



**Environmental Permitting (England and Wales)  
Regulations 2010**

**Application by NNB Generation Company Ltd (NNB GenCo)  
to carry on combustion activities at  
Hinkley Point C Power Station  
EPR/ZP3238FH**

**Decision document**

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**Published by:**

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[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

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## Executive Summary

- 1 NNB Generation Company Limited (NNB GenCo) has applied for an environmental permit to carry on combustion activities at a proposed new nuclear power station it wishes to build at Hinkley Point in Somerset. The proposed new power station is known as Hinkley Point C Power Station.
- 2 Hinkley Point C (HPC) will be located immediately due west of the existing Hinkley Point A and B power stations on the Somerset coast, and approximately 12km north-west of the town of Bridgwater. The combustion activity will consist of twelve back-up diesel generators with a combined net thermal input of 176 MWth, associated fuel storage tanks and interconnecting pipework. The generators will be housed in four purpose built concrete buildings each containing two 18.5 MWth Essential Diesel Generators (EDG) and one 7 MWth Station Blackout Diesel Generator (SBO).
- 3 The diesel generators will be safety classified standby equipment and would only be operated in the event of a power failure and during periodic testing.
- 4 The main emissions are to air via exhaust stacks of approximately 30 metres in height and will consist of combustion gases containing particulates as well as oxides of sulphur, nitrogen and carbon. Our assessment of the environmental impact of these emissions covers three operational scenarios namely Commissioning, Routine Testing and Loss of Off-site Power (LOOP), further details are given below.

### ***Commissioning scenario***

- 5 This scenario recognises that only one EDG or SBO is likely to be in operation at any one time and the assessment scenario uses emission rates from the EDG as these represent the worst case as they have the greater predicted emissions.
- 6 Long term impacts have been assessed on the basis of 4,892 operational hours over one year which represents eight EDGs operated for 242.5 hours each and four SBOs operated for 738 hours each.
- 7 Short term impacts have been assessed on the basis that one EDG is operated continuously throughout the year.

### ***Routine Testing scenario***

- 8 This scenario covers operation of the plant for maintenance and periodic safety tests and involves only a single generator operating at any one time.
- 9 Long term impacts are assessed on the basis of 720 hours combined operation of the EDGs which represents eight EDGs operated for 60 hours each per year.
- 10 Short term impacts have been assessed on the basis that one EDG is operated continuously throughout the year.

### ***LOOP scenario***

- 11 This covers an event resulting in loss of off-site power for 24 hours with all eight EDGs operating for 25 hours. The scenario does not include operation of SBOs as these would only operate if the EDGs failed to start and their combined impact would be less than that of the eight EDGs due to the lower emissions.
- 12 Long term and short term impact have been assessed for all three operational scenarios. Key issues arising during this determination were air quality and the dispersion of emissions to air and the impact of these emissions on the local environment.

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- 13 Our assessment of the air dispersion modelling has concluded that exceedence of the relevant air quality objectives and environmental assessment levels are not likely at the Emission Limit Values (ELVs) we have set within the permit.
- 14 We previously advertised the application and consulted on it. We assessed the application, considered the responses received and made a draft decision to grant the permit subject to the conditions in the draft permit.
- 15 Our overall conclusion at that stage was that there was no reason why we should not grant a permit. We considered that the limits and conditions in the draft permit were suitable to protect people and the environment.
- 16 We then carried out a consultation on our draft decision and draft environmental permit. The purpose of that consultation was to seek views to help us come to a final decision, in particular whether there were any errors, omissions or new relevant information that had not been considered.
- 17 For our consultation we advertised and published our draft decision and draft permit. We held public surgeries and meetings with councillors in the local area as far afield as South Wales. We received responses from partner organisations, other interested groups and members of the public. We have made all the response available on public registers.
- 18 We assessed all the issues raised by consultees. We consider that nothing has been raised that requires us to make any changes to our draft decision. We have, therefore, decided to grant NNB GenCo an environmental permit to allow it to carry on combustion activities at Hinkley Point C Power Station. The permit we are granting has not changed from the draft permit we consulted on.

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## 1. Introduction

### 1.1 About this decision document

19 The purpose of this decision document is to set out our considerations and decisions on the application.

20 This document explains:

- the role of the Environment Agency;
- our assessment of the application; and
- our consideration of the responses received to our consultations.

21 This document includes a:

- description of how we process and determine applications (Section 2);
- summary of the application and our consultation on it (Section 3);
- description of our assessment (Section 4);
- statement of our decision (Section 5);
- summary of responses from those we consulted and how we have covered the issues raised (Annexes 2 and 4);

22 In this document we have:

- identified by name, organisations we have ‘working together’ agreements with; and
- not identified by name, members of the public who responded.

### 1.2 The Environment Agency

23 Our corporate strategy [Creating a better place 2010-2015](#)<sup>1</sup> sets out our aims and describes the role we play in being part of the solution to the environmental challenges society faces.

24 Our strategy aims to create a better place by securing positive outcomes for people and wildlife, in five key areas. We will:

- a) act to reduce climate change and its consequences;
- b) protect and improve water, land and air;
- c) work with people and communities to create better places;
- d) work with businesses and other organisations to use resources wisely;
- e) be the best we can.

<sup>1</sup> <http://publications.environment-agency.gov.uk/PDF/GEHO1109BQXE-E-E.pdf>

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### 1.3 Our role in environmental regulation

- 25 We regulate the environmental impacts of nuclear sites, such as nuclear power stations, nuclear fuel production plants and plants for reprocessing spent nuclear fuel, through a number of environmental permits. These permits may be needed during the site preparation, construction, operation and decommissioning phases of the plant's lifecycle.
- 26 The permits we issue include conditions and limits. In setting these, we take into account all relevant national and international standards and legal requirements, to ensure that people and the environment will be properly protected. These standards and requirements are described in Government and Environment Agency guidance available at:

**DEFRA Environmental Permitting Guidance**

<http://www.defra.gov.uk/environment/policy/permits/index.htm>

**DECC Environmental Permitting**

[http://www.decc.gov.uk/en/content/cms/meeting\\_energy/nuclear/radioactivity/decc/legislation/epr2010/epr2010.aspx](http://www.decc.gov.uk/en/content/cms/meeting_energy/nuclear/radioactivity/decc/legislation/epr2010/epr2010.aspx)

**EA Environmental Permitting Guidance**

<http://www.environment-agency.gov.uk/business/topics/permitting/32320.aspx>

- 27 We inspect sites to check that operators are complying with the conditions and limits, and that they have arrangements in place to help ensure compliance. We may take enforcement action (for example, issuing an enforcement notice or taking a prosecution) if they are not compliant.
- 28 We regularly review permits, and vary them if necessary, to ensure that the conditions and limits are still effective and appropriate. Where significant changes are required, we may consult on these changes.
- 29 We work closely with the Office for Nuclear Regulation (ONR), which regulates the safety, security and nuclear material safeguards and transport aspects of nuclear sites.

### 1.4 Our regulatory role in the development of new nuclear power stations

- 30 As with existing nuclear sites, any new nuclear power station will require environmental permits from us to cover specific aspects of site preparation, construction, operation and eventually decommissioning. In the light of Government and industry expectation that plants of almost the same design might be built on a number of sites and potentially be run by different operating companies, we have split our process for assessing and permitting the operational stage of new nuclear power stations into two phases.
- 31 In the first phase, Generic Design Assessment (GDA), we carry out detailed assessments of candidate designs put forward by reactor designers. We assessed the design of the UK EPR pressurised water reactor submitted by EDF and AREVA. In December 2011 we published our decision document and issued an Interim Statement of Design Acceptability ([interim SoDA or iSoDA](#))<sup>2</sup>

<sup>2</sup> <http://www.environment-agency.gov.uk/homeandleisure/135648.aspx>



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- 32 Our detailed assessment of the UK EPR also considered other (non-radiological) environmental matters where we have a regulatory role, for example, the operation of the diesel generators for backup electrical supply.
- 33 We have now completed the second phase and have completed our determination of an application for the combustion activities (diesel generators) environmental permit from NNB GenCo for its proposed Hinkley Point C Power Station.

## 1.5 NNB GenCo's applications for operational environmental permits

- 34 NNB GenCo has applied for three environmental permits for the power station when it is operational. These are for the disposal of radioactive waste, the operation of the standby diesel generators and the discharge of trade effluent (cooling water and process effluent) and treated sewage effluent.
- 35 We have now considered all three applications. This document deals with our consideration of the application for the stand-by diesel generators. We have produced separate decision documents for the other two applications.
- 36 NNB GenCo has not started to build the proposed power station at Hinkley Point C. NNB GenCo applied for permission in the form of a Development Consent Order from the Infrastructure Planning Commission (IPC). Consideration of the project has passed to the National Infrastructure Directorate (NID) of the Planning Inspectorate who will make a recommendation to the Secretary of State for a decision.
- 37 The Overarching National Policy Statement for Energy EN1 says *"The planning and pollution control systems are separate but complementary"* and that *"the IPC should work on the assumption that the relevant pollution control regime and other environmental regulatory regimes, .....will be properly applied and enforced by the relevant regulator"*, also that *"the IPC should be satisfied, before consenting any potentially polluting developments, that the relevant pollution control authority is satisfied that potential releases can be adequately regulated under the pollution control framework....."*
- 38 EN1 also states that *"Wherever possible, applicants are encouraged to submit applications for Environmental Permits and other necessary consents at the same time as applying to the IPC for development consent"*.
- 39 NNB GenCo applied for the permits and we considered the applications at this early stage of the development so that we were able to provide an update on our progress on our decision making to the NID at the appropriate time.
- 40 We consider that there are significant benefits in early regulation of site-specific design and the development of the operator's organisational capabilities.
- 41 In any case, we consider that issuing a permit early allows us to specify pre-operational conditions and requirements for further information in the permit, so that environmental matters are considered before the detailed design is finalised. We are also able to influence the commissioning programme to ensure that environmental matters are fully addressed.
- 42 When we issue the permit, we will regulate the site in accordance with our guidance in order to ensure that Best Available Techniques (BAT) are employed.

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## 2. How we process and determine applications

43 The Environment Agency is responsible under the Environmental Permitting (England and Wales) Regulations 2010 (EPR 10), as amended, for regulating the carrying on of certain activities on nuclear sites in England and Wales. This decision document details our assessment of an application for combustion activities, namely:

- operating diesel generators for electricity generation if the main power supply to the site is lost.
- commissioning and periodic routine testing of the diesel generators

44 We regulate these sites to protect members of the public from harm from the discharge and disposal of the release of pollutants into the air and to protect the wider environment. We regulate within a framework of extensive Government Policy, Strategy and Guidance. This framework is summarised in the Environmental Permitting Guidance. This guidance sets out the Government's position on how environmental permitting should be applied and implemented, and how both the Environment Agency and operators in England and Wales should interpret particular terms. In summary, the aim of the environmental permitting system is to:

- protect the environment so that statutory and Government policy environmental targets and outcomes are achieved;
- carry out permitting and achieve compliance with permits and certain environmental targets in a more open way, minimising the administrative burden on both the regulator and the operators;
- encourage regulators to promote best practice in operating facilities;
- continue to fully implement European legislation.

45 Operators can apply to the Environment Agency for a new permit or a variation to an existing permit at any time. The process we follow in assessing applications is shown in outline in table 1.

Phase		Comment
1	Pre-application	We encourage applicants to discuss applications with us before submission.
2	Receive application and consult on the application	The Operator makes an application, providing the information as set out in the application form and supporting guidance.  We advertise and consult on all applications for new permits. We may also advertise and consult on some variations, depending on the nature of the proposals and the likely degree of public interest.
3	Assess application and make a draft decision	We carefully assess the application and any responses received from the consultation and come to a draft decision on whether to grant the application and, if so, the appropriate permit conditions.
4	Consultation on draft decision	We may choose to consult further on our draft decision and draft permit, depending on the nature of the proposals and the likely degree of public interest. We do this using a consultation document that sets out our draft decision.
5	Review, approval and issue of decision	Where we consult on our draft decision, we carefully consider all relevant information we have received during and after the consultation, together with existing information.  We decide whether a new permit should be issued and, if so, what its conditions should be. We publish a document that provides the reasons for our decision.

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- 46 We advertised and consulted on this application in accordance with our public participation statement and associated working together arrangements: see our [“Working together: your role in our environmental permitting”](#). In view of the nature of the application and the degree of public interest, we decided to undertake additional consultation on our draft decision and draft permit. We did not make any final decision about this application until we had considered the responses to our public consultations.
- 47 We made our decision taking into account all relevant legal, policy and regulatory matters and consultation responses about the application. Table 2 sets out the main issues we need to consider when making decisions on the application and refers to relevant reference documents and guidance.

<b>Table 2 : Key Areas of Assessment</b>	
<b>Area of Assessment</b>	<b>Documentation</b>
Management and Operator Competence	<a href="#">How to comply with your Environmental Permit</a>  <a href="#">RGN 5 Operator Competence Management Guidance</a>
Technical	<a href="#">Combustion Activities (EPR 1.01)</a>
Monitoring	<a href="#">Technical Guidance Note (Monitoring) M2 Monitoring of stack emissions to air</a>
Other statutory requirements	<a href="#">RGN 4 setting standards for environmental Protection</a>

- 48 In section 4 of this document we explain how we have reached our decision against these and any other relevant considerations. We considered our decision against any responses received, before proceeding to our final decision. We will place the permit we issue and the reasons for our decision on the public register.
- 49 While we will normally determine an application, the Secretary of State can require any application to be sent to them for determination (regulation 62 of the EPR 10). As noted in the [Core guidance](#) this would be an exceptional step and likely to be taken only if the application involves issues of more than local importance – for example, if the application:
- is of substantial regional or national significance;
  - is of substantial regional or national controversy;
  - may involve issues of national security or of foreign governments.
- 50 The Core guidance also says that any decision on the need for determination by the Secretary of State would be made solely on those grounds, with no consideration of the substantive merits of the application itself.
- 51 The Secretary of State has not “called in” this application.

