

# **WORKING GROUP REPORT**

## **CUSC Amendment Proposal CAP002**

### ***Clause 6.5.1***

**Prepared by the 6.5.1 Working Group  
for submission to the Amendments Panel**

Amendment Ref	CAP002
Issue	1.0
Date of Issue	3 January 2002
Prepared by	CAP002 Working Group

## DOCUMENT CONTROL

Version	Date	Author	Change Reference
0.1	24/12/01	David Lane	Initial draft for WG consideration
1.0	3/1/02	David Lane	Final version for CUSC Panel

## DISTRIBUTION

Name	Organisation
	Ofgem
CUSC Parties	Various
Panel Members	Various
National Grid Industry Information Website	

## I. CONTENTS TABLE

Document Control  
Distribution

### I. Contents Table

<b>DOCUMENT CONTROL</b> .....	<b>2</b>
<b>1.0 SUMMARY AND RECOMMENDATIONS</b> .....	<b>4</b>
1.1 Executive Summary.....	4
1.2 Working Group Recommendation .....	4
<b>2.0 INTRODUCTION</b> .....	<b>5</b>
<b>3.0 PURPOSE AND SCOPE OF WORKING GROUP</b> .....	<b>5</b>
<b>4.0 ASSESSMENT AGAINST APPLICABLE CUSC OBJECTIVES</b> .....	<b>6</b>
<b>5.0 ALTERNATIVE AMENDMENT</b> .....	<b>9</b>
5.1 Description of Alternative Amendment .....	9
5.2 Assessment Against Applicable CUSC Objectives.....	9
<b>6.0 PROPOSED IMPLEMENTATION AND TIMESCALES</b> .....	<b>10</b>
<b>7.0 IMPACT ON CUSC</b> .....	<b>10</b>
<b>8.0 IMPACT ON INDUSTRY DOCUMENTS</b> .....	<b>11</b>
8.1 Impact on Core Industry Documents .....	11
8.2 Impact on other Industry Documents.....	11
<b>ANNEX 1 – CUSC AMENDMENT PROPOSAL</b> .....	<b>12</b>
<b>ANNEX 2 – WORKING GROUP TERMS OF REFERENCE AND MEMBERSHIP</b> ...	<b>20</b>
<b>ANNEX 3 – PROPOSED TEXT TO MODIFY CUSC</b> .....	<b>22</b>

## 1.0 SUMMARY AND RECOMMENDATIONS

### 1.1 Executive Summary

CUSC paragraph 6.5.1, originally MCUSA paragraph 2.5.1, was introduced when the Generator Licence threshold was 10MW. However, Licence exemptions for Embedded Generators were increased to 50MW in 1995 and 100MW in 2000. With the change to 100MW, National Grid may not be notified of significant embedded generation that may have an effect on the Transmission System.

There is a need for National Grid to be notified of Embedded Generators that may have an effect on the Transmission System in a way that does not impose unnecessary costs on any CUSC Party.

The Working Group reached a consensus that the CUSC Amendment Proposal better facilitates achievement of the Applicable CUSC Objectives. Section 4 describes the assessment carried out by the Working Group.

During discussions, the Working Group developed an Alternative Amendment that is identical to CAP002, except that the 30MW threshold for notification is changed to 50MW. Section 5 describes the Alternative Amendment and the assessment against the Applicable CUSC Objectives.

The Working Group was unable to reach a consensus as to which of the CUSC Amendment Proposal and the Alternative Amendment better facilitates achievement of the Applicable CUSC Objectives. Details of the Working Group discussions are included in Section 4.

### 1.2 Working Group Recommendation

The Working Group recommendation is that both the Amendment Proposal and the Alternative Amendment Proposal better facilitate achievement of the Applicable CUSC Objectives.

**The CUSC Amendments Panel is invited, in accordance with paragraph 8.16.5 (c) of the CUSC to determine that National Grid consults on the Amendment Proposal and the Alternative Amendment.**

The recommended implementation date is one month after the date of the Authority decision or one month after the date of completion of the National Grid Core Industry Document change co-ordination (CUSC paragraph 8.14) in respect of the Amendment Proposal/Alternative Amendment, whichever is later. It is proposed that the Amendment shall apply to any Embedded Generator not having a Connection Agreement with a Distribution System Operator at the date of Amendment implementation.

## **2.0 INTRODUCTION**

The Working Group was set up to assess CAP002 against the Applicable CUSC Objectives.

