



# CAP169: Provision of Reactive Power from Power Park Modules, Large Power Stations and Embedded Power Stations

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**Working Group Report**

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# CAP169 Summary

**Proposed by National Grid February 27<sup>th</sup>**

**BSSG has acted as a Working Group to develop and evaluate CAP169**

**Given the corresponding Grid Code changes required the group was established as a joint CUSC and Grid Code working group**

**In June the working group requested a one month extension to allow fulfilment of the terms of reference**

# Defect and proposal

## CAP169 was raised in three parts:

### Part 1 – Power Park Modules (PPM)

- ◆ Grid Code previously amended to incorporate reactive capability requirements from PPMs, corresponding changes in CUSC have not yet been introduced
- ◆ CAP169 seeks to introduce additional referencing to reactive power from Power Park Modules and appropriate capability tables within the MSAs

### Part 2 – Large Power Stations

- ◆ Currently National Grid is only “obliged” to conclude or amend MSAs if the Reactive Power capability of the Generating Unit is 15Mvar or more – equating to approximately 45MW
- ◆ This does not cover all categories of Large Power Stations, which have the obligation to provide a Reactive Power Service
- ◆ CAP169 proposal seeks to amend the obligation whereby National Grid is obliged to conclude a MSA on request from a Large Power Station with a reactive capability below 15Mvar

# Defect and proposal - continued

## Part 3 - Embedded Generators

- ◆ Some embedded generators are under connection conditions from the DNOs which prevent despatch instructions from National Grid through 0 Mvar
- ◆ Such restrictions result in National Grid being unable to instruct the relevant generator to achieve economic and efficient use of the reactive power across the transmission system
- ◆ The Proposed Amendment seeks to facilitate partial payment (20%) to generators under such connection conditions, reflecting:
  - The Grid Code requirement and dynamic benefit from those under restriction
  - That it is not possible for National Grid to despatch Reactive Power from such generators to 0 Mvar in line with system operation requirements

# Working Group Discussions - parts 1 and 2

## Part 1 – PPMs

- ◆ The WG agreed with the principles and proposals of part 1
- ◆ The Aggregation of Reactive Power Metering Methodology should be used to account for variations in asset ownership (drafting prepared)

## Part 2 – Large Power Stations

- ◆ The WG agreed that the proposal offers a proportionate solution

# Working Group Discussions - part 3

## Payment Level

- ◆ Most appropriate means for payment would be for the DNO to pay
- ◆ Existing 20% default payment aims to incentivise generators to remove restrictions (not possible for 3<sup>rd</sup> party restrictions)
- ◆ One member of the group felt no payment should be made when 3<sup>rd</sup> party restrictions are in place

## Materiality

- ◆ Estimate £1.2-2.1m cost for generators subject to such restrictions by 2011-12
- ◆ Would be reduced to £0.24-0.42m were CAP169 implemented

## Environmental Assessment

- ◆ Baseline carbon profile will not be altered as a result of CAP169 - carbon costing is not required

## Offshore

- ◆ Group recognised that offshore reactive arrangements require thorough debate and consideration – may result in a requirement to amend the CUSC
- ◆ Principles and provisions that may be introduced through CAP169 should be extended and considered for any offshore proposals

# Alternatives

## WGAA1

- ◆ Looks to extend the original to cover long term operational reactive despatch restrictions (as well as connection restrictions)
  - Covering a restriction in place for 12 months or more (which could be consecutive or non-consecutive within 24 months)

## WGAA2

- ◆ Parts 1 and 2 of CAP169, with part 3 removed

## WGAA3

- ◆ Proposes 0 payment to embedded generators with any form of reactive despatch restriction (both operational and connection)
  - Under such conditions no despatch instruction will be given by NGET

# Impact on Grid Code

## Consequential Grid Code changes

### Part 1

- ◆ Relevant capability data tables for PPMs are required for the submission of revised Mvar data (required for all proposals)

### Part 3

- ◆ Amendment to facilitate the communication of network operator restrictions from generators and network operators (required for the original, WGAA1 and WGAA3)
- ◆ WGAA3 requires an additional amendment whereby no despatch instructions will be given when a reactive despatch restriction is in place

# Assessment Against the CUSC Objectives - original

## Efficient Discharge of Licence Conditions

Promotes	Demotes
<ul style="list-style-type: none"> <li>- Ensures that National Grid can despatch Reactive Power from Power Park Modules, and Large Power Stations, and facilitate payment for this service</li> <li>- Aligns CUSC and Grid Code</li> <li>- Ensures appropriate remuneration (with full payment only where access to the service is available and partial payment when network operator imposed restriction on instruction to 0Mvar are in place)</li> </ul>	<ul style="list-style-type: none"> <li>- 20% payment may introduce perverse incentive for restrictions not to be removed</li> </ul>

