

## Stage 03: Attachment A: Additional Information

# P240: Switching Plant and Apparatus between BM Units

What stage is this document in the process?

- 01 Initial Written Assessment
- 02 Definition Procedure
- 03 Assessment Procedure
- 04 Report Phase

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## About this document:

This is Attachment A to the Assessment Report. This attachment provides additional background, assessment consultation responses, including the BSC Agent Impact Assessment results.

# 1 Background and Related Changes

## 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.

## What changes are being progressed from Issue 37?

The P237 solution developed through discussions within the [Issue 37](#) Group. Issue 37 was raised to consider whether the current requirements for BM Unit configurations and metering are suitably flexible to accommodate the changing designs for generation, in particular for new offshore generation build.

Four changes to the BSC were recommended from Issue 37. The table below summarises each issue with the corresponding Modification reference under which the proposed solution has been raised. Three of the four changes impact Offshore Transmission, and while there are benefits associated with each change, the Issue group felt the combined benefits of all three changes together would be greater than for the individual changes. Should all the changes be approved there would be efficiency benefits from implementing all the changes in parallel.

**Table 1 – Proposed changes arising from Issue 37**

Issue 37 – Proposed Changes	
Modification	Description of change
P237 - Standard BM Unit configuration for Offshore Power Park Modules	To allow Parties the option of having a single (or reduced number of BMU's), subject to Transmission Company agreement, to reduce costs and administration.
P238 - Removal of the requirement to Meter each Boundary Point for Offshore Power Park Modules	To allow Parties to treat all Exports from (or Imports to) a Balancing Mechanism Unit comprising Offshore Power Park Modules as a single Export (or Import). The Party must ensure appropriate compensation is applied to meter readings to account for losses between the location of the metering and the commercial boundary.
P240 - Switching Plant and Apparatus between BM Units	To allow Parties to switch output between BM Units (without the need to re-register the BMU) to resolve issues such as loss of connection or partial plant failure.



### 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](#).

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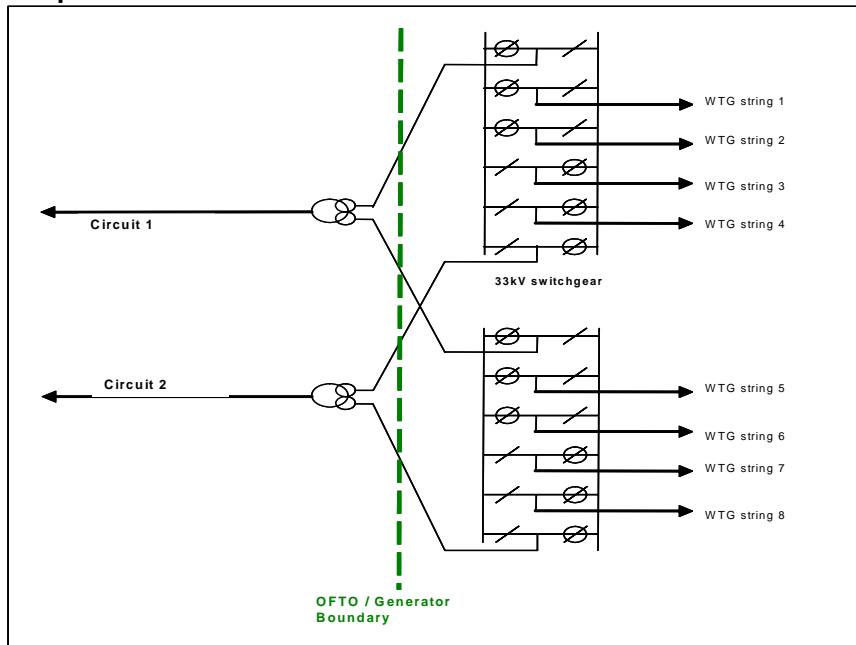
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<p>P241 - Relaxation of Requirement to Separately Meter Licensable Generating Units</p>	<p>To remove the requirement to separately Meter the flows to each Generating Unit within a Combined Cycle Gas Turbine (CCGT) Module with a single Boundary Point.</p> <p>Many sites only meter the net output at the CCGT Module's single Boundary Point, so they would be non-compliant with the BSC.</p>
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## 2 P240 Example Configuration

The following examples are taken from a paper ([ISG99/08](#)) presented to ISG and have also been used to facilitate the P237 discussions. The diagrams illustrate the P240 issue.

