nuclear Licensed Site .................................................... 17  
6.2 Ownership and Control of the Nuclear Licensed Site .......................................... 17  
6.3 Local Demographics ............................................................................................. 18  
6.4 Local Community Engagement ............................................................................ 19  
6.5 Matters Relating to the Adjacent Nuclear Licensed Site ...................................... 19  
6.6 Emergency Preparedness ...................................................................................... 19  
6.6.1 Horizon’s Emergency Arrangements ............................................................... 20  
6.6.2 Off-site Arrangements ...................................................................................... 20  
6.6.3 Existing Power Station ..................................................................................... 20  
6.7 Security ..................................................................................................................... 21  
6.8 Nuclear Safeguards ............................................................................................... 21  
6.9 Spent Fuel and Radioactive Waste ........................................................................ 22  
6.10 Decommissioning ................................................................................................. 23  
6.11 Site Justification ................................................................................................... 24  

7 Summary of the Site Licence Application Documentation ........................................... 27  
7.1 Company Manual .................................................................................................. 27  
7.2 Management Prospectus ....................................................................................... 27  
7.3 Nuclear Baseline Report ......................................................................................... 27  

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Page i of iv
7.4 Nuclear Site Licence Compliance Matrix ................................................................. 27
7.5 Safety Case Development Plan ................................................................................. 28
7.6 Nuclear Licensed Site Boundary Map ....................................................................... 28
7.7 Nuclear Safety Committee - Terms of Reference .................................................... 28
7.8 Nuclear Site Licence Application Glossary ................................................................. 28
7.9 Summary Forward Work Plan .................................................................................... 28

8 Other Permits, Authorisations and Plans ................................................................. 29
  8.1 Office for Nuclear Regulation .................................................................................... 29
  8.1.1 Nuclear Safety Submissions .................................................................................. 29
  8.1.2 Security Requirements ......................................................................................... 29
  8.1.3 Radioactive Materials Transport .......................................................................... 29
  8.2 Natural Resources Wales ........................................................................................ 30
  8.3 Department for Business, Energy and Industrial Strategy ........................................ 30
  8.3.1 Funded Decommissioning Programme ................................................................. 30
  8.3.2 Third Party Nuclear Liability Insurance ............................................................... 30
  8.3.3 Justification of Practices Involving Ionising Radiation Regulations 2004 ............... 31
  8.3.4 Development Consent Order ................................................................................. 31
  8.4 Isle of Anglesey County Council .............................................................................. 32
  8.5 Euratom Obligations ............................................................................................... 32
  8.5.1 Submission of Data under Article 37 of the Euratom Treaty .................................. 32
  8.5.2 Submission of Data under Article 41 of the Euratom Treaty .................................. 33
  8.5.3 Application of Nuclear Safeguards derived from the Euratom Treaty .................. 33

9 Conclusions .................................................................................................................. 35

10 Schedule of References ............................................................................................. 37

Appendix A Meeting the ONR's expectations for the SLA ............................................ 38

List of Tables

Table 2.1 Abbreviations and Acronyms ........................................................................... 3
Table 10.1 Schedule of References .................................................................................. 37

List of Figures

Figure 3.1 Structure of the SLA ....................................................................................... 6
Figure 3.2 SLA Document purpose and inter-relationships ............................................ 7
Figure 3.3 SLA relationship to other permission applications submitted by Horizon ....... 8
Figure 5.1 Simplified plant schematic ............................................................................... 12
Figure 5.2 Indicative site layout – main buildings ............................................................ 15
Figure 6.1 The Power Station and the Existing Power Station ......................................... 17
Figure 6.2 Location of the Nuclear Licensed Site on Anglesey ................................. 18
Figure 6.3 Horizon's waste hierarchy ......................................................................... 22
1 Introduction

1. Horizon Nuclear Power Wylfa Limited\(^{1}\) (Horizon) is applying for a Nuclear Site Licence (NSL) to install and operate the Wylfa Newydd Power Station (the Power Station) on Anglesey in North Wales.

2. The location of the proposed Nuclear Licensed Site (NLS), which encompasses the Power Station, is discussed in more detail in Section 6.1. The NLS falls within the area that was identified in the National Policy Statement for Nuclear Power Generation EN-6 (NPS EN-6) [RD1] referred to as the Wylfa National Policy Statement Site (Wylfa NPS Site). The NPS EN-6 was issued following the UK Government’s Strategic Siting Assessment, designed to identify sites in England and Wales potentially suitable for the deployment of new nuclear power stations by the end of 2025.

3. The proposed NLS is adjacent to the existing Wylfa Nuclear Power Station (referred to as the Existing Power Station) which is operated by Magnox Limited and ceased generation at the end of 2015. The scheme is a multi-billion pound investment and when operational, the generating capacity of the Power Station will be around 2700 megawatts, sufficient to provide electricity for approximately five million homes. The construction and operation of the Power Station will build on a long history of nuclear power generation in North Wales, creating significant medium and long-term employment in the area and injecting millions of pounds each year into the local economy.

4. Horizon will inform the Secretary of State for Business, Energy and Industrial Strategy that it has submitted its Site Licence Application (SLA) to the Office for Nuclear Regulation (ONR) for the installation and operation of the Power Station.

1.1 Ownership of Horizon

5. Horizon is currently a wholly-owned subsidiary of Horizon Nuclear Power Wylfa Holdings Limited, which is a non-trading holding company. This holding company has been established to facilitate future investment in the Wylfa Newydd Project (the Project) and is currently 100% owned by Horizon Nuclear Power Limited, which, via an intermediary company, is ultimately 100% owned by Hitachi, Ltd. For further information about the company structure see the Company Manual.

1.2 Purpose of this Overview Document

6. The purpose of this Overview Document is to:
   - act as the head document for Horizon’s SLA package;
   - outline the contents of the SLA package; and
   - provide information to address SLA expectations that are not captured elsewhere in the application, namely:

1.2.1 The Proposed Nuclear Licensed Site

   - a demonstration of conformity with relevant UK Government siting policies (see Section 1);

\(^{1}\) Registered in England and Wales. Company registration number 06811987. Registered office: Sunrise House, 1420 Charlton Court, Gloucester Business Park, Gloucester, GL3 4AE.
• description of the extent of which the characteristics of the proposed NLS are bounded by the site envelope presented in the Generic Design Assessment (GDA) Safety Case (see Section 5.3 and 6.11);

• details of the ownership of the site or arrangements for its leasing (see Section 6.2);

• position of the proposed NLS and the local demographics (see Section 6.3);

• details of inter-site safety and security agreements in relation to the adjacent nuclear site (see Section 6.5);

• development of the emergency plan and the information presented within it (see Section 6.6.1);

1.2.2 Safety

• a statement on Horizon’s position with respect to the ongoing United Kingdom Advanced Boiling Water Reactor (UK ABWR) GDA (see Section 5.3);

• responses to lessons learned from Fukushima (see Sections 5.3 and 5.4);

1.2.3 Other Information

• a statement regarding the status of the justification of the proposed operational activities as required by the Justification of Practices Involving Ionising Radiation Regulations 2004 (see Section 8.3.3);

• a statement regarding the development of Horizon’s Radioactive Waste management strategy (see Section 6.9);

• statements regarding Horizon’s submissions under Article 37 and Article 41 of the Treaty Establishing the European Atomic Energy Community (Euratom Treaty) (see Sections 8.5.1 and 8.5.2);

• a statement regarding the timing and development of appropriate Nuclear Safeguards arrangements (see Section 6.8);

• a statement setting out the programme for the Department for Business, Energy and Industrial Strategy (DBEIS) assessment of the Funded Decommissioning Programme (FDP) (see Section 8.3.1);

• a statement on other authorisations, consents and permits relating to the Project (see Section 8);

• a statement setting out a strategy for decommissioning the proposed installations (see Section 6.10);

• reference to the approved Construction Site Security Plan (CSSP) and a statement about the development of the Nuclear Site Security Plan (NSSP) (see Section 6.7); and

• description of Horizon’s arrangements regarding third party nuclear liability insurance that will be in place prior to the first receipt of Nuclear Fuel at the NLS (see Section 8.3.2).

7. Appendix A of this document sets out the expectations for the content of the SLA based on guidance provided by the ONR, and shows where in the SLA these expectations are addressed.
## 2 Table of Abbreviations and Acronyms

