

Reactive Power Amendment
Proposals
BSSG 26/01/09

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Background

- ◆ 21/05/08 BSSG presentation was given on a proposed Reactive Power Amendment Proposal
 - With the intention of raising an Amendment Proposal in June 2008
- ◆ Following this an issue was identified relating to restrictions on the use of Reactive Power from embedded generators
- ◆ In addition some further consistency changes have been identified
- ◆ National Grid are keen to develop a complete solution, and therefore decided to delay raising the proposal until further consideration could be completed
- ◆ National Grid now has the intention of raising two discreet Amendment Proposals on this subject

Today

- ◆ Draft Amendment Proposals circulated in advance of today's meeting
- ◆ Purpose of today:
 - Recap on proposal previously discussed in BSSG
 - Present additional requirements identified
 - Consider way forward



Amendment Proposal 1: Provision of
Reactive Power from Power Park
Modules and all Large Power Stations

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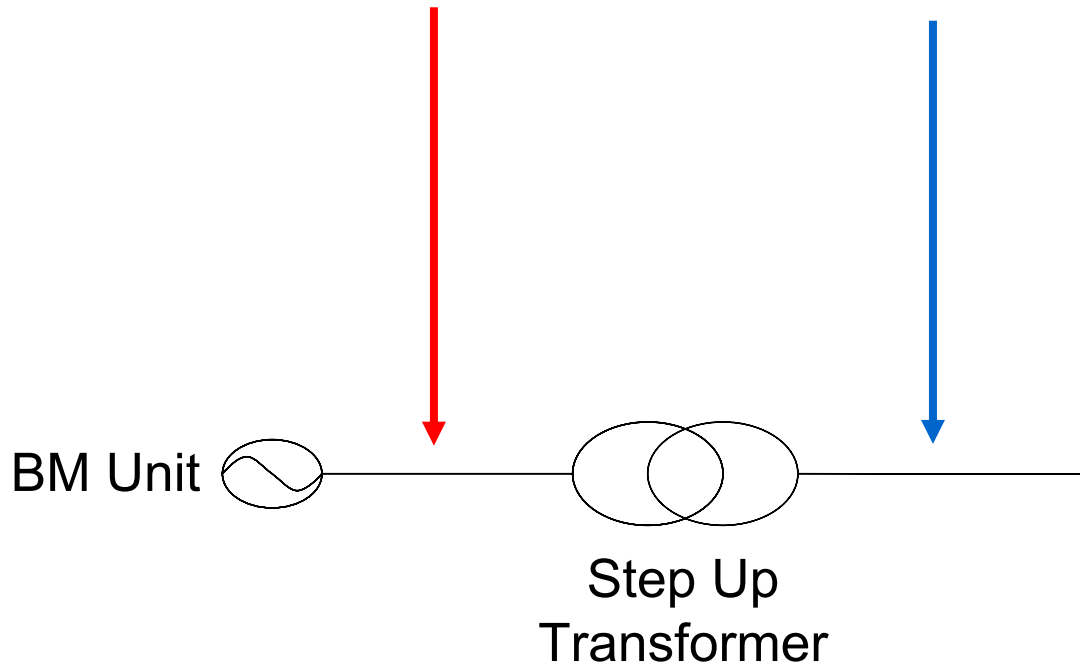
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Background