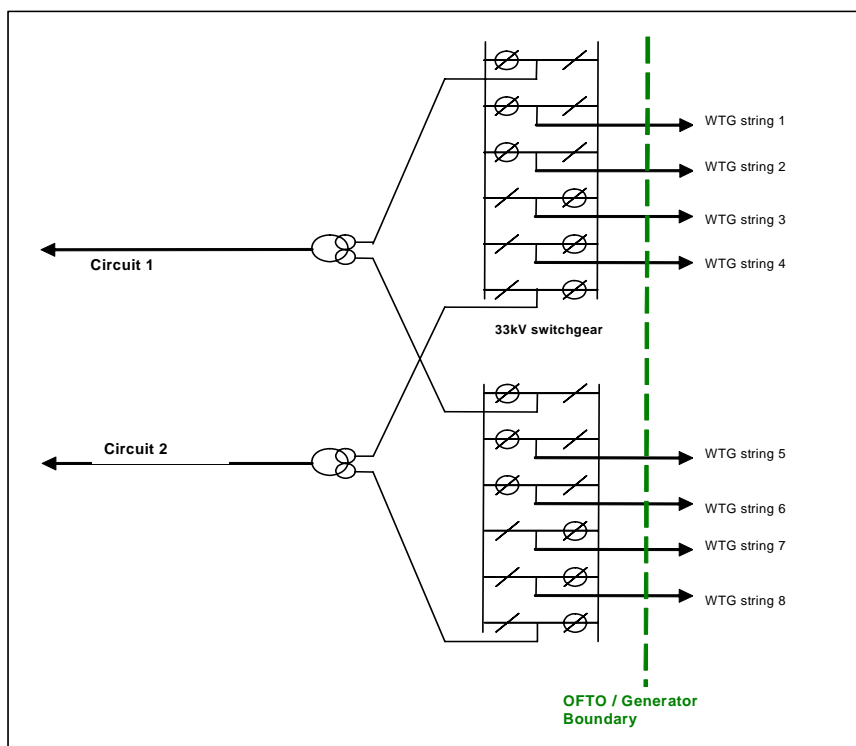
### Example 1



### Example 1

- Four BM Units, each with two WTG strings (or potentially two BM Units with four turbines each if P237 approved);
- Switchgear can change which turbine strings are in which BM Unit

### Example 2



### Example 2

- Same as example 1, but OFTO / Generator boundary is on individual strings
- Aggregation Rules would have to change when switches were changed

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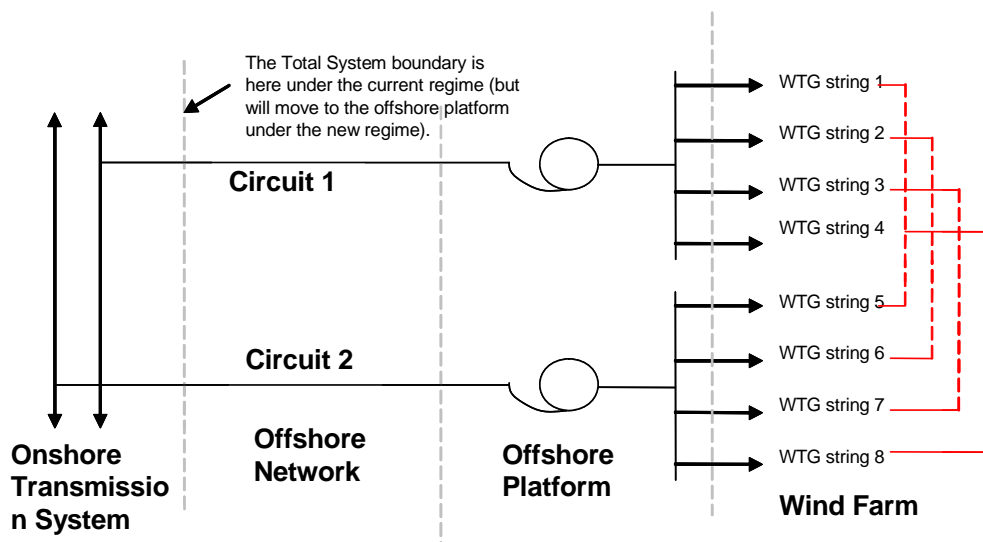
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### Example 3



### Example 3

- Connections between individual strings can be closed if there is a cable fault on one of the strings
- P240 would avoid the need to meter these transfers between strings

## Changes to Aggregation Rules

In many cases, depending on where metering is situated, the switching of Power Park Units between BM Units will not require any changes to Aggregation Rules. Example configurations 1 and 3 above provide illustrations of this.