<table>
<thead>
<tr>
<th>Term or Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABWR</td>
<td>Advanced Boiling Water Reactor</td>
</tr>
<tr>
<td>BWR</td>
<td>Boiling Water Reactor</td>
</tr>
<tr>
<td>CSSP</td>
<td>Construction Site Security Plan</td>
</tr>
<tr>
<td>DBEIS</td>
<td>Department for Business, Energy and Industrial Strategy</td>
</tr>
<tr>
<td>DCO</td>
<td>Development Consent Order</td>
</tr>
<tr>
<td>DWMP</td>
<td>Decommissioning and Waste Management Plan</td>
</tr>
<tr>
<td>EPC</td>
<td>Engineering, Procurement and Construction</td>
</tr>
<tr>
<td>EP-RSR</td>
<td>Environmental Permit – Radioactive Substances Regulation</td>
</tr>
<tr>
<td>FAP</td>
<td>Funding Arrangements Plan</td>
</tr>
<tr>
<td>FDP</td>
<td>Funded Decommissioning Programme</td>
</tr>
<tr>
<td>GDA</td>
<td>Generic Design Assessment</td>
</tr>
<tr>
<td>GDA-PCSR</td>
<td>Generic Design Assessment Pre-Construction Safety Report</td>
</tr>
<tr>
<td>GDF</td>
<td>Geological Disposal Facility</td>
</tr>
<tr>
<td>HLW</td>
<td>High Level Waste</td>
</tr>
<tr>
<td>Hitachi-GE</td>
<td>Hitachi-GE Nuclear Energy, Ltd.</td>
</tr>
<tr>
<td>IAEA</td>
<td>International Atomic Energy Agency</td>
</tr>
<tr>
<td>ILW</td>
<td>Intermediate Level Waste</td>
</tr>
<tr>
<td>LC</td>
<td>Licence Condition</td>
</tr>
<tr>
<td>LLW</td>
<td>Low Level Waste</td>
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<tr>
<td>NDA</td>
<td>Nuclear Decommissioning Authority</td>
</tr>
<tr>
<td>NIA65</td>
<td>Nuclear Installations Act 1965</td>
</tr>
<tr>
<td>NIR71</td>
<td>Nuclear Installations Regulations 1971</td>
</tr>
<tr>
<td>NLS</td>
<td>Nuclear Licensed Site</td>
</tr>
<tr>
<td>NPS EN-6</td>
<td>National Policy Statement for Nuclear Power Generation (EN-6)</td>
</tr>
<tr>
<td>NRW</td>
<td>Natural Resources Wales</td>
</tr>
<tr>
<td>NSC</td>
<td>Nuclear Safety Committee</td>
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<tr>
<td>NSL</td>
<td>Nuclear Site Licence</td>
</tr>
<tr>
<td>NSSP</td>
<td>Nuclear Site Security Plan</td>
</tr>
<tr>
<td>ONR</td>
<td>Office for Nuclear Regulation</td>
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<tr>
<td>ONR CNS</td>
<td>Office for Nuclear Regulation Civil Nuclear Security</td>
</tr>
<tr>
<td>PCSR</td>
<td>Pre-Construction Safety Report</td>
</tr>
<tr>
<td>Term or Abbreviation</td>
<td>Definition</td>
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<tr>
<td>----------------------</td>
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<tr>
<td>PRE-NSC</td>
<td>Preliminary Nuclear Safety Committee</td>
</tr>
<tr>
<td>REPPIR</td>
<td>Radiation (Emergency Preparedness and Public Information) Regulations</td>
</tr>
<tr>
<td>SCDP</td>
<td>Safety Case Development Plan - Wylfa Newydd Power Station</td>
</tr>
<tr>
<td>SLA</td>
<td>Site Licence Application</td>
</tr>
<tr>
<td>SLG</td>
<td>Site Licence Grant</td>
</tr>
<tr>
<td>SNI</td>
<td>Sensitive Nuclear Information</td>
</tr>
<tr>
<td>TCPA</td>
<td>Town and Country Planning Act 1990</td>
</tr>
<tr>
<td>UK ABWR</td>
<td>United Kingdom Advanced Boiling Water Reactor</td>
</tr>
<tr>
<td>WN-PCSR</td>
<td>Wylfa Newydd Pre-Construction Safety Report</td>
</tr>
<tr>
<td>WN-SJR</td>
<td>Wylfa Newydd Site Justification Report</td>
</tr>
</tbody>
</table>

See the Nuclear Site Licence Application Glossary (known as the Glossary) for full definitions of the above terms. The Glossary also contains the definitions of additional technical terms that are presented as capitalised words within this document.
3  Nuclear Site Licence Application

3.1 What is a Nuclear Site Licence?

8. A NSL is described by the ONR in its guidance document Licensing Nuclear Installations [RD2] as follows:

“The safety of nuclear installations in Great Britain is secured primarily through the nuclear site licence and the conditions attached to it. Any organisation wanting to install or operate a prescribed nuclear installation will need a nuclear site licence. A nuclear site licence is granted for an indefinite period and, providing there are no material changes to the basis on which the licence was granted, it can cover the entire lifecycle of a site from installation and commissioning through operation and decommissioning to site clearance and remediation”.

9. The NSL is issued to a named corporate body (Horizon) to install or operate specific nuclear installations, for example two UK ABWRs, in a defined location. The specific Nuclear Installations are described further in Section 3.3. The boundary map that forms part of this application defines the boundary of the proposed Nuclear Licensed Site (NLS), see Section 7.6 for further information.

10. A set of standard Licence Conditions (LCs), for which there are currently 36, covering design, construction, operation and decommissioning, are attached to each NSL and provide the main basis for regulation by the ONR. The LCs, and supporting guidance, are generally non-prescriptive and set goals which the Licensee is responsible for meeting, amongst other things by applying detailed safety standards and safe procedures.

11. The ONR operate a permissioning regulatory approach (whereby permission is provided to undertake specified activities). As such the NSL does not in itself give permission to start nuclear-safety related activities (i.e. construction or commissioning) these will be provided by separate permissions throughout the lifecycle of the Power Station.

12. Further information on the licensing and regulation of Nuclear Installations can be found in the Nuclear Installations Act 1965 (NIA65) [RD3], the Nuclear Installation Regulations 1971 (NIR71) [RD4] and on the ONR’s website: http://www.onr.org.uk/licensing.htm.

3.2 Nuclear Site Licence Application Development

13. Horizon identified the expectations for the content of the SLA by reviewing the NIA65, NIR71 and the ONR’s guidance documents Licensing Nuclear Installations [RD2] and The Processing of Licence Applications for New Nuclear Sites [RD5]. Horizon also considered learning from licensing experiences of other Licensee organisations and documenting the findings, a summary of which can be found in Appendix A.

14. As part of the SLA development arrangements, Horizon sought independent advice from senior industry figures on the contents of the SLA and sought feedback to identify further information that could be usefully included.

15. The SLA has been prepared in accordance with Horizon’s internal processes. It has been subject to critical examination which has included self-assessment, internal and external stakeholder review and independent assessment by Horizon’s own Nuclear Oversight function.
16. Although every effort has been made to ensure this Overview Document accurately reflects the contents of the SLA package, it should be noted that in the event of any inconsistencies, the information within the relevant SLA document(s) takes precedence.

3.3 Licensable Activities

17. In accordance with Section 1 of the NIA65 and Regulation 3(6) of the NIR71 Horizon is applying for a NSL to install and operate nuclear reactors and other prescribed installations.

18. The activities to be licensed will therefore include the installation and operation of:
   - two UK ABWRs (together with any machinery, equipment, appliance, and storage facilities required for the operation thereof), described further in Section 5.3; and
   - facilities for the storage of irradiated Nuclear Fuel or bulk quantities of any other radioactive matter which has been produced or irradiated in the course of the use of Nuclear Fuel and the storage of such Nuclear Fuel, bulk quantities or other radioactive matter.

3.4 Application Structure

19. The SLA structure is illustrated in Figure 3.1 below. The supporting evidence does not form part of the SLA but will be made available to the ONR upon request.

20. The purpose of each of the SLA package documents is described in Section 7.

**Figure 3.1 Structure of the SLA**

21. Figure 3.2 below provides a high level overview of the purpose and relationships between the SLA documents.
3.5 Timing of the Site Licence Application

22. Horizon’s objective is to achieve a positive Final Investment Decision in 2019. The NSL and other major permissions are being sought at this stage to assist with attracting and securing investment and to support that objective.

23. Prior to submission of the SLA a submission under Article 41 of the Euratom Treaty was sent to the European Commission. Horizon will apply for other permits and consents during the period when the ONR is assessing the SLA, including:

- an application to Natural Resources Wales (NRW) under the Environmental Permitting (England and Wales) Regulations 2016 for an Environmental Permit – Radioactive Substances Regulation (EP-RSR) to dispose of Radioactive Waste, including liquid and gaseous discharges;
- an application to the Secretary of State for Business, Energy and Industrial Strategy, via the Planning Inspectorate, for a Development Consent Order (DCO) for the new Power Station; and
- a submission to the European Commission under Article 37 of the Euratom Treaty.

24. Figure 3.3 below illustrates the NSL timeline and interactions with other permissions. While, as illustrated by the figure, it is expected that granting of the NSL and EP-RSR will occur at a similar time, there is no requirement for it to occur concurrently.
Figure 3.3 SLA relationship to other permission applications submitted by Horizon
4 Description of the Applicant

25. Horizon Nuclear Power Wylfa Limited was incorporated on 6th February 2009 as a private limited company registered in England and Wales with company number 06811987 and sits within the wider Hitachi, Ltd. group of companies as a wholly owned subsidiary of Horizon Nuclear Power Wylfa Holdings Limited.

26. The Company Manual describes the corporate structure under Hitachi, Ltd. and explains the relationship between Horizon and its parent and sister companies and the holding company.

27. Horizon is committed to safety, this is demonstrated by the implementation of a Commitment to Conventional and Nuclear Safety Statement and its Safety, Health and Environment Policy (see Appendix 1 of the Management Prospectus) which was developed using national and international guidance.

4.1 Organisation Structure and Capability

28. Horizon, as a prospective Licensee, is required to ensure that it is in control of all activities on its site, including those activities undertaken by others on its behalf. Horizon’s management arrangements provide an integrated safety, security and environment management system. Horizon’s organisational provisions ensure appropriate resources and capability are in place to effectively control activities and discharge legal and business obligations.

29. Horizon’s Company Manual outlines the corporate governance structure, internal management structure and governance arrangements, including those which control and manage activities which could affect safety. The Company Manual defines safety as nuclear safety (including radiation protection), non-nuclear health and safety, radiological environmental protection, non-radiological environmental protection, security (including safeguards and export control), and quality in so far as it supports the delivery of these.

30. The Nuclear Baseline Report identifies the organisational structures, staffing and competencies (known as the Nuclear Baseline) required to maintain nuclear safety, security, radiological environmental protection and quality throughout the full range of Horizon’s activities for the time frame covered by the Nuclear Baseline Report. The Nuclear Baseline provides the basis against which changes to the organisation can be managed and controlled. Changes to the Nuclear Baseline Organisation are controlled through the Management of Nuclear Baseline Change arrangements.