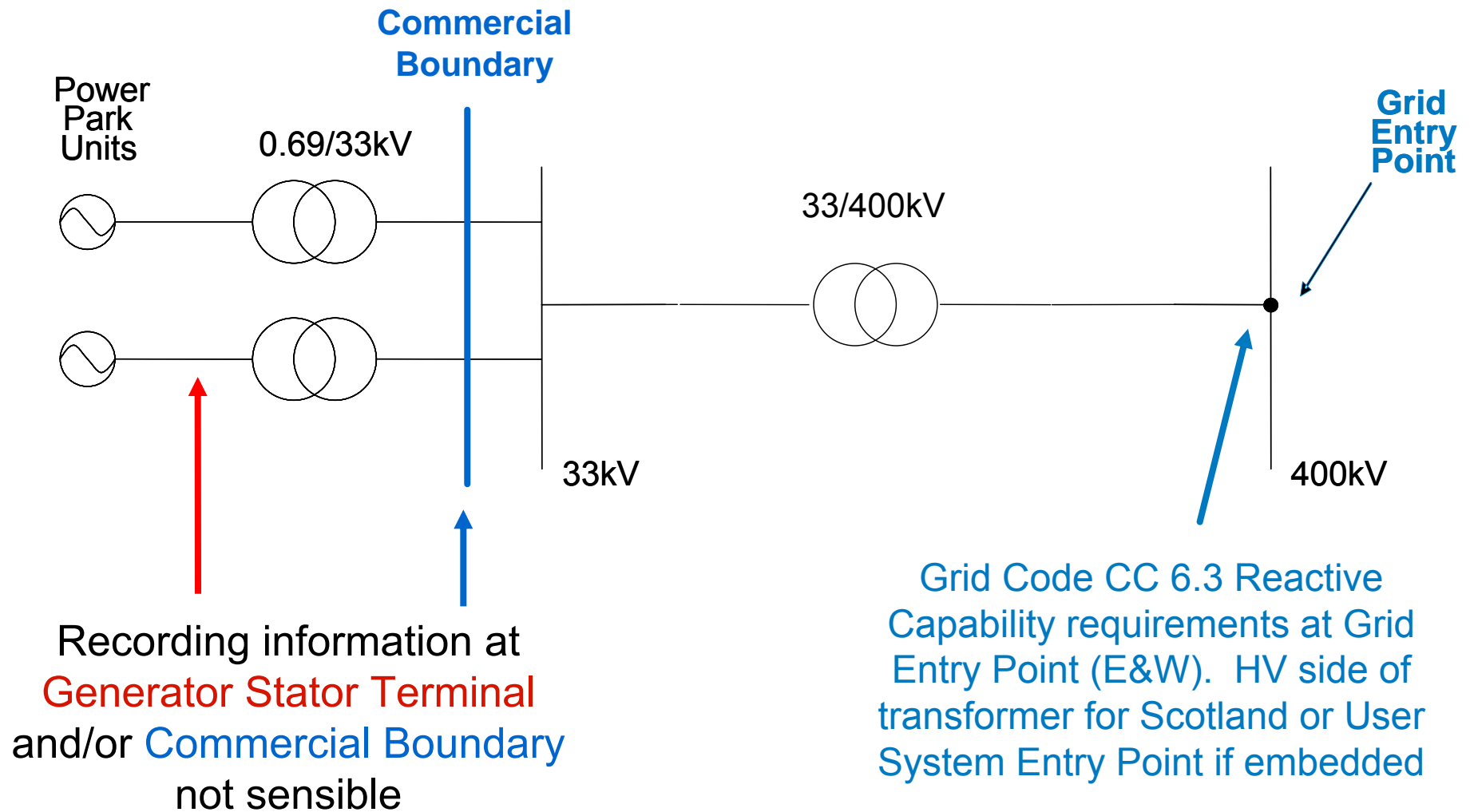
- ◆ **Grid Code CC6.3 already amended to incorporate Reactive Capability requirements from Wind Farms**
- ◆ **Corresponding changes are required in CUSC (including MSA)**
- ◆ **Successful CUSC Modification will allow:**
 - ◆ An increased pool of Reactive Power providers
 - ◆ Wind Farm Providers to be despatched and paid