This report summarises the findings and recommendations of the Working Group. The report has been prepared in accordance with the terms of the CUSC. An electronic copy of this report and notes of the Working Group meetings can be found on the National Grid website at <http://www.nationalgrid.com/uk/indinfo/cusc>

## **3.0 PURPOSE AND SCOPE OF WORKING GROUP**

There is a need for National Grid to be notified of Embedded Generators that may have an effect on the Transmission System, in a way that does not impose unnecessary costs on any CUSC Party. National Grid tabled CUSC Amendment Proposal CAP002 (Annex 1) to resolve current ambiguities surrounding this process.

In accordance with the Terms of Reference for the Working Group (Annex 2), the Working Group considered the National Grid Amendment Proposal. The Working Group also developed and considered an Alternative Amendment Proposal which is described in this report.

#### 4.0 ASSESSMENT AGAINST APPLICABLE CUSC OBJECTIVES

- (a) the efficient discharge by National Grid of the obligations imposed on it by the Act and the Transmission Licence; and
- (b) facilitating effective competition in the generation and supply of electricity, and (so far as consistent therewith) facilitating such competition in the sale, distribution and purchase of electricity.

The group considered each aspect of the Applicable CUSC Objectives individually to determine whether the Amendment Proposal would better facilitate its achievement.

The purpose of paragraph 6.5.1 is to ensure that the transmission system is adequately designed to accept the connection of embedded generation regardless of licensing thresholds. In particular, there is a need to assess the impact of the proposed connection against relevant security standards to ensure continued compliance at the local Grid Supply Point and also wider assessment across the transmission system and to maintain equipment within ratings. In general Embedded Generators will not have a material impact on the transmission system, but the criteria outlined in the proposal are intended to aid transparency, to both Distribution System Operators and Embedded Generators wishing to connect, in terms of when generating plant may have a material system impact.

It is the responsibility of National Grid and the Distribution System Operators to ensure that the system is designed and developed in a co-ordinated manner and to make sure that it is operated safely and efficiently and remains compliant with the relevant security standards. The purpose of a de minimus level is not to define an exact threshold to be appropriate in all cases, rather to reduce ambiguity and provide an indication of materiality without making it too onerous in terms of administration to all parties. If the threshold is set too high, each Distribution System Operator is likely to set its own de minimus level for consultation with National Grid, which would defeat the consistency and transparency that this Amendment Proposal would otherwise bring.

There was broad agreement in the Working Group that in principle paragraph 6.5.1 required clarification. Some members believed that the Amendment Proposal would better facilitate achievement of the Applicable CUSC Objectives if the threshold was set at the specified 30MW, whilst other members argued that a threshold of 50MW would better meet the Applicable CUSC Objectives. However there was consensus within the Working Group that the introduction of a filter at the front end of the process would better meet the Applicable CUSC Objectives. This would identify those unlicensed Embedded Generators that necessitate works by National Grid, thus minimising the requirements, expectations and information flows and making them more transparent. One Working Group Member questioned whether the proposal actually improved the efficiency of the process as it would lead to a 'chain' of agreements.

The Working Group agreed that having a 'one stop shop' for Embedded Generators would simplify the process for them, but would lead to an additional administrative burden on Distribution System Operators, the costs of which may be passed on to Embedded Generators through increased connection charges. It was reiterated that there was nothing in the Amendment Proposal to preclude an unlicensed Embedded Generator from contacting National Grid directly. One group member pointed out that a 'one

stop shop' would cause problems if there was a dispute over works required to the Transmission System. The alternative suggested was for a direct contractual relationship between the Embedded Generator and National Grid when Transmission System works are required. On the other hand it was noted that the approach put forward in the Amendment Proposal avoids the need (and costs) for the Embedded Generator to become a CUSC Party, with the attendant automatic requirement to also be a BSC Party.

The Working Group noted the opinion of one member that the perceived ability of National Grid to delay a Distribution System Operator energising an Embedded Generator would actually create uncertainty and therefore be detrimental to competition. However, the group also noted the counter argument that National Grid has an obligation to treat all parties the same and therefore licence exempt generation should be treated in the same manner as licensed generation. A licence exempt generator could be seen as taking capacity from transmission-connected stations, which could be viewed as discrimination.

There was some discussion about:

(a) The adequacy of existing CUSC, Grid Code, Distribution Code and Connection Agreement notification requirements

In particular, at present National Grid may or may not receive sufficient (if any) information about embedded generation that could have a material effect on the Transmission System. The Proposed Amendment and the Alternative Amendment ensure that this defect is remedied.