31. A key part of Horizon’s organisational capability is the Design Authority which has primary and enduring responsibility for understanding, managing and controlling those aspects of the plant design that have an effect on nuclear safety, security or the radiological environment protection. This includes responsibility and management of the Safety Case. It is anticipated that this in-house capability will be supported by Hitachi-GE Nuclear Energy, Ltd. (Hitachi-GE) acting as a Responsible Designer through formal contractual relationships.

32. Assurance of the nuclear safety (including radiation protection), non-nuclear health and safety, radiological environment, non-radiological environment, security, and quality elements of the company’s activities is principally provided by the Safety and Licensing Functional unit. The Safety and Licensing Functional Unit is operationally separate to the delivery functions which must meet the relevant policies and standards, meaning that the assurance provides the appropriate degree of independence and challenge. In some areas, the accountability for providing assurance is delegated to other Functional Units, such as in the case of quality, however the Safety and Licensing Director remains...
accountable. The Safety and Licensing Director provides the route for raising concerns about assurance matters at HLT and Horizon Board level.

33. With regard to procurement, Horizon recognises the importance of acting as an Intelligent Customer through the specification, management, control, review and acceptance of goods, works and services, which are procured from suppliers and have the potential to impact upon nuclear safety, security or radiological environmental protection. Horizon has developed arrangements to adequately discharge its obligations as an Intelligent Customer. This also includes the ability to quality assure and quality control the delivery of such goods, works and services.

4.2 Key Relationships

34. As well as ultimately owning Horizon, Hitachi, Ltd. is also the majority shareholder of Hitachi-GE, the technology provider and nuclear reactor vendor that will provide the UK ABWR. Horizon acknowledges that it has a group company relationship with Hitachi-GE, arising from Hitachi, Ltd.’s ultimate ownership of Horizon and majority ownership of Hitachi-GE. Notwithstanding that, the procurement of the UK ABWR via Engineering, Procurement and Construction (EPC) contract(s), will be subject to Horizon’s responsibilities under UK law and in particular in ensuring that it can meet its responsibilities under the NSL and the EP-RSR (amongst others).

35. Horizon anticipates placing the major Engineering, Procurement, and Construction (EPC) contract(s) (the EPC Contract) with a joint venture called Menter Newydd whose participants include Hitachi Nuclear Energy Europe, Limited, Bechtel Management Company Limited and JGC Corporation (UK) Limited. The EPC joint venture will be the contractor for major elements of the delivery and construction of the Power Station. The responsibilities of the EPC contractor will be defined in the EPC Contract and more detail is given within the Management Prospectus.

36. Hitachi-GE are the nuclear technology provider to Horizon under contractual arrangements via the EPC Contract. It is also anticipated that Hitachi-GE will act as a Responsible Designer for the Power Station.

37. Hitachi-GE is the Requesting Party for the GDA of the UK ABWR. The GDA process is discussed in Section 5.3 and is anticipated to be completed before grant of the NSL and EP-RSR. Horizon, as the first prospective user of the UK ABWR technology in the UK, continues to provide support to Hitachi-GE in the development of the GDA Pre-Construction Safety Report (GDA-PCSR) and the Generic Environmental Permit. The collaborative approach to development of the GDA-PCSR has assisted in knowledge transfer between Horizon and Hitachi-GE, ensuring a common understanding of the scope of GDA, the documentation expected, and the further work required to underpin the Wylfa Newydd Pre-Construction Safety Report (WN-PCSR).
5 Technical Overview

5.1 Nuclear Power in the UK
38. The world’s first commercial nuclear power reactors were built in the UK at Calder Hall in Cumbria. Four reactors were constructed, the first of which was commissioned in 1956. These were gas-cooled Magnox reactors and were the first of 26 of their kind that were commissioned at 11 sites between 1956 and 1971. The second phase of the UK nuclear power programme led to the introduction of 14 Advanced Gas-cooled Reactors at seven sites that were commissioned between 1976 and 1989. The third UK nuclear power programme saw a change from gas-cooled to water-cooled reactor design and the first Pressurised Water Reactor power station was constructed. This has been operating since 1995 and is the most recent nuclear power station to be built in the UK.

39. In the late 1990s nuclear power contributed around 25% of total electricity generation in the UK, but this has gradually declined as older plants have been shut down. Of the reactor types mentioned above, the Magnox fleet have all reached the end of their generating lives and are in various phases of defueling and decommissioning. The Advanced Gas-cooled Reactor stations remain operational and most have been granted life extensions to around the mid-2020s. The UK’s single Pressurised Water Reactor power station has satisfied the ONR that it can operate safely until at least 2025.

40. In 2008, the UK Government’s White Paper on nuclear power [RD6] confirmed the decision that nuclear power should play a role in the UK’s future energy supply. The White Paper recognised the importance of nuclear power both in terms of helping to meet the challenge of climate change, as well as ensuring the long-term security of electricity supplies in the UK. The policy of the UK Government has continued to be to take active steps to facilitate the construction and operation of new nuclear power stations by the electricity industry, in accordance with normal planning and regulatory requirements. The UK is currently considering a number of Pressurised Water Reactor designs and one Boiling Water Reactor (BWR), which is known as the UK ABWR and is Horizon’s chosen technology.

5.2 Boiling Water Reactors
41. Although well established in other parts of the world, BWR technology has not previously been part of nuclear power generation in the UK. BWRs were the second most common type of nuclear reactor in the world in 2014, generating almost 20% of the gross output from all commercial operating nuclear power plants. The world’s first full-scale commercial BWR power station was built in the United States and began generating in 1960. BWR technology has continued to evolve and the first Advanced Boiling Water Reactor (ABWR) was built in Japan and commenced commercial operation in 1996. Throughout the development of BWR technology, Hitachi-GE and others have focused on a process of evolution, developing successive reactors with higher operational, safety and economic benefits than previous models. The ABWR design introduced features to enhance safety and reliability as well as making the plant easier to operate and maintain. Another key feature was modular design, which resulted in shorter construction times. The UK ABWR GDA (Chapter 28) [RD7] describes the development of the ABWR from the earlier BWR.

42. In Japan, Hitachi-GE has participated in the construction of four ABWRs, which have the benefit of a combined 20 reactor-years of operational experience. Construction has also been started on a further two ABWRs in Japan and two in Taiwan.
43. In a BWR, water is used to remove the heat produced inside the reactor core by the thermal nuclear fission process. The coolant water boils inside the reactor pressure vessel producing high pressure steam. This passes through separators and dryers above the reactor core and is then fed directly to the turbine generator, which produces electricity. The used steam is then converted back to water in the condenser, from where it is pumped back into the reactor as feedwater to repeat the cycle. The water coolant also acts as a moderator, enabling the thermal fission chain reaction to be sustained. A simplified plant schematic is shown below in Figure 5.1.

Figure 5.1 Simplified plant schematic

5.3 The UK Advanced Boiling Water Reactor

44. The design reference for the UK ABWR is the first ABWRs (Kashiwazaki-Kariwa units 6 and 7, plus improvements implemented at Shika Unit 2, Shimane Unit 3 and Ohma Unit 1, in addition to incorporation of post-Fukushima enhancements). The UK ABWR is undergoing GDA, which is assessing the design for suitability of use in the UK.

45. In comparison with earlier reactor designs, the UK ABWR will incorporate further safety enhancements and additional resilience against severe external hazards. These include aircraft impact countermeasures and post-Fukushima countermeasures based on learning from that event, see Section 5.4 below. Specifically, the UK ABWR will include enhancements such as:

- systems to provide alternative and flexible water injection for cooling the reactor and the Spent Fuel pool;
- engineered measures to enable manual operation of specific isolation valves if power supplies are lost;
- robust instrumentation that will provide reliable data in the hostile environment of a severe accident;
- provision of diverse connections for mobile equipment;
- mobile equipment to provide alternative power supplies and coolant injection capability, as well as heavy machinery to maintain plant access in the event of widespread disruption;
- structural enhancements for protection against aircraft impacts to primarily protect the reactor and control buildings; and
• enhanced strategies for comprehensive management of accidents.

46. Furthermore, it is expected that the UK ABWR design will incorporate any additional changes required to deal specifically with UK requirements. Further details of the UK ABWR technology can be found on the Hitachi-GE website; http://www.hitachi-hgne-uk-abwr.co.uk.

47. GDA is a joint process between the ONR and the Environment Agency to ensure that any new nuclear power stations built in the UK meet high standards of safety, security, environmental protection and waste management. NRW is also participating in the process as the Power Station will be situated in Wales. NRW is a member of the EA’s GDA programme board and will use the GDA in its assessment of environmental permit applications for the UK ABWR at the Power Station site.

48. GDA assessment is a staged process, with the assessments becoming increasingly detailed. On successful completion of the GDA process, the ONR will issue a Design Acceptance Confirmation for the generic reactor design from a safety and security perspective. This is based on the generic design of the standard UK ABWR for any site in the UK that falls within the Generic Site Envelope. The Generic Site Envelope was determined by considering the conditions at potential sites, including the Wylfa NPS Site, therefore the Wylfa NPS Site is largely bounded by the Generic Site Envelope within the GDA-PCSR.

49. On successful completion of the GDA process, the Environment Agency will grant a Statement of Design Acceptability to confirm the acceptability of the reactor design from an environmental perspective.

50. Horizon is working closely with Hitachi-GE to ensure the reactor design is suitable for construction and operation in the UK, and to ensure that Horizon has the necessary knowledge of the design.