BM Unit/ CCGT

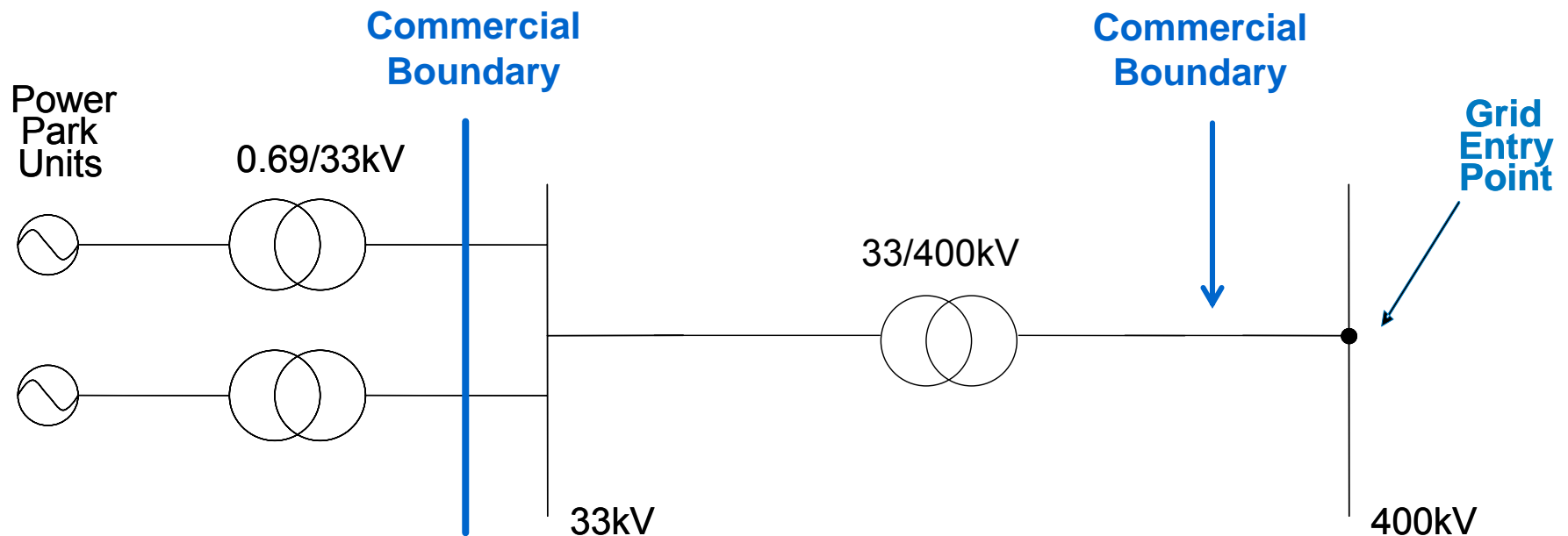
Template for MSA (CUSC Schedule 2 Exhibit 4 and associated text) record Reactive Capability at **Generator Stator Terminal** and **Commercial Boundary**



Directly Connected Wind Farm in England and Wales (using current definitions)



Proposed Solution – ‘Move’ the Commercial Boundary



- ◆ CUSC allows this to be achieved in the site specific MSA
- ◆ Allows for all types of connection to be accommodated

Current Definitions - Commercial Boundary

“(unless otherwise defined in the relevant MSA), the commercial boundary between either The Company or a Public Distribution System Operator (as the case may be) and the User at the higher voltage terminal of the generator step-up transformer;” CUSC Section 11

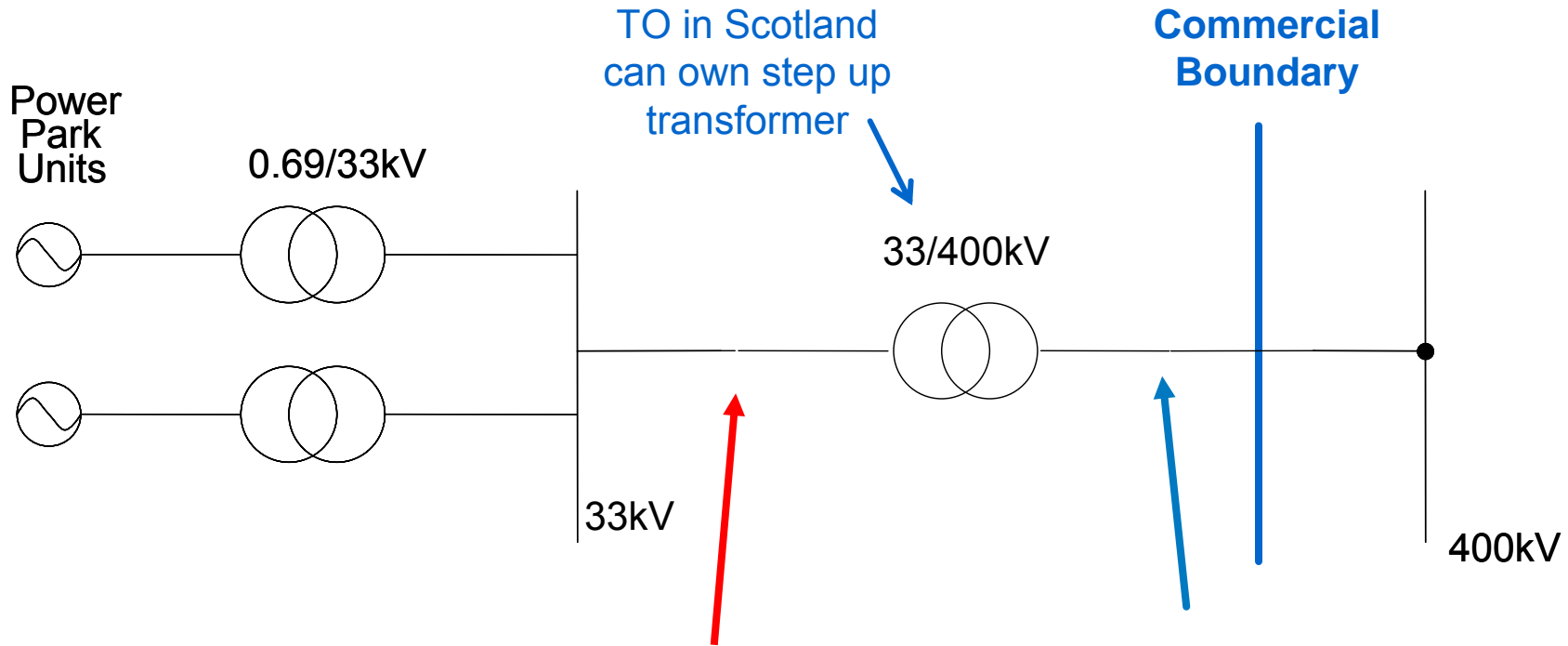
- ◆ Not sensible to uniquely define the Commercial Boundary for Power Parks in CUSC
- ➔ Proposed solution - use the individual MSAs to document where the Commercial Boundary will be (normally it will be at the Grid Entry Point or User System Entry Point for embedded)