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### 3. The application and our consultations

- 52 NNB Generation Company Limited (NNB GenCo) applied for an environmental permit to carry out combustion activities at a proposed new nuclear power station at Hinkley Point in Somerset. The proposed new power station is known as Hinkley Point C Power Station.
- 53 NNB GenCo (Company number 06937084) was incorporated in 2009. It is a wholly owned subsidiary of NNB Holding Company Limited, which, in turn, is owned by EDF Energy Holdings Limited (80% share) and GB Gas Holdings Limited (20% share). Centrica (GB Gas Holdings) announced in February 2013 its decision not to participate in UK nuclear new build. NNB GenCo is known locally, and for some of the planning applications, as 'EDF Energy'.
- 54 NNB GenCo's application consisted of the relevant environmental permit application forms and a submission of information to provide the required detailed technical information.
- 55 NNB GenCo is a new organisation and construction of the proposed Hinkley Point C has not commenced. There are a number of areas where the organisation or the detailed design of the facilities will need to be developed. NNB GenCo proposed a forward action plan to deal with these matters within their application.

#### 3.1 Location of the site

- 56 Hinkley Point is located on the Somerset coast approximately 12 km north-west of Bridgwater. The combustion activity consists of twelve back-up diesel generators.
- 57 There are a number of international and national environmental designated sites close to Hinkley Point. These are:
- *Severn Estuary Special Protection Area (SPA)*
  - *Severn Estuary Special Area of Conservation (SAC)*
  - *Severn Estuary Ramsar site*
  - *Exmoor and Quantock Oakwoods Special Area of Conservation*
  - *Bridgwater Bay Site of Special Scientific Interest (SSSI)*
  - *Severn Estuary Site of Special Scientific Interest (SSSI)*
  - *Blue Anchor to Lilstock Coast Site of Special Scientific Interest*
  - *Bridgwater Bay National Nature Reserve.*
- 58 The nearest Area of Outstanding Natural Beauty (AONB) is Exmoor.

#### 3.2 Description of the proposed facility

- 59 The proposed facility consists of twelve back-up diesel generators which have a combined net thermal input of 176 MWth, associated fuel storage tanks and interconnecting pipework. The generators will be housed in four purpose built concrete buildings each containing two EDGs (18.5 MWth each) and one SBO (7 MWth).
- 60 The diesel generators are safety classified standby equipment and will only be operated in the event of a power failure and during periodic testing.

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61 The main emissions are to air via exhaust stacks of approximately 30 metres in height and will consist of combustion gases containing particulates and oxides of sulphur, nitrogen and carbon.

### 3.3 Further information requested from the applicant

62 If when we consider an application, we need further information, we can serve a notice on the applicant in accordance with Schedule 5 of the EPR 10. We refer to these notices as Schedule 5 notices.

63 As we considered NNB GenCo's application we found we needed further information and we served a Schedule 5 notice. We have made our notices available on our Hinkley Point webpage<sup>3</sup> and at local public registers. NNB GenCo have supplied the information we requested and published it together with the application on EDF Energy's Hinkley Point webpage<sup>4</sup>.

64 In our Schedule 5 notice we asked for:

- *clarification of the input data used for modelling;*
- *information on the modelling of noise from the combustion activity;*
- *a Best Available Techniques (BAT) options appraisal for the diesel engines.*

65 In addition to our information notices, we received additional information during the determination from NNB GenCo by e-mail on 02 February 2012 and by letter on 21 March 2012. We made a copy of this information available to the public in the same way as the response to our information notice.

66 We assessed the information provided and consider it met our requirements. We consider the information provided as detail that supports the information already provided with the application. We consider that making it publicly available before the start of this consultation is an adequate way of performing our "duty to involve" as described in section 4.11.8.

67 We have explained how we have taken into account the further information provided by NNB GenCo at the relevant place in this document, where we are explaining our assessment of the application

### 3.4 Consultation on the application

68 We advertised and consulted on the application from 25 August to 15 December 2011 in accordance with our Public Participation Statement<sup>5</sup> and Working Together Arrangements<sup>6</sup>. We made the responses available at the public registers, at Environment Agency and local authority offices listed in Annex 1, except where the person making the response asked us not to do so.

<sup>3</sup> <http://www.environment-agency.gov.uk/homeandleisure/127159.aspx>

<sup>4</sup> <http://hinkleypoint.edfenergyconsultation.info/public-documents/nuclear-site-licence-and-environmental-permit-applications/environmental-permit-applications/operational/>

<sup>5</sup> [http://www.environment-agency.gov.uk/static/documents/Business/Working\\_together\\_PPS\\_v2.0.pdf](http://www.environment-agency.gov.uk/static/documents/Business/Working_together_PPS_v2.0.pdf)

<sup>6</sup> <http://www.environment-agency.gov.uk/business/topics/permitting/36420.aspx>

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- 69 We have received responses from our consultation on the application from organisations we have working together agreements with, other organisations and members of the public.
- 70 We had some responses that supported the development, some that were opposed in principle to new nuclear development, and some that raised specific issues about the application.
- 71 Some of the responses were outside our remit and we have passed these onto the relevant bodies, for example safety related issues to ONR and general opposition to government policy to the Department of Energy and Climate Change (DECC). Some consultees raised concerns about higher activity waste storage and decommissioning. These issues are matters for government and are subject to the approval of the Funded Decommissioning Plan and the Government's Managing Radioactive Waste Safely programme, including the development of a geological disposal facility (GDF). These are not matters for us and we have forwarded the consultation responses to DECC.
- 72 We have explained how we have taken into account those consultation issues within our remit as detailed in annexes 2 and 4 in this document.

### 3.5 Consultation on the draft decision and draft permit

- 73 We advertised and consulted on the draft decision document and draft permit from 13 August to 9 November 2012 in accordance with our [Public Participation Statement](#)<sup>7</sup> and [Working Together Arrangements](#)<sup>8</sup>.
- 74 We published the draft decision document and draft permit on our website and made them available as listed in Annex 3.
- 75 In accordance with our communications plan, we placed advertisements, distributed posters, issued media releases and wrote to over 1,000 individuals and organisations inviting them to take part in the consultation. We held full day public surgeries in Bridgwater, Burnham, Cannington, Otterhampton, Stogursey, Watchet and Barry. We held meetings with local councillors in Bridgwater, Williton and Winsford in Somerset and Barry, Cardiff and Newport in South Wales.
- 76 We received responses from partner organisations, other interested groups and members of the public. These responses and how we have addressed them are contained within Annex 4.

### 3.6 Other applications

- 77 NNB GenCo has applied for two other environmental permits for the operation of the power station. These are for the operation of the nuclear facility (application reference EPR/ZP3690SY) and for the discharge of cooling water and trade effluent (application reference EPR/HP3228XT).

<sup>7</sup> [http://www.environment-agency.gov.uk/static/documents/Business/Working\\_together\\_PPS\\_v2.0.pdf](http://www.environment-agency.gov.uk/static/documents/Business/Working_together_PPS_v2.0.pdf)

<sup>8</sup> <http://www.environment-agency.gov.uk/business/topics/permitting/36420.aspx>

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## 4. Our assessment

### 4.1 Introduction

- 78 This section sets out our decision based on our assessment of the application and consideration of the responses to consultation on the application. There are a number of matters we need to consider before coming to a decision on whether to grant a permit and, if so, subject to what conditions.
- 79 In reaching our decision we have sought to take into account the relevant legislation, Government policy and guidance, our own guidance and the responses to the consultation on the application. Table 2 in section 2 summarises the main documentation that describes these requirements.
- 80 There are also a number of issues that are outside our remit and which we have not considered when reaching our decision. We have set out these issues at the end of this chapter.

### 4.2 Description of the Installation and related issues

#### 4.2.1 The permitted activities

- 81 The Installation is subject to the EPR because it carries out an activity listed in Part 1 of Schedule 1 to the EPR:
- *Section 1.1 A(1) (a) : Burning any fuel in an appliance with a rated thermal input of 50 megawatts or more.*
- 82 An Installation may also comprise “directly associated activities”, which at this Installation includes fuel oil storage. These activities are one Installation, because the diesel generators and fuel storage are successive steps in an integrated activity.
- 83 Together, these listed and directly associated activities comprise the Installation.
- 84 By the time the combustion activity comes into operation, the industrial emissions directive (IED) (2010/75/EU) will have come into force. This directive amends, consolidates and replaces 7 EU Directives on pollution including IPPC. The enabling legislation to bring this into force in the UK has not yet been enacted. However, the IED does not introduce any controls more stringent than those currently in force in respect of this determination.

#### 4.2.2 The site

- 85 NNB GenCo submitted a plan which we consider is satisfactory, showing the site of the Installation and its extent. A plan is included in Schedule 7 to the permit, and the Operator is required to carry on the permitted activities within the site boundary.
- 86 The Hinkley Point C (HPC) Installation is located in a coastal area adjacent (to the west) of the Hinkley Point A (HPA) Power Station Nuclear Licensed Site boundary approximately 12 km to the north-west of the town of Bridgwater. The surrounding terrain to the east, west and south of the site consists of gently undulating farmland interspersed with farms and small villages whilst to the north of the proposed development lies Bridgwater Bay. For the purposes of the EPR the Installation will lie within the Nuclear Licensed Site boundary. The

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centre of the HPC site is located at Ordnance Survey National Grid Reference (NGR) co-ordinates ST 20300 45800.

87 The centres of the four diesel buildings that comprise the Installation are located at the following Ordnance Survey NGR co-ordinates;

- Reactor 1, Diesel Building 1 ST 20281 45831
- Reactor 1, Diesel Building 2 ST 20460 45831
- Reactor 2, Diesel Building 1 ST 20048 45831
- Reactor 2, Diesel Building 2 ST 20228 45831

88 Further information on the site is addressed below in section 4.3.

### 4.2.3 What the Installation does

89 NNB GenCo has described the Installation as back-up diesel generators for the HPC Power Station.

90 Other combustion plant at HPC not required for operational purposes such as domestic heating and auxiliary boilers are not included within the scope of the permit as they fall outside the scope of the regulations.

91 There will be four separate but identical Essential Diesel Generators (EDGs) for each of the power station's nuclear reactors. These are required in order to restore the power supply in the event of the loss of off-site power.

92 In total there will be eight EDGs as there will be two reactors.

93 In addition there will be two further separate diesel generators per reactor (four in total) to supply power in the event of loss of both off-site supplies and the EDGs. These additional generators are referred to as the Station Blackout (SBO) diesel generators and will be started manually from the main control room within two hours (equivalent to the reserve time of the Station's batteries) of plant blackout occurring.

94 Each diesel generator (EDG and SBO) is a self contained plant in a separate room in each of the diesel buildings, each building will contain two EDGs and one SBO. The plant comprises;

- *Diesel fuel system:*  
The EDG main diesel fuel oil storage tank will have a 180 m<sup>3</sup> capacity and the smaller day (2-hour) tank will have a 4 m<sup>3</sup> capacity. The day tank has enough capacity to allow operation at full load or Maximum Combustion Rate (MCR) for two hours. The SBO main diesel fuel oil storage tank will have a 25 m<sup>3</sup> capacity and the day tank will have a 3 m<sup>3</sup> capacity (sufficient for operating at full load for at least two hours).
- *Lubricating oil system:*  
The EDGs will have a self contained lubrication system using a coupling booster pump. A pre-lubrication device fitted with a recirculating electrical pump reduces the time taken for the engine to start. Continuous pre-lubrication is not required for the SBO plant.
- *Coolant system:*  
The cooling system will be air cooled, with a closed loop water based coolant. The heat produced by the diesel generators is transferred via a cooling loop to a heat



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exchanger. Continuous pre-heating will be carried out for both the EDG and SBO plant.

- *Start-up air system:*  
Each diesel generator will have a complete compressed air start-up plant comprising a compressor, two start-up lines (with one being enough to start an engine), start-up valves and one (or more) tanks where the capacity of a single tank is enough for several consecutive compressor start-ups without refilling.
- *Air intake and extract system:*  
Air will be supplied for combustion and is designed to avoid any recirculation of flow. Combustion air will be taken from outside the building and filtered before use.
- *Local instrumentation and control/alarm signalling.*  
The diesel generators can be started:
  - Locally from the control panel to allow tests to be carried out (measurements and plant data are recorded by the panel);
  - Remotely from the main control room; or
  - Automatically by a signal from the protection systems (only for EDGs, not for SBOs).

95 It is proposed that the standby diesel generators are installed in separate rooms in the diesel buildings; two EDGs and one SBO per building. The buildings will be located separately to protect against simultaneous damage and positioned to allow easy movement of the diesel generators in and out of the buildings for maintenance/replacement purposes. The buildings are designed to withstand a range of internal and external hazards.

96 Each generator will exhaust through its individual stack, which is located on the roof of the diesel building about 30 metres above ground level. All tanks will be bunded to meet the requirements of the Oil Storage Regulations 2001.

97 Both the EDGs and SBOs will undergo test runs to demonstrate reliability. If for any reason a diesel generator fails to start during a test run, a further test run would be required. The detailed test programme will depend on the station safety specification and manufacturer's recommendations.

- *Availability*

98 The EDGs are safety related plant qualified as designed and constructed in accordance with rules for electrical components of Pressurised Water Reactor nuclear islands. This qualification confirms the plant is capable of performing its design functions under seismic and accidental, as well as normal, conditions.

- *Operational Regime*

99 There are three main types of operational regime covered by this application:

- Commissioning
- Routine testing; and
- LOOP events.

#### Commissioning

100 During commissioning it is not anticipated that more than one EDG or SBO will be in operation at any one time. Each EDG and SBO will be operated for 242.5 hours and 738 hours, respectively, during its testing period, that is 4892 combined hours. It should be

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noted that some of the 738 hours needed for commissioning the SBOs will involve tests that can be carried out before the engines are brought to site. The commissioning hours presented therefore represent a conservative estimate of the time for which plant will be run during this phase. It also should be noted that commissioning operations were not considered in the Generic Design Assessment (GDA) as this is a site specific activity that depends on manufacturer's recommendations.

#### Routine Testing

- 101 Experience of operating similar diesel generator plant in France suggests that each EDG and SBO will be operated for less than 60 hours per year. A conservative assumption (set out below) is therefore made for the basis of the air quality assessment (see Section 4.5) that a figure of 60 hours per year will be used as the maximum annual run time for each EDG and SBO diesel generator. In reality it is expected that running hours will be lower than this conservative figure as the required hours for tests are lower.
- 102 The EDG test run is expected to be as follows:
- At least 20 minutes to raise the load on the generator from 0% to 100%;
  - Operation at 100% load for 180 minutes; and
  - At least 20 minutes to reduce the load from 100% to 0%.
- 103 A typical EDG routine test is expected to last somewhere between 3 hours 40 minutes and 5 hours.
- 104 The key features of the Installation can be summarised in the table below.

