

Hinkley Point C | Development Consent Order Application

Additional Information

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Grid Connection Statement



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1. INTRODUCTION

- 1.1.1 This grid connection statement ("**Connection Statement**") relates to EDF Energy's¹ proposed development of a new nuclear power station ("**Power Station**"), with on-site and off-site associated development, at Hinkley Point in Somerset (the "**HPC Project**").
- 1.1.2 In order to construct and operate the HPC Project, EDF Energy is required to apply to the Infrastructure Planning Commission ("**IPC**") for a development consent order ("**DCO**"). This Connection Statement is one of a suite of documents which must be submitted in support of EDF Energy's application for development consent, in accordance with Section 55 of the Planning Act 2008 and Regulations 5 and 6 of The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (the "**Application Regulations**").
- 1.1.3 EDF Energy is required, under Regulation 6(1)(a)(i) of the Application Regulations, to provide this Connection Statement in support of its application for development consent. This is because EDF Energy is seeking consent for the construction of a generating station. The purpose of this Connection Statement is to identify who will be responsible for designing and building the connection of the Power Station to the national high voltage electricity transmission network (the "**Grid**").

¹ NNB Generation Company Limited (Company number 06937084), part of EDF Energy, is the company that will lead the new nuclear programme in the UK. For the purpose of this Connection Statement, NNB Generation Company Limited is referred to as EDF Energy.

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2. SUMMARY

- 2.1.1 National Grid Electricity Transmission plc ("**National Grid**") and EDF Energy Nuclear Generation Limited² ("**NGL**", part of EDF Energy's group) have entered into contractual arrangements which provide for connection of the Power Station to the Grid. These contractual arrangements set out in principle the works that will need to be carried out to provide the Grid connection and upgrade the existing network to accommodate the output from the Power Station. See Section 4 below for further details.
- 2.1.2 These contractual arrangements divide responsibility for designing and building the connection to the Grid between National Grid and NGL. Under the arrangements, National Grid is responsible for designing and building most of the connection and network upgrade, with NGL having responsibility in both areas for certain works to be undertaken on the Power Station site only. Whilst these contractual arrangements may be varied by the parties in future, they provide the contractual basis for, and clearly establish as a principle, the connection of the Power Station to the Grid (which National Grid is legally obliged to provide pursuant to a request from NGL, provided NGL complies with certain conditions). See Sections 4 and 6 below for further details.
- 2.1.3 National Grid is in the process of consulting on its application for a DCO for those works related to the Grid connection to the Power Station that will not be consented by EDF Energy's DCO in respect of the HPC Project. See Section 5 below.

² EDF Energy Nuclear Generation Limited (company number 03076445) was called British Energy Generation Limited until July 2011 when it changed its company name to EDF Energy Nuclear Generation Limited. At the time the company entered into the contractual arrangements referred to in paragraph 2.1.1 it was called British Energy Generation Limited.

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3. POWER GENERATION AND GRID CONNECTION

- 3.1.1 The Power Station will comprise two Pressurised Water Reactors (UK EPRs). At the centre of each UK EPR is a nuclear reactor capable of producing 4,500MW of thermal power from a controlled fission reaction contained within a thick-walled steel pressure vessel. A primary circuit of water under pressure is heated to a high temperature. The pressure in the 'primary circuit' is maintained by heaters within a pressuriser vessel. The high pressure prevents the primary cooling water from boiling even though the temperature of the water is around 330°C. The cooling water in this primary circuit is circulated by electrically driven pumps through four heat exchanges (known as steam generators) where water in a 'secondary circuit' is converted to steam. The reactor pressure vessel, steam generators and pressuriser are contained within a pressure retaining reinforced concrete structure, known as the 'containment'.
- 3.1.2 Steam from the steam generators is used to power a single large turbine rotating at around 1,500 revolutions per minute (rpm). This is housed in a large high bay hall. The turbine is directly connected to a three phase electrical generator capable of exporting up to 1,670 Megawatts ("**MW**") of electrical power – the two UK EPRs together being capable of exporting up to 3,340MW of electrical power to the Grid.
- 3.1.3 Sea water is circulated from Bridgwater Bay through condensers beneath the main low pressured turbines to condense the steam from the turbines and is then returned to the Bridgwater Bay. The steam condensate is returned to the steam generator via high pressure pumps.
- 3.1.4 Electricity from the generators will be stepped-up to high voltage – 400 kilo Volts ("**kV**") – via transformers before being connected by two short sections of overhead lines to an 18-bay 400kV gas insulated switchgear ("**GIS**") substation which will be built on the site. This new substation will then connect the Power Station's generation output to the Grid. Various upgrades to the surrounding Grid, including new overhead lines and substation extensions, will reinforce the Grid to accommodate the Power Station's output.
- 3.1.5 Connections are also provided from the GIS substation back to each station transformer via cables. These connections act as a back-up to the auxiliary supply function of the main connection in both a planned and unplanned situation.