In other cases, switching may require changes to Aggregation Rules. Example configuration 2 above would be an example of this (assuming that metering was installed at the boundary between Generator and Transmission Owner assets).

Where changes of Aggregation Rules are required, the Group agreed the insertion of Section R3.2.5A of the BSC (please refer to Attachment B draft Legal Text for more details) would clarify the new process:

- When first registering the Aggregation Rules, the Lead Party would provide more than one set of Aggregation Rules, each reflecting a different operating configuration;
- Each set of Aggregation Rules would be validated in accordance with normal procedures;
- When the operating configuration of the site changed, the Lead Party would fax/email the CDCA with details of which pre-validated configuration was to be used, and the time at which it would come into effect. The CDCA would then update central systems (prior to Interim Information Volume Allocation Run) to use the stated Aggregation Rule.

The BSC Agent impact assessment has identified a constraint in the CDCA software that prevents changes to Aggregation Rules from becoming effective at any time other than the start of a Settlement Day (i.e. midnight). Removing this constraint would require significant changes to the CDCA software, the cost of which has been assessed at £63k. The Modification Group do not believe that there is a clear case for making this investment, and the following solution is therefore proposed:

- Changes to Aggregation Rules notified to CDCA will be implemented at midnight following the time of the change;
- In the event that this system limitation has an impact on Trading Charges for the Lead Party (or a relevant Subsidiary Party), the Lead Party may request that ELEXON make an adjustment to metered data (in the period between the switching event and the start of the subsequent Settlement Day) to compensate for the incorrect Aggregation

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Rules. This might be necessary if (for example) one of the BM Units was subject to a Bid Offer Acceptance and the allocation of energy to the wrong BM Unit was exposing the Lead Party to Non-Delivery Charges; or if one of the BM Units was subject to a Metered Volume Reallocation Notification and the allocation of energy to the wrong BM Unit was therefore leading to Imbalance Charges;

- On receipt of the request, ELEXON would determine any adjustment to metered volumes required to correct the issue, and notify CDCA accordingly. Such an adjustment would not change the total amount of energy generated by the wind farm, but would potentially move energy from one BM Unit to another;
- CDCA would then implement the adjustment by manually changing the relevant meter readings;
- This new process is described in BSCP03 ('Data Estimation and Substitution for Central Volume Allocation').

The Modification Group envisages that this process will be invoked infrequently. If it turns out to be used more frequently, it may be appropriate to reconsider whether to amend the CDCA software. The Group notes that ELEXON would have the power to propose such a change (in accordance with BSCP40).

### 3 Assessment Consultation Responses

Table 2 summarises the views of the industry respondents to the Group's consultation, and of the Transmission Company (TC) in its impact assessment. You can download the full responses [here](#).

**Table 2 – P240 industry/Transmission Company responses**

	Question	Industry	TC	Conclusion:	See:
1	The Group believes P240 would better facilitate Applicable BSC Objectives (b) and (c). <i>Do you agree?</i>	5 Yes 0 No	Yes	Better facilitates	Main document: Section 6
2	The Group believe switching should be restricted to Power Park Modules only to remain consistent with the Grid Code. <i>Do you agree?</i>	5 Yes 0 No	Yes	Switching should be restricted to Power Park Modules only	Main document: Section 6
3	The Group believe P240 should only apply to BM Units of the same Lead Party. <i>Do you agree with this conclusion?</i>	5 Yes 0 No	Yes	Only apply to BM Units of the same Lead Party	Main document: Section 6
4	Do you support the implementation date to be 5 WDs after the Authority's decision?	5 Yes 0 No	Yes	Implementation Date 5WDs	Main document: Section 5
5	Are you aware of any Power Park Module configuration that would require multiple aggregation rules to be held by the CDCA?	3 Yes 1 No 1 Neutral	No	Multiple Aggregation Rules held by CDCA	Main document: Section 3
6	Do you agree that P240 provides additional benefit when combined with P237/P238?	5 Yes 0 No	Yes	Combined benefits with P237/238	Main document: Section 6
7	Are there alternative solutions that the Modification Group has not identified, that they should consider?	0 Yes 5 No	No	No alternative solutions	Main document: Section 3
8	Do you have any further comments on P240?	0 Yes 5 No	No	No further comments	n.a.