(b) Differing treatment of Demand and Generation within CUSC

The closure of a large demand site in excess of 30MW may have some similar effects on the Transmission System as the connection of 30MW of embedded generation. The Working Group recognised that such events would be rare and in any case no contractual obligations could give Distribution System Operators or National Grid control over the timing of the loss of large loads.

(c) The Threshold Level

The Working Group considered whether the threshold level should be 30MW, 50MW or no level specified (which is effectively 100MW) for Distribution System Operators to provide National Grid with information about Embedded Generators and for the control of energisation for these connections. It was agreed that the threshold for both events be the same in order to avoid perverse incentives and to reduce uncertainty. In terms of having no threshold, the Working Group considered that in practice this would be 100MW (because of the licence exemption provisions) and would be too high to meet planning, security and fault level obligations.

In summary, both Distribution System Operators and National Grid are required to ensure that the Transmission System is compliant and safe prior to the connection of a Party; the clarification of paragraph 6.5.1 of the CUSC is intended to improve this process. The Amendment Proposal sets out the requirements on National Grid to undertake analysis and provide a timely

response; a de minimus level is provided to facilitate this and to ensure that the process is transparent to all Parties.

There was no consensus within the Working Group as to which of the Amendment Proposal (30MW) or the Alternative Amendment Proposal (50MW) better met the Applicable CUSC Objectives. The rationale put forward for the 30MW option follows and the rationale for the 50MW option is described in section 5.2.

### **Comments on the threshold in CAP002 to be set at 30MW**

These were the comments made in support of a 30MW threshold.

National Grid has indicated that in most scenarios a generator of less than 30MW embedded within a Distribution System will not impact on its ability to plan and develop an efficient and safe system.

The de minimus level is based around several effects that generators may have on the transmission system:

**Fault infeed** – In practice a generator will infeed three to four times its size into a fault. For a 30MW generator this could be between 100 - 140MVA of fault infeed compared with equipment rating of 3500MVA (generally minimum rating at 132kV but is rating at over 25% of National Grid sites). This is approximately 3% of rating although in practice this may be lower due to the system impedance between the connection site and the fault and is project specific. However, this is significant when considering National Grid uses a 5% margin of design rating when assessing fault levels at 132kV and below and in some cases 2%. It is believed that deeper Embedded Generators of less than 30MW will not have a material impact on the joint planning carried out at Grid Supply Points by the Distribution System Operators and National Grid. It is likely that any works necessary for smaller generators will have already been identified and planned for, although this work will still need to be completed prior to energisation. This proposal allows good practice to be followed for the safety of staff and ensures the integrity of the system.

**Transformer Rating** – Standard supergrid transformer ratings are 240MVA and therefore a 30MW generator represents some 15% of potential loading. This is significant in the design and development of a site and more specifically when considering operational planning through the year and determining outage windows for maintenance.

All the above effects relate to local considerations but thermal issues may arise more remote from the connection site on parts of the transmission system that has limited capacity. This is particularly significant where there may be an interaction of two or more proposals that will collectively have an effect and may be across different Distribution System Operator licensed areas.

## 5.0 ALTERNATIVE AMENDMENT

### 5.1 Description of Alternative Amendment

The Alternative Amendment is identical to the original CUSC Amendment Proposal except that the 30MW threshold for notification is changed to 50MW.

### 5.2 Assessment Against Applicable CUSC Objectives

The Assessment against the Applicable CUSC Objectives is identical to that of the original CUSC Amendment Proposal, except the rationale for the notification level, which is:

#### **Comments for the threshold in the Alternative Amendment to CAP002 to be set at 50MW**

Presently, embedded/exempt generators have two main thresholds to consider, 50MW for many Grid Code requirements and 100MW for licence exemption. Generators with a capacity below this limit are exempt from many aspects of the commercial and regulatory regime. It would be inconsistent with this provision to require licence exempt generators to comply with aspects of the regime that are not necessary. The Alternative Amendment seeks to align the threshold in paragraph 6.5.1 with the definition of Small Power Station in the Grid Code. Small Power Stations are exempt from a number of requirements under the Grid Code including the Connection Conditions.

