

Operational Models for Offshore Electricity Transmission Networks and their Impact on the STC

Paper to STC Working Group on Offshore Transmission

28 January 2008

1. Introduction

In order to facilitate discussion at the STC Working Group for offshore electricity transmission, National Grid submitted a paper outlining 3 models for control and operation of transmission equipment offshore. The three models were:

Model 1: NGET directs configuration of the transmission system whilst in operational service but the OFTO carries out both operational and safety switching actions.

Model 2: NGET has the means to operate key transmission equipment via remote control and equipment is handed over to the OFTO for safety switching as necessary for maintenance.

Model 3: Only NGET can operate transmission equipment.

NGET's view of the advantages and disadvantages of the three models was also included in the note. These are summarised again in the table in Appendix A of this document. NGET expressed its view that Model 2 should be the default model for offshore transmission. The TOs did not agree with this view and cited a number of unresolved issues which meant Model 2 may not be appropriate. Model 3 attracted some support from one generator as this model would present users with a single operational interface.

This note looks at the current STC provisions and considers the changes which may be required to apply any one of the models outlined above to offshore electricity transmission.

2. Current STC Provisions relating to Operational Switching

The STC governs the relationship between the three existing transmission companies and contains the following features which are relevant to the current arrangements for operational switching and will be relevant to offshore transmission:

- 1) TOs are obliged to provide a NGET with a means of configuring their transmission system;
- 2) TOs have a means of specifying capability limits for their equipment;
- 3) NGET has an obligation to ensure equipment is operated within these capability limits;
- 4) NGET has an obligation to ensure the transmission system is operated within licence standards;
- 5) Operationally significant alarms, analogues and indications are passed to NGET by the TOs;
- 6) There is a process for agreeing switching actions;

- 7) Equipment alarms are classified, graded in terms of immediacy of operational impact, along with responsibility for responding to them;
- 8) Safety rules are specified;
- 9) TO's have the right to act to re-configure their network for public or site safety reasons;
- 10) Contingency arrangements are defined for a loss of control facilities;
- 11) Management processes and levels of resilience are specified for the communications links between NGET and the TOs; and
- 12) Limitation of Liability.

The following sections describe the specific parts of the STC which set out the rights and obligations listed above.

The STC (the Code itself)

The STC clauses relevant to operational switching are contained in four parts of the code.

Section C, Part One (Provision of Transmission Services)

Section C Part One deals with the provision of Transmission Services by the TO to NGET and NGET's operational obligations in coordinating and directing the flow of electricity onto and over the GB Transmission System.

It specifies that the TO will provide services to NGET consisting of:

- Making the Transmission System available;
- A means of enabling NGET to direct configuration; and
- A means of enabling NGET to obtain information required for it to co-ordinate and direct the flow of electricity.

The Code then sets out the means by which a TO specifies the technical limits (Operational Capability Limits (OCLs)) associated with their transmission equipment and obliges NGET to operate within these capability limits and within license standards.

Section C also specifies that the TO may configure its transmission system without direction by NGET where safety and environmental obligations dictate. It also ties all parties into OC7.6 of the Grid Code.

Section C, Part Three Clause 4 (Event Reporting and Joint Investigations); and

Part Three places an obligation on all parties to inform other parties of an event on either the transmission system or a user system that may have an operational effect on another STC party.

Section G Clause 2 (Safety and Environment).

Section G places an on obligation TOs to inform NGET if a safety or environment issue either means they need or are likely to need to reconfigure their own system or if such an issue means they may not be able to act on NGET's direction.

It also provides the framework by which Safety Rules are agreed and enforced between TOs, NGET and Users via the Grid Code.

Section G Clause 4 (Limitation of Liability)

This clause limits STC parties liability for a 'reasonably foreseeable as not unlikely to occur' breach of the code which causes physical damage to the property of another party or triggers a liability of a Party to another person. Claims are limited to £5m per incident or series of related incidents. This limitation does not cover claims in respect of fraudulent misrepresentation, death or personal injury resulting from negligence.

STCPs (the Code Procedures)

The STCPs provide further detail on many of the STC provisions as well as placing additional specific obligations on NGET and the TOs. The most significant provisions in relation to operational switching are summarised below.

STCP 01-1 Operational Switching

This sets out processes by which the TOs configure the transmission system in Scotland on NGET's directions, and how equipment is taken out of and returned to operational service. It establishes a number of key concepts including:

- Transmission Status Certificate (TSC) – the means of documenting the agreed switching process to release primary transmission equipment from operational service, normally as a planned activity; and
- Switching Method – two approaches are established, the first using a TSC and the second being the verbal Switching Method which is used to handle most circumstances where plant is not being taken out of operational service as part of a planned activity (eg voltage control).

STCP 01-1 also specifies actions to be taken in response to an alarm or other relevant event during a switching operation.

