Grid Code Modification MPID133:

Revision 6

Date of last revision: 05 October 2005

Introduction:

This modification proposal aims to clarify the use of terms for Demand Customer, Grid Connected Customer and Demand Consumer and to clarify what signals and from where Demand Customers shall provide signals back to ESBNG.

Background to proposed signals modifications:

Some demand customers have no telemetry and others have telemetry from the HV side of the customer's feed in the 110kV station. 'Newer' stations have telemetry whereas older stations do not. The reason for this is that previously impedance protection was not installed at demand customer sites and therefore, the associated CT (current transformer) would not have been required. However, although it is not explicitly stated in the Grid Code that telemetry be provided, it is required and has been provided by recently connected demand customers. Telemetry from the HV side is ideally what is required but where HV CT/VTs are not available, LV-side signals will be acceptable. This proposal is to ensure that telemetry will be in place for all demand customers.

The rationale behind requesting demand customers to provide information to the TSO is that to allow the TSO to make informed decisions on the operation of the system, it must have the most up-to-date information about the status of all the items of plant connected to the system. For this reason, all items of plants- generators and demand customers - are required to send signals to the TSO's Energy Management System (EMS). This becomes more critical as more plant connects onto the system. For the plant without telemetry, the software that controls the EMS is forced to make an estimation as to what the values are. The more unknowns there are, the more error is introduced into this estimation. Ideally, all the inputs to the transmission system should be made available to the EMS.

11 out of the 19 demand customers (demand only) are not providing telemetry. We believe that 4 of the non-compliant customers are currently terminating or will not be renewing their Connection Agreements with ESBNG. Hence, there are 7 non-compliant sites. Of those 7 sites, 2 already have a RTU (Remote Terminal Unit) and the associated communications links, and the remaining 5 have no RTU. This information is shown in the summary table below.

Summary

	Number of Sites
Telemetry currently available	8
RTU on site, NO Telemetry received from Customer feeders	2
No RTU, No Telemetry, site to continue	5
No RTU, No Telemetry, CA terminated/ about to be terminated	4
Total	19

Compliance

As some time may be required for customers that are not currently providing telemetry to become fully compliant, ESBNG would consider recommending for approval a time-limited derogation until the plant is being upgraded. Non-compliant sites will be examined on a case-by-case basis. The cost to comply may involve the cost of purchasing an RTU and possibly one or more CTs depending on the number of feeders. Some installations may already have a CT and/or an RTU for their own metering and signals purposes and therefore the cost may be reduced.

ESBNG shall contact each of the demand customers that ESBNG believes is non-compliant, advising that either compliance or application for a Grid Code derogation is required. The derogation process shall involve the Demand Customer filling out a Derogation Application Form, available to download on the ESBNG website through the following link:
http://www.eirgrid.com/EirGridPortal/uploads/Regulation%20and%20Pricing/Grid%20Code%20Derogation%20Application1.pdf

This application is then sent to both ESBNG and CER. ESBNG allocate a Derogation Assessment Identification Number (DAID) to the application. ESBNG then assess the application and send a Derogation Assessment Form to the CER. The CER then decide if the derogation shall be granted.

Details of Modification Proposal

The following colour coding will be used in this document:

Existing Grid Code
Additional text for this modification
Inaccurate / inappropriate text to be replaced as part of this proposal

1. Demand Customer Definition:

Current definition for Customer:

Customer	A person to whom electrical power is provided (whether or not this is the same person who provides the electrical power).

Current Definition for Grid Connected Customer:

Grid Connected Customers	A **Customer** who is connected directly to the **Transmission System**.

Propose to delete 'Grid Connected Customers' above and replace with the definition below. All the current instances of 'Grid Connected Customer' in the Grid Code are listed in Appendix 1.

Demand Customer	A person to whom electrical **Energy** is provided by means of a direct connection to the **Transmission System**. **Autoproducers** are to be considered both **Generators** and **Demand Customers**

It is also proposed to amend the definition of Generator as follows:

Generator	~~A entity which~~ A person who generates electricity and is subject to the **Grid Code** pursuant to any agreement with **ESBNG** or otherwise. **Autoproducers** are to be considered both **Generators** and **Demand Customers**

And add the following definition for autoproducer

Autoproducer	Persons to whom electrical **Energy** is provided and by whom electrical **Energy** is generated essentially for their own use, by means of a direct connection to the **Transmission System**

Reference to Demand Consumer:

In the Planning Code Appendix (PCA) there is a reference to ***Demand Consumer***. This should be changed *to* ***Demand Customer*** to ensure continuity in the Grid Code:

PC.A3.3.11 Data Templates

For uniformity of data capture, and to facilitate **Users** of the **Transmission System** who are ~~Demand Consumers~~ **Demand Customers**, ESBNG will provide to each such **User** prepared templates with data validation to facilitate entry of the required data.