CC5.1 of the Grid Code states:

*“The provisions relating to the connection to the NGC Transmission System (or to a User’s System in the case of a connection of an Embedded Large Power Station or Embedded Medium Power Station) are contained in the CUSC and/or CUSC Contract (or in the relevant application form or offer for a CUSC Contract), and include provisions relating to both the submission of information and reports relating to compliance with the relevant Connection Conditions for that User, Safety rules, commissioning programmes, Operation Diagrams and approval to connect. References in this CC to the ‘Bilateral Agreement’ and/or ‘Construction Agreement’ shall be deemed to include references to the application form or offer therefor.”*

The Amendment Proposal essentially sets a limit where an individual station is deemed as having an effect on the system in its own right. The equivalent in the Grid Code of this concept is the Medium Power Station at 50MW or above. By setting the limit at 30MW the original Amendment Proposal appears to be inconsistent with the Grid Code. It is certainly not appropriate to give National Grid a general veto over the connection to the Distribution System of Power Stations of capacity below 50MW.

The impact on the Transmission System of a 50MW generator is minimal. National Grid calculations show that a 30MW generator could increase fault levels by 2-3% at a 132kV 3500MVA substation. However, connections at 132kV would be captured anyway by the other condition, so we need only consider lower voltages. Once the other transformer impedances are also accounted for, a 50MW generator would have a similar effect (and still be less than National Grid's planning margin of 5%).

The small effect that these generators have can adequately be managed through the normal planning process, particularly if information provided from Distribution System Operators is accurate and timely.

Whilst the Amendment Proposal will not affect the way National Grid charges for connections, it is quite likely that this threshold could be used as a way of determining whether Distribution System Operators should pass through their modification costs to Embedded Generators. It could be argued that, as 30MW is deemed as having a material affect on the Transmission System, the costs for a modification should fall solely to the generator even if the reinforcement work would have been required shortly anyway.

Recent initiatives from the DTI to encourage smaller generators are to be supported and setting the threshold at 30MW could potentially counteract the improvements from these initiatives in terms of increased cost, administration and uncertainty.

## **6.0 PROPOSED IMPLEMENTATION AND TIMESCALES**

Potential impacts have been identified on the Grid Code, Distribution Codes and Distribution Connection Agreements. Appropriate procedures will require documentation and implementation. It is therefore recommended that the implementation date is one month after the date of the Authority decision or one month after the date of completion of the National Grid Core Industry Document change co-ordination (paragraph 8.14 of the CUSC), in respect of the Amendment Proposal/Alternative Amendment, whichever is later. It is recommended that if approved the Amendment be applied to any Embedded Generator not having a Connection Agreement with a Distribution System Operator at the date of implementation.

## **7.0 IMPACT ON CUSC**

Implementation of the Amendment Proposal or the Alternative Amendment will require amendment of CUSC paragraph 6.5.1 as detailed in Annex 3 of this Working Group Report.

## **8.0 IMPACT ON INDUSTRY DOCUMENTS**

### **8.1 Impact on Core Industry Documents**

National Grid noted that the proposed amendment to the CUSC would necessitate change to the Grid Code. The provisions within the Grid Code, which relate to Medium Power Stations, are likely to be changed so that the direct relationship between a Distribution System Operator and an Embedded Generator is used to enforce these requirements. [The requirements for small power stations within the Grid Code are already managed through the interface with Distribution System Operators.] National Grid will submit a proposal paper to the next Grid Code Review Panel in February 2002 to ensure that these changes are considered in tandem with the CUSC Amendment Proposal. This will enable the Authority to consider the package of changes required.

The Working Group noted that the Amendment Proposal may have an impact on Core Industry documents. In particular it was recognised that there may be changes required to the Distribution Codes and the Connection Agreements between Distribution System Operators and Embedded Generators. Consideration of these changes will need to take place once there is agreement on the proposed changes to the CUSC and Grid Code CUSC but will involve consultation to ensure that any impacts are managed.

Further details are included in the CUSC Amendment Proposal CAP 002 (Annex 1).

### **8.2 Impact on other Industry Documents**

Coordination with the review of Engineering Recommendation 75 is required. Other than this, no impact on other industry documents, including the BSC, was identified.

## Annex 1 – CUSC Amendment Proposal CAP 002

### Amendment Proposal Form

Those wishing to propose an Amendment to the CUSC should do so by filling in this “Amendment Proposal Form” that is based on the provisions contained in Section 8.15 of the CUSC. The form seeks to ascertain details about the Amendment Proposal so that the CUSC Panel can determine more clearly whether the proposal should be considered by a Working Group or go straight to wider National Grid Consultation.

