Stage 01: Initial Written Assessment

What stage is this document in the process?

01 Initial Written Assessment

02 Definition Procedure

03 Assessment Procedure

04 Report Phase

P240: Switching Plant and Apparatus between BM Units

Currently the BSC does not allow Generating Plant to be moved from one BM Unit to another in operational timescales, except by re-registering the BM Units which takes 30 days.

P240 proposes to allow plant and apparatus that comprise Offshore Power Park Strings to be moved between BM Units in operational timescales. The arrangements would apply in the case where Exports from and/or Imports to Plant and Apparatus may be electrically switched between transmission connections.

ELEXON recommends:
A 3 month Assessment Procedure

High Impact:
Offshore intermittent generators

Medium Impact:
ELEXON and the Transmission Company

Low Impact:
Possible impact on the Central Registration Agent and Central Data Collection Agent (to be confirmed)

Contents

About this document:

This document is an Initial Written Assessment (IWA), which ELEXON will present to the Panel on 13 August 2009. The Panel will consider the recommendations and agree how to progress P240.

Further information is available in the P240 Modification Proposal which is an appendix to this document.

Any questions?

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1 Why Change?

Definitions

The term **Power Park Module** relates to generators who use an Intermittent Power Source. The Grid Code defines an Intermittent Power Source as being 'the primary source of power for a Generating Unit that cannot be considered as controllable (e.g. wind, wave or solar)'. A wind turbine is one example of an intermittent Generating Unit.

A **BM Unit** is a collection of Plant and/or Apparatus (K3.1.1) e.g. Generating Units such as wind turbines. It is not possible for a Party to place the same Generating Plant in more than one BM Unit (K3.1.3).

Offshore Power Park String is a collection of Offshore Generating Units that are powered by an Intermittent Power Source, joined together by cables forming part of a User System with a single point of connection to an Offshore Transmission System. The connection to an Offshore Transmission System may include a DC Converter.

The Issue

For offshore wind farms that have multiple connections to shore, there are a number of scenarios in which a Party may wish to switch the output of individual Wind Turbine Generators from one connection to another (e.g. in response to faults or maintenance). The rules governing BM Unit configurations in Section K of the BSC do not support this capability.

The Grid Code, in Planning Code A.3.2.2 (k), allows for Power Park Units (PPU i.e. generating unit) to be switched from **Power Park Module** (PPM) to PPM, where this is an operational change, with a simple operational notification to the GB System Operator of the number of PPUs of each different type on each PPM that is changed, immediately the change is made.

However the BSC, in Appendix K3.1.3, prohibits Plant and Apparatus from being comprised in more than one BM Unit. The change of a PPU from PPM to another PPM may be seen as changing Plant and Apparatus from one **BM Unit** to another.

Worked example

This example (illustrated overleaf) has two connections to shore. It contains two circuits: each with a separate busbar (the vertical lines) and an associated collection of Offshore Power Park Strings.

Because of the busbar requirements for Offshore generators, each of the two collections of Offshore Power Park Strings in this example (Wind Turbine Generator (WTG) strings 1-4 and WTG strings 5-8) represents a separate Offshore Power Park Module for the purposes of the Grid Code. Under the current BSC provisions, each of these Offshore Power Park Modules has to be registered as a separate BM Unit unless the generator applies for (and is granted) a 'non-standard' BM Unit configuration.

WTGs 1-4 will be directed through circuit 1, however the switchgear can be used to direct energy from WTG strings 1-4 through circuit 2 (via the diagonal lines).

This type of configuration is extremely difficult to handle satisfactorily without the **P240 solution** to address the 'switching issue'. Its treatment under the current baseline would seem to be as follows:

Where can I find full technical definitions of these terms?