Number of Diesel generators	8 x 18.5 MWth EDGs 4 x 7 MWth SBOs	
Fuel	Gas Oil	
EDG Stack	Height, 30.0 m	Diameter, 1.0 m
SBO Stack	Height, 30.0 m	Diameter, 1.0 m
EDG Flue Gas Velocity	Velocity, 35 m/s	
SBO Flue Gas Velocity	Velocity, 10 m/s	

#### **4.2.4 Key Issues in the Determination**

- 105 The key issues arising during this determination were:
- air quality and the dispersion of emissions to air
  - the impact of these emissions on the local environment

and we describe how we determined these issues in more detail in this document.

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## 4.3 The site and its protection

### 4.3.1 Site setting, layout and history

- 106 The site setting and layout is described in section 4.2.2 above.
- 107 A Site Condition Report detailing the environmental setting of the site (including geology, hydrogeology and hydrology), pollution history and historical land use of the proposed site has been compiled by NNB GenCo and submitted as part of the application. This includes detailed appendices covering a Phase I Desk Study and a Phase II Intrusive Investigation Report. The initial intrusive investigation study did not identify the presence of any contamination requiring remediation associated with the combustion activity. Given the extent of excavation that will be required for construction, and the requirement for appropriate remediation measures during this process if necessary, we are satisfied that the base line characterisation of the land beneath the site will be suitably established prior to the commencement of operations at the site. However we have set pre-operational conditions PO3 and PO4 to ensure the characterisation of the soil and groundwater is established and suitable protective measures are adopted as detailed below
- 108 Article 22(2) of the IED requires the Applicant to provide a baseline report containing at least the information set out in paragraphs (a) and (b) of the Article before starting operation.
- 109 NNB GenCo has not submitted a baseline report containing all of the necessary information as detailed above. We have therefore set a pre-operational condition (PO3) requiring the Operator to provide this information prior to the commencement of operations.
- 110 The baseline report is an important reference document in the assessment of contamination that might arise during the operational lifetime of the Installation and at cessation of activities at the Installation.
- 111 The IED also requires that risk assessments or periodic monitoring of ground and groundwater beneath the site should be undertaken throughout the life of the permit such that the absence of pollution to these media from operations at the site can be demonstrated. Pre-operational condition PO4 and condition 3.2.4 of the permit secures and makes provision for this requirement.

#### Site History and Geology

- 112 A review of historical maps by NNB GenCo established the following:
- 113 The site and the surrounding area was characterised as greenfield until 1976 when a Sewage Works is shown located in the centre of the site comprising two large circular tanks (filter beds), a small rectangular tank and a number of rectangular settling tanks. An accommodation camp is shown in the east of the site. These are all shown as demolished by 2006 and no further significant changes to the site are noted.
- 114 The solid geology map indicates that the site is located on or close to several geological boundaries. The Installation is located upon interbedded mudstone and limestone. Made ground was not typically found on site and the surface soils comprised topsoil supporting vegetative growth. The average thickness of the topsoil encountered beneath the site was 0.3 metres with a maximum of 0.6 metres.
- 115 The site does not lie within a Source Protection Zone (SPZ) or above any major aquifer, and there are no groundwater abstractions within 1.0 km of the site. The nearest

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groundwater abstraction is located 1.5 kilometres southwest of the site and is used for general farming and domestic purposes.

#### 4.3.2 Proposed site design: potentially polluting substances and prevention measures

116 The proposed features of the Installation for the prevention of pollution to ground and ground water are detailed below;

##### Bulk Fuel Storage and Secondary Containment

117 The detailed design of the fuel storage facilities is not yet known. However, it is proposed that all tanks will be located in buildings. The pollution prevention measures for fuels and oils stored and handled at the Installation will comply with or exceeds the relevant standards applicable at the time of construction. Current best practice for above ground oil storage in bulk tanks is published by us as Pollution Prevention Guidance (PPG) 02 (February 2004). In accordance with these guidelines the Operator proposes the following for the design and construction of the Installation:

- Safe access to the tanks for maintenance;
- Areas where oil is stored are surfaced with a material that is impermeable to the substances stored and isolated from surface water drainage systems;
- Tanks are of sufficient strength and structural integrity so that they are unlikely to leak during normal operations, are positioned on appropriately designed and constructed supports, and if possible have a design life of twenty years;
- Tanks are type tested to a recognised standard under a quality assurance system complying with BS EN ISO 9001:2000\*, and steel tanks comply with BS 799-5:1987\*;
- Installation of tanks is carried out by technicians registered with a professional scheme such as that operated by Oil Firing Technical Association (OFTEC);
- Tanks and their ancillary equipment (such as sign gauges, valves and vent pipes) are situated within an oil tight secondary containment system such as a bund;
- Shut-off valves will be installed at extended fill points, drip trays or other containment systems will be present at fill points, and remote fill points will be avoided where possible (if used they will comply with BS 799-5:1987\*); and
- Fixed pipework will be above ground where possible and where this is supplying oil to fixed appliances will comply with BS 5410\*.

\* The primary and secondary containment measures will be compliant with the standards valid at the time of construction.

118 Devices such as high level alarms to prevent overfilling will be employed in bulk tanks. An automatic overflow prevention device will be fitted if the tank and vent pipe cannot be seen from where the filling operation is controlled. Internal tanks will be located within a fire resistant chamber.

119 It is not known whether the bulk fuel tanks will be stand alone tanks or hydraulically linked, however secondary containment will be adequate to contain 110% of the tank capacity or a minimum of 25% of the total capacity of several tanks within a bunded area. Bulk tanks at the Installation will benefit from being located inside a building to protect them from the weather.

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### Fuel Pumps and Delivery Pipes

- 120 Fuel pumps will either be located such that any leaks can be captured in the secondary containment serving the tanks or alternative secondary containment measures will be employed. Pumps will be fitted with a check valve in their feed line to prevent the tank contents emptying in the event of damage to the pump or feed line.
- 121 Underground pipework will be avoided in the design if possible and if used will be double skinned and/or laid in accessible ducts where possible.

### Testing and Inspection

- 122 All tanks, pipes and pumps will be regularly inspected as part of the power station's Environmental Management System (EMS). High level alarms and other equipment will also be subject to regular testing.
- 123 Underground pipework, if present, will be tested for leaks at least every five or ten years, depending on whether there are mechanical joints. Manufacturer's test instructions and other guidance, such as British Standard 5410 Parts 1 and 2 will be followed.
- 124 Management systems will be in place during site operations to generate alerts when equipment tests are due and when equipment is likely to be reaching the end of its design life.
- 125 Tests and inspections will be carried out by competent persons.

### Fuel Delivery

- 126 Diesel delivery to the bulk tanks will be by road tanker via connection of a flexible delivery hose to a fill point either within the diesel generator building or within a designated bunded area outside the building. The offloading process will be compliant with the Control of Pollution (Oil Storage) (England) Regulations 2001 with regard to collection of drips during filling, general housekeeping, location of fill points and use of automatic shut-off valves. Drainage from the tanker offloading area will be controlled to prevent any fuel spills or leakages reaching ground or surface water drainage, although the detailed design of the site drainage is not yet known. Pre-operational condition PO2 requires the operator to provide a detailed as-installed site drainage plan including construction details of any sub-surface structures, containment and surfacing infrastructure prior to the commencement of operations at the site.
- 127 Adequate measures will be taken by the Operator to ensure that the risk of tanker collision on site is managed; with due consideration given to traffic route design, on-site signage, speed limits, barriers, driver and/or banksman training and site housekeeping.
- 128 Drummed storage of lubricating oil, waste oil, antifreeze and waste cooling mixture used or produced at the Installation will take place on site but outside the Installation boundary. The handling and storage of these materials will be compliant with best practice (e.g. our guidance PPG2 for storage and handling of drums and intermediate bulk containers) to prevent spills and leaks during transport and to ensure that spills or leaks from stored containers (prior to use or disposal) are captured and dealt with quickly, in order to prevent releases to ground or to surface water drains. Quantities of oils and chemicals stored on site will be managed to ensure that the minimum volumes required for safe operations are maintained but (where possible) not exceeded.

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129 We are satisfied that the above measures and implementation of the operational phase of the Site Condition Report will result in there being no significant risk of pollution to the land or groundwater beneath the site from the operational activities at the Installation.

### 4.3.3 Closure and decommissioning

130 Having considered the information submitted in the Application, we are satisfied that the appropriate measures will be in place for the closure and decommissioning of the Installation, as referred to in section 5.6 of the Application. Pre-operational condition PO1 requires the Operator to have an EMS in place before the Installation is operational, which would include a site closure plan.

131 The Operator has to satisfy us, if it wants to surrender the permit, that the necessary measures have been taken, both to avoid any pollution risk resulting from the operation of the Installation, and to return the site to a satisfactory state, having regard to the state of the site before the Installation was put into operation. To do this, the Operator has to apply to us for surrender of the permit, which we will not grant unless and until we are satisfied that these requirements have been complied with.

## 4.4 Operation of the Installation – general issues

### 4.4.1 Administrative issues

132 NNB GenCo is the sole Operator of the Installation.

133 We are satisfied that NNB GenCo is the person who will have control over the operation of the Installation after the granting of the Permit; and that NNB GenCo will be able to operate the Installation so as to comply with the conditions included in the permit.

134 We are satisfied that NNB GenCo's submitted Operational Risk Appraisal (Opra) profile is accurate.

135 The Opra score will be used as the basis for subsistence and other charging, in accordance with our Environmental Permitting Charge Scheme Guidance. Opra is the Environment Agency's method of ensuring application and subsistence fees are appropriate and proportionate for the level of regulation required.

### 4.4.2 Management

136 NNB GenCo has stated in the Application that they will implement an EMS that will be certified under ISO14001. A pre-operational condition (PO1) is included requiring the Operator to provide a summary of the EMS prior to commissioning of the plant and to make all EMS documentation available for inspection. The Environment Agency recognises that certification of the EMS cannot take place until the Installation is operational. An improvement condition (IC1) is included requiring the Operator to report progress towards gaining accreditation of its EMS.

137 We are satisfied that appropriate management systems and management structures will be in place for this Installation, and that sufficient resources are available to the Operator to ensure compliance with all the permit conditions.

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#### 4.4.3 Site security

138 Having considered the information submitted in the Application, we are satisfied that appropriate infrastructure and procedures will be in place to ensure that the site remains secure.

#### 4.4.4 Accident management

139 NNB GenCo has submitted a preliminary Accident Management Plan for the combustion activity. Having considered the plan and other information submitted in the Application, we are satisfied that appropriate measures will be in place to ensure that accidents that may cause pollution are minimised as far as possible, but that, if they should occur, their consequences are minimised. An Accident Management Plan will form part of the EMS and must be in place prior to commissioning as required by pre-operational condition PO1.

#### 4.4.5 Operating techniques

140 We have specified that NNB GenCo must operate the Installation in accordance with the following documents contained in the Application:

Description	Parts Included	Justification
Application	Parts B2 and B3 and the supplementary information supplied with these parts.	Each of the indicated sections contains information regarding the manner in which the Installation is operated.
Response to Schedule 5 Notice dated 12/10/11	Response to questions 1,2 and 3.	The response details operational techniques relating to fuel and generator specification and noise management.
Other Information received	E-mails received on 02/02/12 and 21/03/12 in respect of diesel generator operational hours	To ensure the engines are operated in line with the scenarios assessed in our determination.

141 The details set out above describe the techniques that will be used for the operation of the Installation that have been assessed by the Environment Agency as Best Available Techniques (BAT); they form part of the permit through permit condition 2.3.1 and Table S1.2 in the Schedules.

142 We have also specified the following limits and controls on the use of raw materials and fuels:

Raw Material or Fuel	Specifications	Justification
Gas Oil	< 0.1% sulphur content	As required by Sulphur Content of Liquid Fuels Regulations.

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- 143 The Installation will be designed, constructed and operated using BAT. We are satisfied that the operating and abatement techniques are BAT for the Installation. Our assessment of BAT is set out later in this document in section 4.10.



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#### 4.4.6 Energy efficiency

(i) Consideration of energy efficiency

We have considered the issue of energy efficiency in the following ways:

1. The use of energy within, and generated by, the Installation which are normal aspects of all EPR permit determinations. This issue is dealt with in this section.
2. The combustion efficiency and energy utilisation of different design options for the Installation are relevant considerations in the determination of BAT for the Installation. This aspect is covered in the BAT assessment in section 4.10 of this Decision Document.

(ii) Use of energy within the Installation

- 144 Having considered the information submitted in the Application, we are satisfied that appropriate measures will be in place to ensure that energy is used efficiently within the Installation.
- 145 The Application states that the specific energy consumption (SEC), a measure of total energy consumed per unit of output is of limited importance for standby plant as efficiency is a secondary measure to reliability/availability and under normal operations, plant will only be operated for maintenance purposes and during periodic testing. In addition the plant is only operated at its optimum state for short periods before being shut down.
- 146 We accept that due to the operational regime of the generators that SEC is not an appropriate measure for the Installation.

(iii) Generation of energy within the Installation

- 147 The Installation will generate electricity only and has been specified to maximise electrical output with little or no use of waste heat. All the electricity generated from loaded test runs will be exported to the grid with that generated by the reactor but due to its relatively minor quantity will not be measured separately.
- 148 A requirement to report power generated has not been included.

(iv) Permit conditions concerning energy efficiency

- 149 Permit condition 1.2.1 requires the Operator to use energy efficiently.
- 150 There are no site-specific considerations that require the imposition of standards beyond indicative BAT, and so we accept that NNB GenCo's proposals represent BAT for this Installation.

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#### **4.4.7 Efficient use of raw materials**

- 151 Having considered the information submitted in the Application, we are satisfied that the appropriate measures will be in place to ensure the efficient use of raw materials and water.
- 152 The Operator is required to report with respect to raw material usage under condition 4.2. and Schedule 4, in respect of fuel oil usage.

#### **4.4.8 Avoidance, recovery or disposal with minimal environmental impact of wastes produced by the activities**

- 153 Having considered the information submitted in the Application, we are satisfied that the waste hierarchy referred to in Article 4 of the Waste Framework Directive (WFD) will be applied to the generation of waste and that any waste generated will be treated in accordance with this Article.
- 154 We are satisfied that waste from the Installation that cannot be recovered will be disposed of using a method that minimises any impact on the environment. Standard condition 1.4.1 will ensure that this position is maintained.