The Panel Secretary will check that the form has been completed, in accordance with the requirements of the CUSC, prior to submitting it to the Panel. If the Panel Secretary accepts the Amendment Proposal form as complete, then he will write back to the Proposer informing him of the reference number for the Amendment Proposal and the date on which the Proposal will be considered by the Panel. If, in the opinion of the Panel Secretary, the form fails to provide the information required in the CUSC, then he may reject the Proposal. The Panel Secretary will inform the Proposer of the rejection and report the matter to the Panel at their next meeting. The Panel can reverse the Panel Secretary’s decision and if this happens the Proposer will be informed by the Panel Secretary.

The completed form should be returned to:

CUSC Panel Secretary  
Commercial Development  
National Grid Company plc  
National Grid House  
Kirby Corner Road  
Coventry, CV4 8JY

Or via e-mail to:

[CUSC.Team@uk.ngrid.com](mailto:CUSC.Team@uk.ngrid.com)

(Participants submitting this form by email will need to send a statement to the effect that the proposer acknowledges that on acceptance of the proposal for consideration by the Amendments Panel, a proposer which is not a CUSC Party shall grant a licence in accordance with Paragraph 8.15.7 of the CUSC. A Proposer which is a CUSC Party shall be deemed to have granted this Licence.)

#### **Proposers Name:**

(Name of party making the proposal. An Amendment Proposal may be made by a CUSC Party, a BSC Party or by “energywatch”)

National Grid Company plc

**Proposers Representative:**

(The name of the person representing the Proposer (and their alternate) for the purposes of the Amendment Process)

Mark Cox (Mike Metcalfe)

**Organisations Name and Address:**

(Organisation on whose behalf the Amendment is proposed)

National Grid Company plc  
National Grid House  
Kirby Corner Road  
Coventry, CV4 8JY

**Capacity in which the Organisation Proposes to make an Amendment:**

(i.e. CUSC Party, BSC Party, or “energywatch”)

CUSC Party

**Description of the issue or defect which the proposed Amendment seeks to address:**

(This should be in reasonable, but not excessive detail)

CUSC Clause 6.5.1 –

The existing wording of clause 6.5.1 provides ambiguity on the necessity for a contractual agreement between unlicensed, embedded generation and National Grid. As a consequence, National Grid is not necessarily made aware of all embedded projects which may have a material impact in advance of connection, and sometimes may only be informed post energisation. This impacts on National Grid’s ability to develop and maintain an efficient, coordinated and economical transmission system. The resulting impact may cause security issues on the transmission system, health and safety concerns and cause potential discrimination in generation.

The clause, originally as MCUSA 2.5.1, was effective as the requirement for a generator licence was set at 10MW at vesting and this enabled National Grid to be notified of all relevant Embedded Generators. However the subsequent changes to the licence exemptions for Embedded Generators to 50MW in 1995 and then again in 2000 to 100MW meant that the necessary contractual relationship with National Grid was unclear. Embedded generators <50MW can have a material effect on the Transmission system and yet may not always contact, or have a Use of System agreement with, National Grid due to the clause’s ambiguity. With the change to 100MW, more significant embedded generation may not necessarily be identified to National Grid with sufficient notice.

In 1998 National Grid highlighted this issue to OFFER after failure to get agreement from all signatories to change and clarify the existing MCUSA 2.5.1. In response OFGEM confirmed that it could find no evidence that National Grid had been unable to meet its duties to date, and were not satisfied that National Grid had fully explored all mechanisms to manage the connection of embedded generation. Modification to CUSC 6.5.1 will resolve this long-standing ambiguity.

### **Description of the proposed Amendment and of its nature and purpose:**

(This should be in reasonable but not excessive detail)

Draft proposal for revised wording of clause 6.5.1:

*“Any **User** who owns or operates a **Distribution System** shall not **Energise** the connection between a **Power Station** of 30MW **Registered Capacity** or greater, or a **Power Station** (whatever its **Registered Capacity**) connected to the same voltage level as the LV side of the **Grid Supply Point** and its **Distribution System** by the same until the **User** has obtained from **NGC** a statement of the works (if any) required to the **NGC Transmission System** and any **User System** to accommodate that **Power Station** and **NGC** has confirmed to the **User** that those works have been completed.*

*When requesting such statement the **User** shall provide **NGC** with details of the **Power Station** and the proposed date of connection to the **Distribution System** and **NGC** shall provide a statement advising whether works are required together with where practicable an indication of those works within 28 days of request. The **User** shall notify **NGC** in the event that the date of connection changes and request a revised statement.”*

The revised clause now identifies unlicensed power stations that may have a material effect on the transmission system. This will enable both the Distribution System Operators and the Embedded Generators to be clear of National Grid's requirement and provide clarity and consistency. On request National Grid will consider the proposed Embedded Generation connection and provide a statement within 28 days to confirm if there is an impact on the Transmission System based on the proposed connection date and generator parameters. National Grid will need to re-assess the impact in the event of the proposed connection date or scheme detail changing.

