



**GRID CODE
CONSULTATION DOCUMENT**

Control Telephony Electrical Standard

The purpose of this document is to consult on the above Grid Code Modification Proposal with authorised electricity operators liable to be materially affected by the proposed changes and forms the basis of the subsequent Report to the Authority

Consultation Ref	C/06
Issue	1
Date of Issue	30 th August 2006
Responses required by	19th September 2006
Prepared by	National Grid

DOCUMENT LOCATION

National Grid website:

<http://www.nationalgrid.com/uk/Electricity/Codes/gridcode/consultationpapers/>

DISTRIBUTION

Name	Organisation
AEO's	Various
GCRP Members/Alternates	Various
Interested Parties	Various
National Grid Website	

A. INTRODUCTION

1. Paragraph 2 of Condition C14 of the Transmission Licence granted to the National Grid Electricity Transmission plc ("National Grid") provides that National Grid shall, in consultation with authorised electricity operators liable to be materially affected thereby, periodically review the Grid Code and its implementation. That paragraph also requires National Grid, following such review, to send to the Authority:-
 - (a) a report on the outcome of such review;
 - (b) any proposed revisions to the Grid Code as National Grid (having regard to the outcome of such review) reasonably thinks fit for the achievement of the objectives set out in sub-paragraph (b) of Condition C14 of the Transmission Licence; and
 - (c) any written representations or objections from authorised electricity operators (including any proposals by such operators for revisions to the Grid Code not accepted by National Grid in the course of the review) arising during the consultation process and subsequently maintained.
2. This review examines the associated Grid Code changes to reference the proposed new Electrical Standard regarding Control Telephony in England and Wales, its technical interfaces and its support requirements. The arrangements governing Control Telephony in Scotland remain unaffected by these proposals.
3. The proposed changes to the Grid Code Connection Conditions and the proposed introduction of the Control Telephony Electrical Standard were discussed with the Grid Code Review Panel (GCRP) on 20th July 2006. Panel Members agreed that having taken account of comments received, National Grid should issue a Consultation Paper regarding the changes to the Grid Code Connection Conditions.
4. The proposed introduction of the Electrical Standard falls under the Governance of Electrical Standards procedure which is described in GC.11 of the Grid Code. Through this governance procedure the Grid Code Review Panel will decide whether the Electrical Standard should be incorporated within the Annex to the General Conditions. However in order to assist the GCRP in their decision, comments upon the proposed Control Telephony Electrical Standard (attached as an appendix to this consultation document) are invited as part of this consultation.
5. The revisions to the Grid Code proposed by National Grid and sent to the Authority, require approval by that body and will, if approved, come into force on such date (or dates) of which you will be notified by National Grid, in accordance with the Authority's approval.
6. Comments should be sent to National Grid by 19th September 2006 as detailed in section C. The comments will be reviewed and responded to.
7. Unless otherwise marked as confidential any responses including those containing objections to the proposals which are sustained will be published on our website.

B. DESCRIPTION OF THE PROPOSED AMENDMENTS AND THEIR EFFECTS

8. Background

8.1 Control Telephony is a highly resilient private telephony network used to carry Control Calls for both the day to day management of the Electricity Transmission System and for contingency or emergency purposes including Black Start. Where National Grid requires Control Telephony at a User's location National Grid will install the Control Telephony system where the User's own telephony system is not capable of providing the required facilities or where it is incompatible with National Grid's Control Telephony system. Where National Grid installs a Control Telephony system Users are required to use this system in order to contact National Grid Control Engineers under normal and emergency operating conditions.

8.2 The entire Control Telephony network is resilient to complete loss of mains electricity, and will continue to operate normally following a mains power loss. There is no reliance on public telephony networks which may suffer congestion during power blackouts or other events affecting the general public.