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## 4.5 Minimising the Installation's environmental impact

- 155 Regulated activities can present different types of risk to the environment, including: odour, noise and vibration, accidents, fugitive emissions to air and water, releases to air, discharges to ground or groundwater and generation of waste. Consideration has also been given to the effect of emissions being deposited onto land (where there are ecological receptors).
- 156 For an Installation of this kind, the principal emissions are those to air, although we also consider those to land and water.
- 157 This section of the document explains how we have approached the critical issue of assessing the likely impact of the emissions to air from the Installation on human health and the environment and what measures we are requiring to ensure a high level of protection.

### Human health risk assessment

#### Our role in preventing harm to human health

- 158 The Environment Agency has a statutory role to protect the environment and human health from all processes and activities it regulates. We assessed the effects on human health for this application in the following ways:

#### **i) Applying Statutory Controls**

- 159 The plant will be regulated under EPR. These regulations include the requirements of relevant EU Directives, notably, the integrated pollution prevention and control directive (IPPCD), the air quality directive (AQD) and the waste framework directive (WFD),
- 160 The main conditions in the permit are based on the requirements of the IPPCD. The requirements of the IPPCD include the use of BAT. The assessment of BAT for this Installation is detailed in section 4.10 of this document.

#### **ii) Environmental Impact Assessment**

- 161 Industrial activities can give rise to odour, noise and vibration, accidents, fugitive emissions to air and water, releases to air, discharges to ground or groundwater and generation of waste. For an Installation of this kind, the principal environmental effects are through emissions to air, although we also consider all of the other impacts listed. Sections 4.5.1, 4.5.2, 4.6, 4.7 and 4.8 below explain how we have approached the critical issue of assessing the likely impact of the emissions to air from the Installation on human health and the environment and any measures we are requiring to ensure a high level of protection.
- 162 The proposed limits on emissions to air are shown in schedule 3 to the permit.

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## 4.5.1 Assessment Methodology

### Application of Environment Agency H1 Guidance

- 163 A methodology for risk assessment of point source emissions to air, which we use to assess the risk of applications we receive for permits, is set out in our Horizontal Guidance Note H1 and has the following steps:
- Describe emissions and receptors
  - Calculate process contributions
  - Screen out insignificant emissions that do not warrant further investigation
  - Decide if detailed air modelling is needed
  - Assess emissions against relevant standards
  - Summarise the effects of your emissions
- 164 The H1 methodology uses a concept of “process contribution (PC)”, which is the estimated concentration of emitted substances after dispersion into the receiving environmental media at the point where the magnitude of the concentration is greatest. The guidance provides a simple method of calculating PC primarily for screening purposes and for estimating process contributions where environmental consequences are relatively low. It is based on using dispersion factors. These factors assume worst case dispersion conditions with no allowance made for thermal or momentum plume rise and so the process contributions calculated are likely to be an overestimate of the actual maximum concentrations. More accurate calculation of process contributions can be achieved by mathematical dispersion models, which take into account relevant parameters of the release and surrounding conditions, including local meteorology – these techniques are expensive but normally lead to a lower prediction of PC. NNB GenCo has the choice to use either method.

### **Screen Out Insignificant Emissions**

- 165 Once short-term and long-term PCs have been calculated (either by dispersion factors or modelling), they are compared with Environmental Quality Standards (EQS) referred to as “benchmarks” in the H1 Guidance.
- 166 Where an EU EQS exists, the relevant standard is the EU EQS. Where an EU EQS does not exist, our guidance sets out a National EQS (also referred to as Environmental Assessment Level - EAL) which has been derived to provide a similar level of protection to Human Health and the Environment as the EU EQS levels.
- 167 PCs are considered **Insignificant** if:
- the **long-term** process contribution is less than **1%** of the relevant EQS; and
  - the **short-term** process contribution is less than **10%** of the relevant EQS.
- 168 The **long term** 1% process contribution insignificance threshold is based on the judgements that:
- It is unlikely that an emission at this level will make a significant contribution to air quality;
  - The threshold provides a substantial safety margin to protect health and the environment.

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- 169 The **short term** 10% process contribution insignificance threshold is based on the judgements that:
- spatial and temporal conditions mean that short term process contributions are transient and limited in comparison with long term process contributions;
  - the proposed threshold provides a substantial safety margin to protect health and the environment.

### **Deciding whether Detailed Modelling is Needed**

- 170 Where an emission cannot be screened out as insignificant as a PC through applying the first stage of our H1 Guidance, it does not mean it will necessarily be significant.
- 171 In these circumstances, the H1 Guidance justifies the need for detailed modelling of emissions, long-term, short-term or both, taking into account the state of the environment before the Installation operates, where:
- local receptors may be sensitive to emissions;
  - released substances fall under an Air Quality Management Plan;
  - the long term Predicted Environmental Concentration (PEC) exceeds 70% of the appropriate long term standard, (where the PEC is equal to the sum of the background concentration in the absence of the Installation and the process contribution);
  - the short term Process Contribution exceeds 20% of the headroom, (where the headroom is the appropriate short term standard minus twice the long term background concentration).

### **4.5.2 Applying the guidance to the application**

- 172 We review NNB GenCo's detailed impact assessment to confirm whether or not we agree with NNB GenCo's conclusions with respect to H1 screening against the above criteria.
- 173 For those pollutants where the  $PEC_{\text{long term}}$  exceeds 70% of an EQS or the  $PC_{\text{short term}}$  exceeds 20% of the headroom between an EQS and the background concentration, we determine whether exceedences of EQS are likely. This is done through detailed audit and review of NNB GenCo's impact assessment taking headroom and modelling uncertainties into account. Where an exceedence of an EQS is identified, we may require NNB GenCo to go beyond what would normally be considered BAT for the Installation or refuse the application. Whether or not exceedences are considered likely, the application is subject to the requirement to operate in accordance with BAT.
- 174 National EQSs do not have the same legal status as EU EQSs, and there is no explicit requirement to impose stricter conditions than BAT in order to comply with a national EQS. However, national EQSs are a standard for harm and any significant contribution to a breach is likely to be unacceptable.
- 175 This is not the end of the risk assessment, because we also take into account local factors (for example, particularly sensitive receptors nearby such as a SSSIs, SACs or SPAs). These additional factors may also lead us to include more stringent conditions than BAT.
- 176 If, as a result of reviewing of the risk assessment and taking account of any additional techniques that could be applied to limit emissions, we consider that emissions would cause significant pollution, we would refuse the Application.

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177 In this Application, NNB GenCo has carried out detailed air dispersion modelling. We are satisfied that the model proposed reflects the likely impact of the emissions from the activity. We have applied the H1 criteria above to the model outputs, and this is described in the following sections.

## 4.6 Air Quality Assessment

### 4.6.1 Assessment of Air Dispersion Modelling Outputs

178 NNB GenCo assessed the Installation's potential emissions to air against the relevant air quality standards, and potential impact upon local habitat sites and human health. These assessments predicted the potential effects on local air quality from the Installation's stack emissions using the ADMS 4 Version 4.2 dispersion model, which is a commonly used computer model for regulatory dispersion modelling. The model used 5 years (2005 – 2009) of meteorological data collected from the United Kingdom Meteorological Office (UKMO) Numerical Weather Prediction model for the Hinkley Point site. The impact of the terrain surrounding the site upon plume dispersion was considered in the dispersion modelling. The concentrations reported in the assessments were the maximum ground level concentrations predicted by the dispersion modelling packages over the 5 years of meteorological data.

179 The air impact assessments, and the dispersion modelling upon which they were based, employed the following assumptions;

- First, that the input parameters would be consistent with those determined through consultation with EDF and information made available from equipment manufacturers.
- Second, and conservatively, they considered three operational scenarios namely Commissioning, Routine Testing and Loss of Off-site Power (LOOP), further details are given below.

#### ***Commissioning scenario***

180 Commissioning is not usually considered however due to the periodic operational regime for the diesel generators the emissions from commissioning are likely to be one of the more significant impacts. Therefore we have assessed them in more detail than we would usually do for a combustion activity.

181 This scenario recognises that only one EDG or SBO is likely to be in operation at any one time and the scenario uses emission rates from the EDG as these represent the worst case.

182 Long term impacts have been assessed on the basis of 4,892 operational hours over one year which represents 8 EDGs operated for 242.5 hours each and 4 SBOs operated for 738 hours each.

183 Short term impacts are assessed on the basis that one EDG is operated continuously throughout the year.

#### ***Routine Testing scenario***

184 This covers operation of the plant for maintenance and periodic safety tests and involves only a single generator operating at any one time.

185 Long term impacts are assessed on the basis of 720 hours combined operation of the EDGs represents 8 EDGs operated for 60 hours each per year.

186 Short term impacts are assessed on the basis that one EDG is operated continuously throughout the year.

**LOOP scenario**

187 This covers an event resulting in loss of off-site power for 24 hours with all 8 EDGs operating for 25 hours. The scenario does not include operation of SBOs as these would only operate if the EDGs failed to start and their combined impact would be less than that of the 8 EDGs.

188 The way in which NNB GenCo used dispersion models, their selection of input data, and the assumptions they made have been reviewed by the Environment Agency’s modelling specialists to establish the robustness of NNB GenCo’s air impact assessment. Our review of NNB GenCo’s assessment leads us to agree with NNB GenCo’s conclusions. We have also audited the air quality and human health impact assessment and similarly agree that the conclusions drawn in the reports were reasonable.

189 The emission concentrations used for modelling purposes are detailed in the table below:

Diesel Generators	Emission Point Concentration (0°C, 15% O <sub>2</sub> , 101.3 Pa and dry)			
	Nitrogen oxides (mg/m <sup>3</sup> )	Sulphur dioxide (mg/m <sup>3</sup> )	Carbon monoxide (mg/m <sup>3</sup> )	Particulates (mg/m <sup>3</sup> )
EDG vent stacks	1,908	182	150	50
SBO vent stacks	1,801	106	150	50

190 NNB GenCo’s modelling predictions are summarised in the tables below. Where a relevant short or long term EQS or EAL has been established we have assessed the potential contribution of pollutants with respect to the appropriate standard.

Commissioning Scenario

**Long term**

Pollutant	EQS / EAL	Background Concentration	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
Nitrogen dioxide	40	6.8	0.98	2.45	7.78	19.4
Particulates PM <sub>10</sub>	40	18.2	0.04	0.10	18.24	45.6
Particulates PM <sub>2.5</sub>	25	7.9	0.04	0.16	7.94	31.7

Note 1 All the above concentration figures are in µg/m<sup>3</sup>

### Short term

Pollutant	EQS / EAL	Background Concentration	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
Nitrogen dioxide	200	6.8	101.54	50.77	115.14	57.6
Particulates PM <sub>10</sub>	50	18.2	0.21	0.42	36.61	73.2
Carbon monoxide	30,000	78.5	25	0.08	182	0.6
Sulphur dioxide	266	1.8	31.27	11.76	34.87	13.1

Note 1 All the above concentration figures are in  $\mu\text{g}/\text{m}^3$   
Note 2 For the assessment of short term impacts the PEC is determined by adding twice the long term background concentration to the short term process contribution.

### Routine Testing Scenario

#### Long term

Pollutant	EQS / EAL	Background Concentration	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
Nitrogen dioxide	40	6.8	0.14	0.35	6.94	17.4
Particulates PM <sub>10</sub>	40	18.2	0.01	0.03	18.21	45.5
Particulates PM <sub>2.5</sub>	25	7.9	0.01	0.04	7.91	31.6

Note 1 All the above concentration figures are in  $\mu\text{g}/\text{m}^3$

#### Short term

Pollutant	EQS / EAL	Background Concentration	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
Nitrogen dioxide	200	6.8	101.54	50.77	115.14	57.6
Particulates PM <sub>10</sub>	50	18.2	0.21	0.42	36.61	73.2
Carbon monoxide	30,000	78.5	25	0.08	182	0.6
Sulphur dioxide	266	1.8	31.27	11.76	34.87	13.1

Note 1 All the above concentration figures are in  $\mu\text{g}/\text{m}^3$   
Note 2 For the assessment of short term impacts the PEC is determined by adding twice the long term background concentration to the short term process contribution.



## LOOP Scenario

### **Long term**

- 191 NNB GenCo did not assess the long term LOOP event due to the short term nature of the release which would be unlikely to contribute significantly to concentrations averaged over longer periods.
- 192 We agree with NNB GenCos assessment that long term emissions from the LOOP scenario do not need assessment for the above reason.

### **Short term**

Pollutant	EQS / EAL	Background Concentration	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
Nitrogen dioxide	200	6.8	358	179	372	185.8
Particulates PM <sub>10</sub>	50	18.2	1.56	3.12	37.96	75.92
Carbon monoxide	30,000	78.5	92	0.31	249	0.8
Sulphur dioxide	266	1.8	123.17	46.3	126.77	47.7

Note 1 All the above concentration figures are in  $\mu\text{g}/\text{m}^3$

Note 2 For the assessment of short term impacts the PEC is determined by adding twice the long term background concentration to the short term process contribution.

- 193 From the tables above the following emissions can be screened out as insignificant in that the PC is < 1% of the long term EQS/EAL and <10% of the short term EQS/EAL;
- Carbon monoxide for all scenarios
  - Particulates (PM<sub>10</sub> and PM<sub>2.5</sub>) for all scenarios
  - Nitrogen dioxide for long term (Routine Testing Scenario)
- 194 Therefore, generally, we consider NNB GenCo's proposals for preventing and minimising the emissions of these substances to be BAT for the Installation subject to the detailed audit referred to below.
- 195 Also from the tables above the following emissions (which were not screened out as insignificant) cannot be considered to have the potential to give rise to significant pollution in that the predicted environmental concentration is less than 70% of the long term EQS/EAL and that the PC is less than 20% of the short term EQS/EAL headroom;
- Long term nitrogen dioxide emissions (Commissioning Scenario) PEC 19.4% of the EAL
  - Short term emissions of sulphur dioxide (Commissioning and Routine Testing Scenarios) PEC 13.1% under both scenarios.

196 For these emissions, we have carefully scrutinised NNB GenCo's proposals to ensure that they are applying the Best Available Techniques to prevent and minimise emissions of these substances. This is reported in section 6 of this document.