The revision will simplify the existing interface and contractual relationship between all parties by enabling unlicensed, Embedded Generators to have a single point of contact and single contractual relationship with the Distribution System Operator and remove the need for an agreement with National Grid. The revision will more easily enable National Grid to develop the Transmission System in an efficient, coordinated and economic fashion and promote transparent competition in generation.

**An indication of those parts of the CUSC which would require amendment in order to give effect to (or would be otherwise affected by) the proposed amendment and an indication of the nature of those amendments or effects:**

(This should be given where possible)

Change to Clause 6.5.1 should not affect other sections of the CUSC.

**Reasons why the Proposer believes that the proposed Amendment would better facilitate achievement of the applicable CUSC objectives as compared with the current version of the CUSC with background information in support thereof:**

The change to clause 6.5.1 as described above would remove the existing ambiguity and make clear and transparent the impact of embedded generation on the transmission system. National Grid will then be able to more easily fulfill its duties to facilitate competition in generation and ensure that there is no potential discrimination. Awareness of all potential Users will also facilitate the development of the transmission system in an efficient and coordinated manner. Simplification of the contractual interfaces between parties will also reduce administration, in particular for the Embedded Generator and ensure improved connection processes.

**An indication of the impact of the proposed Amendment on Core Industry Documents:**

(This should be given where possible)

The removal of any contractual agreement between National Grid and an unlicensed Embedded Generator means that there will no longer be a requirement on them to comply with the Grid Code. It will therefore be necessary to ensure that alternative arrangements are put in place to ensure that the existing provisions in the Grid Code on small and medium embedded power stations are still enforced.

This may be achieved by amendments to the Distribution Code to add provisions equivalent to those existing within the Grid Code, which would be effected through bilateral agreements between the Distribution System Operator and the Embedded Generator.

An alternative approach for the short term could be to change the Grid Code to put an obligation on the Distribution System Operator to ensure that the existing provisions in the Grid Code relating to <100MW power stations connecting to their network remain enforced. It follows that possible subsequent changes to the Distribution Code could fulfill this obligation and also provide consistency and clarity.

Appendix 1 of this amendment form details parts of the Grid Code that relate to medium power stations that will need to be enforced. This is not intended to

be an exhaustive list but to provide an indication of the key issues. Areas of the Distribution Code and ER G75 are listed that may be considered for review.

**An indication of the impact of the proposed Amendment on relevant computer systems and processes used by CUSC Parties.**

(This should be given where possible.)

None identified

**A statement to the effect that the Proposer acknowledges that on acceptance of the proposal for consideration by the Amendments Panel a Proposer shall grant a licence in accordance with 8.15.7 of the CUSC.**

(A signature to this effect must be given by a proposer which is not a CUSC Party)

## Appendix 1: Suggested areas for harmonisation of Technical and Information Requirements between Grid Code and Distribution Code

The Grid Code currently contains a large number of provisions impacting directly on Embedded Generation relating to both technical requirements and provision of information. The proposed CUSC Amendment is likely to necessitate changes to the Grid Code to permit the collection of much of this data by the Network Operator and also to ensure the continued technical performance of medium power stations. The key areas are detailed below:

### **Technical Requirements for 50-100MW Generators**

Currently medium power stations are required to have a robust design and must be compatible with the technical requirements specified in the Grid Code. Medium power stations are likely to be connected at the same voltage level as that of the LV side of National Grid's supergrid transformers (mainly 132kV, 66kV or 33kV) and do form part of the integrated electrical system, which is required to ride through various disturbance conditions where system voltage and/or frequency deviate from nominal values. It is therefore crucial that these medium power stations stay connected and remain stable under various system frequency/voltage variations and must not exacerbate the system condition under such disturbances.