Users shall provide data to **ESBNG** using these data templates or in such other form as may be agreed by **ESBNG**.

References to Grid Connected Customer:

All references in Grid Code version1.2 to **'Grid Connected Customer'** to change to '**Demand Customer'**.

These references are listed in Appendix 1 at the end of this document.

2. Change to CC.12

The following changes to CC.12 are proposed:

CC.12 SIGNALS TO BE PROVIDED BY USERS

CC.12.1 Each **User** shall provide such signals and indications in relation to the **User's Plant** and **Apparatus** as are required by **ESBNG** (acting reasonably) in accordance with the **Connection Agreement**.

CC.12.2 Signals and indications required to be provided by **Users** will include but shall not be limited to the following:

(a) **LV** switchgear positions pertinent to the status of each **Grid Connected Transformer** through a set of two potential free auxiliary contacts (one contact normally open and one contact normally closed when circuit breaker is open) for each circuit breaker;

(b) kV at transformer low **Voltage** terminals; and

(c) a minimum of four sets of normally open potential free auxiliary contacts in each transformer LV bay for fault indication.

(d), (e), (f), (g) and (h) are applicable to ***Generators*** *only,*

(d) MW and +/-Mvar at alternator terminals of each **Generation Unit**;

(e) kV at **Generator Transformer LV** terminals;

(f) **Generator Transformer** tap position; ~~and~~

(g) Measured or derived MW output on each fuel, from **Generation Units** that can continuously fire on more than one fuel simultaneously; and

(h) Where it is agreed between **ESBNG** and the ~~User~~ **Generator** that signals are not available on the **HV** terminals, +/- MW and +/- **Mvar** shall be provided at the ~~transformer~~ **Grid Connected Transformer** low **Voltage** terminals.

*(i) and (j) are applicable to **Demand Customers** only*

(i) **MW** and +/- **Mvar** at the **HV** terminals of the **Grid Connected Transformer**; and

(j) **Grid Connected Transformer** tap position

APPENDIX 1

Current references to 'Grid Connected Customer' in Grid Code v1.2

PC.3 SCOPE
The **Planning Code** applies to **ESBNG** and to the following **Users:**
…
(d) **Grid Connected Customers**.

PC.7.4 The Transmission System Voltage level at which a Grid Connected Customer will be connected to the Transmission System will depend upon but shall not be limited to the following:

CC.3 SCOPE
The **Connection Conditions** apply to **ESBNG** and to the following **Users**:
…
(c) Grid Connected Customers

CC.10 USER PROTECTION AND POWER QUALITY
CC.10 shall apply to the **DSO, Generators** and **Grid Connected Customers**.

CC.10.11 Grid Connected Customers

CC.10.11.1 **Grid Connected Customers** shall provide differential-protection on **Grid Connected Transformers.**

CC.10.11.2 **ESBNG** may require **Grid Connected Customers** to install additional protection schemes, where **ESBNG** can reasonably show that it is prudent or necessary to do so, which may include the following:

CC.10.12.1 The aggregate power factor for a **Grid Connected Customer** is calculated in accordance with the following formula:

$$APF = \frac{\text{Sum P}}{((\text{Sum P})^2 + (\text{Sum Q})^2)^{0.5}}$$

where**:**
APF is the Aggregate Power Factor for the **Grid Connected Customer**

Sum P is the Energy exchanged with the **Grid Connected Customer** at the **Connection Point** for any half-hour period; and

Sum Q is the Reactive Energy exchanged with the **Grid Connected Customer** at the **Connection Point** for the same half-hour period.