9. Proposed Grid Code Changes

9.1 The Grid Code requirements and high level functionality for Control Telephony are described in CC.6.5. To build upon and clarify the Control Telephony arrangements for affected Users, it is proposed to introduce a new Electrical Standard, applicable in England and Wales only, into the Grid Code.

9.2 The inclusion of the new Standard will necessitate formal changes to paragraph CC.6.5.5 of the Grid Code such that it refers to the new Electrical Standard for Control Telephony.

9.3 The amended provision will also clarify to Users how to obtain Control Telephony information applicable in Scotland and the process for obtaining additional information, if required.

9.4 The proposed changes to CC.6.5.5 which are the subject of this consultation can be found in Appendix A to this consultation, the proposed Electrical Standard on Control Telephony may be found in appendix B

10. Control Telephony Electrical Standard

10.1 The new Electrical Standard would describe in more detail the technical interfaces and support requirements for Control Telephony and has been designed to give Users background and technical information regarding the Control Telephony systems that National Grid may choose to install at a User's Site.

10.2 The Standard also allows Users to understand the requirements of the Control Telephony System should a User decide to amalgamate its own telephony system with the National Grid provided Control Telephony system.

10.3 The Standard will only contain generic information pertaining to Control Telephony. There still may be occasions where additional obligations relating

to Control Telephony will be required on a site-specific basis. Such site-specific details pertaining to Control Telephony will continue to be specified in the Bilateral Agreement in accordance with current practice.

- 10.4 The process for introducing the proposed Electrical Standard on Control Telephony into the Grid is outlined in Section 11 (Implementation Issues).

11. Implementation Issues

- 11.1 There are two distinct elements to these Control Telephony proposals and each is planned to be introduced under separate governance processes. The first is the changes to the Connection Conditions which can only be implemented upon the approval and direction of the Authority. It is these changes that form the basis of this consultation.

- 11.2 The second element is the introduction of the Control Telephony Electrical Standard. This can be managed through the Governance of Electrical Standards procedure (detailed in GC.11 or the Grid Code) without direct Authority involvement. However as the two issues are clearly interlinked, views on the content of the Electrical Standard are also invited as part of this consultation.

- 11.3 Once the consultation is closed a Report to the Authority regarding the changes proposed to the Connection Conditions will be prepared. Simultaneously the Grid Code Review Panel will be contacted to progress the proposed adoption of the Electrical Standard. Should the Authority decide to approve and implement the changes to the Connection Conditions, National Grid would intend to align the implementation date of these changes with any implementation of the Electrical Standard as directed by the GCRP.

C. RESPONSES

12. This section will contain a summary of responses received during the Consultation and will be completed as part of the Report to the Authority.

13. Your formal responses may be:-

Posted to: Mark Duffield
Electricity Codes
Commercial Frameworks
National Grid Electricity Transmission plc
National Grid House
Warwick Technology Park
Gallows Hill
Warwick
CV34 6DA

Emailed to: mark.duffield@uk.ngrid.com

Appendix A: Proposed Changes to the Connection Conditions

It is proposed to amend CC.6.5.5 such as it refers to the new Electrical Standard for Control Telephony:

CC.6.5.5 ~~Generic Detailed information on Control Telephony facilities and suitable equipment requirements applicable in England and Wales is provided in the Electrical Standard for Control Telephony in the Annex to the General Conditions. Where additional information, or information in relation to Control Telephony applicable in Scotland, is requested by Users, this will, where possible, be provided by NGET upon any such request. for individual User application will be provided by NGET upon request.~~

Proposed Changes to the Annex to the General Conditions

It is proposed to amend the Annex to the General Conditions such as it refers to the new Electrical Standard for Control Telephony:

(a) Electrical Standards applicable in England and Wales.