It is for these reasons that the Grid Code requires medium power stations to be designed to European/ International standards and also meet specific technical requirements to take into account the characteristics of the UK electrical system and, in particular, its needs for frequency control and overall stability. In accordance with these, a medium power station at commissioning and until decommissioning:

- ÷ Must be able to operate continuously within a system frequency range of 47.5 to 52Hz and for a period of at least 20 seconds each time the frequency is below 47.5 Hz but not less than 47Hz (CC6.1.3). Under system split conditions the plant is expected to be able to control the frequency below 52Hz (CC6.3.7(c)(i)).
- ÷ Must be capable of continuously maintaining its constant active power output for system frequency changes within the range 50.5 to 49.5Hz. However, for system frequency changes within the range 49.5 to 47 Hz any reduction in output power must not be greater than pro-rata with falling frequency, with the reduction in power output being no more than 5% for a system frequency drop to 47Hz. (CC6.3.3).
- ÷ Must be fitted with a fast acting proportional turbine speed governor and unit load controller or equivalent control device to be capable of providing frequency response under normal operational conditions (CC6.3.7(a)). The droop setting is generally required to be set between 3% and 5% (CC.6.3.7(c)(ii)). The speed governor, in co-ordination with other control devices, must control the generating plant active power

output with stability over the entire operating range of the Generating Unit (CC.6.3.7(b)).

- ÷ Must be fitted with a continuously acting automatic excitation control facility to control the terminal voltage without instability over the entire operating range (CC.6.3.8(a)).

### **National Grid's Requirements for Provision of Information**

To enable National Grid to meet its Licence obligations, it requires information from embedded generating units and these requirements are detailed in the Grid Code. This information is to allow adequate design for the connection and on-going operation of the system.

- ÷ For all medium power stations and all generating units connected at the same voltage level as that of National Grid's supergrid transformer LV side: Provision of data currently specified in the Grid Code for medium power stations (i.e. Grid Code Planning Data, classed as DPD and PD) to allow adequate design for connection and also the on-going operational data requirements to manage operational planning.
- ÷ For all power stations of capacities between 30MW and 50MW that are connected to a voltage level below that of National Grid's supergrid transformer LV side: Notification of the existence of all such generators and provide at NGC's request technical data if deemed necessary by National Grid. (This level of information is already required by the Distribution Code)

### **Impact on Industry Documents**

It will be sensible to co-ordinate any changes to Grid Code and Distribution Code with changes to Engineering Recommendation G75 for power stations of less than 100MW. Below is a list of the clauses which may require modifications with the majority of these being minor ones:

#### *Possible Required Changes to Grid Code:*

In the Grid Code there are many clauses which refer to medium and small power stations and these potentially can be subject to some modifications. However, it is likely that a new blanket clause in the Grid Code will be added which will eliminate the need to modify many of the clauses in question. The relevant Grid Code clauses deal mainly with the provision of information and are:

PC.3.2(a), PC.3.2(b), PC.4.1(b), PC.4.2.4, PC.4.3.1, PC.4.3.1, PC.A.1.2(d),  
PC.A.1.12, PC.A.2.1.3, PC.A.2.2.2, PC.A.2.5.4, PC.A.3.1.2(a),  
PC.A.13.1.2(b), PC.A.3.1.3, PC.A.3.1.4(a), PC.A.3.1.4(b), PC.A.3.2.2(a),  
PC.4.2.3, PC.A.4.3.2, PC.A.5.1.2, PC.A.5.1.3, PC.A.5.1.4, PC.A.5.2.3,  
PC.A.5.3.1, PC.A.5.3.1(b), PC.A.5.3.1(c), PC.A.5.3.1(d)  
CC.5.1, CC5.2(a), CC.5.2(b), CC.5.2(d), CC.5.2(f), CC.5.2(j), CC.5.2(l)  
OC1.4.2, OC1.5.1, OC1.5.2, OC1.5.3

*Possible Required Changes in Distribution Code:*

The following clauses in the Distribution Code may require augmentation as discussed above:

DPC6.7 (re Telemetry)

DPC7.2 (re General Requirement for Embedded Generators)

DPC.7.3 (re Provision of Information)

DPC7.4 (re Technical Requirements for Embedded Generators)

*Possible Changes in ER G75:*

The following clauses may be modified (subject to current EA Review, OSGSG7)

3.2 (re Compliance with Grid Code)

4.1, 4.2, 4.3, 4.4 (re Generating Unit Parameters)

## **Annex 2 – Working Group Terms of Reference and Membership**

### **CUSC AMENDMENTS PANEL CAP002 - Clause 6.5.1 Working Group Terms of Reference**

#### **Responsibilities**

The Working Group is responsible for the evaluation of CUSC Amendment Proposal CAP002 tabled by National Grid at the Amendments Panel meeting on 9<sup>th</sup> November 2001.