51. The UK ABWR completed Step 3 of the GDA at the end of October 2015. The ONR Step 3 Summary Report [RD8] concluded that Hitachi-GE had made sufficient progress to continue into Step 4 of GDA. The principal achievements noted during Step 3 included further development of Safety Case expertise, establishment of the Joint Safety Case Office to support GDA (between Hitachi-GE and Horizon), enhanced collaborative working between Horizon and Hitachi-GE, and submission of updated safety assessments.

52. Step 4 of GDA is underway and currently scheduled to be completed at the end of 2017. Further information on progress of the UK ABWR GDA can be found on the ONR and Hitachi-GE websites.

5.3.1 Safety Case

53. A nuclear Safety Case is a set of documents that describe the radiological hazards relating to a facility or site and modes of operation (including potential undesired modes) and the measures that prevent or mitigate against harm being incurred. The Safety Case and associated Safety Report (for example a Pre-Construction Safety Report) is linked to defined activities, provides a coherent demonstration that relevant standards have been met and that risks to persons have been reduced to be As Low As Reasonably Practicable.

54. The lifecycle of the Power Station is broken down into key phases (e.g. construction, commissioning and generation) and each requires a separate Safety Case and Safety Report to be produced. The Safety Case for each phase demonstrates the safety of that phase before it starts and identifies any significant issues that impact upon future phases.
5.4 Lessons Learned from Fukushima

55. In March 2011 the nuclear power station at Fukushima Daiichi in Japan suffered significant damage due to a tsunami caused by a major earthquake.

56. In response, the International Atomic Energy Agency (IAEA) (set up in 1957 to promote worldwide safe, secure and peaceful use of nuclear technologies) produced a report on the Fukushima accident [RD9]. The IAEA Director General's foreword states that:

“The report considers human, organizational and technical factors, and aims to provide an understanding of what happened, and why, so that the necessary lessons learned can be acted upon by governments, regulators and nuclear power plant operators throughout the world.”

57. In the UK, the ONR published the Japanese Earthquake and Tsunami: Implications for the UK Nuclear Industry Report (known as the Weightman Report) [RD10] that recommended a number of actions for Licensees.

58. The UK ABWR design includes specific features to help mitigate the consequences of such events, see Section 5.3. These post-Fukushima counter-measures are reviewed as part of the GDA process, which is discussed above in Section 5.3.

59. Hitachi-GE has considered generic hazards from extreme events as part of the GDA. Horizon will assess site-specific external hazards as part of the WN-PCSR (see Section 6.11). The WN-PCSR will also detail specific design aspects following learning from Fukushima.

60. Horizon is committed to learning from events and experience such as Fukushima, as well as capturing wider learning from non-nuclear industries. The Management Prospectus discusses in more detail how Horizon will use internal and external learning to support continuous improvement, particularly in the delivery of nuclear safety, security, and radiological environmental protection. For example, as described within Section 5.4 Horizon’s learning from Fukushima and other events will be reflected in the design of emergency response facilities and arrangements for emergency planning.

5.5 Proposed Nuclear Licensed Site Layout

61. The main buildings and their functions associated with each generating unit are outlined below.

I. Reactor Building – The Reactor Building houses the reactor pressure vessel, primary containment, major portions of the nuclear steam supply system, the refuelling area and Spent Fuel pool, emergency core cooling systems, as well as power supply and other supporting systems. It also forms the reinforced concrete secondary containment boundary which surrounds the reinforced concrete containment vessel above the basement.

II. Control Building – The Control Building houses the main control room and is located between the Reactor Building and the Turbine Building. As well as control system equipment and cabling, it contains some of the essential switchgear, power supplies and ventilation systems. The main steam tunnel from the Reactor Building to the Turbine Building is located on the ground floor of the Control Building.
III. Service Building – The Service Building provides the main entrance to the plant, along with changing rooms and monitoring facilities. It also includes offices and other services required to support operations. It is located next to the Control Building.

IV. Heat Exchanger Building – The Heat Exchanger Building houses portions of the Reactor Building cooling water system, the Turbine Building cooling water system and the parts of the sea water system that provide cooling. The Heat Exchanger Building is located adjacent to the sea water intake point.

V. Turbine Building – The Turbine Building houses all equipment associated with the main turbine generator. This includes the parts of the steam system that feed into the turbine, the main steam condenser and the off-gas system.

VI. Radwaste Building – The Radwaste Building houses equipment associated with collection and processing of solid and liquid Radioactive Waste generated by the Power Station.

VII. Spent Fuel Storage Facility – The Spent Fuel Storage Facility provides on-site storage of Spent Fuel in accordance with UK Government policy, until the UK’s Geological Disposal Facility (GDF) becomes available, at which point the Spent Fuel can be removed from the NLS. Following removal from the reactor, Spent Fuel will initially reside in the Spent Fuel pool where it will be cooled. Following this stage, the Spent Fuel will be transferred to the Spent Fuel Storage Facility. As the Spent Fuel is initially stored in the Spent Fuel pool, the Spent Fuel Storage Facility will not be required immediately, but is likely to be constructed during the first few years of reactor operation.

62. An indicative site layout is shown in Figure 5.2 below. It remains subject to other regulatory processes, including assessment under the Planning Act 2008 and related environmental impact assessment.

Figure 5.2 Indicative site layout – main buildings
6 Additional Information

63. This section discusses a number of topics that relate to the NLS. This includes information not given elsewhere in the SLA package (as listed in Appendix A).

6.1 Location of the Proposed Nuclear Licensed Site

64. The NLS will be located within the larger Wylfa NPS Site which covers approximately 236 hectares of land. Settlement patterns around the NLS are characterised by small clusters of residential dwellings and more isolated farmsteads. Larger settlements include the villages of Cemaes to the immediate east and Tregele to the south-east.

65. To the south and west, the NLS also borders agricultural land.

66. Figure 6.1 below shows the location of the Power Station and the Existing Power Station in relation to the Wylfa NPS Site.

![Figure 6.1 The Power Station and the Existing Power Station](image)

6.2 Ownership and Control of the Nuclear Licensed Site

67. Horizon has secure tenure over all the land within the proposed NSL boundary. The northern half of the site is leased to Horizon by the Nuclear Decommissioning Authority (NDA) for 999 years from 2011 (leasehold ownership) and the southern half is owned (freehold ownership) by Horizon.

68. The titles have a number of restrictions attached that need to be addressed before Horizon can be in full control of the land. These include the use of the highway across the site by third parties and rights of third parties, such as those to run cables and pipelines across the land. The restrictions are understood fully by Horizon and are actively being addressed. It is anticipated that the majority will be resolved by voluntary
agreements before Site Licence Grant (SLG), with the remaining restrictions being dealt with through the DCO. For example, Horizon’s DCO application will request that the DCO includes provisions which will permanently close the highway that currently divides the site. It is anticipated that all restrictions will be removed from the titles approximately six months after DCO grant.

69. Small parcels of unregistered land are currently excluded from the title. These are considered to result from historical conveyancing discrepancies and Horizon will request that these be remedied via compulsory purchase provisions to be included in the DCO.

70. Evidence of ownership can be provided to the ONR through the provision of certificates of title, and copies of the relevant title documentation.

6.3 Local Demographics

71. As described in Section 1, the UK Government’s Nuclear NPS EN-6 has concluded that the Wylfa NPS Site is potentially suitable for the deployment of a new nuclear power station by the end of 2025. The assessment criteria which led to this conclusion took account of Government policy on demographics and the siting of nuclear power stations, the objective of which is “…to limit the radiological consequences to the public in the unlikely event of an accident involving the spread of radioactive materials beyond the site boundary”.

72. The area surrounding the NLS is sparsely populated and is within the semi-urban criterion, which is broadly based on models of population density and Radioactive Material dispersion. With regard to the local demographics, particularly vulnerable groupings of people such as at schools and hospitals, it should be noted that the Existing Power Station operated on Anglesey since 1971.

73. Figure 6.2 below shows the location of the proposed NLS on Anglesey.

Figure 6.2 Location of the Proposed Nuclear Licensed Site on Anglesey
6.4 Local Community Engagement

Horizon takes its role in the community very seriously and aims to be a responsible developer and a good neighbour throughout the life of the Power Station, from planning through to decommissioning. Activities include:

- regular newsletters to around 33,000 households across Anglesey;
- resident’s letters to those closest to the Power Station;
- project information issued via social media and Horizon’s website;
- monthly open surgeries in communities across Anglesey;
- regular meetings with community group representatives; and
- engagement with local schools, further education colleges and Bangor University.

As the Power Station progresses towards construction and operation, Horizon will be supporting improvements to local infrastructure and services. Horizon is committed to building a lasting positive legacy for Anglesey and is working closely with local schools, colleges and universities to support education and training. Funding arrangements have also been set up to provide support for various local community initiatives.

6.5 Matters Relating to the Adjacent Nuclear Licensed Site

The Power Station is adjacent to the Existing Power Station owned by the NDA and operated by Magnox Limited, which is the Licensee. The Existing Power Station ceased generation at the end of 2015 and defueling activities began in 2016, with a target completion date for defueling at the end of 2018. Based on the current schedule, the Existing Power Station site will become fuel free during 2019. However, it will remain a NLS, as Intermediate Level Waste (ILW) will be present at least until the GDF is available, meaning the site remains within the regulatory control of the ONR until Magnox Limited’s period of responsibility under Section 5 of the NIA65 ends.

An over-arching co-operation agreement exists between Horizon, Magnox Limited and the NDA dealing with common issues affecting both sites. The agreement incorporates a general principle of co-operation and is designed to provide a framework for enabling continued compliance by all parties with all relevant legislation, including safety and security activities. It is also intended to facilitate the smooth operation of adjacent NLSs and operations. This will be supported in the future by agreements with Magnox Limited covering, but not limited to, issues between Horizon and the Existing Power Station relating to access, shared services and emergency arrangements.