The Relevant Electrical Standard Document	Issue 1.0	09-Jan-2006
Control Telephony Electrical Standard	Issue 1.0	

Appendix B: Proposed Control Telephony Electrical Standard

Control Telephony Electrical Standard

1. Introduction

The Grid Code requirements and the high level functionality for **Control Telephony** across Great Britain are described in CC.6.5. This **Electrical Standard** describes in more detail the technical interfaces and support requirements for **Control Telephony** and is applicable in England & Wales only.

For the purposes of this document, any reference to **NGET** also includes any person, service provider or company nominated by **NGET** to fulfil its obligations described in this document.

2. Scope

This **Electrical Standard** applies to **NGET** and to **Users**, which for the purposes of this document comprise:

- (a) **Users with Connection Points to the GB Transmission System;**
- (b) **Embedded DC Converter Stations;**
- (c) **Embedded Large Power Stations;** and
- (d) **Embedded Medium Power Stations** (where deemed appropriate by the **User**, the relevant **Network Operator** and **NGET**).

The provisions of this document will, in the case of **Network Operators**, apply to **Network Operator Control Centres**, and, in the case of all other **Users** listed above, apply at the relevant **Control Point**.

3. Definitions

In this document any emboldened words are defined Grid Code terms with the associated meaning as stated in the Glossary and Definitions. This is with the exception of the following words which for the purposes of this document have the following meanings:

<u>AC-15</u>	Signalling system used on Private Wires employing tones at a specific frequency.
<u>Analogue Trunk</u>	Analogue connection to the Control Telephony Network using AC-15 and DTMF signalling.
<u>CAS</u>	Channel Associated Signalling
<u>Control Telephony Network</u>	Network provided by NGET to carry Control Telephony used for managing the GB Transmission System .
<u>Control Telephony</u>	Digital connection to the Control Telephony Network using CAS and DTMF signalling.
<u>Digital Trunk</u>	Digital connection to the Control Telephony Network using CAS and DTMF signalling.
<u>DR</u>	Disaster Recovery

<u>DTMF</u>	Dual-tone multi-frequency signalling
<u>Emergency Control Call</u>	Control Call initiated by dialling the Emergency code. On encountering network congestion, non-emergency calls will be automatically disconnected. These calls are presented with a distinctive ringing signal at the ENCC .
<u>ENCC</u>	NGET Electricity National Control Centre
<u>Green Phone</u>	Common name given to the Control Telephone provided by NGET at Control Points or Network Operator Control Centres .
<u>Normal Control Call</u>	Control Call with normal (i.e. non-Emergency) status.
<u>PABX</u>	Private Automatic Branch Exchange – name given to a User's own telephone exchange.
<u>Pilot Cable</u>	Privately owned telecommunications circuit provided on a dedicated cable within a site or between sites in close proximity to each other.
<u>Private Wire</u>	Telecommunications circuit provided by a public telecommunications operator.
<u>PSTN</u>	Public Switched Telephone Network
<u>Secure Supplies</u>	Power supplies which continue to operate after a mains failure. A minimum of 2 days endurance is required but this may be longer depending on strategic importance of site. Usually satisfied by providing UPS (Uninterruptible Power Supply) and auto-start diesel generators with sufficient fuel reserves for at least 2 days continuous running, without refuelling.
<u>SLA</u>	Service Level Agreement
<u>Trunk Line</u>	Connection to the Control Telephony Network for carrying telephone calls.

4. **Overview of Control Telephony Network**

The **Control Telephony Network** is a highly resilient private telephony network used to carry **Control Calls** for both the day-to-day management of the **GB Transmission System**, and for contingency or emergency purposes including **Black Start**.

The entire network is resilient to a complete loss of mains electricity, and will continue to operate normally following a mains power loss. There is no reliance on the **PSTN** which may suffer congestion during power blackouts or other events affecting the general public.

To maximise availability, most locations provided with **Control Telephony** are served by at least two separately routed connections to the **Control Telephony Network**.