STCP 02-1 Asset and Event Management

STCP 02-1 sets out how NGET and TOs liaise in response to different categories of equipment alarms and events. Alarms are grouped into three categories:

- Class 1 alarms are those which are triggered by an event with an immediate operational impact (a protection, trip or sequence alarm);
- Class 2 alarms are mainly time critical asset integrity alarms which signal a potential reduction in operational capability or a need to take equipment out of operational service altogether; and
- Class 3 alarms are defined as alarms which do not have an immediate operational impact. Under the current procedure, class 3 alarms are handled by the TO.

STCP 04-1 Real Time Data Change Management

This procedure states how changes are managed to the real time SCADA data which is passed between TOs and NGET are managed when changes are made to the transmission system, including the introduction of new equipment.

SCTP 04-2 Real Time Datalink Management

STCP04-2 sets how the datalink between each TO and NGET is managed, including alarm and fault management, change management, outage co-ordination and site access and support arrangements. Faults on TO equipment are tied into a standing Service Restoration Proposal.

STCP 04-3 Real Time Data Provision

This procedure specifies that the TO shall provide alarms, indications and analogue data to NGET, including passing on user data from TO connection sites.

STCP 04-4 Provision of Asset Operational Information

STCP 04-4 deals with the management of the OCLs (Operational Capability Limits) that NGET is obliged to operate within. This includes the processes for both capability reductions as well as enhancements at NGET's request.

STCP 04-5 Operational Telephony

This procedure specifies that both NGET and TOs should provide a resilient telephony infrastructure which can withstand the failure of a single piece of equipment, is mains independent, provides for two way emergency calling and to accommodate priority calls. Resolution of faults on TO owned telephony is tied into the standing Service Restoration Proposal.

STCP 06-3 System Incident Management

Roles and responsibilities in the management of a major transmission system incident (eg adverse weather, terrorist action etc.) are specified in this procedure. Both NGET and TOs must have the capability to set up System Incident centres to a minimum capability in order to manage communications with external parties during a major incident.

STCP 06-4 Contingency Arrangements

STCP 06-4 describes how the capability to monitor and operate the transmission system is maintained in the event of a major control facility failure such as the evacuation of a control centre, SCADA system failure or failure of telephony systems.

It specifies that NGET and TOs should have a separate emergency control centre with a duplicated SCADA system, means of communicating real-time data with NGET and a means of communication with external parties. The procedure also provides for deployment of personnel to substations in the event of a significant loss of remote control facilities.

STCP 09-1 Safety Co-ordination Between Parties

This procedure covers the implementation of safety precautions across transmission and user boundaries.

STCP 09-2 Public and Site Safety

STCP 09-2 expands on the TO's right under the STC to configure its equipment without direction from NGET on the grounds of public or site safety. It also specifies that contact with the public is conducted via the TO and links into other STCPs for re-energisation criteria and circuit breaker operation limits.

Summary of Current Provisions Relating to Operational Switching

The placement of current STC provisions relevant to Operational is summarised in table 1 below.

Requirement		Placement in Current STC Framework
1)	TOs are obliged to provide a NGET with a means of configuring their transmission system	<i>Section C Part One, STCP 01-1</i>
2)	TOs have a means of specifying capability limits for their equipment	<i>Section C Part One, STCP 04-4</i>
3)	NGET has an obligation to ensure equipment is operated within these capability limits	<i>Section C Part One, STCP 04-4</i>
4)	NGET has an obligation to ensure the transmission system is operated within licence standards	<i>Section C Part One</i>
5)	Operationally significant alarms, analogues and indications are passed to NGET by the TOs	<i>Section C Part One, STCP 04-3</i>
6)	There is a process for agreeing switching actions	<i>STCP 01-1</i>
7)	Equipment alarms are classified, graded in terms of immediacy of operational impact, along with responsibility for responding to them	<i>STCP 02-1</i>
8)	Safety rules are specified	<i>Section G</i>
9)	TO's have the right to act to re-configure their network for public or site safety reasons	<i>Section G, STCP 09-2</i>
10)	Contingency arrangements are defined for a loss of control facilities	<i>STCP 06-4</i>
11)	Management processes and levels of resilience are specified for the communications links between NGET and the TOs	<i>STCP 04-2, STCP 04-5</i>
12)	Limitation of Liability	<i>Section G</i>

Table 1: Placement of Operational Switching Rights and Obligations in the Current STC Framework

3. New Features Required for Offshore Transmission

The existing transmission licencees have a proven record of performance in the management of networks using existing facilities, backed up by licence obligations and periodic regulatory scrutiny. Offshore TOs (OFTOs) will not be under the same regular scrutiny and may not have direct experience of building and operating UK transmission infrastructure.

The following new features therefore need to be considered for introduction into the STC as applied to Offshore Transmission in relation to operational switching:

- a) Specific resilience criteria for control facilities;
- b) Location of control facilities;
- c) Minimum acknowledgement times (both TOs and NGET), to:
 - o Directions to reconfigure;
 - o Requests for site attendance;
 - o Service restoration proposals; and
 - o Reporting of events.

4. Modifying and Adding to Existing Provisions

The following sections describe changes required to the STC itself and the provisions of the STCPs (as included in revised or new STCPs, or in an alternative instrument under the STC framework) to cater for offshore electricity transmission. These are considered for each of the three operational switching models outlined above.