Current Definitions - Generating Unit

“Unless otherwise provided in the Grid Code any apparatus which produces Electricity”, CUSC Section 11

- ◆ This definition leads to a solution at the individual turbine level rather than at the Power Park Level
 - ◆ Changes to Grid Code definition would have other impacts
- ➔ Proposed solution - any text in CUSC which refers to a “Generating Unit” should be changed to “Generating Unit or Power Park Module”

Directly Connected Wind farm in Scotland



Metering may be at LV side of transformer

Grid Code CC 6.3 reactive capability requirements at HV side of transformer for Scotland (User System Entry Point if embedded).

Summary of Proposed CUSC Changes

Section 1: Applicability of Sections and Related Agreements Structure

- ◆ Add referencing to Power Park Modules

Section 4: Balancing Services

- ◆ Add Referencing to Power Park Modules

Schedule 3: Reactive Power

- ◆ Add referencing to Power Park Modules

Summary of Proposed CUSC Changes (Cont)

Schedule 2 Exhibit 4: MSA

- ◆ Site specific Commercial Boundary for Wind Farms
- ◆ Appendix 1 – new Capability tables for Power Park Modules

Methodology for Aggregation of Reactive Power Metering

- ◆ Adapt for Power Park Modules as required

Additional changes identified

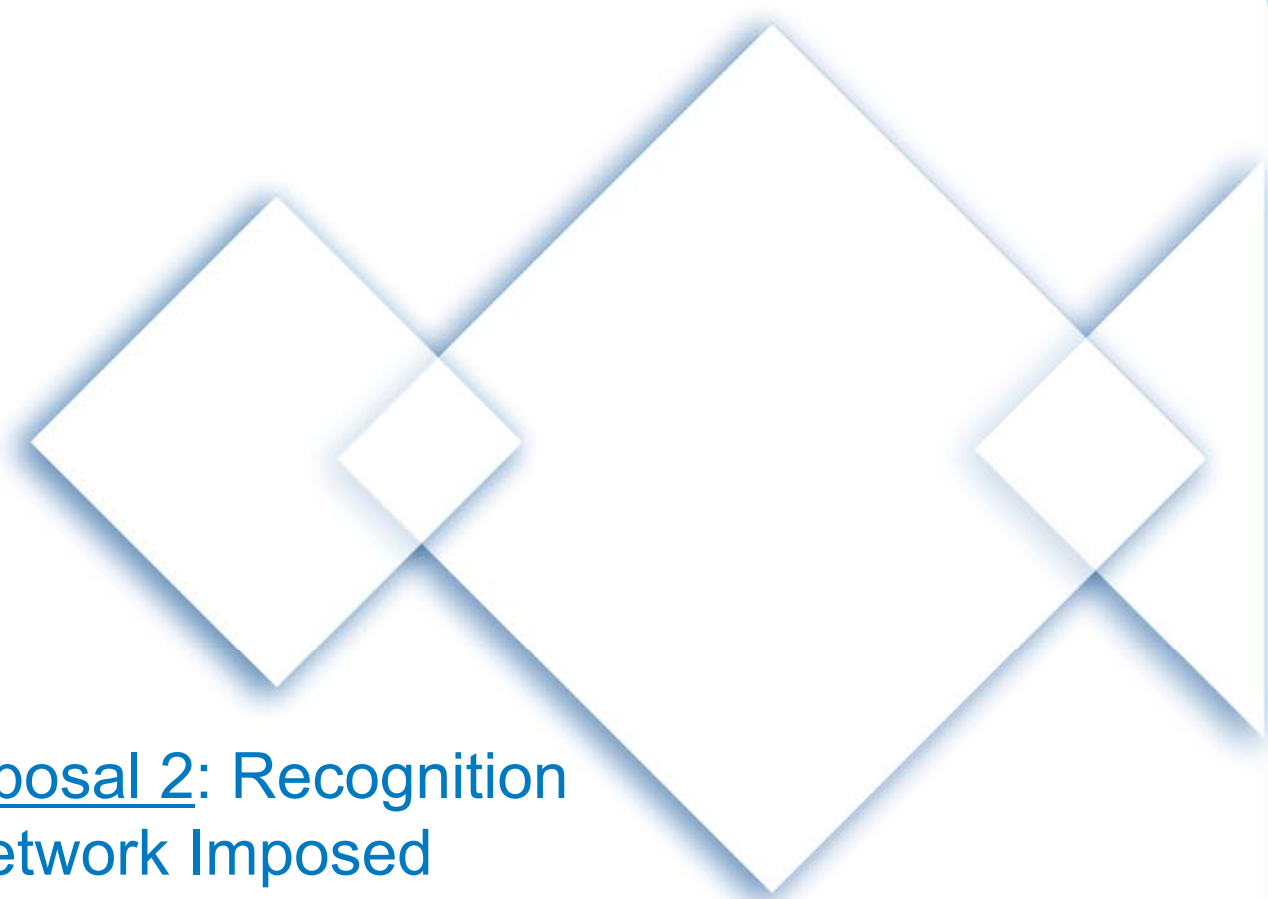
- ◆ **Schedule 3: Interpretation and Definitions**
- ◆ Reactive Power from Power Park Modules provided by synchronous or static compensators is defined in Grid Code CC8.1 as:
 - Mandatory Ancillary Service/Obligatory Reactive Power Service
(Rather than Commercial Service/Enhanced Reactive Power Service)
- ◆ This proposal looks to amend the CUSC Interpretation and Definitions in line with the Grid Code definition

Additional changes identified

- ◆ **Schedule 3: Default Payment Arrangements**
- ◆ Current provisions require that 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
- ◆ Large Power Stations are defined as those which in:
 - NGET’s Transmission System have a Registered Capacity of 100MW or more;
 - SPT’s Transmission System have a Registered Capacity of 30MW or more
 - SHETL’s Transmission System have a Registered Capacity of 10MW or more
