

Offshore Transmission Networks

An Update to the Grid Code Review Panel

Background

In order to facilitate the construction of Offshore Wind Farms the DTI and OFGEM have commenced an industry wide project to examine options for Offshore Transmission Networks. The project was initiated by the DTI in July 2005 with a consultation which examined at a high level the options for the regulation of Offshore Transmission.

<http://www.dti.gov.uk/energy/sources/renewables/whats-new/page25958.html>

Following this consultation the DTI concluded in March 2006 that the existing onshore regulated transmission model was the most appropriate mechanism to be extended Offshore. This conclusion was followed by the issuing of an OFGEM Scoping Document examining the Offshore Electricity Transmission Arrangements.

Government Announcement on Offshore Regulatory Regime

<http://www.gnn.gov.uk/environment/detail.asp?ReleaseID=193600&NewsAreaID=2&NavigatedFromDepartment=False>

OFGEM Scoping Document

http://www.ofgem.gov.uk/temp/ofgem/cache/cmsattach/14533_6006.pdf

The OFGEM Scoping Document set out the high level areas of work OFGEM/DTI believe need to be carefully examined over the forthcoming months; these are:

- The geographic scope of offshore transmission licences
- The allocation of offshore transmission licences
- The offshore transmission technical rules (Security and Quality of Supply Standards)
- The offshore transmission price control design
- The necessary licence and industry code changes

Subsequently on 29 May 2006 the DTI invited views from the industry on extending the role of National Grid as the onshore GB System Operator to offshore. The Secretary of State noted in that consultation that he was minded to extend the role of the GBSO offshore.

<http://www.dti.gov.uk/files/file29895.doc>

Current Progress

To facilitate the development of proposals in the areas set out within the OFGEM Scoping Document, OFGEM/DTI have set up the Offshore Transmission Expert Group (OTEG). OTEG is comprised of a number of invited industry experts and meets monthly, with an open meeting held every third month. July 2006 saw the first such open meeting of OTEG at which a number of the issues included within OFGEM's Scoping Document were discussed. At this meeting National Grid gave its

view of the likely changes that would be required to the Grid Code, SO-TO Code and CUSC.

It is likely in National Grid's view that changes (which may be significant) will be required to the GB Grid Code to facilitate the development of Offshore Transmission Networks. A high level overview of the changes required was included in a paper circulated to OTEG by National following the July open OTEG Meeting. This is attached for GCRP Members information at Appendix A to this update.

In terms of next steps the required code changes are likely to be developed and taken forward through subgroups reporting to OTEG. There is already a subgroup that has been established to look at the impact of offshore transmission on the GB SQSS and it is envisaged that this will evolve in the autumn to examine the likely changes to the GB Grid Code. This subgroup or potentially additional subgroups will also consider changes to the other industry codes. National Grid's intention is to provide regular updates to the GCRP to inform on progress in this area.

Appendix A: National Grid OTEG Paper on Code Changes**Offshore Transmission Networks
July 2006****National Grid's Initial Thoughts on Changes to the Commercial Codes****Part 1: Introduction**

The purpose of this note is to examine the Connection and Use of System Code (CUSC), the System Operator – Transmission Owner Code (STC), and the Grid Code and set out National Grid's initial thoughts on the high level changes that we believe OFGEM/DTI should progress to ensure successful delivery of the Offshore project.

It should be noted that at this stage such views are initial views only and may be subject to revision in light of future developments. Also this note sets out only a very high level view of the areas in which changes will be required given the existing understanding of the Offshore framework. It may transpire that where developments differ from the current understanding, changes other than those described in this note may be required.

This note also only sets out the areas where enduring changes to the Codes are envisaged at this stage. Other transitional arrangements may be required should there be Offshore Networks in place prior to any "Go-Live" of the Offshore arrangements within the Codes.

This note does not consider any changes that may be required to the Balancing and Settlement Code (BSC) or to any Distribution Codes.

Part 2: Assumptions

A number of assumptions have been made when preparing the initial views in this paper. They are as follows:

- That "Offshore Users" will be treated in the Industry Codes in an identical manner to "Onshore Users".
- That the Offshore regime will need to be able to accommodate both radial offshore networks and fully interconnected offshore networks that could parallel the onshore elements of the GB Transmission System.
- That offshore transmission networks may connect to the onshore transmission system or distribution networks. Note that the introduction of a DNO interface could result in significant changes to existing industry codes and processes.
- That offshore transmission systems may be nested amongst each other, i.e. one offshore TO connects to another that then connects to the onshore transmission system.
- That offshore networks may be comprised of AC or DC technologies.
- That the new framework must accommodate one or many new TOs.
- That any regime developed must be adaptable for the future.