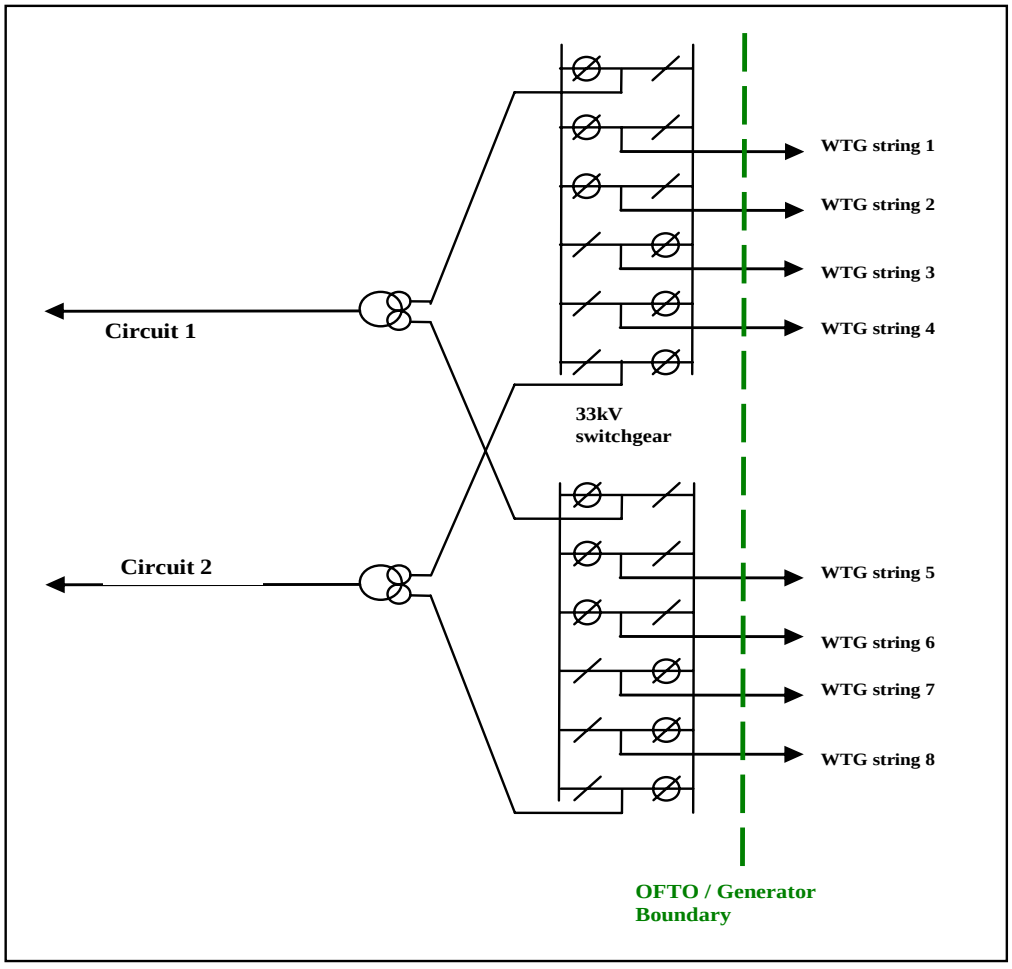
You can find the full BSC definitions of Power Park Module, Generating Unit and BM Unit in Annex X-1 and Section K3.

All Grid Code definitions are contained in the Grid Code Glossary and Definitions.

- By default, each of the four Offshore Power Park Modules would form a BM Unit;

- The Transmission Company would need to be able to despatch separately the plant on the two circuits to shore, so there is no possibility of applying for a non-standard configuration that treats the whole wind farm as a single BM Unit. At best, the site could be treated as two BM Units (one per connection to shore).
- The BSC would not allow strings of turbines to be switched from one transformer to another without going through a re-registration process (with lead time of at least 30 Working Days)

The benefits of the related Modification P237 (Standard BM Unit configuration for Offshore Power Park Modules) would be limited in this case. P237 would potentially allow the site to be treated as two BM Units rather than four without the need for a non-standard configuration, but would not address the fundamental 'switching' problem.



The time scale and the need for a re-registration process may pose a significant issue for certain offshore wind farms included in the new Offshore Transmission Regime where output can be electrically switched between transmission connections.

Background and related changes

On the 14 May 2009 we presented a paper to the BSC Panel on two issues relating to metering requirements for CCGT Modules and PPMs and one on the problems associated with switching assets between BM Units. The BSC Panel raised **Standing Issue 37** (Boundary Point Metering and BM Unit Issues in Section K). The Issue 37 Group met on the 3rd and 27th June 2009 and identified potential solutions to these issues.

Re-registration process

The BSC's BM Unit re-registration process takes at least 30 days, and may therefore not be a practical way to manage a short-notice operational reconfiguration (for example, in response to a fault). The BSC only allows Plant/Apparatus to be contained in one BM Unit at a time.

