Grid Code Review Panel

Proposed Electrical Standard Document – Control Telephony

Overview

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.

2. The entire 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 the PSTN which may suffer congestion during power blackouts or other events affecting the general public.

Proposal

3. The Grid Code requirements and high level functionality for Control Telephony are described in CC.6.5. It is proposed to introduce a new Electrical Standard in accordance with GC.11 of the Grid Code which would describe in more detail the technical interfaces and support requirements for Control Telephony.

4. The inclusion of the new standard would necessitate consequential changes to CC.6.5.5 of the Grid Code which will be subject to industry consultation and determination by the Authority.

5. Site specific details pertaining to Control Telephony will continue to be specified in the Bilateral Agreement in accordance with current practice.

6. The proposed Electrical Standard on Control Telephony is available as an appendix to this paper alongside the subsequent changes to CC.6.5.5.

Way Forward

7. GCRP are invited to consider the proposed Control Telephony document and provide comments at the meeting on 20th July 2006.

8. Subsequently, if there is broad consensus at the Panel Meeting, National Grid would propose to initiate a short industry wide consultation on the associated changes to CC.6.5.5. The Control Telephony document will be included in the Consultation Document as an appendix.

9. National Grid would propose that if GCRP were to agree to adopt the attached document on Control Telephony as a new Electrical Standard, such adoption would only take place subject to any Authority approval of the consequential proposed changes to CC.6.5.5.

10. If there is no broad consensus, National Grid would propose to establish a working group to discuss the proposed Electrical Standard in greater detail.

Appendix 1 - Proposed Changes to 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 ~~D~~detailed information on **Control Telephony** facilities and suitable equipment requirement is provided in the **Electrical Standards** for **Control Telephony** in the Annex to the **General Conditions**. Where additional information 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 General Condition Annex

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

(e) **Control Telephony** for **DNO Control Centres** and other **User Sites** applicable in Scotland, England and Wales.

Appendix 2 – Electrical Standard – Control Telephony

Control Telephony for DNO Control Centres and other User Sites

1. Introduction

The Grid Code chapter Connection Conditions, Section CC.6.5 Communications Plant, describes the requirement for, and high level functionally of, **Control Telephony** (also known as **Operational Telephony**).

This appendix describes **Control Telephony** in more detail, the technical interfaces and support requirements.

Throughout this appendix, any reference to **NGET** also includes any person, service provider or company nominated by **NGET** to fulfil its obligations described in this document.

2. Definitions

AC-15	Signalling system used on **Private Wires** employing tones at a specific frequency
Analogue Trunk Line	Analogue connection to the **OTN** using **AC-15** and **DTMF** signalling
Black Start	The procedure necessary for a recovery from a **Total Shutdown** or **Partial Shutdown**.
CAS	Channel Associated Signalling
Control Call	A telephone call whose destination and/or origin is a key on the control desk telephone keyboard at a **NGET Control Centre** and which has the right to exercise priority over (i.e. disconnect) a call of a lower status
Control Telephony	The method by which a **User's Responsible Engineer/Operator** and **NGET Control Engineer(s)** speak to one another for the purpose of control of the **Total System** in both normal and emergency conditions
Digital Trunk Line	Digital connection to the **OTN** using **CAS** and **DTMF** signalling
DNO	Electricity Distribution Network Operator
DR	Disaster Recovery
DTMF	Dual-tone multi-frequency (also known a key code) signalling.
Emergency Control Call	**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**.
ENCC	**NGET** Electricity National Control Centre
Green Phone	Common name given to the Control Telephone provided by **NGET** at **User Sites**.