6.6 Emergency Preparedness

All nuclear operators in the UK must make and implement adequate emergency arrangements for dealing with any accident or emergency and consequent effects, arising on the NLS. Horizon’s key strategic focus for emergency preparedness is to ensure that the public, workers, environment and the plant are protected and to maintain security of the NLS, during an event.

To achieve this goal, development of proportionate emergency arrangements must form a key part of the development of the management of the Power Station during all lifecycle phases. During each phase the arrangements will need to remain proportionate to the risk and hazard present at the time.
80. Effective development of Horizon’s arrangements requires a clear integrated approach within Horizon with close working relationships across all functions, especially the site management, operations, security and environment and waste management functions.

6.6.1 Horizon’s Emergency Arrangements

81. Emergency preparedness will be actively managed throughout the lifecycle of the Power Station. For example, the design of the UK ABWR includes features to ensure that the plant can be safely shut down following an emergency. A number of emergency back-up facilities will be positioned both on and off-site to guarantee availability of emergency facilities and response for the most severe circumstances. Due to the remote location of the Power Station, Horizon’s emergency capability is designed to provide a stand-alone response for up to seven days without external support from, for example, local emergency responders or key supplies.

82. Horizon’s emergency arrangements will be reviewed and updated whenever an increase or decrease to the level of hazard or risk at the NLS is identified, ensuring compliance with the current standard LC11 (Emergency Arrangements) at all times.

83. An operational emergency plan, approved by the ONR, will be in place prior to Nuclear Fuel being brought to the NLS for the first time (the emergency plan can be approved at any time after SLG up to this point if deemed necessary). This is the first point at which an incident at the NLS could (although highly unlikely) result in an off-site release of radioactivity. This operational emergency plan will be tested and exercised in advance to ensure that the arrangements are demonstrably robust.

6.6.2 Off-site Arrangements

84. The Radiation (Emergency Preparedness and Public Information) Regulations (REPPiR) require Horizon to carry out a hazard identification and risk evaluation and submit a report of this assessment to the ONR. This will be used by the ONR to determine if a radiation emergency could occur following an incident at a particular NLS and this would determine if an off-site emergency plan is required. Before an off-site emergency plan can be prepared, the ONR will establish a REPPiR Emergency Off-site Planning Area (previously known as a Detailed Emergency Planning Zone) based on an assessment of the area potentially affected by an off-site release of radioactivity following an incident. The local authority then produces and maintains an off-site emergency plan for the area defined by the ONR.

85. In support of the off-site emergency plan and to comply with REPPiR, Horizon will distribute information to everyone within the REPPiR Emergency Off-site Planning Area defining the actions to be taken in the event of an emergency. Such information is known as Prior Information and must be distributed before the first receipt of Nuclear Fuel on the NLS. If a radiation emergency did occur at the Power Station, Horizon would raise the alarm and instruct everyone within the REPPiR Emergency Off-site Planning Area to follow the relevant instructions set out in the Prior Information.

6.6.3 Existing Power Station

86. Magnox Limited, the operator of the Existing Power Station, has emergency arrangements proportionate to the activities being undertaken at its NLS. It has reviewed and updated these arrangements due to the presence of people at the Power Station site. Magnox Limited provided Horizon with Prior Information once people started to occupy the Power Station site. It is envisaged that Magnox Limited and Horizon will carry out joint emergency exercises in the future to ensure each party’s emergency arrangements are coordinated.
6.7 Security

87. Horizon is compliant with the relevant parts of the Nuclear Industries Security Regulations 2003 which set out the requirements that the ONR’s Civil Nuclear Security (ONR CNS) regulate against. The ONR CNS is responsible for approving security arrangements within the civil nuclear industry and enforcing compliance to protect Nuclear Matter and Sensitive Nuclear Information (SNI).

88. Horizon’s activities are currently controlled by a Construction Site Security Plan (CSSP) that has been approved by the ONR CNS. The CSSP details the security regime at the Power Station site up to the time when the NSL is granted. The ONR CNS assess Horizon’s compliance with the approved plan. A Nuclear Site Security Plan (NSSP) is currently being developed which will supersede the CSSP once the NSL is granted. It will be submitted to the ONR CNS for approval, which must be obtained before the NSL can be granted.

89. Security is embedded in Horizon’s Management System with specific arrangements in place for ensuring an integrated approach is taken to physical security, personnel security and information security (including cyber security). Security is an integral and essential part of the design process for the UK ABWR and the NSL to ensure Nuclear Matter, other Radioactive Material, nuclear facilities and SNI are kept secure at all times.

6.8 Nuclear Safeguards

90. The Treaty on the Non-Proliferation of Nuclear Weapons came into force in 1970, promoting cooperation in the field of peaceful nuclear technology and equal access to the technology for all states. The treaty forms the basis for the Nuclear Safeguards system, under the responsibility of the IAEA, to prevent the undetected diversion of (civil) Nuclear Material by states for weapons use. Nuclear Safeguards are measures used to verify that Nuclear Materials are properly accounted for and are not diverted to undeclared uses; examples of Nuclear Safeguards include the use of tamper-proof seals and remote surveillance.

91. The application of Nuclear Safeguards in the UK is currently aligned to the Euratom Treaty. The Nuclear Safeguards requirements in the UK are implemented by the Safeguards Inspectorates of the European Commission and the IAEA, as they both have legal functions under the separate treaties, although they do work together and share information.

92. Horizon will have Nuclear Material on the NLS, including Nuclear Fuel and Spent Fuel and is therefore required to comply with Nuclear Safeguards obligations. Horizon currently plans to provide the required information to the ONR, who will issue the information to the appropriate regulatory body (European Commission or IAEA as appropriate), on behalf of the UK Government, which is ultimately responsible for Nuclear Safeguards compliance.

93. Horizon will implement Nuclear Safeguards arrangements before Nuclear Material is brought to the NLS for the first time, however engagement with the ONR and the European Commission has already commenced to ensure Horizon can meet the UK’s obligations at the relevant time.

94. BWRs are well established worldwide and so there is considerable experience of applying Nuclear Safeguards to this reactor type. Therefore Horizon is confident that it can fulfill all Nuclear Safeguards requirements for the UK ABWR using existing techniques and technology.
6.9 Spent Fuel and Radioactive Waste

95. Horizon has an integrated waste strategy, which describes how all waste (including the strategy for Radioactive Waste management) arising from the construction, operation and decommissioning of the Power Station will be managed. The Horizon waste hierarchy (see Figure 6.3 below) shows the principles that will be applied to minimise the volume and radioactivity of Radioactive Wastes generated. This approach represents best available techniques and aligns with other nuclear operators.

96. Horizon has conducted a number of optioneering studies to identify the most appropriate way to manage and dispose of Radioactive Waste expected to be produced on the NLS. Horizon’s waste management strategy meets all relevant legislative and regulatory waste management requirements, whilst incorporating techniques which are tried-and-tested in the UK and internationally.

**Figure 6.3 Horizon’s waste hierarchy**

**Towards Zero Waste**

The Horizon Waste Hierarchy

- **Prevention & Minimisation**
  - Reduce the quantity of waste produced, use less materials in design, design products for a longer life, reduce the content of harmful substances, buy fewer items, buy products with higher recycled content, keep products longer and reuse products. Minimisation of the activity and volume of radioactive waste generated.

- **Preparing for Reuse**
  - Checking, cleaning, repairing, refurbishing whole items or spare parts, and preparing products for reuse that have become waste without any further processing.

- **Recycling**
  - Reprocessing waste into materials, products or substances that meet quality protocols, including anaerobic digestion and composting but excluding backfilling.

- **Other Recovery**
  - Incineration with energy (fuels, heat, power) recovery, incineration of radiological waste and backfilling.

- **Disposal**
  - Incineration without energy recovery and landfill.

97. Horizon will produce Radioactive Wastes that fall into different categories depending on the type and level of radioactivity emitted and whether the waste generates heat. The different categories of Radioactive Waste recognised in the UK are Low Level Waste (LLW), Intermediate Level Waste (ILW) and High Level Waste (HLW).

98. In addition, Horizon will produce Spent Fuel, defined as fuel which has been used in the reactor and is no longer useful in sustaining a nuclear reaction. Although Spent Fuel is managed as a waste, it is not strictly defined as such as it may be re-processed for further use if there are future changes to UK policy.

99. Disposal routes already exist for LLW, so any LLW that Horizon produces in the future will be consigned to suitable off-site disposal facilities as soon as practicable.

100. ILW will be processed and packaged into appropriate containers before being stored in the ILW storage facility on the NLS.
101. HLW consisting of control rods and other activated metals will be stored in the Spent Fuel pool prior to being packaged into appropriate containers and stored on the NLS. The HLW will remain in decay storage until it has reduced in radioactive content (decayed) sufficiently to be categorised as ILW.

102. Spent Fuel will be stored in the Spent Fuel pool prior to being packaged into appropriate containers before being stored in the Spent Fuel Storage Facility on the NLS.

103. The UK Government has committed to provide a disposal solution for Spent Fuel and ILW from UK new build nuclear plants. Government policy requires Horizon to safely and securely store Spent Fuel and ILW produced on the NLS, until it can be disposed of to a national GDF. Once the GDF is built, it will first accept wastes from existing nuclear power stations and then wastes from new nuclear power stations built after the Government made this commitment in 2014.

104. Horizon intends to store and manage all ILW and Spent Fuel on the NLS in secure, purpose-built facilities for up to 140 years. The storage period is a result of the GDF not being immediately available as well as the heat constraints associated with the GDF, which are expected to require a period of cooling for the Spent Fuel prior to disposal.