The Group agreed that there are a number of scenarios in which wind farms with more than one connection to shore may wish to switch the output of certain Wind Turbine Generators from one connection to the other. This would typically occur when one of the offshore circuits cannot be used (due to faults or maintenance), and the generator therefore wishes to reconfigure the network to make full use of the remaining capacity.

The Group agreed that the BSC does not currently allow this type of operational reconfiguration, for reasons stated in the Section 1.

The Group therefore agreed that the current BSC drafting will severely constrain the ability of Generators with more than one connection to shore to maximise their generation during conditions of network fault of maintenance.

P240 is based on the one of the solutions identified by the Issue 37 Group to deal with the problems associated with switching assets between BM Units for operational reasons (particularly relevant to offshore wind farms under fault conditions).

Two other modifications that are currently in process which deal with the issues identified by the Issue 37 Group are:

- P237 'Standard BM Unit configuration for Offshore Power Park Modules'; and
- P238 'Removal of the requirement to Meter each Boundary Point for Offshore Power Park Modules'.

2 Solution

How will P240 resolve the issue?

P240 proposes to allow plant and apparatus that comprise Offshore Power Park Strings to be moved between BM Units in operational timescales. The arrangements would apply in the case where Exports from and/or Imports to Plant and Apparatus may be electrically switched between transmission connections.

The Modification Group may wish to consider whether the plant and apparatus associated with power stations other than offshore wind farms could be able to be in more than one BM unit.

The main areas for assessment to be considered with regard to the proposal are:

- The extent of registration detail required (currently there is little detail regarding Plant and Apparatus, beyond metering);
- The notification process (should it be optional for individual sites if no Aggregation Rule changes are require, or should it be mandatory); and
- The Aggregation Rules that need to be applied, where appropriate, based on the specific switching configuration.

If, due to appropriate location of meters, the BM Unit's details and the Aggregation Rules do not need to change, it would be possible to avoid any need for BSC related administration upon switching.

The last option clearly requires a notification process, and will also, if it is not to be an extended process (i.e. not a revision to Aggregation Rules under BSCP75, taking up to 20 days), require more detail in registration than is currently provided.

Impact on Code

The proposed modification could be implemented by:

- a revision of Clause K3.1.3 to enable plant and apparatus to be included in more than one BM Unit (the "**Clause K3.1.3 Revision**") or,
- a revision to the concept of Plant and Apparatus comprising a BM Unit, such that plant which is switchable between BM Units is only regarded as being 'comprised in' the BM Unit to which it is electrically switched (the "**BM Unit Concept Revision**") or,
- through a revision to the BM Unit registration process (as the Issue 37 group proposed) that would enable plant and apparatus to "switch" between BM Units in operational timescales (the "**Switching Arrangements Revision**")

(Please note these options are not necessarily exclusive.)

The first two revisions are administratively identical, and which is preferred may depend on any impact arising in other parts of the BSC from the definition of Plant and Apparatus as being 'in more than one BM Unit' or 'in one BM Unit (or possibly not in any)'.

Further detail was set out in the Issue 37 report, which will be used by the P240 Group.

What are Aggregation Rules?

Aggregation Rules are rules submitted by the Lead Party of a BM Unit that specify which meter registers should be aggregated to derive the Metered Volume for that BM Unit.

Applicable BSC Objectives

The Proposer believes that P240 will better facilitate the achievement of **Applicable BSC Objectives (b) and (c)**. Further details are given in the table below.

Proposer's view of benefits of P241 against the Applicable BSC Objectives	
Description of Objective	Identified benefit
a) Efficient discharge of the obligations of the Transmission Licence.	None identified.
b) Efficient, economic and co-ordinated operation of the GB transmission system.	By allowing the assets to be switched between BM units for operational reasons, P240 will promote the efficient, economic and co-ordinated operation of the national electricity transmission system.
c) Promoting effective competition in the generation and supply of electricity and in the sale and purchase of electricity.	P240 would remove issues related to the re-registration process (in order to allow Generating Plant to be switched between BM units) for some new Offshore Transmission Regime where output can be electrically switched between transmission connections. P240 would also facilitate the development of new power stations the proposal will also promote effective competition in the generation and supply of electricity.
d) Promoting efficiency in the implementation and administration of the balancing and settlement arrangements.	None identified.