Only once key areas of policy and decisions have been made upon the "Primary Documents" (e.g. the version of the GB SQSS that is to apply to Offshore Networks) can the changes to the Commercial Codes be more readily identified. This note

therefore attempts to quantify the areas where changes are likely to be required should certain decisions be taken. It is also likely that a number of the changes to the Codes that are ultimately required cannot be identified at this stage.

Part 3: Analysis of the Codes:

SO-TO Code:

The SO-TO Code was activated on the BETTA Go-Active Date (1 September 2004) and went live on 1 April 2005. The STC defines the high-level relationship between the GB System Operator and the Transmission Owners. It is supported by a number of procedures (SOTO Code Procedures or STCPs) that set out in greater detail the roles, responsibilities, obligations and rights etc. of the GBSO and the TOs.

Accession Agreements:

Accession Agreements will need to be entered into for each new Offshore Transmission Network Owner to become a party to the SO-TO Code.

Section B – Governance:

The existing governance framework for the STC is designed around three parties only. Therefore it is likely that changes to the representation of parties at the STC Committee and the STC change process itself will need to be established should there be an increase in the numbers of parties to the STC.

Section C – Transmission Services:

The current arrangements for the switching of transmission networks in the STC are based around the host TO maintaining its own Control Room and undertaking switching activities under the instruction of the GBSO. Whether this is the appropriate model to extend to the offshore networks will need to be established.

The arrangements may need to be amended to allow for the co-ordination of outages across a potential Offshore TO – DNO – Onshore TO interface.

Similarly should Offshore Networks become interconnected and act as a parallel for the onshore transmission network arrangements, new and/or revised operational arrangements to cater for such interactions may be required.

Section D – Planning Co-ordination:

Investment Planning activities will need to be revised to ensure a coherent and co-ordinated process is in place to facilitate investment planning amongst potentially several different Transmission Owners and the GBSO. Currently the investment planning processes are set up around three Parties and two boundaries where each boundary is distinct from the other boundary. Moving to a multi-TO system with boundaries that interact with each other could lead to significant additional complexities in both the investment planning process and the transfer of data. Furthermore where the offshore transmission system is connected to an onshore distribution system it may well be the case that the DNO will need to be involved in the investment planning process (either directly through the STC or indirectly through National Grid where the required information is gathered through the Grid Code). Facilitating such a structure may therefore require significant changes to Schedule 3 of the STC (which sets out the restrictions on the exchange of data between the

GBSO and TOs). Similarly Boundaries of Influence will need to be established for each Offshore TO. These could become more complex if Offshore TO networks are in fact “embedded” in a Distribution System, or where Boundaries of Influence interact with each other.

The processes surrounding the making of TO Construction Offers for new connections to a transmission network will need to be reviewed. It may be that for new Offshore transmission networks the owner of the network may not be able to provide a similar service to that provided by the existing Scottish TO (which have fully established planning departments). In such case it may be that the arrangements for designing new connections to the GB Transmission System need to be altered from the current norm within the STC.

In the early stages of the Offshore regime it may also be the case that further provisions are put in place to ensure that builders of Offshore TO networks are able to put forward TO Construction Offers for a third party in a fair and independent manner. (It is recognised that this is predominantly a licensing issue rather than an STC issue).

Processes will need to be put in place to ensure that information about Offshore networks can be appropriately incorporated into the Seven Year Statement.

Section E – Charging:

It is likely that each new TO will require a new Charging Statement to be incorporated within the STC.

Section F – Communications and Data

It will be necessary to examine the existing confidentiality provisions contained within the STC and indeed the conditions applied to the exchange of Network Data and User Data under the SO-TO Code. The existing provisions contained in Section F and Schedule 3 were designed around National Grid and the TOs, SPT and SHETL. The provisions will therefore need further examination to ensure that they are suitable to be applied to Offshore Networks.

STCPs:

All of the STCPs will need to be thoroughly reviewed in line with the main sections of the STC that they complement. As changes are made to the STC it is also highly likely that changes to the STCPs will also be required.