105. All Radioactive Waste and Spent Fuel within the storage facilities will be consigned off-site to the GDF when it is available and in accordance with terms to be agreed with the Government. Before the point of disposal to the GDF, Spent Fuel and HLW (decayed to ILW as described above) will need to be repackaged in purpose built facilities. The ILW packages will not require repackaging prior to disposal. Decommissioning will be complete once all waste and spent fuel has been consigned to the GDF and the site has been delicensed following assessment by the ONR.

6.10 Decommissioning

106. At the end of the Power Station’s expected 60-year operating phase, the activities required to decommission the Power Station and associated off-site structures will commence. The objective of decommissioning is to transition the NLS from an operational state to an end state that will be agreed with the relevant authorities.

107. The ability to safely decommission the Power Station is being considered as part of the design of the Power Station, with chapters on decommissioning included in the GDA-PCSR, and to be included in the WN-PCSR.

108. Horizon undertook an option study to identify the preferred decommissioning strategy. The preferred option is being used to develop the Decommissioning and Waste Management Plan (DWMP) which supports the FDP discussed further in Section 8.3.1. Under the Energy Act 2008, before starting nuclear significant construction (interpreted as the pouring of nuclear safety related concrete), a prospective operator of a new nuclear power station must hold an approved FDP, to demonstrate that it has secure financing arrangements in place to meet the full costs of decommissioning and its full share of waste management and disposal costs.

109. Horizon’s current preferred decommissioning strategy is to safely decommission the NLS promptly, ahead of fulfilling the ‘no danger’ criteria to end the ‘period of responsibility’, in two distinct phases.

   I. First Decommissioning Phase: Currently this phase will see all buildings demolished, except the Spent Fuel and ILW storage facilities and the facilities that support them. All waste that can be disposed of off-site will be consigned as soon as reasonably practicable to prevent its accumulation on-site. Any remaining Radioactive Waste that cannot immediately be consigned off-site will remain in the on-site storage...
facilities until a disposal route is available and the waste is suitable for disposal. The land previously occupied by the operating reactors and associated facilities (that is, the land other than the Spent Fuel and ILW storage facilities and the facilities that support them) will no longer require a NSL so Horizon will move towards delicensing this land. A delicensing Safety Case will be presented to the ONR; this report will include the results of extensive surveying and sampling which will demonstrate that the land meets the no danger criterion set by NIA65. The ONR will assess the delicensing Safety Case and once it is satisfied that the land does not present any danger from ionising radiations it will delicense this part of the site, which signifies the end of the first Decommissioning Phase.

II. Second Decommissioning Phase: This will comprise activities to manage ILW and Spent Fuel and on-going maintenance of the storage facilities for up to 140 years after operation of the Power Station ceases. Once all the waste has been consigned to the GDF, the storage facilities will be decommissioned and the remaining land will be delicensed.

110. Due to the long timescales involved, Horizon will continue to review its decommissioning strategy to ensure the assumptions within it remain valid, and will add detail as required.

6.11 Site Justification

111. In applying for a NSL, it is incumbent upon Horizon to demonstrate that the proposed NLS is suitable for the proposed development and its engineering and infrastructure requirements. A Wylfa Newydd Site Justification Report (WN-SJR) will be produced, as defined in the SCDP. The WN-SJR provides an overview of the Wylfa Newydd site characteristics and references documents that provide supporting detailed information on the Wylfa Newydd site characteristics.

112. The scope of the WN-SJR includes a comparison of the Wylfa Newydd site characteristics and the generic site characteristics used, and provided in the GDA-PCSR for the purposes of defining a generic site envelope. Furthermore, the WN-SJR considers and provides detail of hazards not considered within the GDA-PCSR. For all external hazards, the WN-SJR identifies why the site is suitable, and/or future work related to dealing with external hazards. See the SCDP for further information on Horizon’s plans for the development of Safety Cases.

113. Justification of the NLS is in two parts, the first of which is the suitability of the site itself based on the site-specific characteristics. The proposed NLS is being characterised in ongoing site works and by using available data from existing documentation for the area. Significant work has been undertaken and the characterisation of the site will link into the assessment of the site-specific external hazards, required for the development of a WN-PCSR, which will demonstrate that risks to persons at the NLS have been reduced to a level that is As Low As Reasonably Practicable.

114. The second part of the justification is the demonstration of the following, with appropriate evidence.

I. The NLS is of sufficient size. Horizon has produced an indicative site layout based on the current plans (see Figure 5.2) which demonstrates that the proposed size of the NLS is sufficient to house two UK ABWRs and all associated ancillary buildings.

II. The Power Station is (or can be) connected to grid supplies. The Power Station will require a new connection to the national grid. The grid connection to the Existing Power Station has been in place since the 1960s but is insufficient to handle the output of the Wylfa Newydd Power Station. National Grid therefore needs to strengthen the network and accordingly has carried out a strategic options process.
Following an initial consultation process in 2012, the preliminary preferred option was for a new overhead line with underground cables at the Menai Strait. This would broadly follow the existing power line on Anglesey that currently connects the Existing Power Station. National Grid undertook further consultation between October and December 2016, looking at the overland route options and issues associated with the underground section at the Menai Strait. Further information can be found on the National Grid website; http://www.northwalesconnection.com.

III. There is adequate cooling capability for normal and fault conditions. The design of the cooling water system will be such that it can be demonstrated that the cooling water pumps can deliver a sufficient flow rate under all conditions. Cooling water must be available at all times to cool the reactor core, the Nuclear Fuel and the Spent Fuel pool. Provision will also be made for a Reserve Ultimate Heat Sink, given the potential for cooling water intake blockage and loss of the normal heat sink. The cooling water supply from the Irish Sea will be characterised, for example, for minimum and maximum temperatures and water levels.

IV. The environmental conditions would not preclude the use of the site with respect to external hazards, namely; the impact of the two UK ABWRs on the environment will be justified, and with respect to the presence of the Existing Power Station. External hazards are broadly defined as those which originate outside the boundaries of a site. This includes natural hazards such as earthquakes and extreme weather (including flooding), as well as man-made hazards such as aircraft impact and electromagnetic interference. An assessment of the external hazards will be included as part of the WN-PCSR. Initial assessments have demonstrated that no single hazard or reasonably foreseeable combination of external hazards would threaten the long-term viability of the NLS. The assessment will be presented during the period when the ONR is assessing the SLA. The WN-SJR will also present a preliminary assessment of the physical factors at site that could affect the dispersion of radioactivity in the event of an undesired release.

V. The underlying geology will provide secure long-term support to the various structures, systems and components. Significant ground investigation work has been undertaken at the NLS, principally to support the ongoing seismic hazard assessment work and to provide other geological evidence for the forthcoming WN-SJR. The investigation work included ground-penetrating radar surveys and excavation of trial pits, observation trenches and boreholes. The information gained has enhanced the knowledge base with respect to the geological and hydrogeological characteristics of the NLS. Furthermore, the analysis of the ground investigation results will support the demonstration that the Power Station structures will not be vulnerable to seismic action and that the design and construction of safety-related structures will be compatible with the local ground conditions.

VI. There is a schedule for safety submissions to support subsequent construction, commissioning, operation and decommissioning milestones. The SCDP presents the high level plan for the development of Safety Cases.
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7 Summary of the Site Licence Application Documentation

7.1 Company Manual

115. This section introduces and describes the main purpose of the key documents that make up the SLA package. The overall structure of the SLA is given in Section 3.4.

116. The Company Manual outlines the corporate governance structures which implement Horizon’s safety, assurance, technical, legal, commercial, financial and project management arrangements, which control the entirety of Horizon’s business.

117. The Company Manual describes the accountabilities of HLT Directors and the purpose of the HLT and the Horizon Board, describing the framework that enables Horizon to discharge its regulatory duties, including in relation to safety. The Company Manual also describes how Horizon secures and controls its staff resource.

118. The Company Manual will be reviewed and updated as necessary.

7.2 Management Prospectus

119. The purpose of the Management Prospectus is to describe Horizon’s organisation and management arrangements (including management system) to demonstrate that Horizon is capable of holding and maintaining a NSL. The Management Prospectus provides a strategic, overarching description of how regulated activities, including nuclear safety, security, radiological environmental protection, and quality (in so far as it supports the delivery of these), are managed within the organisation and shows how the management controls will be appropriate and sufficient to enable Horizon to discharge its obligations under the NSL in all lifecycle phases. This Management Prospectus will be kept under review and may be updated at appropriate business delivery points to ensure its accuracy and validity.

7.3 Nuclear Baseline Report

120. The Nuclear Baseline is the means by which Horizon demonstrates that the organisational structures, staffing and competencies are, and remain, suitable and sufficient to manage nuclear safety, security, radiological environmental protection; and quality in so far as it supports the delivery of these, throughout the full range of Horizon’s activities for planned and reasonably foreseeable events including emergencies.

121. The Nuclear Baseline Report describes Horizon’s Nuclear Baseline for the organisation at SLG and indicates Horizon’s current position in relation to this Nuclear Baseline.

7.4 Nuclear Site Licence Compliance Matrix

122. The NSL Compliance Matrix summarises how Horizon complies with or will comply with, each of the current standard 36 Licence Conditions that are expected to be attached to the NSL.

123. The NSL Compliance Matrix identifies that Horizon will formally apply to the ONR for the exclusion of LC2(4) (which relates to the requirement to physically mark the NLS boundary) from the Licence that is granted to Horizon. It is considered impracticable and potentially unsafe to physically mark and maintain the NLS boundary during the Development Phase and earlier part of the Construction Phase, due to the significant earthworks and deep excavations that are anticipated to occur on and around the site during those times. Horizon plans to ensure the NLS boundary is physically marked by
appropriate means before pouring nuclear safety-related concrete for construction of unit 2 of the Power Station (following completion of earthworks, deep excavations and creation of the unit 2 platform). Horizon therefore anticipates that the LC2(4) exclusion will only apply until that point in time.