#### 4.6.2 Consideration of Impacts where $PEC > 70\%$ of $EQS_{long\ term}$ or the $PC_{short\ term} > 20\%$ of the short term headroom

Pollutant	EQS / EAL	Background Conc	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Headroom (EQS/EAL – 2xbackground)	PC as % of Headroom
Short term nitrogen dioxide emissions (Commissioning Scenario)	200	6.8	101.54	50.77	186.4	54.47
Short term nitrogen dioxide emissions (Routine Testing Scenario)	200	6.8	101.54	50.77	186.4	54.47
Short term nitrogen dioxide emissions (LOOP Scenario)	200	6.8	358	179	186.4	192.06

Note 1 All the above concentration figures are in  $\mu\text{g}/\text{m}^3$

Note 2 For the assessment of short term impacts the PEC is determined by adding twice the long term background concentration to the short term process contribution.

197 Finally from the table above the following emissions are considered to have the potential to give rise to pollution in that the PEC exceeds 70% of the long term EQS/EAL or the PC exceeds 20% of the short term EQS/EAL headroom;

- Short term nitrogen dioxide emissions (Commissioning Scenario)
- Short term nitrogen dioxide emissions (Routine Testing Scenario)
- Short term nitrogen dioxide emissions (LOOP Scenario)

198 For the Commissioning and Routine testing scenario emissions, NNB GenCo has concluded that exceedences of the relevant air quality objectives and environmental assessment levels are not likely. The LOOP scenario is highly unlikely and represents the operation of the generators in the event of total power failure and is designed to prevent radioactive releases. This will result in short term emissions of  $\text{NO}_x$  above the EAL.

199 As a result of our detailed audit, of NNB GenCo's modelling assessment, we are able to agree with NNB GenCo's conclusions in this respect taking modelling uncertainties into account and the fact that the emissions modelled represented worst case scenarios both in hours of operation and meteorological conditions.

200 In any case, with respect to these pollutants, we have carefully scrutinised NNB GenCo's proposals to ensure that they are applying the Best Available Techniques to prevent and minimise emissions of these substances.

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201 We have also carefully considered whether additional measures are required above what would normally be considered BAT in order to prevent significant pollution. This is reported in section 4.10 of this document.

## 4.7 Water Quality Assessment

202 The Operator states in the Application that there will be little (if any) emissions to water from the diesel generators.

203 There is the potential for point source releases to water from surface water run-off and potentially contaminated drainage from oil storage. All oily water drains on site will be routed through an oil/water separator and discharged via a separate discharge being determined under Application EPR/HP3228XT/A001.

204 As there are no point source releases to water associated with the diesel generators within this permit no further assessment is deemed necessary and no emission limits have been set.

## 4.8 Habitats Regulations Assessment

205 In this section we have considered the impact of the proposed discharges on the environment. We have also considered the impact in relation to our duties under various statutory provisions as set out below in Table 3. (We refer to these as “conservation duties”).

<b>Table 3 : Summary of conservation duties</b>	
<b>Provision</b>	<b>Duty</b>
The Conservation of Natural Habitats and Species Regulations 2010	Before deciding to undertake, or give a permit which; (a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in combination with other plans or projects), and (b) is not directly connected with or necessary to the management of that site,  we must make an appropriate assessment of the implications for that site in view of that site’s conservation objectives and we must consult Natural England if there is a significant effect.
Section 28G of the Wildlife and Countryside Act 1981	We must take reasonable steps, consistent with the proper exercise of its functions, to further the conservation and enhancement of the flora, fauna, or geological or physiographical features, by reason of which a site of special scientific interest (SSSI) is of special interest.
Section 28I of the Wildlife and Countryside Act 1981	We are under a duty to consult Natural England/Countryside Council for Wales before permitting any operation which is likely to damage any flora, fauna or geological or physiographical features by reason of which a SSSI is of special interest.
Section 85 of the Countryside and Rights of Way Act 2000	In exercising or performing any functions in relation to, or so as to affect, land in an area of outstanding natural beauty, a relevant authority shall have regard to the purpose of conserving and enhancing the natural beauty of the area of outstanding natural beauty.

206 We have considered the potential effects of discharges to air from the site on plant and animal life at the relevant designated “European sites” (Special Protection Areas (SPAs) for birds, and Special Areas of Conservation (SACs) for other species, and for habitats) under the Conservation of Natural Habitats and Species Regulations 2010, which implement the Habitats and Birds Directives.

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#### 4.8.1 Sites Considered

207 The following Habitats (i.e. Special Areas of Conservation, Special Protection Areas and Ramsar) sites are located within 10Km of the Installation:

- Exmoor & Quantock Oakwoods SAC
- Severn Estuary/ Môr Hafren SAC
- Severn Estuary SPA
- Severn Estuary Ramsar
- River Wye SAC\*
- River Usk SAC\*
- River Tywi SAC\*

\*Although the River Usk SAC, River Wye SAC and Afon Tywi SAC lie outside of the 10km inclusion zone, they are both intrinsically linked to the Severn Estuary/ Mor Hafren SAC in relation to migratory fish. However, it has been agreed by both Natural England (NE) and the Countryside Council for Wales (CCW) that potential effects to the Rivers Usk, Wye and Tywi SACs will not be directly considered as part of the assessment, but will be considered if effects arise in relation to the Severn Estuary/Mor Hafren migratory fish feature, specifically in relation to Atlantic Salmon, shad and sea lamprey.

208 The following Sites of Special Scientific Interest are located within 2km of the Installation:

- Blue Anchor to Lilstock Coast
- Bridgwater Bay
- Severn Estuary

209 The following non-statutory local wildlife and conservation sites are located within 2km of the Installation:

- Hinkley Local Wildlife Site
- Bridgwater Bay National Nature Reserve.

#### 4.8.2 Habitats Assessment

210 NNB GenCo's assessment of the potential impact on the local Habitat submitted as part of this application was reviewed by the Environment Agency's technical specialists for air quality modelling, who confirmed that the modelling undertaken was suitable for the assessment.

211 The main emissions are to air via exhaust stacks of approximately 30 metres in height and will consist of combustion gases containing particulates and oxides of sulphur, nitrogen and carbon. The emissions which are relevant for this assessment are oxides of sulphur and nitrogen.

212 NNB GenCo's modelling predictions at the nearest habitats site the Severn Estuary SPA/SAC/Ramsar are summarised in below:

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## Commissioning Scenario

### **Long term**

Pollutant	EQS / EAL	Background Concentration	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
Nitrogen dioxide	30	11.5	11.74	39	23.24	77.5
Sulphur dioxide	20	1.8	1.14	5.7	2.94	14.7

Note 1 All the above concentration figures are in  $\mu\text{g}/\text{m}^3$

### **Short term**

Pollutant	EQS / EAL	Background Concentration	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
Nitrogen dioxide	75	11.5	207	276	230	307

Note 1 All the above concentration figures are in  $\mu\text{g}/\text{m}^3$

Note 2 For the assessment of short term impacts the PEC is determined by adding twice the long term background concentration to the short term process contribution.

### ***Nitrogen deposition and acidification***

213 The maximum nitrogen and acid process contribution deposition rates are predicted as  $1.71\text{kg N ha}^{-1}\text{y}^{-1}$  and  $0.26\text{keq ha}^{-1}\text{y}^{-1}$  respectively.

Pollutant	Lower Critical load	Background Load	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % Lower Critical Load
Nitrogen deposition	20 - 30	13	1.71	8.6	14.7	73.5
Acidification	-	-	0.26	-	-	-

Note 1 For the assessment of impacts the PEC is determined by adding the background concentration to the process contribution.

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### Routine Testing Scenario

#### **Long term**

Pollutant	EQS / EAL	Background Conc	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
Nitrogen dioxide	30	11.5	1.75	5.8	13.25	44.2
Sulphur dioxide	20	1.8	0.17	0.85	1.97	9.85

Note 1 All the above concentration figures are in  $\mu\text{g}/\text{m}^3$

#### **Short term**

Pollutant	EQS / EAL	Background Conc	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
Nitrogen dioxide	75	11.5	207	276	230	307

Note 1 All the above concentration figures are in  $\mu\text{g}/\text{m}^3$

Note 2 For the assessment of short term impacts the PEC is determined by adding twice the long term background concentration to the short term process contribution.

#### **Nitrogen deposition and acidification**

214 The maximum nitrogen and acid process contribution deposition rates are predicted as  $0.25\text{kg N ha}^{-1}\text{y}^{-1}$  and  $0.04\text{keq ha}^{-1}\text{y}^{-1}$  respectively.

Pollutant	Lower Critical load	Background Load	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % Lower Critical Load
Nitrogen deposition	20 - 30	13	0.25	1.25	13.25	66.3
Acidification	-	-	0.04	-	-	-

Note 1 For the assessment of impacts the PEC is determined by adding the background concentration to the process contribution.

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## LOOP Scenario

### **Long term**

- 215 NNB GenCo did not assess the long term LOOP event due to the short term nature of the release which would be unlikely to contribute significantly to concentrations averaged over longer periods.
- 216 We agree with NNB GenCos conclusion that long term emissions from the LOOP scenario do not need assessing for the reason above.

### **Short term**

Pollutant	EQS / EAL	Background Concentration	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
Nitrogen dioxide	75	11.5	933	1244	956	1,275

Note 1 All the above concentration figures are in  $\mu\text{g}/\text{m}^3$

Note 2 For the assessment of short term impacts the PEC is determined by adding twice the long term background concentration to the short term process contribution.

- 217 The initial assessment above concluded that long and short term emissions of  $\text{NO}_x$  with respect to the Severn Estuary SPA/SAC/RAMSAR in the Commissioning scenario and short term emissions of  $\text{NO}_x$  in respect of the Severn Estuary SPA/SAC/RAMSAR in the Routine Testing scenario and LOOP scenarios were above the screening criteria.
- 218 The scenarios detailed above represent the worst case in both hours of operation and meteorological conditions; actual ground level concentrations would be expected to be lower. In the commissioning scenario it has been assumed that all generator testing will take place on site but in reality it is expected that annual commissioning hours will be less than predicted as some testing will occur prior to delivery of the generators and will bring the long term PEC below the 70% screening criteria. Further information concerning the commissioning hours received on 02/02/12 by e-mail confirmed that the actual hours are likely to be in the order of

EDGs: 287 hours each (x 8 EDGs = 2,296 hours)

SBOs: 247 hours each (x 4 SBOs = 998 hours)

Total: 2,296 + 998 = **3, 294 hours** compared to the previous figure of **4,892** hours.

It should be noted that this is still a conservative figure as:

- 1) There may be scope for more testing to take place at the manufacturers' site - this will be investigated during the procurement process.
- 2) It is likely that the commissioning process will take longer than 12 month so the number of hours operated over a 12 month period is likely to be lower than stated here. This information will be reviewed during the procurement and design processes.



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- 219 By applying the revised operating hours to the modelling inputs the long term PEC for NO<sub>x</sub> in the Commissioning scenario is 64.7% of the AQS which is below the significance screening threshold of 70% and therefore no further assessment is required.
- 220 The short term routine testing and commissioning scenarios assumes 24 hour operation however a typical testing regime is expected to be a maximum of 5 hours which will reduce the daily mean PEC to 66µg/m<sup>3</sup> which is below the AQS and therefore we conclude that there will be no likely significant effect.
- 221 The LOOP scenario is highly unlikely and represents the operation of the generators in the event of total power failure and is designed to prevent radioactive releases. This will result in short term emissions of NO<sub>x</sub> above the EAL.
- 222 In addition the main risk of NO<sub>x</sub> to the environment would be likely to be through its contribution to total nitrogen deposition (acidification and nutrient enrichment) to the habitats and vegetation rather than from aerial concentrations directly. Any impacts on the designated birds will be indirect through influences on plant and animal food sources, vegetation composition and cover, associated mainly with nutrient enrichment.
- 223 The dispersion modelling has shown that nutrient N deposition will have no adverse effect at the Severn Estuary for the three scenarios. The maximum nitrogen and acid process contribution deposition rates are predicted as 1.71kg N ha<sup>-1</sup> y<sup>-1</sup> and 0.26keq ha<sup>-1</sup> y<sup>-1</sup> respectively in the commissioning scenario which represents the worst case. According to APIS data, the sites are not sensitive to acid deposition and so no further assessment is needed. The Severn estuary SPA is not sensitive to nutrient nitrogen deposition however the SAC contains Salt meadows that have a critical load of 20 to 30kg N ha<sup>-1</sup> y<sup>-1</sup>. The predicted deposition equates to 8.6% of the lower critical load value and can not be regarded as insignificant. However taking the existing background deposition level from APIS of 13kg N ha<sup>-1</sup> y<sup>-1</sup> into consideration the predicted PEC of 14.7kg N ha<sup>-1</sup> y<sup>-1</sup> is less than the lower critical load value for the SAC and therefore we conclude that there will be no likely adverse effect.
- 224 This view regarding the main risk of NO<sub>x</sub> to the environment detailed above is supported by information in the Air Pollution Information System and the 2001 report – Transboundary Air Pollution: Acidification, Eutrophication and Ground Level Ozone in the UK. However, considering aerial NO<sub>x</sub> further as a precautionary approach, this report also mentions that direct effects of gaseous nitrogen oxides may also be important, especially in areas close to source. Moderate concentrations of NO<sub>x</sub> may produce both positive and negative growth responses, and there is also the potential for synergistic interactions with SO<sub>2</sub>, the effects of NO<sub>x</sub> being more likely to be negative in the presence of equivalent concentrations of SO<sub>2</sub>. This is not the situation with the current proposal – the SO<sub>2</sub> level at the nearest point of the European site (obtained from the Air Pollution Information System) is 14.7% (Commissioning Scenario) of the EAL for the protection of vegetation (20 µg/m<sup>3</sup>). The report also identifies an influence of NO<sub>x</sub> on insect populations, the performance of insect pests such as aphids being improved on plants grown in moderate concentrations of NO<sub>2</sub> and of SO<sub>2</sub>. This effect is not considered relevant to the features of interest at the European Site.
- 225 In summary, it is considered that the nutrient effect resulting from deposition of NO<sub>x</sub> remains the strongest impact of NO<sub>x</sub> emissions. Nitrogen deposition resulting in both acidification and nutrient enrichment, has already been assessed as not significant (see above and Appendix 11), and no further assessment is considered necessary.