## Facilitates Competition

Facilitates	Frustrates
<ul style="list-style-type: none"> <li>- Provides appropriate remuneration for a restricted service, ensuring inappropriate cost for a restricted service is not picked up by other parties through BSUoS payments</li> </ul>	<ul style="list-style-type: none"> <li>- Introduces price anomalies whereby a provider receiving reduced payment may be used as an alternative source to a non-restricted provider</li> <li>- May not reflect cost incurred by embedded generators under restriction for Reactive Power capability</li> </ul>

# Assessment Against the CUSC Objectives – WGAA1

## Efficient Discharge of Licence Conditions

Promotes	Demotes
<ul style="list-style-type: none"> <li>- Ensures that National Grid can despatch Reactive Power from Power Park Modules, and Large Power Stations, and facilitate payment for this service</li> <li>- Aligns CUSC and Grid Code</li> <li>- Ensures appropriate remuneration (with full payment only where access to the service is available and partial payment when network operator imposed restriction on instruction to 0Mvar are in place) covering operational and connection restrictions</li> </ul>	<ul style="list-style-type: none"> <li>- 20% payment may introduce perverse incentive for restrictions not to be removed</li> </ul>

## Facilitates Competition

Facilitates	Frustrates
<ul style="list-style-type: none"> <li>- Provides appropriate remuneration for a restricted service (operational and connection), ensuring inappropriate cost for a restricted service is not picked up by other parties through BSUoS payments</li> </ul>	<ul style="list-style-type: none"> <li>- Introduces price anomalies whereby a provider receiving reduced payment may be used as an alternative source to a non-restricted provider</li> <li>- May not reflect cost incurred by embedded generators under restriction for Reactive Power capability</li> </ul>

# Assessment Against the CUSC Objectives – WGAA2

## Efficient Discharge of Licence Conditions

Promotes	Demotes
<ul style="list-style-type: none"> <li>- Ensures that National Grid can despatch Reactive Power from Power Park Modules, and Large Power Stations, and facilitate payment for this service</li> <li>- Aligns CUSC and Grid Code</li> </ul>	<ul style="list-style-type: none"> <li>- Introduces perverse incentive for restrictions not to be removed</li> <li>- By increasing pool of providers exacerbates problem part 3 seeks to address</li> <li>- May lead to uneconomic and inefficient use of the transmission system (through paying for a service that cannot be used)</li> </ul>

## Facilitates Competition

Facilitates	Frustrates
	<ul style="list-style-type: none"> <li>- Increases anomaly whereby restricted embedded generators receive payment for a service not required or able to be accessed</li> </ul>

# Assessment Against the CUSC Objectives – WGAA3

## Efficient Discharge of Licence Conditions

Promotes	Demotes
<ul style="list-style-type: none"> <li>- Ensures that National Grid can despatch Reactive Power from Power Park Modules, and Large Power Stations, and facilitate payment for this service</li> <li>- Aligns CUSC and Grid Code</li> <li>- Does not exacerbate the defect whereby restricted generators are paid for a service for which access is not available</li> </ul>	

## Facilitates Competition

Facilitates	Frustrates
<ul style="list-style-type: none"> <li>- Recognises potential additional cost for Reactive Power from restricted embedded generators to other users</li> <li>- Ensures no differential treatment of units fully compliant with the CUSC and Grid Code when compared to a unit under Network Operator restriction</li> </ul>	<ul style="list-style-type: none"> <li>- Does not reflect capability requirement met (and provided for) by embedded generator or dynamic service provided</li> </ul>

# Working Group Recommendation

## Results of the Working Group vote:

Proposal	Better	Not Better	Best
Original	2	3	0
WGAA1	2	3	2
WGAA2	3	2	2
WGAA3	1	4	1

## The Working Group recommends to the CUSC Panel:

- ◆ The Working Group report is accepted by the CUSC Panel
- ◆ A consultation report containing the CAP169 original, WGAA1, WGAA2 and WGAA3 should proceed to wider industry consultation by the Company

# Timeline Proposed

- ◆ Grid Code report to be circulated to CAP169 WG today for 5 BDs
  - ◆ GCRP meeting on the 17<sup>th</sup> of August
  - ◆ Consultation on CAP169 and corresponding Grid Code changes issued on the 18<sup>th</sup> of August
  - ◆ Consultation for a minimum of 3 weeks
- ➔ CAP169 Amendment Report prepared for the CUSC Panel by papers day on the 17th of September