Grid Code Review Panel
Offshore Power Stations, BMU Configurations
Paper by National Grid

Background

For Offshore Power Stations comprised of a large number of strings, operating each string as a separate BMU would cause a significant operational burden for both the Generator and NGET. Therefore reducing the number of BMUs by aggregating the strings, in accordance with operational requirements, has significant benefits for both parties. Furthermore, to reduce restrictions on generation under outage conditions, some offshore networks with more than one connection to the shore are designed to enable the connection point of turbine strings to be 'moved' between cables and transformers. The combination of aggregation and transferable connections means that the composition of a BMU, in terms of turbine strings is not fixed, and is dependent upon the configuration of the offshore network and turbine availability, see figure 1.

Under current BSC rules neither of the above facilities is allowed. Two modification proposals have been put before the BSC Panel to allow BMU aggregation (P237) and allow turbine strings to be transferred between BMUs (P240)

The BSC Panel has recommended that the changes to P237 be approved and they are now with Ofgem for approval. P240 is about to go out for Industry consultation.

Prior to the Offshore Power Station being connected, the standard BMU configuration for the Offshore Power Station will be agreed by NGET. If these BSC modifications are approved other BMU configurations will be allowed which will affect the way in which the generation and the transmission system are operated. To avoid any confusion, it is proposed that a diagram showing the agreed configuration should be produced by NGET and made available to the Generator. Furthermore the obligation to provide the diagram should be included in the Grid Code.

Reason for Amendment

The Standard BMU Configuration for Offshore Power Park Modules under normal intact conditions will be agreed by the Generator and NGET prior to the Bilateral Connection Agreement being signed. In operational timescales NGET and the Offshore Generator will co-ordinate outages and determine the configuration of the offshore network and the BMUs through the existing OC2 process. Changes to the configuration of the BMUs may require consequential changes to:-

settlement metering

turbine control systems

NGET's real time and offline modelling

Any misunderstanding on the part of NGET or the Generator on the configuration could lead to unnecessary restrictions on generator output. For example incorrect configuration of the turbine control system. It would therefore be prudent for NGET to

provide the Generator with a diagram showing the agreed BMU configuration at week ahead.

Interaction with the existing Power Park Availability Matrix (PPAM)

Both the PPAM and the configuration diagram are required by NGET to model the offshore network. The PPAM defines which turbines are connected to a particular Power Park Module whereas the configuration diagram defines how the Offshore Power Park Strings are connected to the transmission system. The boundaries of a PPAM and the BMU Configuration Diagram are shown on figure 1.

Proposed Grid Code Changes

Glossary and Definitions

Definitions for:-

Standard BMU Configuration Diagram i.e. the configuration agreed for the BCA

Amended BMU Configuration Diagram i.e. the configuration agreed through the OC2 process

Under OC 2.4.2.1

Prior to a Statement of Readiness to connect being submitted and thereafter in week 24 NGET and the Generator will agree on the Standard BMU Configuration for the Offshore Power Park Module.

Under OC 2. 4.1.3.5

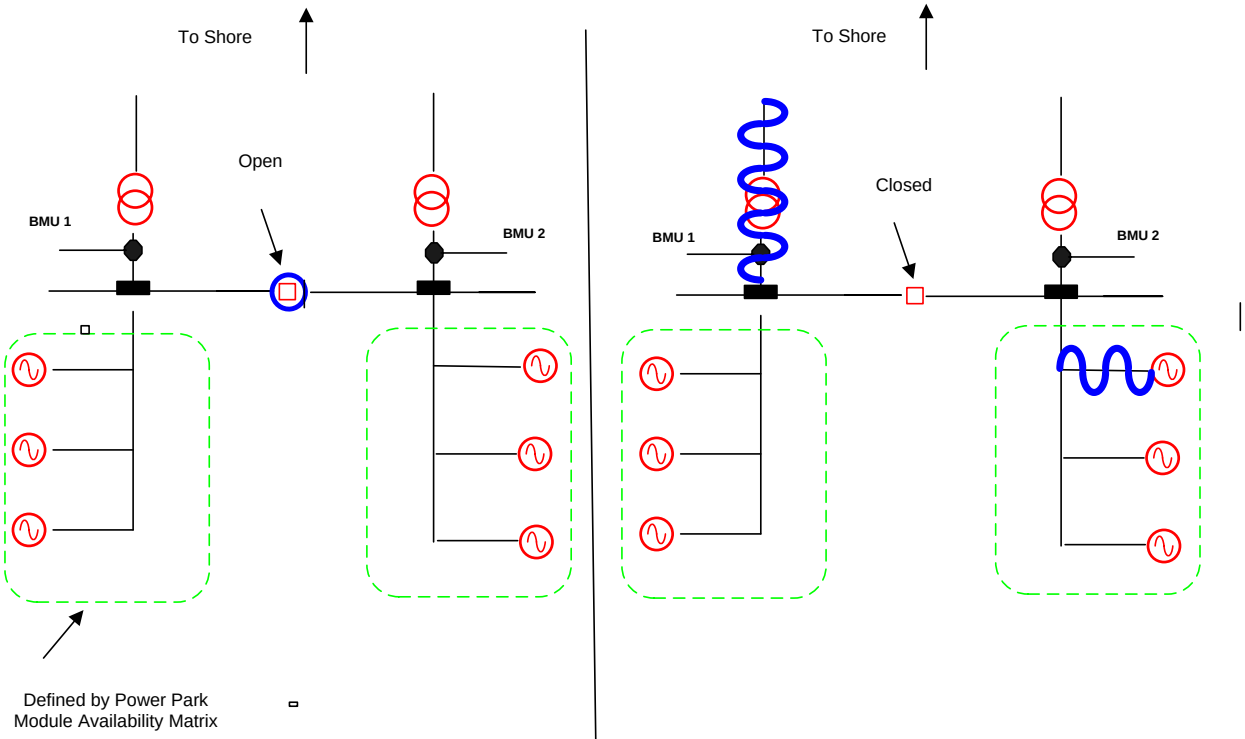
By 16.00 hours each Thursday NGET will if necessary provide the relevant Generator with the Amended BMU Configuration Diagram showing changes to the Standard BMU Configuration for the following week. Subsequent changes to the BMU Configuration may be required to maintain secure and economic operation of the transmission system. Under these circumstances NGET will issue a revised diagram as soon as is reasonably practicable.

Recommendation

The Gird Code Review Panel is invited to:

Note the operational benefit a BMU Configuration Diagram would be to Offshore Generators and NGET.

Note that once Ofgem have made a determination of BSC changes P237 and P240, assuming they are approved then, NGET will consult on the legal drafting to allow the Grid Code to be amended to facilitate the production of the BMU Configuration Diagram.



Standard BMU Configuration

Amended BMU Configuration

Figure 1