5. Provision of Services at Control Points and Network Operator Control Centres

If **NGET** and a **User** agree that **Control Telephony** is required at a **Control Point** or **Network Operator Control Centre**, **NGET** will provide one **Green Phone** connected to the **Control Telephony Network** via a **Private Wire** or **Pilot Cable**. Where a **Private Wire** is utilised, signalling equipment will be provided at the **Control Point** or **Network Operator Control Centre**. The **User** is responsible for ensuring this equipment is connected to **Secure Supplies**.

At **Network Operator Control Centres** and some other **Control Points**, **NGET** may also install a second **Green Phone** for receipt of **Emergency Control Calls** or for **Black Start**, this is described in further detail in paragraphs 7 and 10.

In some circumstances, **NGET** may choose to install its own telephone exchange to deliver the **Control Telephony** service. The **User** will be responsible for providing **Secure Supplies** for this equipment.

At sites where the **User** prefers to terminate the **Control Telephony** service on their own **PABX** or other telephony apparatus in place of a standalone **Green Phone** or **NGET** exchange, **NGET** will normally provide one or more **Trunk Lines** to the **Control Point** or **Network Operator Control Centre**. The **User** is responsible for ensuring all equipment used to carry the **Control Telephony** service is powered from **Secure Supplies** and supported by an **SLA** that provides a 5hr fix, 24hrs per day 365/6 days per year.

In addition to the methods of provision described above, a hybrid solution may be employed using a combination of **NGET** installed exchange and **User PABX**.

6. Presentation of Calls at Control Points and making Normal and Emergency Control Calls

At **Control Points** (but not **Network Operator Control Centres**) where **NGET** provides the **Control Telephony** service, a **Green Phone** will be provided. The **Green Phone** must be installed in a prominent position at the **Control Point**, suitable for use by operational staff.

The **Green Phone** has pre-programmed memory keys. Keys are provided for making **Normal Control Calls** and **Emergency Control Calls**. **Emergency Control Calls** automatically override network congestion by disconnecting non-emergency calls, and are presented with a distinctive ringing signal at the **ENCC**.

An incoming **Normal Control Call** is indicated by a continuous ringing signal on the **Green Phone**. The **ENCC** will only make **Emergency Control Calls** to **Network Operator Control Centres**, not **Control Points** (see paragraph 7).

If the **User** is required to participate in a **Local Joint Restoration Plan**, a second **Green Phone** may be provided for communication with the relevant **Network Operator Control Centre** (see paragraph 10).

Where the **User** chooses to present the **Control Telephony** service on their own telephony system in place of the **Green Phone**, these arrangements must be agreed with **NGET** (see also paragraph 7).

7. Presentation of Calls and making Normal and Emergency Control Calls at Network Operator Control Centres

At **Network Operator Control Centres**, where **NGET** provides the **Control Telephony** service, two **Green Phones** will normally be provided: one **Green Phone** will be provided for **Normal Control Calls** and the other **Green Phone** for **Emergency Control Calls**. Both **Green Phones** may also be used for **Black Start** (see paragraph 10). The two phones will normally be connected by infrastructure which is physically separate e.g. separately routed **Private Wires** to separate **Control Telephony Network** core sites.

The **Green Phones** must be installed in a prominent position at the **Network Operator Control Centre**, suitable for use by operational staff.

Both phones have pre-programmed memory keys for making **Normal Control Calls** and **Emergency Control Calls** as appropriate. **Emergency Control Calls** automatically override network congestion by disconnecting non-emergency calls, and are presented with a distinctive ringing signal at the **ENCC**.

An incoming **Control Call** (both **Normal** and **Emergency**) is indicated by a continuous ringing signal on the respective **Green Phone**.