CC.10.12.2	A **Grid Connected Customer** shall ensure that at any load above 50% of **Maximum Import Capacity** the aggregate power factor as determined at the **Connection Point** in any half-hour period shall be within the range 0.90 lagging to unity.
OC1.3	***SCOPE*** OC1 applies to **ESBNG** and to all **Users**, which term in this OC1 means: **…** **Grid Connected Customers**.
OC1.4.2	For year 1 the following shall be supplied to **ESBNG In Writing** by week 22 in year 0: (a) The **DSO** and **Grid Connected Customers** shall supply typical profiles of the anticipated **Demand** (averaged over any half hour on any **Grid Supply Point**) on half hourly and **Grid Supply Point** basis for defined categories of day type as determined by **ESBNG**; (b) The **DSO** and **Grid Connected Customers** shall supply MW profiles of the amount and duration of anticipated **Demand Control** which may result in a **Demand** change of 10MW or more (averaged over any half hour on **any Grid Supply Point**) on half hourly and **Grid Supply Point** basis;
OC1.4.3	The **DSO** and **Grid Connected Customers** shall inform **ESBNG** of any changes to the information supplied under OC1.4.2 as soon as this information is available. This information will be provided **In Writing**, or as otherwise agreed between the **DSO** or **Grid Connected Customers** and **ESBNG**, such agreement not to be unreasonably withheld. (a) In particular, the **DSO** and **Grid Connected Customers** shall provide to **ESBNG In Writing** information pertaining to new connections greater than 2MW immediately this information is available. This information must include: anticipated connection date, location of connection, size of connection category of connection (e.g. residential, industrial etc.) and the typical profiles of the anticipated **Demand** on half hourly basis for defined categories of day type as determined by **ESBNG**; (b) In particular, the **DSO** and **Grid Connected Customers** shall provide to **ESBNG In Writing** information pertaining to disconnection of existing **Demand** immediately this information is available. This information must include: anticipated disconnection date, location of connection, size of connection, and the revised typical profiles of the anticipated **Demand** on a half hourly basis at the **Grid Supply Point** for defined categories of day type as determined by **ESBNG**;

OC1.4.4 On the 5th last **Business Day** of every month the **DSO and Grid Connected Customers** shall verify **In Writing** that the most recently submitted MW **Demand** profiles for the following two months are in accordance with their current best estimate of these values.

OC1.5. POST CONTROL PHASE

The following is required by ESBNG In Writing (or by such electronic data transmission facilities as have been agreed with ESBNG) by 14.00 hours each day in respect of Active Power data and Reactive Power data:

a) MW profiles for the previous Schedule Day of the amount and duration of Demand reduction achieved from the use of Demand Control of 10MW or more (averaged over any half hour on any Grid Supply Point), on a half hourly and Grid Supply Point basis, from the DSO;

b) MW profiles of the amount and duration of Demand reduction achieved from the use of Customer Demand Management of 10MW or more on a half hourly basis during the previous Schedule Day, from Suppliers and **Grid Connected Customers**;

OC4.2 SCOPE

OC4.2.1 OC4 applies to ESBNG and to the following, each of which is a User under this OC4:

…

(b) **Grid Connected Customers**; and

OC4.5.4.3 Typical examples of actions notified in accordance with OC4.5.4.2 may include:

Notification to the DSO of a significant reduction in supply security to a Grid Supply Point, where the DSO may arrange standby feeding arrangements at lower Voltages;

Notification to a **Grid Connected Customer** of a significant reduction in supply security to a Grid Supply Point (such as the Outage of one of two transmission connections) where the **Grid Connected Customer** may arrange standby supply or run in-house Generation.

OC5.1.1 OC5 is concerned with the provisions to be made by the DSO and, by ESBNG in relation to **Grid Connected Customers**, to permit the reduction of Demand in the event of available Generating Plant and transfers from External Interconnections being insufficient to meet Demand, or in the event of breakdown or operating problems such as in respect of System Frequency, Voltage levels or Thermal Overloads on any part of the Transmission System.