- ◆ All three categories of Large Power Stations have the obligation to provide a Reactive Power Service
- ◆ This proposal seeks to reduce the 15Mvar limit to 3.3Mvar, to ensure that National Grid is obliged to conclude MSAs with all Large Power Stations

Amendment 1 – Way Forward

- ◆ Indicative drafting will be circulated
- ◆ BSSG comments/feedback invited
- ◆ Raise as Amendment Proposal February 27th (circulate February 19th)
- ◆ Recommendation proposal goes straight to company consultation



Amendment Proposal 2: Recognition
of Distribution Network Imposed
Restriction on Reactive Power

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DNO Restriction Overview

- ◆ Some embedded generators have DNO connection conditions which prevent instruction from National Grid to the embedded generator to reduce output to 0 Mvar
 - Resulting in it not being possible for National Grid to instruct the relevant generator with regards use of Reactive Power across the Transmission system
- ◆ The Proposed Amendment seeks to facilitate partial payment to generators under such restriction 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
- ◆ Payment under such restrictions would be in line with current arrangements in CUSC Schedule 3, Appendix I (2) whereby a 20% payment is made in the event that certain conditions are not met

DNO Restriction – Grid Code Change

Corresponding Grid Code Change

- ◆ A communication is required to National Grid to trigger acknowledgment and corresponding action as a result of the described restriction
- ◆ It would be appropriate for the communication to be provided by DNOs, who require the restrictions and correspondingly require that no despatch instructions are issued
- ◆ Such communication is likely to be applied through the Grid Code
- Therefore a corresponding Grid Code modification may need to be raised to facilitate this communication

Amendment 2 – Way Forward

- ◆ Initial BSSG comments/feedback invited on proposal
- ◆ Raise Amendment Proposal February 27th
- ◆ Recommend WG/BSSG be convened to consider
- ◆ Provide overview of proposal at Grid Code Panel on February 4th
 - Invite Grid Code to participate in CUSC WG/BSSG