198/02 - APPLICATION FOR A NON-STANDARD BM UNIT FOR WEST BURTON B BATTERY MODULES

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Summary	EDF Energy (West Burton Power) Ltd has applied for two non-standard BM Units for two battery modules associated with West Burton B Power Station battery storage project. We invite the ISG to approve the application.

1. Background

1.1 EDF Energy (West Burton Power) Ltd (EDFEWBPL) (Party ID 'WBURTONB') is developing the 49MW battery storage project comprised of two battery modules, each containing a set of 5 battery units (and associated low voltage auxiliary supplies). The planned energisation date is the beginning of October 2017 and commercial operation is scheduled for January 2018.

1.2 For the purpose of this paper each battery unit is equivalent to a Generating Unit (GU) and so we will refer to them as battery GUs[1]. Reference to battery modules is to a collection of battery GUs. This approach is consistent with references to other types of module in the Grid Code (e.g. CCGT Modules and PPMs), which refer to collections of GUs.

1.3 Each of the battery modules is located at the same site as the West Burton B Power Station near Retford, Nottinghamshire. The West Burton B Power Station currently comprises of three Combined Cycle Gas Turbine (CCGTs) BM Units (standard BM Units) – T_WBURB-1, T_WBURB-2 and T_WBURB-3.

1.4 The two battery modules will be connected to the 6.6kV auxiliary boards for two of the CCGT Modules at West Burton B Power Station. One battery module connects to the CCGT Module auxiliary board for BM Unit T_WBURB-1 and the other battery module connects to the CCGT Module auxiliary board for BM Unit T_WBURB-3.

1.5 The battery modules will be connected via two of the three CCGT Gas Turbine Units' auxiliary and generator transformers to the Transmission System at 400kV at West Burton.

1.6 EDFEWBPL has submitted electrical single line diagrams (SLD) to support this application (Attachments B and C). The relevant commercial boundaries between the EDFEWBPL assets (i.e. battery modules and CCGT Modules) and the Transmission System are on the high voltage side of the 400kV generator transformers for the West Burton CCGT Modules, 1 and 3. As explained in more detail below, both battery modules will have a single point of control meaning the BM Unit for each battery module will not be independently controlled). This is contrary to the provisions of Section K 3.1.2(b) which requires that the Plant and Apparatus comprised in one BM Unit must be capable of being controlled independently of the Plant and Apparatus in another

[1] Neither "Battery storage" nor "energy storage" is defined in the Balancing and Settlement Code. Nevertheless, energy storage is treated as though it is a generator because the definition of a Generating Unit 'means any Apparatus which produces electricity'. Grid Code Modification GC0096 'Energy Storage' is currently considering changes to the Grid Code to explicitly recognise the role and participation of energy storage.

BMU. As a result, the applicant has applied for a non-standard BM Unit configuration for each battery module.

1.7 The SLDs also shows that there is an interconnection between one battery GU within each battery module and the other battery module below the associated Settlement Meters for the battery modules. ELEXON queried this with the applicant to understand how much energy can be re-routed from one battery module to the other. Furthermore ELEXON asked in what circumstances this interconnection would be used (i.e. is it auxiliary or constant). The applicant informed that the interconnection is constant. However there is a limit of capacity which can be rerouted. The lower output capacity limit for a single battery module is 20MW, the upper is 30MW and the overall capacity for both battery modules combined cannot exceed 50MW. As a result, at any point in time each battery GU can shift between 20MW to 30MW (e.g. 22MW for one battery GU, 28MW for other and total of 50MW). However, EDFEWBPL confirmed that they will never be able to reroute a whole capacity, i.e. 49MW, via a single battery module.

2. Non-standard BM Unit application

2.1 EDFEWBPL is seeking approval for two non-standard BM Units, one for each battery module, but with a single point of control (Attachment A) for both BM Units.