It is also likely that new STCPs will be required to deal with potential operating/planning scenarios that are unique to the Offshore Networks.

Given the high level nature of the STC it is likely that this will be a significant piece of work.

Grid Code:

The Grid Code is required to cover all material technical aspects relating to connections to, and the operation and use of, the transmission system or, in as far as relevant to the operation and use of the transmission system, the operation of the electric lines and electrical plant connected to it, or to a distribution system.

The Grid Code also specifies data which system users are obliged to provide to National Grid for use in the planning and operation of the transmission system, including demand forecasts, availability of generating sets and intended dates of overhaul of large generating sets.

Regional Differences

Currently there are a number of regional differences within the Grid Code that provide for differing definitions and processes depending upon which Transmission Area a User is located. There is the potential for further regional differences to be examined for each offshore transmission network in order for each TO to be able to effectively plan and maintain its network or indeed for the GBSO to operate the GB Transmission System in an economic, efficient and secure manner.

DC Transmission Technologies

The Grid Code is currently structured around Users that are connected to or using a GB Transmission System that operates around an AC supply. If Offshore Transmission Networks are designed around DC technologies then it is likely that each section of the Grid Code will need to be examined to ensure that it is able to deal with the different information and processes necessary for a DC Transmission Network. This would be a considerable amount of work.

Planning Processes:

The Planning process is designed with National Grid at the top of the information hierarchy. DNO's feed information about their networks to National Grid, National Grid is then able to co-ordinate the planning of the GB Transmission System (with input from the Scottish TOs). However should it be the case that an Offshore TO network connects into a DNO network, changes to the Planning Code may be needed to facilitate the transfer of Offshore TO Data to the DNO (via the GBSO). The Grid Code may need to be modified to enable this Offshore TO data to be collected and transferred to the DNO.

Connection Conditions:

The Connection Conditions may need to be altered to account for the particular characteristics of an Offshore Transmission Network. Also there may be the need to develop the Connection Conditions if there are any differences in the Security Standards adopted on Offshore Transmission Networks through the GB SQSS.

Operating Codes:

The Operating Codes currently contain differing Safety Rules dependent on TO area. Whether this treatment is expanded to Offshore Networks or whether Offshore Networks "adopt" the Safety Rules in OC8A or OC8B will also need to be established.

Other aspects of the Operating Codes may also be required to be amended.

General Conditions:

It may become necessary to revise the constitution of the Grid Code Review Panel to ensure that the views of Offshore TOs can be accounted for in discussions at GCRP meetings.

Connection and Use of System Code:

The Connection and Use of System Code (CUSC) constitutes the contractual framework for connection to, and use of, National Grid's high voltage transmission system.

Exporting GSPs

Should an offshore transmission network connect to an onshore distribution system then it may well be the case that a greater number of exporting GSPs are seen transferring energy from the host distribution system to the onshore elements of the GB Transmission System. It is noted that OFGEM's further thoughts document on Enduring Transmission Arrangements for Distributed Generation proposed further work on possible agency models that may remedy some future issues caused by Offshore TOs.

Transmission Charging:

Clearly a large amount of effort may be required in this area although it will be highly dependent on the charging structure adopted (this will be subject to separate consideration). It may well be that the existing charging system for BETTA is extended in which case National Grid will need to set charges across all Users for each Offshore Network, then each Offshore TO will need to develop its own Charging Statement to recover its regulated income from National Grid (as the Scottish TOs do presently). Other charging regimes could however be taken forward with potentially differing consequences for the CUSC and its associated Charging Statements.

Access

The arrangements for allocating access to an Offshore Transmission System in an independent manner will need to be established. There may be two aspects to this work. The first will be to establish whether the existing onshore access arrangements are suitable to be extended offshore. Then once an appropriate regime has been established the method through which such access is allocated will then need to be considered further.

There is also the case of compensation for loss of Access to an Offshore Transmission System. For the Main Interconnected Onshore Transmission System this is governed through the CUSC process implemented through CAP048. It may be that subject to the financial consequences of such a scheme being adequately catered through changes the regulatory regime, a similar arrangement is extended to offshore networks. The terms of this will however be heavily dependent on the Security Standards adopted offshore. Should the standard for an Offshore network be less than that for equivalent onshore networks then the compensation arrangements may need to be different to reflect the differing levels of risk taken on by Users for disconnections.