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### 4.8.3 SSSI Assessment

- 226 The assessment for the Severn Estuary, Blue Anchor to Lilstock Coast and Bridgwater Bay SSSIs is consistent with the habitats assessments detailed above.
- 227 NNB GenCo's assessment of SSSIs was reviewed by the Environment Agency's technical specialists for modelling, air quality, conservation and ecology technical services, who agreed with the assessment's conclusions, that the proposal does not damage the special features of the SSSIs.

### 4.8.4 Assessment of Non-Statutory Sites

- 228 The modelling supplied by NNB GenCo did not provide numerical predictions at the Hinkley Local Wildlife Site however sufficient information was provided to understand the likely environmental impacts at the site.
- 229 We have assessed the impact and can conclude that the process contribution is not likely to exceed 100% of any critical levels or loads. This indicates that there will be no significant pollution and no further assessment is required.

### 4.8.5 Assessment of Noise Impact

- 230 NNB GenCo submitted a detailed Noise modelling report in response to a Schedule 5 Notice on 27/10/11. The report predicted the worst case noise emission levels from the operation of the emergency diesel generators. The report assumed that four of the eight EDGs and two of the four SBOs were in operation.
- 231 The modelling study utilised Cadna A Noise Prediction Model (Version 4) software and noise propagation calculations were undertaken in accordance with the International Standards Organisation guidance document ISO 9613: Part2:1966. The model incorporated the local topography, meteorological conditions and existing and proposed buildings.
- 232 The results of the model indicated that even under worst case meteorological conditions (downwind) the operation of the generators would be inaudible at the foreshore (wintering birds using the intertidal zone).
- 233 We accept NNB GenCo's conclusions and agree that noise from the diesel generators either prolonged or intermittent will not have any significant effects on the habitats sites and further assessment is not considered necessary.

### 4.8.6 Conclusion on likelihood of significant effect

- 234 We consider that the discharges of gases into the environment at our proposed limits, together with other relevant authorised discharges, would not adversely affect the integrity of the European Sites or damage the special features of any SSSI.
- 235 We have applied the same approach to our other conservation duties (as listed in table 3) and also conclude that because the emissions are below relevant standards there will be no effect on any of the flora and fauna in the environment. By definition there can be no effect on purely physical features, such as the geology, physiographical or the built environment. We therefore are satisfied that we have addressed our conservation duties as set out in table 3 in relation to discharges to air from the diesel generators.

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## 4.9 Monitoring

- 236 We have assessed NNB GenCo's proposals for monitoring and conclude that they represent BAT for monitoring in accordance with our guidance.
- 237 We have decided that monitoring should be carried out for the following parameters listed in the permit, using the methods and to the frequencies specified;
- oxides of nitrogen;
  - sulphur dioxide;
  - carbon monoxide;
  - particulates.
- 238 These monitoring requirements have been set in order to ensure emissions are at a level that do not result in harm to the local environment.
- 239 Based on the information in the application we are satisfied that the operator's techniques, personnel and equipment have either MCERTS certification or MCERTS accreditation as appropriate. MCERTS is our Monitoring Certification Scheme. It provides the framework for businesses to meet our quality requirements. If an operator complies with MCERTS we have confidence in the monitoring of emissions to the environment.

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## 4.10 Application of Best Available Techniques

240 In this section, we explain how we have determined whether NNB GenCo's proposals are the Best Available Techniques for this Installation.

- The first issue we address is the fundamental choice of electrical generation technology. There are a number of alternatives, and NNB GenCo has explained why they have chosen one particular kind for this Installation.
- We then consider in particular control measures for the emissions which were not screened out as insignificant in the previous section on minimising the Installation's environmental impact.
- We also have to consider the combustion efficiency and energy utilisation of different design options for the Installation, which are relevant considerations in the determination of BAT for the Installation.

241 NNB GenCo compared three options for the technology to supply an independent emergency electricity supply to HPC power station as detailed below:

- *Option 1 – Diesel generators run on fuel oil,*
- *Option 2 – Gas turbines run on fuel oil,*
- *Option 3 – Gas turbines run on gas.*

242 The first screening ruled out Option 3, Gas turbines run by gas, as it did not fulfil the requirement for independent operation.

243 Options 1 and 2 were compared further using criteria from the Institute of Electrical and Electronics Engineers (IEEE) standard. The assessment showed that both options were equally matched in most areas and the majority of the differences were found under criteria of relatively low importance. However, the diesel generator performed better than the gas turbine in one particularly important area; fast start-up.

244 Fast start-up is a fundamental requirement of the technology as it is essential to resume, almost instantaneously, a supply of electricity to essential systems in the event of loss of power to the site. This is why diesel generators are the preferred option in the design of pressurised water reactors around the world, resulting in improved environmental and safety performance associated with a wide pool of operational experience and optimised staff management.

245 It is concluded by NNB GenCo that Option 1, diesel generator run on fuel oil, is considered to be the best technology and should be used to provide the emergency electricity supply to the essential systems for the HPC power station.

246 It should be emphasised that:

- The choice of diesel generators rather than gas fired engines, for the reactor emergency power supply, is considered to be BAT, with regards to safety aspects and based on the operational experience feedback available on the fleet of French nuclear power stations, which has shown that this equipment is highly reliable and well tested;

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- EDGs can be started from cold very quickly (in less than 30 seconds). This is vital given their role on the site;
- Gas turbines are more expensive to purchase than the equivalent size diesel generator due to the high spinning speeds and temperatures they operate at however this is balanced by lower operating expenditure so there is little difference in cost;
- Safety case requires EDGs and SBOs to be of diversified technologies (different types of diesel generators will be used); and
- The decision to use EDGs is part of the reference design in GDA and safety assessments carried out for the EPR.

247 In addition to this, EDF Energy and the wider EDF Group of companies have extensive experience in successfully maintaining and operating EDGs on sites across the UK as well as in support of 58 nuclear reactors in France and has provided engineering expertise to the nuclear sector across Asia and the United States of America.

### ***Choice of Fuel***

248 As part of the development process, the Operator has considered suitable fuels for the provision of emergency power. A range of considerations are discussed below. As each plant will only be operated (under normal operations) for maintenance purposes and during periodic nuclear safety tests, the storage of the fuel is an important aspect in decision making.

249 Reciprocating engines can be operated on diesel (typically  $C_{14}H_{30}$ ) or a short chain hydrocarbon such as kerosene or petroleum (typically  $C_9H_{20}$ ). There are two main reasons that diesel is the preferred fuel choice:

- Diesel is a long chain hydrocarbon which has a greater energy to volume ratio. This means that slightly lower volumes need to be stored; and
- The long chain hydrocarbons evaporate more slowly than short chain hydrocarbons resulting in a smaller release of fugitive loss to the environment from the storage tanks.

250 Both of these aspects are key decision making factors where larger volumes of fuel are stored for standby use.

251 For large combustion plant, the techniques for controlling releases of  $NO_x$ , carbon monoxide and particulates (particulate matter (PM)) are based on burner design, the method of atomisation and the control of primary, secondary and tertiary air. A control loop system is required to govern the air and fuel supply and is significant in air pollution control.

252 These techniques are not appropriate for small Installations using compact, high thermal rating compression ignition engines (as there are no burners). Particulate matter (PM) can be reduced by the removal of solids from the fuel, this is not considered practicable for a standby system where the benefits from minimal use outweigh the Installation and maintenance costs; additional plant equipment also increases the chances of plant failure which could impact on reliability.

253  $NO_x$  is mostly formed from oxidation of nitrogen in the combustion air. The Operator has committed to optimising  $NO_x$  control at the procurement phase by consideration of the

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design specifications. It is noted that these considerations will address equipment reliability as this is the priority for standby safety related diesel generators. NO<sub>x</sub> control will also be addressed via a maintenance programme to ensure diesel generator performance is optimised.

- 254 End-of-pipe flue gas technologies such as Selective Catalytic Reduction (SCR) and Selective Non Catalytic Reduction (SNCR) to reduce NO<sub>x</sub> emissions were assessed by the Operator. The conclusion was that as these technologies require steady operating conditions to function effectively they are not a practical cost effective consideration for applications of this type where the plant is only operated on an infrequent basis. We agree with the Operators assessment of secondary abatement measures for the diesel generators.
- 255 To ensure protection of the environment we have set emission limit values for NO<sub>x</sub>, carbon monoxide and particulates as detailed below;
- NO<sub>x</sub> (expressed as NO<sub>2</sub>) 1900mg/m<sup>3</sup>
  - Particulate matter 50mg/m<sup>3</sup>
  - Carbon monoxide 150mg/m<sup>3</sup>
- 256 The source of sulphur, in emissions to air from combustion processes, is the fuel. Oil (including bitumen) emulsions and many heavy fuel oils have high sulphur contents. The use of oil fuels containing sulphur will result in some sulphur dioxide (SO<sub>2</sub>) releases, (as well as sulphur trioxide), however the EDGs will use low sulphur oils (below 0.1% w/w sulphur) in line with the Sulphur Content of Liquid Fuels (SCOLF) Regulations 2007 (or relevant future legislation). This precludes the need for any form of flue gas desulphurisation (FGD). As stated above the maximum sulphur content of fuel oil and hence emissions of sulphur dioxide are controlled by the SCOLF Regulations and no ELVs are proposed for this pollutant.
- 257 For safety reasons there should be different sources of fuel supply. This will not have any effect on the sulphur content of the diesel fuel used as all suppliers will be able to provide diesel with sulphur levels that comply with the SCOLF Regulations 2007 (or relevant future legislation).
- 258 We have reviewed NNB GenCo's choice of technology and agree that the proposed equipment represents BAT for the Installation.

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## 4.11 Other statutory considerations

### 4.11.1 EA 95 – Section 4 Principal Aim of the Environment Agency (“sustainable development”)

- 259 We have considered the principal aim of the Environment Agency, set out in section 4 of the Environment Act 1995 (EA 95), which relates to sustainable development and the guidance issued:
- 260 to the Environment Agency in December 2002 ([The Environment Agency’s Objectives and Contributions to Sustainable Development: Statutory Guidance, December 2002](#))<sup>9</sup> and links to the UK [Sustainable Development Strategy \(A Better Quality of Life: A strategy for sustainable development in the UK \(May 1999\), Cm 4345\)](#)<sup>10</sup>, although we note that this strategy has now been updated, see below).
- 261 This document provide guidance to us on matters such as the formulation of approaches that we should take to our work, decisions about our priorities and our allocation of resources. We are required under section 4(4) of EA95 to have regard to the statutory guidance in delivering our functions, but they are not directly applicable to our individual regulatory decisions.
- 262 The Guidance states that our main contribution to sustainable development will be to meet our various objectives in a way that takes account (subject to and in accordance with EA 95 and any other enactment) of economic and social considerations.
- 263 The UK Sustainable Development Strategy was updated in 2005 with the publication of [The UK Government’s Sustainable Development Strategy \(March 2005\), Cm 6467](#)<sup>11</sup>. This states that 'Our [UK] Strategy for sustainable development aims to enable all people throughout the world to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life of future generations', and introduces five guiding principles. These are:
- ***Living within environmental limits:*** *respecting the limits of the planet’s environment, resources and biodiversity – to improve our environment and ensure that the natural resources needed for life are unimpaired and remain so for future generations.*
  - ***Ensuring a strong, healthy and just society:*** *meeting the diverse needs of all people in existing and future communities, promoting personal wellbeing, social cohesion and inclusion, and creating equal opportunity for all.*
  - ***Achieving a sustainable economy:*** *building a strong, stable and sustainable economy, which provides prosperity and opportunities for all, and in which environmental and social costs fall on those who impose them ('polluter pays'), and efficient resource use is incentivised.*
  - ***Using sound science responsibly:*** *ensuring policy is developed and implemented on the basis of strong scientific evidence, while taking into account*

<sup>9</sup><http://archive.defra.gov.uk/corporate/about/with/ea/documents/ea-susdev-guidance.pdf>

<sup>10</sup><http://collections.europarchive.org/tna/20080530153425/http://www.sustainable-development.gov.uk/publications/uk-strategy99/index.htm>

<sup>11</sup>[http://archive.defra.gov.uk/sustainable/government/publications/uk-strategy/documents/SecFut\\_complete.pdf](http://archive.defra.gov.uk/sustainable/government/publications/uk-strategy/documents/SecFut_complete.pdf)

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*scientific uncertainty (through the 'precautionary principle') as well as public attitudes and values.*

- **Promoting good governance:** *actively promoting effective, participative systems of governance in all levels of society – engaging people’s creativity, energy and diversity.*

264 The Government published further guidance on “[mainstreaming sustainable development](#)”<sup>12</sup> in 2011.

265 We consider that the overall approach described in this consultation document, and in particular the application of the BAT, which takes into account social and economic factors, and the assessment of the impact of the discharges on members of the public and the environment, contributes appropriately to the aim of achieving sustainable development, having regard to the statutory guidance.

#### 4.11.2 EA 95 - Pollution control powers

266 Section 5 of EA 95 sets out the statutory purpose for which the Environment Agency’s pollution control powers, including our powers under EPA 10, must be exercised, namely 'preventing or minimising, or remedying or mitigating the effects of, pollution of the environment'.

267 We consider that we have properly exercised our pollution control powers contained in section 5 of EA 95, in that:

- *we have set limits and conditions based on BAT, as specified in the statutory guidance, having regard to Government policy;*
- *the potential for impact of the permitted discharges on members of the public;*
- *the environment is protected.*

#### 4.11.3 EA95 - Amenity issues

268 Under s.7(1)(c)(ii) of EA 95 the Environment Agency must take into account any effect which the proposals would have on the beauty or amenity of any rural or urban area or on any such flora, fauna, features, buildings, sites or objects. Our assessment of the impact from the proposal is that there are no effects that would require us to include additional limits or conditions in the permit.

269 Sedgemoor District Council raised the issues of loss of area and potential air quality impacts on the Hinkley Point County Wildlife Site. The loss of area is within the scope of our duties under s.7(1)(c)(ii). The loss of area is primarily a planning matter. We are satisfied that the planning process can deal with this matter without the need for us to include additional limits or conditions in the permit. We consider that the impact from gaseous discharges will not detract from the benefits that such wildlife sites provide to wildlife species, habitat and amenity for the local population. Our assessment of the impact from the proposal is that there are no effects that would require us to include additional limits or conditions in the permit.