2.2 Each battery unit is a Generating Unit and therefore satisfies the requirement in K3.1.4(a). However, as each battery GU is not independently controlled, EDFEWBPL proposes to combine the battery GUs into two battery modules which will have a single point of control. They therefore seek approval of non-standard BM Units for each of these modules, in accordance with Section K3.1.5(b) and 3.1.6[2].

2.3 Section K 3.1.2(a) of the BSC states that 'only one Party must be responsible for the Exports and/or Imports from or to the Plant and/or Apparatus which is comprised in the BM Unit'. EDFEWBPL has stated that it will have sole responsibility for the proposed non-standard BM Units for the battery modules as well as the other West Burton B Power Station CCGT Module BM Units which are impacted as a result of the connection of the battery modules to the existing West Burton B Power Station network. Two existing West Burton B Power Station CCGT Module BM Units are impacted because the Exports and/or Imports associated with the battery modules will flow through these two BM Units and their Meters so their Aggregation Rules will need to be amended to account for the battery modules flows (i.e. deduct them).

2.4 Under Section K, paragraph 3.1.2(b), a BM Unit must be controlled independently of any other. EDFEWBPL confirmed that the two battery modules will share a single control point and will not be controlled independently of each other. The reason for controlling both battery modules and therefore BM Units as one is explained in Section 3 below.

2.5 Under Section K, paragraph 3.1.2(c), a BM Unit must have Metering Equipment which is installed pursuant to Section L and conforming to the appropriate Code of Practice. EDFEWBPL has confirmed that the Metering Equipment for each battery module will comply with the technical requirements of Code of Practice 1. However, the Metering Equipment is not situated at the Defined Metering Point with the Transmission System. Consequently, EDFEWBPL applied for a Metering Dispensation (D/478) to account for this non-compliance (ISG198/03). EDFEWBPL has stated that it is aware that Aggregation Rules for the two CCGT BM

[2] K3.1.5(b) states that where Plant and Apparatus do fall into a standard configuration of BM Unit and the responsible Party considers an alternative configuration would satisfy the requirements of K3.1.2, a Party may apply for a non-standard BM Unit per K3.1.6. Where no configuration of the Plant and Apparatus will satisfy K3.1.2, K3.1.6(c) requires the Panel to determine which configuration for a given BM Unit will most nearly achieve the objectives which are reflected in K3.1.2.

Units will be amended once the battery modules are in operation. EDFEWBPL also provided assurance that the third CCGT BM Unit (T_WBURB-2) present on site will remain unaffected as there is no unit transformer for this CCGT Module (i.e. no physical connection). As a result, no flow from the battery modules to this CCGT's 400kV transmission connection is possible.

2.6 Under Section K, paragraph 3.1.2(d) the BM Unit shall not comprise Plant and Apparatus whose Imports and Exports are measured by both CVA Metering System(s) and SVA Metering System(s). Each battery modules flows will be captured separately in dedicated Metering Systems comprised of CoP1 compliant Metering Equipment (subject to Metering Dispensation D/478), which will be CVA registered.

2.7 Under Section K, paragraph 3.1.2(e) a BM Unit must be the smallest aggregation of Plant and/or Apparatus that satisfies paragraphs K3.1.2(a), (b) and (c). While each battery module will be metered independently, they cannot be independently controlled, thus not meeting paragraph 3.1.2 (c).

2.8 EDFEWBPL wants to register the two battery modules as two (non-standard) BM Units. EDFEWBPL believes that it meets the spirit of the BSC in that their proposed approach provides for the smallest aggregation of battery GUs that satisfies the conditions of 3.1.2 (a), (b), (c), (d) and (e) and reflects how the asset will be controlled.

2.9 EDFEWBPL believes that it is reasonable and practical to consider and treat the battery modules as two non-standard BM Units. This reflects the comments on configuration provided by the Transmission Company. Note that EDFEWBPL originally applied for a single non-standard BM Unit for both battery GUs but amended this application to two non-standard BM Units based on discussions with the Transmission Company.