The proposal must be evaluated to see if it better meets the applicable CUSC objectives. (The efficient discharge by the Licensee of its obligations and the facilitation of effective competition in the generation, supply, distribution and purchase of electricity.)

#### **Scope of Work**

The Working Group must consider the issues raised by the proposal and consider if the solution identified better meets the Applicable CUSC Objectives.

The areas for review are:

- 1) The process contained within clause 6.5.1 to ensure that the impact of Embedded Generators on the transmission system is identified and managed prior to energisation.
- 2) Consideration of any consequential impact on the existing provisions in the Grid Code for medium power stations to ensure that they are not lost following generator licence exemption changes.
- 3) Evaluate the rationale for the proposed 30MW Registered Capacity threshold.

The Working Group is responsible for the formulation and evaluation of any Alternative Amendments arising from Group discussions. The Working Group should have due regard to other Core Industry Documents in the evaluation of the Amendment Proposal and any Alternative Proposal.

The Working Group is to submit their final report to the CUSC Panel Secretary on 9<sup>th</sup> February 2002 for circulation to Panel Members and the conclusions will be presented to the CUSC Panel meeting on 22<sup>nd</sup> February 2002.

#### **Membership**

The Working Group has the following members:

David Lane	Chair
Mark Cox	National Grid
Nigel Turvey	WPD
Michael Wilks	Enron/Williams Energy
Paul Jones	PowerGen
John Stewart	Campbellcarr Consultancy
Bridget Morgan	Ofgem
Nick George*	TXU - Europe
Emma Groves	Technical Secretary

\*Nick George attended the first Working Group meeting as an observer and was later appointed as a Working Group Member by the CUSC Amendments Panel on 7 December 2001.

## Relationship with Amendments Panel

The Working Group shall seek the views of the Amendments Panel before taking on any significant amount of work. The Working Group Chairman should contact the CUSC Panel Secretary.

Where the Working Group requires instruction, clarification or guidance from the Amendments Panel, particularly in relation to their Scope of Work, the Working Group Chairman should contact the CUSC Panel Secretary.

## Meetings

The Working group shall develop and adopt its own internal working procedures and provide a copy to the Panel Secretary for each of its Amendment Proposals.

## Reporting

The Working Group Chairman shall prepare a report to the Amendments Panel responding to the matter set out in the Terms of Reference.

A draft Working Group Report must be circulated to Working Group members, with not less than five business days given for comments.

Any unresolved comments within the Working Group must be reflected in the final Working Group Report.

The Chairman (or another member nominated by him) will present the Working Group report to the Amendments Panel as required.

### Annex 3 – Proposed Text to Modify CUSC

The CAP002 proposed revised wording of clause 6.5.1 is:

*“Any **User** who owns or operates a **Distribution System** shall not **Energise** the connection between a **Power Station** of 30MW **Registered Capacity** or greater, or a **Power Station** (whatever its **Registered Capacity**) connected to the same voltage level as the LV side of the **Grid Supply Point** and its **Distribution System** by the same until the **User** has obtained from **NGC** a statement of the works (if any) required to the **NGC Transmission System** and any **User System** to accommodate that **Power Station** and **NGC** has confirmed to the **User** that those works have been completed. When requesting such statement the **User** shall provide **NGC** with details of the **Power Station** and the proposed date of connection to the **Distribution System** and **NGC** shall provide a statement advising whether works are required together with where practicable an indication of those works within 28 days of request. The **User** shall notify **NGC** in the event that the date of connection changes and request a revised statement.”*

The Alternative Amendment proposed revised wording of clause 6.5.1 is:

*“Any **User** who owns or operates a **Distribution System** shall not **Energise** the connection between a **Power Station** of 50MW **Registered Capacity** or greater, or a **Power Station** (whatever its **Registered Capacity**) connected to the same voltage level as the LV side of the **Grid Supply Point** and its **Distribution System** by the same until the **User** has obtained from **NGC** a statement of the works (if any) required to the **NGC Transmission System** and any **User System** to accommodate that **Power Station** and **NGC** has confirmed to the **User** that those works have been completed. When requesting such statement the **User** shall provide **NGC** with details of the **Power Station** and the proposed date of connection to the **Distribution System** and **NGC** shall provide a statement advising whether works are required together with where practicable an indication of those works within 28 days of request. The **User** shall notify **NGC** in the event that the date of connection changes and request a revised statement.”*