#### 4.11.4 EA 95 – Well-being of local communities

270 Under section 7(1)(c)(iii) of EA 95, we must have regard to the effect our proposals may have on the economic and social well-being of local communities in rural areas.

<sup>12</sup><http://sd.defra.gov.uk/documents/mainstreaming-sustainable-development.pdf>



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271 We have had regard, as appropriate, to the potential effect on the economic and social well-being of the local community as part of our:

- *assessment of the operator's proposals in relation to the use of BAT, which involves considering costs and benefits;*
- *considerations in relation to the principal aim of the Environment Agency (sustainable development);*

272 Our assessment of the impact from the proposal is that there are no effects that would require us to include additional limits or conditions in the permit.

#### **4.11.5 EA 95 – Likely costs and benefits**

273 We have taken into account the likely costs and benefits in accordance with section 39 of EA 95 in our assessment of BAT. We are satisfied that the conditions in the permit are proportionate.

#### **4.11.6 Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 - Groundwater Directive (Schedule 22 to EPR 10)**

274 Under the Water Environment (Water Framework Directive) Regulations, we must exercise our functions to secure compliance with the Water Framework Directive (Directive 2000/60/EC), which seeks to protect ground and surface water on an integrated river basin basis. We have considered the applicant's proposals in relation to the use of BAT to minimise discharges to the environment and the impact of these discharges on members of the public and the environment. As described earlier in section 4, we consider that the applicant's proposals and the permit conditions represent the use of BAT to reduce the impact to as low as reasonably achievable. We are, therefore, satisfied that the conditions are sufficient in relation to these regulations.

275 Schedule 22 of EPR 10 implements the Groundwater Directive to require the taking of all necessary measures to prevent the input of any hazardous substances to groundwater, and to limit the input of non-hazardous pollutants into groundwater so as to ensure these pollutants do not cause pollution. The permit does not permit any releases to groundwater from the combustion activities.

#### **4.11.7 Human Rights Act 1998 (HRA 98)**

276 We have considered potential interference with rights addressed by the European Convention on Human Rights in reaching our decision. We consider that our decision is compatible with our duties under the Human Rights Act 1998. In particular, we have considered the right to life (Article 2), the right to a fair trial (Article 6) (which here includes the right to a reasoned decision – as provided in this document), the right to respect for private and family life (Article 8) and the right to protection of property (Article 1, First Protocol).

#### **4.11.8 Duty to Involve**

277 Regulation 59 of EPR 10 requires the Environment Agency to prepare and publish a statement of its policies for complying with its public participation duties. We have published such a document, "[how we work together](#)"<sup>13</sup> and this application has been consulted on in line with our public participation statement, as well as with [RGN 6 on Sites of High Public](#)

<sup>13</sup> <http://www.environment-agency.gov.uk/business/topics/permitting/36420.aspx>

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[Interest](#)<sup>14</sup>. The latter addresses extended consultation arrangements for determinations where public interest is particularly high. This satisfies the requirements of the Public Participation Directive.

- 278 Section 23 of the Local Democracy, Economic Development and Construction Act 2009 requires us, where we consider it appropriate, to take the necessary steps to involve interested persons in carrying out our role by providing them with information, consulting them or involving them in any other way.
- 279 We have described in section 4 of this document our consultation in relation to this application and we have described the way in which we have taken account of representations we have received to date in Annex 2.

## 4.12 Matters which are outside the Environment Agency's permitting remit

### 4.12.1 Location of the installation

- 280 Decisions about land use are matters for the land-use planning system. The location of the facility is a relevant consideration for environmental permitting, but only with regard to its potential to have an adverse environmental impact on members of the public or sensitive environmental receptors. The impact on members of the public and the environment has been assessed as part of the determination process, is reported in section 5 of this document, and is small and well within relevant limits and constraints.

### 4.12.2 Flood risk

- 281 We provide advice and guidance on flood risk in our consultation responses relating to the operators application to the planning authority for a development control order. Both the applicant and planning authority normally accept our advice on these matters. The ONR considers flood risk as part of the licensee's safety case under the Nuclear Site Licence.
- 282 Some consultees have raised concerns about the effects of flooding on the safety of the site. We have passed these consultation responses to the ONR.

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<sup>14</sup><http://publications.environment-agency.gov.uk/PDF/GEHO1111BUKC-E-E.pdf>

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## 5 Our decision

- 283 We consulted on our draft decision that we should grant a permit, and on the conditions of the draft permit. We have now carefully considered all the consultation responses and consider that our original conclusions remain valid.
- 284 Our decision is that we should grant a permit for Hinkley Point C Power Station operated by NNB Generation Company Limited.
- 285 The Permit number is EPR/ZP3238FH.
- 286 See section 4 for more detailed discussion of these matters.

### Conditions of permit

- 287 The permit is based on our standard template permit for combustion activities. We have developed the standard template over a number of years and we regularly review it to make sure that it is up to date and effective, and that permits for specific sites properly protect people and the environment and are consistent with the relevant legislation. The permit template and its conditions are described more fully in the document "[How to comply with your Environmental Permit](#)".
- 288 The standard permit template consists, principally, of:
- an introductory note (this is not part of the permit);
  - a certificate page granting the permit;
  - Parts 1-4, being standard conditions about management, operations, waste management and monitoring, and provision of information;
  - Schedule 1, defining the activities permitted;
  - Schedule 2, specifying raw materials.
  - Schedule 3, specifying routes for, monitoring and limits on emissions to air, water and land.
  - Schedule 4, specifying reporting requirements.
  - Schedule 5, notification form.
  - Schedule 6, interpretation.
  - Schedule 7, a site plan showing the geographical extent of the regulated facility.
- 289 The conditions in Parts 1-4 of the proposed permit have not been modified from the standard conditions of our template.
- 290 In Schedule 1, we have proposed:
- 1 improvement condition
  - 2 pre-operational measures
- for the reasons explained in Chapter 4.
- 291 Schedule 3 specifies the proposed point source releases and, as relevant, the proposed limits that apply to specific substances for each of the approved release points.
- 292 We are of the view that our decision and permit conditions are consistent with the relevant legislation, and that we have determined the application having regard to the statutory

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guidance concerning the regulation of discharges into the environment and relevant Government policy.

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## Glossary

(Please note that this glossary is standard for our decision documents and therefore not all these acronyms are necessarily used in this document.)

APC	Air Pollution Control
BAT	Best Available Technique(s)
BAT-AEL	BAT Associated Emission Level
BREF	BAT Reference Note
CCW	Countryside Council for Wales
CHP	Combined heat and power
CROW	Countryside and rights of way Act 2000
DAA	Directly associated activity – Additional activities necessary to be carried out to allow the principal activity to be carried out
DD	Decision document
EAL	Environmental assessment level
EIAD	Environmental Impact Assessment Directive (85/337/EEC)
ELV	Emission limit value
EMAS	EU Eco Management and Audit Scheme
EMS	Environmental Management System
EPR	Environmental Permitting (England and Wales) Regulations 2010 (SI 2010 No. 675) as amended
EQS	Environmental quality standard
EU-EQS	European Union Environmental Quality Standard
FSA	Food Standards Agency
GWP	Global Warming Potential
HHRAP	Human Health Risk Assessment Protocol
HMIP	Her Majesty's Inspectorate of Pollution
HPA	Health Protection Agency
HRA	Human Rights Act 1998
HW	Hazardous waste

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HWI	Hazardous waste incinerator
IPPCD	Integrated Pollution Prevention and Control Directive (2008/1/EC)
LCPD	Large Combustion Plant Directive (2001/80/EC)
LOI	Loss on Ignition
NOx	Oxides of nitrogen (NO plus NO <sub>2</sub> expressed as NO <sub>2</sub> )
Opra	Operator Performance Risk Appraisal
PAH	Polycyclic aromatic hydrocarbons
PC	Process Contribution
PCT	Primary Care Trust
PEC	Predicted Environmental Concentration
POP(s)	Persistent organic pollutant(s)
PPS	Public participation statement
PR	Public register
RGS	Regulatory Guidance Series
SAC	Special Area of Conservation
SCR	Selective catalytic reduction
SGN	Sector guidance note
SHPI(s)	Site(s) of High Public Interest
SNCR	Selective non-catalytic reduction
SPA(s)	Special Protection Area(s)
SSSI(s)	Site(s) of Special Scientific Interest
TGN	Technical guidance note
UN_ECE	United Nations Environmental Commission for Europe
US EPA	United States Environmental Protection Agency
WFD	Waste Framework Directive (2008/98/EC)
WHO	World Health Organisation

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We define Best available techniques BAT in the following way.

The term "best available techniques" means the latest stage of development (state of the art) of processes, of facilities or of methods of operation which indicate the practical suitability of a particular measure for limiting discharges, emissions and waste. In determining whether a set of processes, facilities and methods of operation constitute the best available techniques in general or individual cases, special consideration shall be given to:

- a) comparable processes, facilities or methods of operation which have recently been successfully tried out;
- b) technological advances and changes in scientific knowledge and understanding;
- c) the economic feasibility of such techniques;
- d) time limits for Installation in both new and existing plants;
- e) the nature and volume of the discharges and emissions concerned.

It therefore follows that what is "best available techniques" for a particular process will change with time in the light of technological advances, economic and social factors, as well as changes in scientific knowledge and understanding.

If the reduction of discharges and emissions resulting from the use of best available techniques does not lead to environmentally acceptable results, additional measures have to be applied.

**"Techniques" include both the technology used and the way in which the Installation is designed, built, maintained, operated and dismantled.**

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## **Annex 1 – Places where the application was advertised or could be viewed and list of respondents**

### **Print and digital media**

We placed an advert announcing the start of the consultation in The Somerset County Gazette, Western Daily Press and the Bridgwater Mercury. We also advertised in the South Wales Echo.

We issued a press release to key local media outlets across the region.

We used social media such as Twitter and Facebook to help promote the consultation.

We sent letters to those people and organisations in our database for Hinkley Point consultations.

We updated our Hinkley Point web-pages to link to the application documents and inform people about how to respond.

### **Location where the documents could be viewed**

<b>Environment Agency</b>	<b>Somerset County Council</b>	<b>Environment Agency Office</b>
<b>Rivers House</b>	<b>Major Energy Projects</b>	<b>Rivers House</b>
<b>East Quay</b>	<b>Environment Directorate</b>	<b>St. Mellons Business Park</b>
<b>Bridgwater</b>	<b>Somerset County Council</b>	<b>Fortran Road</b>
<b>Somerset</b>	<b>County Hall</b>	<b>St. Mellons</b>
<b>TA6 4YS</b>	<b>Taunton</b>	<b>Cardiff</b>
	<b>TA1 4DY</b>	<b>CF3 0EY</b>
<b>West Somerset Council</b>	<b>North Somerset Council</b>	<b>West Somerset Council</b>
<b>West Somerset House</b>	<b>Corporate Services Unit</b>	<b>Minehead Customer Centre</b>
<b>Killick Way</b>	<b>Somerset House</b>	<b>1-3 Summerland Road</b>
<b>Williton</b>	<b>Oxford Street</b>	<b>Minehead</b>
<b>Somerset</b>	<b>Weston-super-Mare</b>	<b>TA24 5BP</b>
<b>TA4 4QA</b>	<b>BS23 1TG</b>	
<b>Sedgemoor District Council</b>	<b>Vale of Glamorgan Council</b>	<b>Burnham-on-Sea Library</b>
<b>Bridgwater House</b>	<b>Civic Offices</b>	<b>Princess Street</b>
<b>King Square</b>	<b>Holton Road</b>	<b>Burnham-on-Sea</b>
<b>Bridgwater</b>	<b>Barry</b>	<b>Somerset</b>
<b>TA6 3AR</b>	<b>CF63 4RU</b>	<b>TA8 1EH</b>



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## Annex 2 - Consultees and responses on the Application

We wrote to a wide range of organisations that we have working together agreements with or that we believed might be interested in the consultation.

- Health and Safety Executive (Office for Nuclear Regulation)
- Health and Safety Executive (Wales)
- Food Standards Agency
- Sedgemoor District Council
- West Somerset Council
- Somerset County Council
- North Somerset Council
- Mendip District Council
- Taunton Deane District Council
- Vale of Glamorgan Council
- Somerset Primary Care Trust
- Cardiff and Vale University Local Health Board
- Natural England
- Countryside Council for Wales
- Centre for Environment, Fisheries and Aquaculture Science
- Marine Management Organisation
- Association of Sea Fisheries Committees (Wales)
- Devon and Severn Inshore Fisheries and Conservation Authority
- Welsh Assembly Government, Fisheries Policy Branch

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## 1) Consultation Responses from Statutory and Non-Statutory Bodies

Response Received from the <b>Health Protection Agency</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
No issues with respect to the combustion activity.	-

Response Received from the <b>Food Standards Agency</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
No concerns on the grounds of Food Safety.	-

Response Received from the <b>Somerset Primary Care Trust</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
<p>1) Providing there is adequate management and regulation of activities associated with the operation of the diesel generators, then they would not expect there to be significant public exposure to emissions from this site, other than due to accidental and fugitive releases or from combustion gas emissions to air.</p> <p>2) They recommended that we confirm that operational activities do not exceed the parameters used to assess impacts on air quality. Should a situation arise where these conditions might no longer be valid, we should notify NHS Somerset and the Health Protection Agency and require NNB GenCo to update the risk assessment.</p> <p>3) In addition, due to the predicted impacts on short-term air quality from a loss of power supply scenario, in the unlikely event that backup generators are required for more than 24 hours, they recommended that we ensure that NNB</p>	<p>1) NNB GenCo has stated in the Application that they will implement an Environmental Management System (EMS) that will be certified under ISO14001. The EMS will include measures to prevent accidents, minimise their consequences and avoid fugitive releases. A pre-operational condition (PO1) is included requiring the Operator to provide a summary of the EMS prior to commissioning of the plant and to make all EMS documentation available for inspection. The Environment Agency recognises that certification of the EMS cannot take place until the Installation is operational. An improvement condition (IC1) is included requiring the Operator to report progress towards gaining accreditation of its EMS.</p> <p>2) Monitoring will provide evidence of compliance – any consistent deviation would entail the need for a revised risk assessment potentially requiring a variation to the permit. In addition consistent exceedences would lead to enforcement action.</p> <p>Operational hours are required to be reported under condition 4.2.2(b) of the permit - any substantial deviation would entail the need for a revised risk assessment.</p> <p>3) MCERTS accredited monitoring is required under condition 3.5.3 of the permit.</p>

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GenCo has appropriate arrangements for emission monitoring.	
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Response Received from the <b>Health and Safety Executive</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
No issues with respect to the combustion activity.	-

Response Received from <b>Devon and Severn Inshore Fisheries and Conservation Authority</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Noted that there was no process release to water and therefore no issues raised.	-

Response Received from <b>English Heritage</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
No issues raised.	-

Response Received from the <b>Welsh Government</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
They stated that although there are 12 generators on site in total they will be operated for only a relatively short period. They considered the potential impact of this and did not consider that it will have any significant impact in South Wales.	The air quality modelling assessment has confirmed that there will be no significant effect on air quality in South Wales.