3. Transmission Company and ELEXON comments

3.1 The Transmission Company has provided the following comments on the application:

3.1.1 'National Grid is unable to support a single non-standard BMU application for the Battery at West Burton B; as it consists of two battery modules with each connecting into separate generation circuits.'

3.1.2 'National Grid's West Burton 400KV substation sits at the junction of several major north-south transmission routes and, to control power flows, is often run split as two separate nodes, with one generation circuit on each node. As the transmission system cannot be paralleled at a lower voltage, the two battery modules will feed into two separate nodes on two separate power flow routes. To enable the response characteristics of each battery module to be utilised correctly, we need to model them separately and the only way we can do this is to register them as two BMUs.'

3.1.3 'As EDF intend for the Battery Modules to provide the Enhanced Frequency Response service, and the system frequency will be the same on both nodes then there is no impact if both modules share a common control system. However should the BMUs want to actively participate in the BM or are required to respond to voltage instructions then separate control of the BMUs will be required.'

3.1.4 National Grid supports the application as two BM Units.

3.2 ELEXON recommends that the ISG agree this application on the basis that:

- the responsibility for the flows of electricity associated with the BM Unit lie with one Party (Section K 3.1.2 (a));
- all volumes flowing from and to the BM Units will be captured by compliant Metering Systems (subject to Metering Dispensation D/478) and these volumes will be determined separately from volumes to and from other BM Units (Section K 3.1.2 (c));

- the BM Unit does not comprise Central Volume Allocation (CVA) and Supplier Volume Allocation (SVA) Metering Systems that measure the same Imports or Exports (Section K 3.1.2 (d)); and
- whilst a single point of control for the two BM Units is contrary to the requirement of K3.1.2(b) and therefore 3.1.2(e), that each BM Unit should be capable of independent control, we believe singular control will have no adverse effects on Imbalance Settlement calculations for or related to the two proposed BM Units.

4. Recommendations

4.1 We invite you to:

a) **APPROVE** two non-standard BM Units, one for each of the West Burton B battery modules.

Appendices

Appendix 1 – BM Unit Configurations

Attachments

Attachment A - West Burton B battery non-standard BM Unit application Letter

Attachment B (CONFIDENTIAL) - West Burton B battery single line diagram

Attachment C (CONFIDENTIAL) - West Burton B battery single line diagram v2

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APPENDIX 1 - BM UNIT CONFIGURATIONS

The BSC states that a BM Unit shall comprise Plant and/or Apparatus for who's Exports and / or Imports a Party is responsible (Section K3.1.1).

A BM Unit must satisfy the following conditions (K3.1.2):

- responsibility for the BM Unit would lie with one Party;
- it would be capable of independent control;
- it would be visible to the Settlement Administration Agent (SAA) as a metered quantity separately from anything that is not included in the BM Unit;
- the BM Unit does not comprise of CVA and SVA Metering Systems that measure the same Imports or Exports
- it would be the smallest aggregation of Plant and Apparatus that satisfies the first three bullet points above.

The BSC also sets out a number of standard configurations of BM Units (Section K3.1.4), including:

- a single Generating Unit (GU), Combined Cycle Gas Turbine (CCGT) or Power Park Module (PPM),
- a Combined BM Unit,
- the Imports through the station transformers of a Generating Plant or premises, which are directly connected to the Transmission System, at a single Boundary Point.

The BSC states that a Registrant and/or Central Data Collection Agent (CDCA) / Central Registration Agent (CRA) can apply to the Panel for a non-standard BM Unit configuration in the following circumstances (K3.1.5):

- the Plant / Apparatus does not fall into a category listed in section K3.1.4 or the CDCA / CRA considers that there is reasonable doubt that this is the case;
- the Plant / Apparatus does fall into a category listed in K3.1.4 but the responsible Party considers that a different configuration would satisfy the requirements set out in K3.1.2; or
- there is more than one set of Exports / Imports at a CVA boundary Point and more than one Party is responsible for these.