3 Proposed Progression

What is the recommended way forward?

The P240 Modification Group will be formed from the same Group who are considering P237/P238. The Group will consider the following items:

Ref	Area	Reason for inclusion in Terms of Reference
01	How much notification (if any) is required by BSC when switching occurs?	To assess whether Parties should be required to notify ELEXON and/or BSC Agents when Generating Plant is switched between BM Units.
02	How does P240 affect the offshore wind farm configuration?	To identify the types of offshore wind farm configuration that are affected by the issue, and the specific benefits of P240 for each affected configuration type.
03	What is the best way to amend the BSC?	To Consider the three possible approaches to the BSC drafting identified by the Proposer, and determine which is the best option, identifying any impact arising in other parts of the code if necessary: - Clause K3.1.3 Revision; - BM Unit Concept Revision; and - Switching Arrangement Revision.
04	Does P240 impact the BM Unit registration process?	To identify any changes required to the BM Unit registration process.
05	Should Aggregation Rules change?	To assess whether any additional processes are required to allow for configurations in which the switching of Generating Plant from one BM Unit to another requires a change to Aggregation Rules.
06	Does P240 impact ELEXON and Party Agent?	BM Units are registered and used in the central BSC Systems. ELEXON recommends that the Modification Group undertakes a BSC Agent impact

Proposer's Quote:

The Proposer invites the Modification Group to note that the Grid Code allows for WTG strings to switch between PPMs (and has procedures) while the BSC does not. This inconsistency should be addressed.

		assessment to establish whether any changes to BSC Agent systems, processes and/or documents are needed to support P240.
07	What are benefits/disadvantages for P240 both: - As a stand alone; and - In conjunction with P237/P238.	The Modification Group will need to agree which of the benefits identified by the Issue 37 Group are important for P240, and will assess P240 on its own merits against the existing Code baseline. However, ELEXON recommends that the Modification Group also notes any benefits from combining P237 with P238 or any of the other changes recommended by the Issue Group, so that these can be taken into account by Ofgem when making its decision on the various changes.
08	Are there any alternative solutions?	To consider any Alternatives e.g. whether the plant and apparatus associated with power stations other than offshore wind farms could be able to be in more than one BM unit.
09	Are the alternatives better than the proposed solution?	To assess whether the Proposed and any Alternative solutions better meet the Applicable BSC Objectives.

Modification Group Terms of Reference

You can download the SSMG's standard Terms of Reference here.

ELEXON recommends that the P240 Terms of Reference should also include the specific areas identified in this IWA.

Timetable and costs

ELEXON recommends that P240 undergoes a 3-month Assessment Procedure.

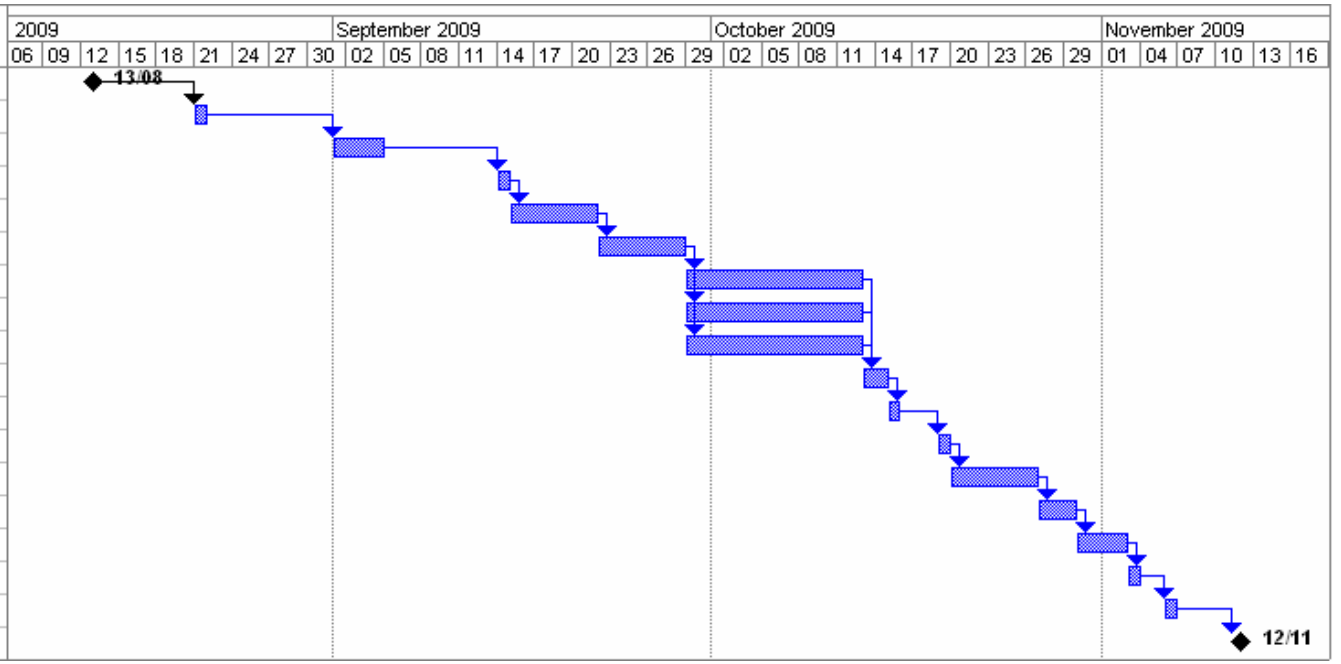
The following page shows the full recommended timetable of activities, which includes:

- A 2-week industry consultation;
- A BSC Agent impact assessment (in parallel with the consultation);
- A Transmission Company impact assessment (in parallel with the consultation);and
- 3 Modification Group meetings.

Estimated progression costs based on proposed timetable	
Meeting costs (including Modification Group member expenses)	£750 (3 meetings, shared with P241 and/or P242)
Non-ELEXON legal and expert costs	£0
Service Provider impact assessment costs	£3,000
ELEXON resource	72 man days, equating to £14.5k

Progression timetable for P240

ID	Task Name	Duration	Start
1	IWA presented to Panel	0 days	Thu 13/08/09
2	Mod Group Meeting 1	1 day	Fri 21/08/09
3	ELEXON drafts legal text	4 days	Tue 01/09/09
4	Mod Group Meeting 2	1 day	Mon 14/09/09
5	ELEXON drafts consultation document	5 days	Tue 15/09/09
6	Group review by email	5 days	Tue 22/09/09
7	Industry consultation	10 days	Tue 29/09/09
8	BSC Agent impact assessment	10 days	Tue 29/09/09
9	Transmission Company impact assessment	10 days	Tue 29/09/09
10	ELEXON reviews draft legal text	2 days	Tue 13/10/09
11	ELEXON internal legal text walkthrough	1 day	Thu 15/10/09
12	Mod Group Meeting 3	1 day	Mon 19/10/09
13	ELEXON drafts Assessment Report	5 days	Tue 20/10/09
14	Group reviews report/legal text by email	3 days	Tue 27/10/09
15	ELEXON updates report/legal text	2 days	Fri 30/10/09
16	Internal paper day	1 day	Tue 03/11/09
17	External paper day	1 day	Fri 06/11/09
18	Assessment Report presented to Panel	0 days	Thu 12/11/09



4 Likely Impacts

At this stage, ELEXON believes that P240 will or may impact:

- **Section K3** of the BSC, which contains the requirements for registering BM Units;
- **Balancing and Settlement Code Procedure (BSCP) 15**, which contains the detailed process for registering and re-registering BM Units;
- **BSCP75**, which contains the process for registering Aggregation Rules (and which contains worked example for particular generation types);
- **Offshore intermittent generators**, who will be able to request aggregation of their Offshore Park Modules in a single BM Unit;
- The **Transmission Company**, who will need to:
  - Assess each application from a Lead Party to aggregate its Offshore Power Park Modules in a single BM Unit;
- Decide whether to agree the requested configuration;
- The **Central Registration Agent** and **Central Data Collection Agent**, who will need to register and validate each application respectively; and
- **ELEXON**, who supports the BM Unit registration and validation processes (including supporting the **ISG** in processing any appeals).

ELEXON does not anticipate that any changes will be required to the Grid Code. However, Transmission Company expertise will be needed as part of the Modification Group's discussions, to ensure that the P240 solution and legal text is consistent with the Grid Code requirements.

