



The Sizewell C Project

7.1 Grid Connection Statement

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1 Grid Connection Statement

1.1 Introduction

1.1.1 This grid connection statement forms part of an application by SZC Co. to the Secretary of State for Business, Energy and Industrial Strategy under the Planning Act 2008 for powers to construct, operate and maintain a power station in Suffolk (Sizewell C), and the associated development in the vicinity necessary to facilitate the construction and use of the power station (the ‘Sizewell C Project’).

1.1.2 This grid connection statement is one of a suite of documents which must be submitted in support of SZC Co.'s application for development consent, in accordance with Regulations 5 and 6 of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009.

1.1.3 SZC Co. is required, under Regulation 6(1)(a)(i) of the Applications: Prescribed Forms and Procedure Regulations 2009, to provide this grid connection statement in support of its application for development consent. This is because SZC Co. is seeking consent for the construction of an on-shore generating station. The purpose of this grid connection statement is to identify who would be responsible for designing and building the connection of Sizewell C to the National Electricity Transmission System.

1.2 Summary

1.2.1 National Grid and SZC Co. have entered into contractual arrangements which provide for connection of Sizewell C to the National Electricity Transmission System. These contractual arrangements set out in principle the works that would need to be carried out to provide the grid connection and enable the National Electricity Transmission System to accommodate the output from Sizewell C.

1.2.2 These contractual arrangements divide responsibility for designing and building the grid connection between National Grid and SZC Co. Under the arrangements, National Grid is responsible for designing and building most of the connection and reinforcement works, with SZC Co. having responsibility for the connection between Sizewell C and the National Grid substation. 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 Sizewell C to the National Electricity Transmission System.

1.3 Sizewell C Grid Connection

a) Description of Sizewell C power station

1.3.1 Sizewell C would comprise two UK European Pressurised Water Reactor (UK EPR™) units. A UK EPR™ reactor produces heat from nuclear fission which takes place in the reactor core. The core is contained within a thick-walled steel pressure vessel, and heats water in the ‘primary circuit’ under high pressure. The water in this primary circuit is circulated by electrically driven pumps through four heat exchangers (known as steam generators), where water in a ‘secondary circuit’ is converted to steam. The reactor pressure vessel, and steam generators, are contained within a pressure retaining reinforced concrete structure, known as the containment.

1.3.2 Steam from the steam generators is used to power a single large turbine, rotating at around 1,500 revolutions per minute. This is housed in a turbine hall and is connected directly to a three-phase electrical generator capable of producing around 1,770 megawatts (MW) of electrical power, of which approximately 1,670MW is exported.

1.3.3 Steam leaving the turbine is circulated through condensers, which are cooled by a further separate circuit of sea water, and turned back into water (or condensate). This steam condensate is returned to the steam generators via high pressure pumps.

1.3.4 The two UK EPR™ reactor units together would be capable of exporting approximately 3,340MW to the National Electricity Transmission System.

b) Description of the Grid Connection

1.3.5 Electricity from the generators would be stepped up to 400 kilovolts (kV) via the main transformer, and then transferred via overhead lines to the National Grid 400kV substation.

1.3.6 An extension to the existing National Grid 400kV substation would be required to accommodate the additional generation output of Sizewell C. The overhead lines that currently terminate at the existing National Grid 400kV substation would be diverted into a new substation building built alongside and interconnected with the existing substation building, so that the electricity generated by both the existing Sizewell B and new Sizewell C power stations can be exported to the National Electricity Transmission System.

1.3.7 Connections are also provided from the proposed new National Grid 400kV substation building back to each UK EPR™ reactor unit via underground cables. These connections act as a back-up to the auxiliary supply function of the main connection in both a planned and unplanned situation.

c) The Sizewell C Connection Agreements

- 1.3.8 National Grid owns and manages the National Electricity Transmission System in England and Wales, and applicants wanting to construct a generating station to connect to it are responsible for securing this connection with National Grid. National Grid is under a statutory duty, under section 9 of the Electricity Act 1989, to develop and maintain an efficient, co-ordinated, and economical system of electrical transmission. National Grid is also required, pursuant to its Connection and Use of System Code, to offer and honour terms of a connection to the National Electricity Transmission System where such a connection is requested by an entity which is a party to the Connection and Use of System Code Framework Agreement (which gives contractual effect to the Connection and Use of System Code). This is pursuant to the terms of National Grid's transmission licence (granted to it under section 6(1)(b) of the Electricity Act 1989) whereby 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 National Electricity Transmission System.
- 1.3.9 On 27 November 2007, British Energy Generation Limited and National Grid entered into a construction agreement and a bilateral connection agreement (together, the “connection agreements”) for the connection of Sizewell C to the National Electricity Transmission System. British Energy Generation Limited changed its name to EDF Energy Nuclear Generation Ltd on 21 June 2011 and the connection agreements were subsequently novated to SZC Co. on 6 October 2015.
- 1.3.10 The connection agreements form the contractual basis for the connection of Sizewell C to the National Electricity Transmission System, and provide for connection with a transmission entry capacity of 1,670MW from 2029, increasing to 3,340MW from 2030. This allows for connection of Sizewell C's first UK EPR™ reactor unit in 2029 and the second unit 12 months later.
- 1.3.11 The connection agreements were varied in each of 2009, 2013, and 2018 (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 Sizewell C and the grid connection). The contractual arrangements under the 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 clear that the connection agreements establish as a principle that Sizewell C would be connected to the National Electricity Transmission System.

NOT PROTECTIVELY MARKED**d) Responsibility for consenting, designing, and building the grid connection**

1.3.12 The connection agreements set out in principle the proposed grid connection works and other modifications to the surrounding National Electricity Transmission System to accommodate Sizewell C's output.

1.3.13 The grid connection works included in SZC Co.'s application for development consent are the extension of the National Grid 400kV substation, the connections between this substation and Sizewell C, the diversion of the existing overhead lines into a new substation building, and associated works within the existing substation.

1.3.14 Reinforcement works to the surrounding National Electricity Transmission System, including increasing the capacity of the existing overhead lines that connect to the Sizewell site, would be carried out by National Grid as appropriate.

1.3.15 The connection agreements divide responsibility for designing and building the grid connection between National Grid and SZC Co. Under the connection agreements, National Grid is responsible for designing and building the new National Grid 400kV substation building, the diversion of the existing overhead lines into this building, and associated works within the existing substation. SZC Co.'s role is limited to, broadly, designing, constructing, and connecting Sizewell C to the National Grid 400kV substation.

1.4 Conclusion

1.4.1 The connection agreements, which were entered into further to National Grid's duty to connect new generating stations to the National Electricity Transmission System, provide the contractual basis for, and clearly establish as a principle, the connection of Sizewell C to the National Electricity Transmission System. Under the connection agreements, responsibility for designing and building the grid connection is allocated between National Grid and SZC Co. 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 Sizewell C to the National Electricity Transmission System pursuant to the connection agreements would remain.