7.5 Safety Case Development Plan
124. The SCDP presents a high level plan for the development of the Safety Case(s) required for the Power Station. Safety Cases are described in Section 5.3.1.

7.6 Nuclear Licensed Site Boundary Map
125. The NLS Boundary Map defines the extent of the NLS, which encompasses all Licensable Activities. It therefore assists with the application of the LCs and indicates the extent of Horizon’s absolute liability for occurrences on the NLS.

7.7 Nuclear Safety Committee - Terms of Reference
126. In accordance with the current standard LC13 Horizon will set up a Nuclear Safety Committee (NSC); however this cannot be formally established until the NSL has been granted. In the interim, Horizon has established a Preliminary NSC (Pre-NSC) which operates as closely as possible to the requirements of the NSC. The Pre-NSC will be dissolved following SLG and the NSC will be formally established at that point. The Terms of Reference (ToR) for the NSC outline the purpose, membership and arrangements for the NSC and are supported by a number of more detailed working procedures.

7.8 Nuclear Site Licence Application Glossary
127. The Glossary defines the terms that are used throughout the SLA documentation.

7.9 Summary Forward Work Plan
128. The Summary Forward Work Plan summarises key plans and strategies which relate to the NSL, describing how Horizon will develop through the lifecycle of the Power Station with greater detail given for the current and next phase of work.
8 Other Permits, Authorisations and Plans

129. In common with any other large infrastructure projects, Horizon will require a number of permits and authorisations before starting construction of the Power Station. In addition to the NSL, a number of nuclear and non-nuclear related permits and authorisations will also be needed. These are outlined below.

8.1 Office for Nuclear Regulation

8.1.1 Nuclear Safety Submissions

130. Under the LCs, Horizon’s arrangements and activities which have nuclear safety significance are subject to expert assessment by the ONR and may require prior regulatory permission before work commences or changes are implemented.

131. Horizon will require regulatory permission to carry out certain activities which the ONR may specify. For example, the ONR normally specifies that a Licensee shall ensure that when a plant is shut down in accordance with the requirements of its maintenance schedule, it shall not be started up again without permission from the ONR. Before being granted such regulatory permission the Licensee must satisfy the ONR that the proposed activity is supported by an adequate Safety Case and that adequate procedures are in place to manage safety.

132. Horizon and the ONR will agree a schedule of safety submissions leading up to SLG, and subsequently the Safety Case, to support the permission of specified activities to proceed from one stage to the next. The ONR’s intervention strategy will set out some of the key topics to be assessed in the Safety Case submissions. The safety documentation may draw upon the generic Safety Case but will need to include additional site-specific information.

8.1.2 Security Requirements

133. The ONR CNS has responsibility for regulating security at civil nuclear sites and enforcing the Nuclear Industries Security Regulations 2003. The ONR will not grant a NSL until it is satisfied that appropriate measures are in place to manage all relevant aspects of security. Up to the point of SLG, Horizon will operate under an approved CSSP. At the point of SLG, there is a similar requirement for a NSSP which will remain in place throughout the life of the Power Station until all Nuclear Material and other Radioactive Material has been removed from the NLS following decommissioning. Horizon’s security arrangements are discussed in more detail in Section 6.7 above.

8.1.3 Radioactive Materials Transport

134. Regulations governing the transport of Radioactive Material in Great Britain are based on standards developed by the IAEA. The ONR regulate safety and security during the transport of Radioactive Material by road and rail in Great Britain, therefore Horizon will be subject to regulation for the transport of Radioactive Material associated with the Power Station. This will include items such as sealed radioactive sources used during construction, and in the future transporting flasks carrying Spent Fuel from the NLS to the GDF when available.

135. The ONR grant approval for the designs of packages (such as Spent Fuel flasks) used to carry high-hazard Radioactive Material. This is to ensure the designs meet exacting international safety standards, and that packages are built to robust Quality Assurance requirements, and are correctly used and maintained.
8.2 Natural Resources Wales

136. Applications to NRW under the Environmental Permitting (England and Wales) Regulations 2010 will be sought for water discharge activities, combustion activities and radioactive substances activities. Additionally, a water abstraction licence may be required from NRW in order to remove water from deep excavations during construction.

137. Although a NSL is not necessarily required in order to be granted an EP-RSR, it is anticipated that Horizon would receive the permit from NRW around the time of SLG.

8.3 Department for Business, Energy and Industrial Strategy

138. In 2016 the Department of Energy and Climate Change was merged with the Department for Business, Innovation and Skills to form the Department for Business, Energy and Industrial Strategy (DBEIS).

8.3.1 Funded Decommissioning Programme

139. The Energy Act 2008 requires that all operators of new nuclear power stations have secure financial arrangements in place to meet the full costs of decommissioning and their full share of waste management and disposal costs. As a result, all operators of new nuclear power stations are required to have in place a FDP so that the risk of recourse to public funds is remote. Under the Energy Act 2008, this must be approved by the Secretary of State for Business, Energy and Industrial Strategy and be in place before starting construction of the new nuclear power station (DBEIS guidance interprets this point as the placement of the first structural concrete for buildings which have nuclear safety significance). Following approval, the Licensee must comply with the FDP.

140. The DBEIS guidance document identifies the key principles of a FDP. On the basis of that guidance, Horizon’s FDP will comprise two related parts: the DWMP, as introduced in Section 6.10, and the Funding Arrangements Plan (FAP). The DWMP details the likely size of the liabilities and the FAP, which is legally binding on the operator, ensures that the associated funding is available. The aim of the DWMP and FAP is to consider the strategic and technical issues, financial costs and funding arrangements such that the FDP can be delivered to DBEIS.

141. The Horizon FDP will contain arrangements to ensure the fund company (established under the FAP) is independently governed. This will ensure the fund assets are protected. The approved FDP must be in place to obtain regulatory permission from the ONR to begin nuclear construction.

8.3.2 Third Party Nuclear Liability Insurance

142. As identified in the ONR’s guidance document Licensing Nuclear Installations [RD2] the NIA65 [RD3] places an absolute liability upon the Licensee as regards injury to persons or damage to property arising from a nuclear occurrence, without need for proof of Licensee fault. NIA65 Section 19(1) requires Licensees to make provision for sufficient funds to be available (by way of insurance or some other means) in respect of such liabilities. Horizon will seek approval from DBEIS that the cover period under Section 19(1) shall become effective upon the first receipt of Nuclear Fuel at the NLS (this approval has not yet been granted). If this approval is not in place at the time of SLG, provision will be made by way of insurance or some other means to ensure that sufficient funding is available to meet this obligation. In this way Horizon will ensure that at all times it will be able to fully meet its obligation under the provisions of Section 19(1).
Nuclear Installations (Liability for Damage) Order 2016 includes provisions which will expand the scope of a Licensee’s absolute liability under this regime. When the relevant provisions of this order come into force, Horizon will ensure that the provision it makes for the purposes of Section 19(1) addresses this expanded scope.

8.3.3 Justification of Practices Involving Ionising Radiation Regulations 2004

143. The Justification of Practices Involving Ionising Radiation Regulations 2004 implemented the European Union Council Directive 96/29/Euratom (known as the Basic Safety Standards Directive) which set down the basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation. The Directive requires the UK to ensure that all new classes or types of practice resulting in exposure to ionising radiation are justified by assessing the economic, social or other benefits against the health detriment they may cause, in advance of being first adopted or first approved.

144. The UK ABWR practice has been justified for the purposes of the regulations by virtue of the Justification Decision (Generation of Electricity by the UK ABWR Nuclear Reactor) Regulations 2015 and is defined as follows:

“the class or type of practice which is the generation of electricity from Nuclear Energy using oxide fuel of low enrichment in fissile content in a light water-cooled, light water moderated thermal reactor known as UK ABWR designed by Hitachi-GE Nuclear Energy, Ltd. and where the specification of that reactor matches that set out in Annex 1 to the document “Consultation on the Nuclear Industry Association’s Application to Justify the UK Advanced Boiling Water Reactor (UK ABWR)-Volume 2: Application Submitted by the Nuclear Industry Association” published in February 2014 by the Department of Energy and Climate Change, URN 14D/004”.

145. As noted above, since the justification decision, the Department of Energy and Climate Change has been merged with the Department for Business, Innovation and Skills to become DBEIS.

8.3.4 Development Consent Order

146. As noted previously, Horizon will be submitting an application to the Secretary of State for Business, Energy and Industrial Strategy via the Planning Inspectorate seeking a DCO to build and operate the new Power Station.

147. In accordance with its Statement of Community Consultation, Horizon has undertaken two stages of pre-application consultation. Stage 1 was completed in late 2015 and Stage 2 took place in the late summer of 2016. Horizon is also due to undertake a third stage of pre-application consultation scheduled for the summer of 2017. This process provides the public and prescribed consultees with information about the Power Station and the effect that construction and operation could have on local communities, the environment and infrastructure. Consultation feedback is being used to inform and refine certain aspects of the Project where there is scope for influence. This includes for example, landscaping preferences and opportunities for legacy benefits.