5 Recommendations

On the basis of the initial written assessment, ELEXON invites the Panel to:

- DETERMINE that Modification Proposal P240 should be submitted to the Assessment Phase;
- AGREE the Assessment Procedure timetable of 3 months, such that an Assessment Report will be completed and submitted to the Panel at its meeting on 12 November 2009;
- DETERMINE that the P240 Modification Group will be formed from members of the Settlement Standing Modification Group, supplemented with members of the Issue 37 Group and with expertise from the Transmission Company on the Grid Code requirements; and
- AGREE the Modification Group's Terms of Reference.

Recommendation

ELEXON recommends a 3-month Assessment Procedure for P240.

6 Further Information

You can find more information in:

Attachment A: P240 Modification Proposal form

Modification Proposal – BSCP40/03	MP No: P240 *(mandatory by BSCCo)*

Title of Modification Proposal

Switching Plant and Apparatus between BM Units

Submission Date

21st July 2009

Description of Proposed Modification

It is proposed to allow plant and apparatus that comprise Offshore Power Park Strings to be moved between BM Units in operational timescales. The arrangements would apply in the case where Exports from and/or Imports to Plant and Apparatus may be electrically switched between transmission connections. The modification group may wish to consider whether the plant and apparatus associated with power stations other than offshore wind farms could be able to be in more than one BM unit.

The chief options to be considered with regard to the proposal are

- The extent of registration detail required (currently there is little detail regarding Plant and Apparatus, beyond metering)
- The notification process (if optional for individual sites if no aggregation rule change, or is mandatory)
- The possibility of changes to aggregation rules, based on switching configuration

If, due to appropriate location of meters, the BM Unit's details and the aggregation rules do not need to change, it would be possible to avoid any need for BSC related administration upon switching.

The last option clearly requires a notification process, and will also, if it is not to be an extended process (i.e. not a revision to aggregation rules under BSCP75, taking up to 20 days), require more detail in registration than is currently provided.

Description of Issue or Defect that Modification Proposal Seeks to Address

The Grid Code, in PC A.3.2.2(k), allows for Power Park Units (i.e. generators) to be switched from Power Park Module (PPM) to PPM, where this is an operational change, with a simple operational notification to GBSO of the number of PPUs of each different type on each PPM that is changed, immediately the change is made.

However the BSC, in Appendix K3.1.3, prohibits Plant and Apparatus from being comprised in more than one BM Unit. The change of a PPU from PPM to another PPM may be seen as changing Plant and Apparatus from one BM Unit to another.

Currently the BSC does not allow Generating Plant to be moved from one BM Unit to another, except by re-registering the BM Units in accordance with section K3.6, which takes 30 days.

Modification Proposal – BSCP40/03	MP No: P240 *(mandatory by BSCCo)*

The time scale and the need for a re-registration process may pose a significant issue for certain of the offshore wind farms included in the new Offshore Transmission Regime where output can be electrically switched between transmission connections.

The rules regarding BM Units in section K of the BSC do not appear to allow a wind farm with two or more connections to shore to switch the output of plant or apparatus that comprises an Offshore Power Park String from one BM Unit to another in response to outages (e.g. faults or maintenance) in operational timescales because

- To enable GBSO to predict the results of BM Unit despatch, a BM Unit may not span multiple Connections
- K3.1.3 prevents the Generator from placing a given wind turbine generator (WTG) in more than one BM Unit (thus tying it to a particular Connection)
- K3.6 does allow Plant to move to a different BM Unit, but only through re-registration, which takes at least 30 days.

However, it should be noted that the BM Unit registration process does not appear to identify WTGs, so it is difficult to see how the current registration / re-registration process could capture such a reconfiguration.

Impact on Code

The proposed modification could be implemented by for instance

- a revision of Clause K3.1.3 to enable plant and apparatus to be included in more than one BM Unit (the "Clause K3.1.3 Revision") or,
- a revision to the concept of Plant and Apparatus comprising a BM Unit, such that plant which is switchable between BM Units is only regarded as being 'comprised in' the BM Unit to which it is electrically switched (the "BM Unit Concept Revision") or,
- through a revision to the BM Unit registration process (as the Issue 37 group proposed) that would enable plant and apparatus to "switch" between BM Units in operational timescales (the "Switching Arrangements Revision")

although these are not necessarily exclusive.