Agreements:

There may be a requirement to review the existing agreement pro-formas to ensure that the existing onshore pro-formas are fit for purpose for Offshore Networks.

Part 4: Change Governance:

Clearly there are a large number of potential code changes that have been identified within this note, nearly all of which are dependent on either a change to a “higher” code or policy or which are the result of a fundamental change in the Transmission Network topology.

There are two methods via which changes to the codes could be enacted, and these are considered below:

1. Modifying the Codes through the existing change governance processes contained within each Code
2. Modifying the Code through changes that are consulted upon by Ofgem/DTI and then designated by the Secretary of State.

Of the two options National Grid favours the latter option to pursue changes through Ofgem/DTI consultation then designation by the Secretary of State which would closely mirror the change governance process used throughout the BETTA project. National Grid’s reasons for this are:

1. **Process and means of Implementation:** The offshore regime introduces a complex raft of changes that are significantly beyond the scope of “normal” amendments to the Codes using the “normal” process. National Grid believes that it would be extremely difficult to manage such a range of complex interacting changes across the codes under the normal mechanisms.
2. **Timeliness:** The timescales associated by the Offshore TO programme are necessarily short and the normal code governance processes do not necessarily lend themselves to such short timescales. While there are provisions within the codes for Urgent amendments etc, they are not designed to process such a large number of highly interdependent amendments in such a short space of time.
3. **Cross Governance:** Each Code amendment process is distinct and must consider changes based against an assessment against its own Applicable Objectives. Should potential changes need to be amended during their assessment due to developments in other codes this may not be able to be accounted for in the assessment process as this does not fall within the remit of a particular Applicable Objective and beyond this as already noted it may also create significant procedural difficulties.
4. **Flexibility:** The code arrangements are relatively inflexible – in particular the SO-TO Code and the CUSC – once past the consultation phase no changes to the legal text consulted upon are permitted by the change governance process. Such arrangements may not be best suited to the development of the codes for the offshore regime given that it is likely to require a very flexible change governance process that is able to react at any point in the process to developments in other Codes.
5. **Interested Parties:** This is predominantly an STC issue. Clearly there may in the future be further STC Parties, however the existing STC governance framework focuses predominantly on existing STC Parties. Although non-STC Parties are permitted to propose amendments (where designated by the Authority for such purpose) the actual assessment of such amendments is restricted to an assessment by the STC Parties themselves. It seems preferable that the assessment of any amendments to the STC should factor in the views of future potential Offshore TOs which the existing STC change governance framework does not currently permit.

Though a process independent of the normal Codes governance process is advocated there is clearly a significant resource of knowledge present within the Industry that National Grid believes should be utilised as fully as possible in the development of the future Offshore arrangements. In order to facilitate this it may be prudent to establish a structure similar to that deployed through the BETTA project. Here User Groups focussed on issues, for instance groups such as the Charging User Group and the Investment Planning User Group were formed and their conclusions informed the development of the STC and the designated changes to the CUSC, Grid Code and BSC. It is National Grid's proposal that, for Offshore Networks, this is facilitated via the Offshore Transmission Expert Group (OTEG). Under this proposal it will be necessary to liaise with, and co-ordinate with, ongoing GB code change processes and their respective panels.

The structure whereby OFGEM/DTI designates changes to the codes following widespread industry debate through User Groups may then provide the ideal balance between the necessary degree of industry debate while at the same time providing for the required levels of flexibility and timeliness that the formal Code amendment processes may not be able to offer.

Part 5: Proposal for Way forward

National Grid proposes the following approach for the OTEG to consider in more detail the changes required to industry codes to accommodate Offshore Transmission Networks:

- July 2006 - Initial presentation on changes to codes, and consideration of assumptions;
- September 2006 – Further to the planned completion of the GBSQSS sub-group work, this sub-group should evolve (with changes in membership as appropriate) to consider changes to codes and scope out the required changes further;
- Q1, 2007 – Further to the Conclusions on Regulatory Framework and Consultation Response, sub-group to identify specific changes to the codes;
- Q2, 2007 – Industry consultation on proposed changes;
- Q2/3 2007 – Refine changes and finalise legal drafting;
- Q3/4 2007 – Final consultation on proposed changes; and
- Mid 2008 – Go-live for revised framework.