148. In order to secure a DCO for the Power Station, Horizon will need to ensure that the planning applications for Associated Development (see Section 8.4), and other important consents such as the marine licence for works and activities in the marine environment, have also been approved or progressed to a position where approval is likely, ahead of the examination period of the DCO.
8.4 Isle of Anglesey County Council

Horizon will need to obtain planning permission and other consents under the Town and Country Planning Act 1990 (TCPA) and the Highways Act 1980 to construct certain infrastructure and other development (Associated Development) necessary to support the delivery of the Power Station. Isle of Anglesey County Council will be the determining authority for applications made under these two acts. Those developments that will require planning permission under the TCPA may require supporting environmental statements depending on their scale and nature. Any environmental statements or reports along with any other supporting materials, will also be subject to scrutiny by statutory consultees such as NRW. In some cases (for example, pre-DCO site preparation and clearance) an Environmental Permit for surface water drainage from NRW, will also be required. There may also be requirements for additional licences and orders related to for example, translocation of protected species, temporary closure or diversion of footpaths and removal of trees and hedgerows.

149. The list of Associated Development for which planning permission from the Isle of Anglesey County Council will be sought includes but is not limited to activities such as:

- road improvements;
- pre-DCO site preparation and clearance;
- development of permanent (that would initially be used for workers) accommodation aligned with spatial planning; and
- development of a visitor and media centre.

150. Once the Isle of Anglesey County Council has issued such consents, Horizon will need to discharge any associated planning conditions and obligations that are specified.

8.5 Euratom Obligations

The result of the UK referendum regarding membership of the European Union was for the UK to cease to be a member state. Whilst the realisation of non-membership will relieve the UK of strict compliance with the total body of European law (including those obligations placed on a member states’ administration or on a developer by the Euratom Treaty), Horizon has adopted the strategy of ‘no change’ until advised otherwise by the UK Government, or an actual change of law occurs.

8.5.1 Submission of Data under Article 37 of the Euratom Treaty

Under Article 37 of the Euratom Treaty, every time a member state alters the way in which it plans to dispose of Radioactive Waste or has a new nuclear facility that may increase discharges to air, water or land, it must make a submission of general data to the European Commission (referred to as an Article 37 submission). The European Commission will use the general data to determine whether the implementation of such plans is liable to result in the radioactive contamination of the water, soil or airspace of another member state [RD11]. The Article 37 submission for the NLS will be made in accordance with Annex 1 of [RD11] for the operation of two UK ABWRs with associated on-site storage of Spent Fuel and Radioactive Waste.

154. The legal duty is on the UK Government to make the Article 37 submission to the European Commission. Horizon is preparing the Article 37 submission for consideration by DBEIS (as the UK competent body) prior to DBEIS sending it to the European Commission.
8.5.2 Submission of Data under Article 41 of the Euratom Treaty

155. An Article 41 submission was made to the European Commission prior to SLA. Article 41 of the Euratom Treaty stipulates that persons and undertakings shall communicate to the European Commission the details of investment projects relating to new Nuclear Installations they propose to develop in a European Union member state. The submission allows the European Commission to consider the Power Station in relation to the objectives of, and compliance with, the Euratom Treaty. UK law does not make an Article 41 submission a prerequisite to the granting of mandatory permissions, however, Horizon believes it is prudent to make the Article 41 submission at this time, prior to the establishment of major construction or procurement contracts.

8.5.3 Application of Nuclear Safeguards

156. The application of Nuclear Safeguards is described in Section 6.8.
9 Conclusions

157. Horizon considers that the documents that make up the SLA package provide all the information required for the application and represent a route map to Horizon becoming a Licensee. The SLA describes the suitability of Horizon’s proposals, and explains how Horizon is in control of all activities required to demonstrate the following:

- the development of the organisation is on track for Horizon to become a capable Licensee at SLG;
- the design of the UK ABWR will meet UK regulatory requirements and that risks to workers, visitors and the public will be reduced to a level that is As Low As Reasonably Practicable;
- the Wylfa NPS Site is a suitable location for a UK ABWR power station; and
- appropriate safety, security, emergency planning and waste management arrangements will be in place for the lifecycle of the Power Station through to decommissioning and final site clearance.
## 10 Schedule of References

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Document Number</th>
<th>Title</th>
<th>Rev No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>[RD3]</td>
<td></td>
<td>Nuclear Installations Act 1965 (NIA65)</td>
<td></td>
</tr>
<tr>
<td>[RD4]</td>
<td></td>
<td>Nuclear Installations Regulations 1971 (NIR71)</td>
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</tr>
<tr>
<td>[RD9]</td>
<td>IAEA STI/PUB/1710</td>
<td>The Fukushima Daiichi Accident</td>
<td>2015</td>
</tr>
</tbody>
</table>
## Appendix A  Meeting the ONR’s expectations for the SLA

<table>
<thead>
<tr>
<th>No.</th>
<th>ONR Expectation</th>
<th>Relevant SLA Document(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name and description of Licensee</td>
<td>Application for Nuclear Site Licence for Wylfa Newydd Power Station Letter and Company Manual</td>
</tr>
<tr>
<td>2</td>
<td>A description of the installations and licensable activities</td>
<td>Application for Nuclear Site Licence for Wylfa Newydd Power Station Letter and Nuclear Site Licence Application - Overview Document</td>
</tr>
<tr>
<td>3</td>
<td>A demonstration of conformity with relevant UK Government siting policies</td>
<td>Nuclear Site Licence Application - Overview Document</td>
</tr>
<tr>
<td>4</td>
<td>A map of the site and its location, with details of the local demographics</td>
<td>Nuclear Site Licence Application - Overview Document</td>
</tr>
<tr>
<td>5</td>
<td>Details of the ownership of the site or arrangements for its leasing, by which the applicant will achieve security of tenure and rights of access to the site commensurate with its obligations under NIA65 and the site licence conditions</td>
<td>Nuclear Site Licence Application - Overview Document</td>
</tr>
<tr>
<td>6</td>
<td>Details of inter-site safety and security agreements in relation to the adjacent nuclear site</td>
<td>Nuclear Site Licence Application - Overview Document</td>
</tr>
<tr>
<td>7</td>
<td>A safety management prospectus including the nuclear baseline</td>
<td>Management Prospectus and Nuclear Site Licence Application - Nuclear Baseline Report</td>
</tr>
<tr>
<td>8</td>
<td>Licence condition compliance arrangements</td>
<td>Nuclear Site Licence Compliance Matrix - Wylfa Newydd Power Station</td>
</tr>
<tr>
<td>9</td>
<td>Adequate safety submissions complemented by a programme setting out their continued development where necessary</td>
<td>Safety Case Development Plan - Wylfa Newydd Power Station and Nuclear Site Licence Application - Overview Document</td>
</tr>
<tr>
<td>No.</td>
<td>ONR Expectation</td>
<td>Relevant SLA Document(s)</td>
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</tr>
<tr>
<td>10</td>
<td>Details of appropriate emergency arrangements and a suitable emergency plan (this may be limited in extent for the period before Nuclear Fuel is brought onto the site)</td>
<td>Nuclear Site Licence Application - Overview Document</td>
</tr>
<tr>
<td>11</td>
<td>Terms of reference for the Licensee’s Nuclear Safety Committee (NSC)</td>
<td>Nuclear Safety Committee - Terms of Reference</td>
</tr>
<tr>
<td>12</td>
<td>A statement setting out a strategy for decommissioning the proposed installation</td>
<td>Nuclear Site Licence Application - Overview Document</td>
</tr>
<tr>
<td>13</td>
<td>A statement regarding the status of the justification of the proposed operational activities as required by the Justification of Practices Involving Ionising Radiation Regulations 2004</td>
<td>Nuclear Site Licence Application - Overview Document</td>
</tr>
<tr>
<td>15</td>
<td>An explanation of the relationship between the Licensee and parent company</td>
<td>Company Manual</td>
</tr>
<tr>
<td>16</td>
<td>A statement on Horizon’s position with respect to the outcome of GDA</td>
<td>Nuclear Site Licence Application - Overview Document</td>
</tr>
<tr>
<td>17</td>
<td>A statement regarding the development of Horizon’s waste management strategy</td>
<td>Nuclear Site Licence Application - Overview Document</td>
</tr>
<tr>
<td>18</td>
<td>Statements regarding Horizon’s submissions under Article 37 and Article 41 of the Euratom Treaty</td>
<td>Nuclear Site Licence Application - Overview Document</td>
</tr>
<tr>
<td>19</td>
<td>Reference to the approved construction site security plan, and a statement about the development of the nuclear site security plan</td>
<td>Nuclear Site Licence Application - Overview Document</td>
</tr>
<tr>
<td>20</td>
<td>A statement regarding the timing and development of appropriate Nuclear Safeguards arrangements</td>
<td>Nuclear Site Licence Application - Overview Document</td>
</tr>
<tr>
<td>21</td>
<td>A statement setting out the programme for the Department for Business, Energy and Industrial Strategy (previously DECC) approval of the Funded Decommissioning Programme (FDP)</td>
<td>Nuclear Site Licence Application - Overview Document</td>
</tr>
<tr>
<td>22</td>
<td>A statement on Third Party Nuclear Liability Insurance</td>
<td>Nuclear Site Licence Application - Overview Document</td>
</tr>
<tr>
<td>No.</td>
<td>ONR Expectation</td>
<td>Relevant SLA Document(s)</td>
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| 23  | Address the development of organisational capability, company structures, governance and procedures including:  
• core capability;  
• Intelligent Customer;  
• Design Authority;  
• internal challenge; and  
• procurement | Company Manual, Management Prospectus and Nuclear Site Licence Application - Summary Forward Work Plan |
| 24  | Statement on other authorisations, consents and permits relating to the SLA | Nuclear Site Licence Application - Overview Document                                    |
| 25  | Responses to lessons learnt from Fukushima                                       | Nuclear Site Licence Application - Overview Document                                    |
| 26  | Nominate a specific site and provide a suitable map of the proposed boundary     | Nuclear Licensed Site Boundary Map for Wylfa Newydd Power Station                      |