LJRP	A plan produced under OC9.4.7.11 detailing the agreed method and procedure by which a **Genset** at a **Black Start Station** (possibly with other **Gensets** at that **Black Start Station**) will energise part of the **Total System** and meet complimentary blocks of local **Demand** so as to from a **Power Island**.
NGET	National Grid Electricity Transmission plc. New name for **National Grid Company plc**
Normal Control Call	**Control Call** with normal (i.e. non-Emergency) status.
Operational Telephony	Alternative name for **Control Telephony**
Operational Telephony Network (OTN)	Network provided by **NGET** to carry **Operational Telephony** used for managing the Electricity Transmission system.
PABX	Private Automatic Branch Exchange – name given to a **User's** own telephone exchange
Pilot Cable	Privately owned telecommunications circuit provided on a dedicated cable within a site or between sites in close proximity to each other
Private Wire	Telecommunications circuit provided by a public telecommunications operator
PSTN	Public Switched Telephone Network
Secure Supplies	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.
SLA	Service Level Agreement
Trunk Line	Connection to the **OTN** for carrying telephone calls.
User	In this appendix **User** means any person provided with **Control Telephony**.
User Sites	A site owned (or occupied pursuant to a lease, licence or other agreement) by a **User** in which there is a **Connection Point**. For the avoidance of doubt ,a site owned by **NGET** but occupied by a **User** as aforesaid, is a **User Site**. In this appendix a **User Site** for **Control Telephony** also includes **DNO** Control Centres.
Nominated Agent	Any other person, service provider or company nominated by **NGET** to fulfil its obligations described in this document.

3. Overview of Operational Telephony Network

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

The entire 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 the **PSTN** which may suffer congestion during power blackouts or other events affecting the general public.

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

4. Provision of Services at User Sites

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

At **DNO** Control Centres and some other **User Sites**, **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 6 and 9.

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

At sites where the **User** prefers to terminate the **Operational 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 T**runk Lines** to the **User Site**. The **User** is responsible for ensuring all equipment used to carry the **Operational 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**.

5. Presentation of Calls at User Sites (excluding DNO Control Centres) and making Normal and Emergency Control Calls

At **User Sites** (excluding **DNO** 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 **User Site**, 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** does not make **Emergency Control Calls** to **User Sites** except **DNO** Control Centres (see paragraph 6).

If the **User** is required to participate in an **LJRP**, a second **Green Phone** may be provided for communication with the relevant **DNO** Control Centre (see paragraph 9).

Where the **User** chooses to present the **Operational Telephony** service on their own telephony system in place of the **Green Phone**, these arrangements must be agreed with **NGET** (see also paragraph 6).

6. Presentation of Calls and making Normal and Emergency Control Calls at DNO Control Centres

At **DNO** 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 9). The two phones will normally be connected by infrastructure which is physically separate e.g. separately routed **Private Wires** to separate **OTN** core sites.

The **Green Phones** must be installed in a prominent position at the **DNO** site, 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 **DNO** chooses to present the **Operational Telephony** service on their own telephony system in place of the **Green Phones**, these arrangements must be agreed with **NGET**. The **DNO** must ensure that incoming calls from **NGET** are presented in a way that distinguishes these from other calls received by the **DNO**. 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 **DNO** site. 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 **DNO** system, calls from **NGET** must be given priority over other calls at the **DNO** site, as if they were presented on a separate **Green Phone**.

If calls from separate desks at the **DNO** are required to be identified uniquely at the **ENCC** e.g. if the **DNO** 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 **User Site** rather than an extension.

7. Operational Telephony DR Arrangements for DNO Control Centres

For **DNOs** that have both Main and Contingency Control Centres, when the contingency site is operational, arrangements must be invoked to transfer **Operational Telephony** calls to the contingency site. For each **DNO**, actual

provision of services and changeover arrangements will require separate technical and operational agreement between **NGET** and the **DNO**.

8. Costs associated with the movement of an existing Operational Telephony Service

NGET are responsible for providing and supporting the **Operational Telephony** service at **User Sites**. 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 **Operational 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.

9. Black Start Assured Service

Where a **User Site** is required to participate in an **LJRP**, **NGET** will provide sufficient **Green Phones** and **Trunk Lines** to enable the **LJRP** to be implemented without encountering congestion e.g. were a **DNO** is required to communicate with a **Black Start** Power Station and the **ENCC**, two separate **Green Phones** connected to the **OTN** by separate **Trunk Lines**, will be provided.

As a contingency against failure of the **OTN**, **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 communication[1] 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.

10. 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 boa-fide testing of such apparatus