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Response Received from <b>Countryside Council for Wales</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
<p>1) Concern raised that any other combustion plant at HPC with a thermal input of &lt;3MWth not required to provide back-up power will not be included within the scope of the permit. Recommend that we seek confirmation that the impacts from any other combustion plant will be assessed as part of the IPC or other application. If this is not the case then it is recommended that they are included within the permit.</p> <p>2. With respect to the process contributions of nitrogen deposition and sulphur dioxide, from the information provided by NNB GenCo, they are of the view that these are unlikely on their own to have a significant effect on the Severn Estuary or other designated sites.</p> <p>3. With respect to nitrogen oxides, the information provided from the ADMS detailed modelling indicates that both the long and short term critical levels are exceeded. However, CCW is of the opinion that given the nature of the worst case scenario modelled the proposed development is not likely on its own to have a significant effect on the Severn Estuary SAC, SPA or other designated sites.</p> <p>4. CCW refer us to Natural England for their comments on any features of Bridgwater Bay and Steep Holm SSSIs that are not related to the features of the Severn Estuary SPA, SAC and Ramsar site.</p> <p>5. In conclusion, on the basis of the information provided, CCW is of the opinion, given the scale and nature of this element of the Hinkley proposals, that it is not likely to have a significant effect on its own on the Severn Estuary SPA, SAC.</p>	<p>We are restricted by the EPR as to what we can include in this permit. The planning regime should consider the potential impacts of activities not regulated under other regimes.</p> <p>2), 3) and 5) We have carried out an assessment of the impact as detailed in Chapter 4 and this confirms that there will be no significant impact on air quality or noise associated with normal operation.</p> <p>As above.</p> <p>Natural England have been consulted (see below).</p> <p>As point 2) above.</p>

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Response Received from the <b>Natural England</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Natural England stated that they did not intend to comment at this stage. Natural England stated that they will await our statutory consultation with them via the Appendix 11 and Appendix 4 processes.	Appendix 11 and 12 consultations submitted to Natural England for comment.

Response Received from the <b>Aneurin Bevan Local Health Board</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
The geographical area covered by Aneurin Bevan Health Board is so far away from the Hinkley Point site that it is highly unlikely that any planned construction or normal operational activity at the site would have significant impact on our population.	We have carried out an assessment of the impact as detailed in Chapter 4 and this confirms that there will be no significant impact on air quality or noise associated with normal operation.

Response Received from the <b>Centre for Environment, Fisheries and Aquaculture Science</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
No issues raised.	-

Response Received from the <b>Office for Nuclear Regulation</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
No issues with respect to the combustion activity.	-

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## 2) Consultation Responses from Members of the Public and Community Organisations

The responses summarised and addressed below are those relevant to the activities permitted by permit No. EPR/ZP3238FH. Other comments received will be addressed under the consultation document for the relevant activities.

### a) Representations from Local MP, Assembly Member (AM), Councillors and Parish / Town / Community Councils

Response Received from <b>Cardiff Council</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
The Council had no technical or policy comments to make on the consultation.	N/A

Response Received from <b>Burnham-On-Sea and Highbridge Town Council</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
No issues with respect to the combustion activity.	N/A

Response Received from <b>Selworthy and Minehead Parish Council</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
No issues with respect to the combustion activity.	N/A

Response Received from <b>Stogursey Parish Council</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Concern regarding the noise and air pollution associated with the operation of the large diesel standby generators.	We have carried out an assessment of the impact as detailed in Chapter 4 and this confirms that there will be no significant impact on air quality or noise associated with normal operation.

Response Received from <b>Watchet Town Council</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Concern regarding what provision will be made for them to understand the full nature of the process.	The decision document will be made available and will explain the operations and detail our assessment of any potential impact.

Response Received from <b>Taunton Deane Borough Council</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
No issues with respect to the combustion activity.	-

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<b>Response Received from Williton District Council</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
No issues with respect to the combustion activity.	N/A

<b>Response Received from Mr G Chichester MEP for South West</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
States his broad support for the project.	N/A

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b) Representations from Individual Members of the Public

Responses were received from individual members of the public.

Response Received from <b>resident of Timberscombe</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Concern that no live monitoring of emissions is planned by ourselves and that we will rely on the operator's results.	<p>MCERTS accredited monitoring is required under condition 3.5.3 of the permit along with reporting requirements.</p> <p>NNB GenCo has stated in the Application that independent external contractors certified to MCERTS will undertake monitoring on their behalf. This has been incorporated within the permit in table S1.2 and hence becomes part of the operating conditions of the permit under condition 2.3.1 (a).</p>

Response Received by <b>email</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
No objection to this proposal.	-

Response Received from a <b>resident of Bury St Edmunds</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Issue raised regarding the ownership of NNB Generation Company Ltd. Concerned that attributing liability or levying penalties for misdemeanours could be difficult.	The responsibility for compliance with the permit lies with NNB Generation Company Ltd – the Operator. Like all limited companies they are a legal entity in their own right and can be subject to enforcement action in the same way as any other company. See also section 4.3.2
Concern regarding the level of power provided by the standby diesel generators. Whether sufficient power is available to allow a controlled reduction in the coolant temperature and pressure, so that the creation of flash steam can be avoided after an emergency shutdown.	<p>The capacity of the generators stated in the response was 6MWe for each reactor. However the Application is for 31.6Mwe capacity for each reactor.</p> <p>The assessment of the necessary capacity will be undertaken by the Office for Nuclear Regulation as part of the site safety case.</p>



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Response Received from a <b>resident of Bridgwater</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Concern regarding the location of the plant particularly with respect to the Hinkley Point geological fault line and the potential for flooding.	<p>There is negligible tidal or fluvial flood risk associated with the site. Higher probability natural disasters will be assessed by the Office for Nuclear Regulation as part of the site safety case.</p> <p>Site location and flooding will also be considered as part of the planning process.</p>

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## **Annex 3 – Places where the draft decision documents could be viewed**

<b>Environment Agency Rivers House East Quay Bridgwater Somerset TA6 4YS</b>	<b>Environment Agency Office Rivers House St. Mellons Business Park Fortran Road St. Mellons Cardiff CF3 0EY</b>	<b>Somerset County Council Major Energy Projects Environment Directorate Somerset County Council County Hall Taunton TA1 4DY</b>
<b>West Somerset Council, West Somerset House Killick Way Williton Somerset TA4 4QA</b>	<b>West Somerset Council Minehead Customer Centre 1-3 Summerland Road Minehead TA24 5BP</b>	<b>North Somerset Council Corporate Services Unit Somerset House Oxford Street Weston-super-Mare BS23 1TG</b>
<b>Sedgemoor District Council Bridgwater House King Square Bridgwater TA6 3AR</b>	<b>Burnham-on-Sea Library Princess Street Burnham-on-Sea Somerset TA8 1EH</b>	<b>Vale of Glamorgan Council Civic Offices Holton Road Barry CF63 4RU</b>

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## Annex 4 – Consultation responses on our draft decision

### 1) Consultation Responses from Statutory and Non-Statutory Bodies

Response Received from the <b>Countryside Council for Wales (Letter dated 08/11/2012)</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
<p>1) With respect to acid deposition, CCW concurred this is not likely to be significant to saltmarsh feature of the Severn Estuary SAC, or other features of the international sites.</p> <p>2) With respect to nitrogen (N), CCW noted the reference in nutrient enrichment and acidification : Severn Estuary SPA, SAC, Ramsar in the appropriate assessment ('Commissioning Scenario', section 3.6.1, p258) to the maximum deposition being 1.71kgN/ha/yr. This is 8.6% of the lower nitrogen critical load for saltmarsh (20-30kgN/ha/yr). The PEC is 14.7kgN/ha/yr and so is 73.5% of the critical load. In their view based on jointly agreed H1 guidance Annex F Air Emissions the nitrogen deposition from the combustion process should be considered significant and require further consideration of impacts). They commented that our statement that the PEC (14.7kgN/ha/yr) is below the lower critical level load and therefore not significant does not follow the agreed guidance. They therefore recommended that further assessment/clarification is provided to justify the conclusions reached.</p> <p>They noted that in section 3.6.1.1 (p260-261) it is indicated that the operating hours have been reduced from those originally assessed. These revised operating hours have decreased the predicted NO<sub>2</sub> and so may also decrease the predicted N deposition on the saltmarsh. This may demonstrate that the PEC could be &lt;70% of the N Critical Load and therefore there is no likely significant effect.</p>	<p>1) No further action required.</p> <p>2) The guidance with respect to habitats assessment has been updated since the original determination detailed in Chapter 4. There were no significant changes to the guidance; however we have reviewed the Operators assessment of nitrogen deposition in line with the updated guidance (Operational Instruction 66_12 issued 05/05/12). Our assessment of our findings found that our original conclusion remains valid and we did not feel it was necessary to update Chapter 4 however our review is detailed below.</p> <p>The Operator derived their process contribution (PC) of 1.71kgN/ha/yr from assuming that 100% of the nitrogen oxides (NO<sub>x</sub>) contribute to nitrogen deposition for comparison with the critical load. Following our guidance (AQTAG06), nitrogen oxides (NO<sub>x</sub>) as emitted from the engines should have assumed 70% conversion to NO<sub>2</sub> on an annual basis. This would have resulted in a PC of 1.2kgN/ha/yr based on the applicants detailed modelling and a Predicted Environmental Contribution (PEC) of 70.1%.</p> <p>The Operator based their prediction on an assumed 4,892 hours of operation. The operating hours have been revised from those originally assessed, with reduced operating hours of 3,294 which as explained in Chapter 4 is still a conservative estimate. Depending on when precisely they operate the plant during the year, this on average gives a revised PC of 0.8kgN/ha/yr (4% of the EAL) and a PEC of 13.7kgN/ha/yr which is 68% of the lower critical load. This is below the threshold for further detailed assessment in accordance with our Operational Instruction 66_12.</p> <p>Clearly all assessments have an inherent uncertainty. However, we have reviewed the sensitivity to a large number of variables and we are satisfied that the applicant's predictions can be used as a worst-case. Therefore we are confident in the risk basis for the above assessment.</p>

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<p>3) CCW recommended that the data for N deposition be presented as in the other tables in section 4.</p> <p>4) CCW commented that in the LOOP Scenario short term table (p35) the PC is given as 1213 and PEC as 933. They stated that this may be a typographic error because the PC cannot be greater than PEC by definition (i.e. <math>PEC = PC + \text{background}</math>).</p>	<p>3) The data for N deposition has been tabulated as requested.</p> <p>4) The typographic error has been corrected – the PC is 933 and the PEC is 956.</p>
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Response Received from the <b>Countryside Council for Wales (Email dated 28/01/2013)</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
<p>CCW considered the additional clarifications provided (as detailed in the table above) and concluded that their concerns have been addressed and can agree with the EA conclusions in the appropriate assessment for aerial emissions and deposition that there will be no likely significant effect (email dated 28/01/13).</p>	<p>No further action required.</p>

Response Received from <b>Sedgemoor District Council</b>	
Brief summary of issues raised:	Summary of action taken / how this has been covered
<p>1) The Council noted that any proposals for the management of pollution should take into full account the requirements imposed upon the Development Consent Order (DCO). All measures should be taken to ensure that operating techniques are complementary and in no way conflict with these requirements. The Council supported the principal of an emissions management plan and again would wish to ensure that this is complementary to requirements imposed on the DCO.</p> <p>2) The Council notes that all suitable measures should be employed to minimise odour arising from the site and that an odour management plan may be required where pollution due to odour is detected outside the site. This odour management plan should incorporate all suitable measures to address odour.</p> <p>3) The Council notes that noise and vibration levels are to be controlled so as to limit levels likely to cause pollution outside the site. The Council noted that these levels are to be as perceived by an officer from the Environment Agency. The Council has made representations through the Examination in respect of noise and vibration control and note that requirements are to be imposed upon the project by virtue of any DCO which may be issued to the applicant. The Council wished to bring these requirements to the attention of the Environment Agency and seek assurance that these would inform any noise and vibration management plan. The Council would wish the permitted activities (or conditions imposed therein) to be complementary to these requirements.</p> <p>4) We note the measures set out in IC1 for the operator to submit a report on its implementation of an</p>	<p>1) We have been involved as a consultee throughout the planning process to ensure that the Permit in conjunction with the DCO will provide adequate protection for human health and the environment. The planning and permitting regimes are designed to provide separate but complimentary systems of control.</p> <p>2) Odour is not expected to be an issue with this activity; however standard Permit condition 3.3 addresses any potential issues with odour.</p> <p>3) We have carried out an assessment of the impact as detailed in Chapter 4 and this confirms that there will be no significant impact on noise associated with normal operation. However standard Permit condition 3.4 addresses any potential issues with noise or vibration.</p> <p>4) Standard Permit condition 1.1 requires the Operator to manage the operations in accordance with a written Environmental Management System (EMS) designed to</p>

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<p>Environmental Management System (EMS) and the commitment for accreditation by a suitable external body. Again, the Council would anticipate full regard be had to the requirements associated with the DCO in developing this EMS.</p>	<p>safeguard the environment. Pre-operational condition PO1 is in place to ensure that the EMS is in place prior to commencement of operations.</p>
<p>5) The Council notes the emissions and monitoring limits specified in schedule 3 to the permit and specification of monitoring standards BS EN14792; BS EN 15267-3; BS EN 15058 and BS EN 13284-1. The Council defer to the Environment Agency on regulating these limits. .</p>	<p>5) No further action required.</p>

**b) Consultation responses from Individual Members of the Public**

No responses received relevant to the Combustion Activity.

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