Where the **Network Operator** chooses to present the **Control Telephony** service on their own telephony system in place of the **Green Phones**, these arrangements must be agreed with **NGET**. The **Network Operator** must ensure that incoming calls from **NGET** are presented in a way that distinguishes these from other calls received by the **Network Operator**. On receipt of an incoming **Control Call**, Operational staff must be made aware that **NGET** are making either a **Normal Control Call** or **Emergency Control Call** to the **Network Operator Control Centre**. Incoming **Emergency Control Calls** from **NGET** should be presented in a way that distinguishes them from other non-emergency calls and gives them the appropriate priority. Facilities must be provided for initiating **Normal** and **Emergency Control Calls** to the **ENCC**.

If incoming calls are queued by the **Network Operator** system, calls from **NGET** must be given priority over other calls at the **Network Operator** site, as if they were presented on a separate **Green Phone**.

If calls from separate desks at the **Network Operator Control Centre** are required to be identified uniquely at the **ENCC** e.g. if the **Network Operator Control Centre** manages more than one electricity Distribution Area, then separate **Trunk Lines** will be provided by **NGET** for each area. This is because, at the **ENCC**, calling party identity for incoming calls from 3rd party sites is associated with a **Trunk Line** at the **Network Operator Control Centre** rather than an extension.

8. Control Telephony DR Arrangements for Network Operator Control Centres

For **Network Operators** that have both Main and Contingency **Control Centres**, when the contingency site is operational, arrangements must be invoked to transfer **Control Telephony** calls to the contingency site. For each **Network Operator**, actual provision of services and changeover arrangements will require separate technical and operational agreement between **NGET** and the **Network Operator**.

9. Costs associated with the movement of an existing Control Telephony Service

NGET are responsible for providing and supporting the **Control Telephony** service at **Control Points** or **Network Operator Control Centres**. An exception applies where the **User** has opted to connect the service via their own telephony system, in which case **NGET** will be responsible for the service up-to the **Trunk Line** delivery point on the **User's** equipment.

Where the **User** requires **NGET** to move an existing **Control Telephony** service to an alternative location or site (e.g. due to site closure) the **User** will be expected to pay all reasonable costs incurred by **NGET** to move the service.

10. Black Start Assured Service

Where a **Control Point** or **Network Operator Control Centre** is required to participate in a **Local Joint Restoration Plan**, **NGET** will provide sufficient **Green Phones** and **Trunk Lines** to enable the **Local Joint Restoration Plan** to be implemented without encountering congestion e.g. where a **Network Operator** is required to communicate with a **Black Start Power Station** and the **ENCC**, two separate **Green Phones** connected to the **Control Telephony Network** by separate **Trunk Lines** will be provided.

As a contingency against failure of the **Control Telephony Network**, **NGET** may also provide one Satellite Phone for use during the **LJRP**. The **User** shall be responsible for providing **Secure Supplies** for this equipment. This equipment is provided for the sole purpose of operational communication¹ between the **User** and **NGET** and any other parties that may be joint signatories to a **Local Joint Restoration Plan** pursuant to OC9.4. It shall not be used for any other purposes without the express agreement of **NGET**. All calls made on this equipment are itemised to **NGET**. **NGET** may seek to recover call charges where there is clear evidence of unauthorised use.

NGET and the **User** will implement frequent testing of these facilities to ensure they are in good working order and the operational staff are familiar with its use.

11. Technical Standards and Service Levels

The following technical standards and service levels apply to the **Control Telephony** service. The **User** is responsible for providing access to **NGET** in order for it to meet the **SLAs** quoted.

Note that these standards may be amended with the introduction of next generation telephony networks by the Public Telecommunications Operators.

Description	Standard/SLA
Control Telephone Service (Green Phone)	Analogue Telephone, with memory keys 5hr fix 24 hrs/day , 365/6 days/yr
Analogue Trunk	4 wire, AC-15 with DTMF signalling BT TotalCare 4hr response, 5hr fix
Digital Trunk	2Mbit/s G.703, CAS with DTMF signalling. Other interface standards and signalling systems on request. BT TotalCare 4hr response, 5hr fix

¹ Operational communication includes any bona-fide testing of such apparatus