The first two revisions are administratively identical, and which is preferred may depend on any impact arising in other parts of the BSC from the definition of Plant and Apparatus as being 'in more than one BM Unit' or 'in one BM Unit (or possibly not in any)'.

For the "Clause K3.1.3 Revision" the following Code changes may be required:

"K3.1.3 Subject to Clause K3.1.3 (a) the same Plant and Apparatus may be comprised in more than one BM Unit only to the extent that different persons are responsible for the Exports from and the Imports to such Plant and Apparatus.

K3.1.3 (a) in the case of Plant and Apparatus that comprise a[n Offshore] Power Park String the

Modification Proposal – BSCP40/03	MP No: P240 *(mandatory by BSCCo)*

same Plant and Apparatus may be comprised in more that one BM Unit subject to the appropriate planning information under Grid Code PC A.3.2.2(k) having been provided, and where the same persons are responsible for the Exports from and Imports to such Plant and Apparatus and provided always that the combined flows from or to such Plant and Apparatus are associated with only one BM Unit at any one time, and provided that such flows are measured by the meters associated with that BM Unit at that time.

For the "BM Unit Concept Revision", the use of a term in which generating Plant and Apparatus is 'comprised in' a BM Unit would require definition, probably located with other similar definitions in Section X 2.2.1.

To the extent that the registration process for a BM Unit does not explicitly require identification of the plant and apparatus forming the BM Unit (BSC 3.2.3), and BSCP15 and BSCP20 appear to concentrate references to plant and apparatus on metering plant and apparatus; provided that the meter aggregation rules do not change, there does not seem to be any need for a BSC notification process.

For the "Switching Arrangement Revision", the intention is to allow the BSC to explicitly recognise the PPMs between which switching may take place (as defined under the Grid Code), to allow a Lead Party to define a number of BM Units as forming a group (a 'Switching Group'), and to move Generating Plant from one BM Unit to another (within the Switching Group) as required for operational reasons. Parties would be able to register the operational configuration and define what the effect of switching operations would be on the aggregation rules. A simple notification of the current switching arrangement should then enable a revised set of aggregation rules to be employed. It is suggested that the BSCP75 procedure not be used, so that operational staff can issue a notification at any time, based on physical plant arrangement details.

For the "Switching Arrangements Revision" the following changes may be required:

- Amend K3.1.3
- Amend K3.2 (Registration of BM Units) to allow registration of a 'Switching Group' of BM Units
- Draft provisions to cover notification of change of configuration for a Switching Group – either in K3.6 (Changes in BM Unit Registration) or in a new section
- Amend R3.2 to allow for preparation of (and switching between) multiple sets of Aggregation Rules, or rules for preparing revised aggregation rules.

Impact on Core Industry Documents or System Operator-Transmission Owner Code *(optional by originator)*

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Impact on BSC Systems and Other Relevant Systems and Processes Used by Parties

There may be the following BSC Agent impacts:

For the Clause K3.1.3 Revision and the BM Unit Concept Revision,

- On CRA when the BM Units are registered, to allow the registration of Plant and Apparatus in more than one BM Unit, and to verify it is in accordance with K3.1.3(a) (or other revised or new clauses)
- On CRA when the BM Units are registered, to verify that no change of aggregation rules is required when Plant and Apparatus is switched between BM Units

although it should be noted that BM Unit registration concentrates on meters, not on Generating Plant and Apparatus.

For the Switching Group modification,

- On CRA and CDCA when Switching Groups are first notified,
- On CDCA when change of configuration requires change of Aggregation rules

Impact on other Configurable Items (*optional by originator)*

Justification for Proposed Modification with Reference to Applicable BSC Objectives

Wind farm projects are being designed and built which are assuming that some form of redundant connection can be achieved (either by switching, or with interconnection cables). Currently, although the Grid Code allows this, the BSC arrangements appear to exclude such configurations. Therefore the proposed modification will better meet Objective B ("the efficient, economic and co-ordinated operation of the national electricity transmission system"). In facilitating the development of new power stations the proposal will also better meet Objective C ("promoting effective competition in the generation and supply of electricity").

Urgency Recommended: No

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Justification for Urgency Recommendation

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