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### Summary

Modification P240 has been raised to address a number of issues which arise when Offshore Power Park Modules (Wind farms) switch configuration in response to operational events e.g. faults or planned maintenance. This Impact Assessment presents a package of 4 solutions which may be required to address the issues raised by this Modification. With the exception of the Manual element which is mandatory the other options can be ordered together or separately to meet ELEXON's requirements.

These solutions have been developed assuming a low level (less than 10 switching events per year) of switching activity in line with guidance from ELEXON regarding the number of sites potentially able to switch in this manner, the probability of a switching event and a desire not to invest significant money in a solution which may be used infrequently (especially if related Modifications P237 and P238 are approved further reducing the likelihood of switching events impacting on the CDCA Aggregation Rules).

### BSC Services Agreement Impact Assessment

The BSC Agent has assessed P240 (in its capacities as BSC Agent and developer of the BSC Systems). These impact assessments identified two options **for supporting switching between multiple sets of Aggregation Rules**:

- Manual solution - P240 will be implemented with no system changes.
- Semi Manual solution - Introducing functionality that would make use of the existing copy function within the CDCA system to simplify the process of switching to an alternative rule as all rules would be entered into the system and only need copying forwards upon notification to use an alternative rule.

The impact assessments also identified a constraint in the current system that requires Aggregation Rule changes to come into effect at midnight. Two options for addressing this were identified:

- System Change solution - Introducing Period boundary for Aggregation Rules processing into the CDCA System.
- Manual solution - Using meter reading estimation to correctly allocate energy between BM Units for Settlement Periods where the "incorrect" rule was present in the system. This would only be done where the incorrect allocation of energy resulted in a material impact on any BSC Party, and the process for doing so would be described in BSCP03 ('Data Estimation and Substitution for Central Volume Allocation')

These impact assessment responses are detailed below:

#### Option 1 - Manual Solution for Switching of Aggregation Rules

Logica propose the following process for applying the revised Aggregation Rule when a Participant makes a switch of plant from one BM Unit to another under the P240 rules;

- Participants will send pre-approved Aggregation Rules to Logica who will store the information on a network file share. Participants will be limited to a maximum of 9 Aggregation Rules per BM Unit which must be clearly labelled with appropriate configuration references.



- After a switch has occurred, an authorised signatory of the registrant BSC Party for the BM Unit will contact the CDCA, informing of the switch and specifying which Aggregation Rule to apply and the Settlement Date from which this should apply. Notification should be given to Logica of a switching event within two working days of the switch taking place and within working hours. This ensures that the CDCA Interim Initial aggregation run operates using the correct rule and avoids changing the aggregation rules for historic dates which involves more effort.
- Logica will apply the requested Aggregation Rule and send a confirmation note back to the Participant.

## Option 2 - Semi Manual Solution

As part of the AMD solution Logica also investigated a method of entering the pre validated aggregation rules into the core CDCA system for past effective dates and then using the existing "Copy" functionality for aggregation rules to bring each rule into effect as required. The benefit of this scenario was to reduce the time taken to input and implement the Aggregation Rule and reduce the possibility of any typing errors.

The issue encountered with this solution was that the existing Copy function on the Aggregation Screen only works for the highest effective from date (i.e. evergreen rules). Therefore in order to allow Logica to store multiple rules on the CDCA system a code change on the Maintain Aggregation Rule Form would be required. Due to the expense of making this code change when weighed against the small advantage (especially compared to the improved manual solution) it offered, Logica decided not to price this solution for AMD or the Operate and Host.

## Option 3 – System Changes for Switching Within Day

A switching event under modification P240 is unlikely to occur at exactly midnight local time (i.e. at the start of Settlement Period 1) unless this is prescribed by the changes to the BSC. In practise the switch is likely to take place at the most operationally convenient time for the BSC Party concerned. The current software baseline, however, only allows CDCA Aggregation Rules to change on Settlement Day boundary so there will be a period of the switching day during which the "incorrect" aggregation rule is applied by CDCA.

In many cases (all BM Units within the Wind farm owned by the same participant, no Bid Offer Acceptances issued to either BM Unit on the switching day) this will have no material impact on the BSC Party registering the BM Units or any other Party and no further action will be required. However, in some cases there may be a material impact of the CDCA applying the aggregation rule to the incorrect configuration (following the switching) for part of the day.