4. RESPONSIBILITIES FOR THE GRID CONNECTION

- 4.1.1 National Grid owns and manages the electricity transmission network in England and Wales, and applicants wanting to construct a generating station to connect to the Grid are responsible for securing this connection with National Grid. National Grid is under a statutory duty to develop and maintain an efficient, co-ordinated and economical system of electrical transmission³, and is required, pursuant to its Connection and Use of System Code (the "**CUSC**")⁴, to offer and honour terms of a connection to the Grid where such a connection is requested by an entity which is a party to the CUSC Framework Agreement (which gives contractual effect to the CUSC).
- 4.1.2 On 27 November 2007, pursuant to a connection offer provided by National Grid to NGL (NGL is a party to the CUSC and requested National Grid to make the connection offer in relation to the Power Station), NGL and National Grid entered into a Construction Agreement and a Bilateral Connection Agreement (together, the "**HPC Connection Agreements**") for the connection of the Power Station to the Grid.
- 4.1.3 The HPC Connection Agreements form the contractual basis for the connection of the Power Station to the Grid, and provide for connection of a transmission capacity of 1,670MW from 2017, increasing to 3,340MW from 2018 (this allows for connection to the Grid of the Power Station's first UK EPR in 2018, and the second 18 months later – see Section 3 above for details of the generation).
- 4.1.4 The HPC Connection Agreements set out in principle the proposed Grid connection works and other modifications to the surrounding Grid to accommodate the Power Station's output and divide responsibility for designing and building the connection to the Grid between National Grid and NGL. Under the HPC Connection Agreements National Grid is responsible for designing and building most of the works required for the Grid connection and modifications. NGL's role is limited to, broadly, connecting the Power Station to the new 400kV GIS substation and providing generator bays and station transformer bays at the substation (EDF Energy has, as part of its pre-application consultation in relation to its DCO application in respect of the HPC Project, consulted on the elements NGL is responsible for).
- 4.1.5 The HPC Connection Agreements were varied in each of 2008, 2009 and 2010 (in each case, for the most part, to accommodate changes to the works to be included in the Grid connection and/or the construction programme for the Power Station and the Grid connection). The contractual arrangements under the HPC Connection Agreements will be kept under review and may be modified in future (as such, this Connection Statement does not set out the arrangements in detail), although it is

³ Section 9 of the Electricity Act 1989.

⁴ Pursuant to the terms of National Grid's transmission licence (granted to it under section 6(1)(b) of the Electricity Act 1989) it is required to prepare and comply with the Connection and Use of System Code, which forms the basis of the contractual framework for connection to and use of the Grid.

clear that the HPC Connection Agreements establish as a principle that the Power Station will be connected to the Grid.

5. CONSENT FOR THE CONNECTION WORKS

- 5.1.1 National Grid will be applying to the IPC for its own DCO (or otherwise obtaining consent) to authorise all the Grid connection works set out in the HPC Connection Agreements other than those Grid connection-related works that will be included in EDF Energy's DCO in respect of the HPC Project. The Grid connection-related works included in EDF Energy's draft DCO are the 400kV GIS substation at Hinkley Point and the connections between this substation and the Power Station.

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6. CONCLUSION

- 6.1.1 The HPC Connection Agreements, which were entered into further to National Grid's duty to connect new generating stations to the Grid, provide the contractual basis for, and clearly establish as a principle, the connection of the Power Station to the Grid. Under the HPC Connection Agreements, responsibility for designing and building the connection to Grid is allocated between National Grid and NGL. Although changes to the allocation of responsibility and the design of the connection may be subsequently agreed between the parties, the principle of connection of the Power Station to the Grid pursuant to the HPC Connection Agreements will remain.