OC5.1.6	Demand Control shall be exercised equitably in respect of Customers connected to the Distribution System and **Grid Connected Customers**.
OC5.1.7.1	Demand Control is exercised through operation of the Distribution System or of the Transmission System (in the case of **Grid Connected Customers**).
OC5.2.1	The overall objective of OC5 is to require the provision of facilities by DSO and **Grid Connected Customers** to enable ESBNG to achieve the reduction in Demand that will either avoid or relieve operating problems on the Transmission System, in whole or in part, and thereby to enable ESBNG to instruct Demand Control in a manner that does not unduly discriminate against, or unduly prefer, any one or any group of Users. It is also to ensure that ESBNG is notified of any Demand Control utilised by Users other than following an instruction from ESBNG.
OC5.3	SCOPE OC5 applies to ESBNG and to all Users, which term in this OC5 means: … (c) **Grid Connected Customers**.
OC5.5.3	**Grid Connected Customers** shall provide automatic low Frequency Disconnection, which will be split into discrete blocks. The number and size of blocks and the associated low Frequency settings will be as specified by ESBNG by week 39 each calendar year following discussion with the **Grid Connected Customers**. In the case of a User, it is not necessary for it to provide automatic low Frequency Disconnection under OC5.5 if it is providing low Frequency Disconnection at a higher level of Frequency as an Ancillary Service.
OC7.1.3	SCOPE
OC7.1.3.1	OC7.1 applies to ESBNG and to Users, which term in OC7.1 means:- … (c) **Grid Connected Customers**.
OC7.2.3.1	OC7.2 applies to ESBNG and to Users, which term in OC7.2 means: … (c) **Grid Connected Customers**.

OC7.2.4.3	**Grid Connected Customers**
OC7.2.4.3.1	The **Grid Connected Customer** contact locations and personnel referred to in this Section OC7.2.4.3 shall be notified by the **Grid Connected Customer** to ESBNG prior to connection and thereafter updated as appropriate.
OC7.2.4.3.2	The **Grid Connected Customer** is required to provide ESBNG with the contact information of a Responsible Operator(s) who shall respond to communications from ESBNG without undue delay (except where otherwise provided for by agreement between the **Grid Connected Customer** and ESBNG, such agreement not to be unreasonably withheld) and are of suitable experience and training and are authorised to perform functions on behalf of the Grid Connected Customer. OC7.2.4.3.3 The Responsible Operator shall have the ability to attend the Site of the **Grid Connected Customer** within 60 minutes of an instruction to do so being issued by ESBNG.
OC7.2.4.3.4	At any point in time, a single person shall be designated by the **Grid Connected Customer** and notified to ESBNG as the Responsible Manager. The Responsible Manager shall be responsible for dealing with ESBNG on matters relating to the Grid Code other than as provided for in OC7.2.4.3.2 and OC7.2.4.3.3. In the event that the Responsible Manager is not a person on duty at the Site of the Grid Connected Customer , then the Responsible Manager must be capable of being contacted from the Site of the **Grid Connected Customer** at all times, and in the event that ESBNG issues a request to the Site of the **Grid Connected Customer** requiring the Responsible Manager to contact the NCC, the Responsible Manager shall comply with the request without unreasonable delay and in any case within 15 minutes of the request.
OC8.3	SCOPE OC8 applies to ESBNG and to all Users, which term in this OC8 means: … (c) **Grid Connected Customers**.
OC9.3	SCOPE OC9 applies to ESBNG and to all Users, which term in this OC9 means: … (c) **Grid Connected Customers**.
OC10.3	SCOPE OC10 applies to ESBNG and to the following Users … (d) **Grid Connected Customers**.

OC11.3 SCOPE

OC11 applies to ESBNG and to all Users, which term in this OC11 means:

…

Grid Connected Customers; and

Bulk Supply Points	A point of connection between the **Transmission System** and the **System** of a **Distribution System Operator** or a **Grid Connected Customer** or other network operator.
Grid Supply Point or GSP	A point of connection between the **Transmission System** and the **Distribution System** or a **Grid Connected Customer** or other network operator.
Maximum Import Capacity	The values (kW and/ or kVA) provided in accordance with the **Grid Connected Customer's Connection Agreement**
User System	Any system owned or operated by a **User** comprising:- (i) **Generating Units;** and/or (ii) systems consisting (wholly or mainly) of electric circuits used for the distribution of electricity from **Grid Supply Points** or **Generating Units** or other entry points to the point of delivery to **Customers**, or other **Users**; and **Plant** and/or **Apparatus** connecting:- (i) the system as described above; or (ii) **Grid Connected Customers** equipment; to the **Transmission System** or to the relevant other **User System**, as the case may be. The **User System** includes any **Remote Transmission Assets** operated by such **User** or other person and any **Plant** and/or **Apparatus** and meters owned or operated by the **User** or other person in connection with the distribution of electricity but does not include any part of the **Transmission System**.