Logica have assessed the impact of amending CDCA to allow Aggregation Rules to change within a Settlement Day. This would require the following changes to the CDCA system:

- The Aggregation Rule table would be amended to include the effective from and to Settlement Period values.
- Amendments to the Maintain Aggregation Rule form
- Amendments to the Valid Aggregation Rule Report (used by CDCA to validate Aggregation Rules)
- Amendments to the Aggregation process itself

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#### Option 4 - Manual Solution for Switching Within Day

If option 3 is not approved for implementation then there is the potential for participants to be materially affected by the CDCA system restriction.

In this eventuality it is assumed that a materially-affected Party would request manual correction of the issue through a new BSCP03 process. ELEXON would investigate (on accordance with the BSCP03 process) and ensure that all necessary validation is performed outside of CDCA systems and the final binding meter readings are presented to CDCA. CDCA would then estimate the meter readings for all channels in the affected BM Unit's aggregation rule to zero except for one channel which would be estimated to the final metered volume required for this BM Unit. In this way the aggregated metered volume supplied by the CDCA Aggregation Run for each BM Unit can be controlled as necessary.

The P240 Modification Group consists of members of the Settlement Standing Modification Group (SSMG), supplemented with:

- Members of the Issue 37 Group; and
- The Transmission Company's expertise on the Grid Code requirements for intermittent generators.

Section 4 contains full details of the Group's membership.

Table 2 shows the areas which the Group has considered in accordance with its Terms of Reference, and where you can find its discussions of each area.

**Table 3 – P240 Assessment Procedure Terms of Reference**

P240 Terms of Reference	
The P240 Modification Group is formed from the same Group who are considering P237/P238. The Group will consider the following items:	
Ref	
01	How much notification (if any) is required by BSC when switching occurs?
02	How does P240 affect the offshore wind farm configuration?
03	What is the best way to amend the BSC?
04	Does P240 impact the BM Unit registration process?
05	Should Aggregation Rules change?
06	Does P240 impact ELEXON and Party Agent?
07	What are benefits/disadvantages for P240 both: <ul style="list-style-type: none"> <li>- As a stand alone; and</li> <li>- In conjunction with P237/P238.</li> </ul>
08	Are there any alternative solutions?
09	Are the alternatives better than the proposed solution?

## 6 Timetable and Responsibilities

**Table 3 – P240 timetable and related changes**

Date	Assessment activity
28/04/09	ISG discusses issues with Offshore metering and BM Units
14/05/09	Panel raises Issue 37
03/06/09	Issue 37 Group holds its first meeting
23/06/09	Issue 37 Group holds its second and final meeting
09/07/09	ELEXON presents the Issue 37 report to the Panel
21/07/09	Npower raised P240
13/08/09	ELEXON presents the P240 IWAs to the Panel / Panel submits P240 to the Assessment Procedure
21/08/09	Modification Group holds its first meeting for P240
14/09/09	Modification Group holds its second meeting for P240
28/09/09	ELEXON issues the P240 Assessment Consultation Documents for industry consultation, and for impact assessment by BSC Agents and the Transmission Company
12/10/09	Participants return Assessment Consultation responses / BSC Agents and the Transmission Company return impact assessments
19/10/09	Modification Group holds its third meeting for P240
12/11/09	ELEXON submits the Group's P240 Assessment Reports to the Panel

**Table 4 – Estimated P240 progression costs up to an Authority decision**

Meeting cost	External legal/ expert cost	BSC Agent impact assessment cost	ELEXON resource
£750 <sup>1</sup>	£0	£3,000	72 man days, equating to £14.5k

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<sup>1</sup> 3 meetings, shared with P241

**Table 5 – P240 Modification Group attendance**

Member	Organisation	21/08/09	14/09/09	19/10/09
David Jones	ELEXON (Chair)	Y	Y	Y
Bu-Ke Qian	ELEXON (Lead Analyst)	Y	Y	Y
Ed Marr	RWE Npower (Proposer)	Y	Y	Y
Ian Pashley	National Grid	Y	Y	Tel.
Gary Henderson	SAIC	Y	Y	Y
Esther Sutton	E.ON UK	Y	Y	Tel.
Andy Colley	SSE	Y	Y	Tel.
Fiona Irwin	Great Gabbard Offshore Winds Limited	Y	Y	Y
Chris Stewart	Centrica	Y	Y	Tel.
Attendee	Organisation	17/07/09	14/09/09	14/10/09
John Lucas	ELEXON (Technical Support)	Y	Y	Y
Diane Mailer	ELEXON (Lawyer)	Y	Y	Y
Yvonne Naughton	Ofgem	Tel.	N	Tel.
Adam Richardson	ELEXON	N	N	Y