The STC

Changes are necessary in the clauses which cover:

- the means by which NGET directs configuration of the transmission system;
- the service capability specification which may need to cover the capability of OFTO control facilities;
- the division of responsibilities in response to an event; and
- the applicability of safety provisions.

All three models necessitate changes to existing drafting. These are described by clause in Appendix B.

Model 1 – NGET directs, OFTO Performs Operational Switching and Safety Switching

This model is conceptually similar to the model operating in Scotland under the existing STC framework.

Given that the current STC provisions were developed in the context of existing, proven, control facilities, new provisions would be required to set out clear and consistent technical criteria for new OFTO control facilities and possibly to embed these in the Service Capability Specification.

This means specifying further detail in clause 3.1.1 which states items to be included in a Service Capability Specification.

Model 2 – NGET Performs Operational Switching/OFTO Performs Safety Switching

This model is different to that currently operating in Scotland under the STC.

Two main changes from existing provisions are driven by adoption of this model. The first is the need to add to clause 2.1.2 ('...means of enabling NGET to direct...') to the effect that NGET may direct configuration by remote control of key transmission equipment.

The second is to highlight the need to specify the division of responsibilities for real-time monitoring with further detail (such as categorisation of equipment alarms and specified responses) set out at SCTP or equivalent level. Clause 4.1.2 within Section C Part Three may need to be redrafted to reflect this.

Model 3 – NGET Performs all Switching

This model is significantly different to that currently operating in Scotland under the STC.

The User and Transmission Owner Safety requirements specified in Section D would likely be redundant offshore although the overriding general safety and environment provisions would still apply.

Changes to section C would be similar to those under Model 2 but with additional changes perhaps required to deal with situations where OFTOs were wholly reliant on NGET to monitor and operate their equipment in real-time.

The STCPs

Table 2 below summarises the changes required to the provisions of the STCPs described previously in this paper under the three switching models.

STCPs relevant to Offshore Operational Models	Redrafting Required		
	Model 1 – NGET Directs, OFTO performs Operational and Safety Switching	Model 2 – NGET Performs Operational Switching/OFTO Performs Safety Switching	Model 3 – NGET Performs all Switching
STCP 01-1 Operational Switching	Minor Changes and Consistency Checks	New Offshore Specific Arrangements	New Offshore Specific Arrangements
STCP 02-1 Asset and Event Management	Minor Changes and Consistency Checks	Clearer and more specific division of responsibilities, obligations and operational liason. Link alarm classes and predefined events into Asset Operational Information procedures. Generic Alarm classes and responsibilities remain.	Clearer and more specific division of responsibilities, obligations and operational liason. Link alarms and predefined events into Asset Operational Information procedures Generic Alarm classes and responsibilities revised
STCP 04-1 Real Time Data Change Management.	Minor Changes and Consistency Checks	Minor Changes and Consistency Checks	Minor Changes and Consistency Checks

STCPs relevant to Offshore Operational Models	Redrafting Required		
	Model 1 – NGET Directs, OFTO performs Operational and Safety Switching	Model 2 – NGET Performs Operational Switching/OFTO Performs Safety Switching	Model 3 – NGET Performs all Switching
SCTP 04-2 Real Time Datalink Management	Explicit Link to Service Capability	Explicit Link to Service Capability	Explicit Link to Service Capability
STCP 04-03 Real Time Data Provision	Explicit Link to Service Capability	Explicit Link to Service Capability	Explicit Link to Service Capability
STCP 04-4 Provision of Asset Operational Information	Minor Changes and Consistency Checks	Predefined Capability changes could be linked to alarms and events	Predefined Capability changes could be linked to alarms and events
STCP 04-05 Operational Telephony	Explicit Link to Service Capability	Less onerous requirements on OFTOs	Less onerous requirements on OFTOs
STCP 06-3 System Incident Management	Explicit Link to Service Capability	Less onerous requirements on OFTOs	Less onerous requirements on OFTOs
STCP 06-4 Contingency Arrangements	Explicit Link to Service Capability	Less onerous requirements on OFTOs	Less onerous requirements on OFTOs
STCP 09-1 Safety Co-ordination Between Parties	Minor Changes and Consistency Checks	Minor Redrafting and Consistency Checks	Not Required offshore
STCP 09-2 Public and Site Safety	Minor Changes and Consistency Checks	New Processes Required	New Processes Required

Table 2: Changes to STCP provisions for the Three Switching Models

The most significant changes under Model 1 would be to link all aspects of OFTO control facility provision to service capability specification in order to ensure an appropriate enduring level of transmission service.

Under Model 2, the provisions of STCP 01-1 would change to remove the need to agree configuration options in specific circumstances or to refer to pre-defined actions. The generic alarm categorisation in STCP 02-1 could remain but a clear division of responsibilities would need to be agreed. There is a need to define events which would trigger a predefined Operational Capability Limit reduction in response to asset integrity issues and link to the provisions currently within STCP 04-4. The requirement for resilient voice communications and contingency arrangements could be less onerous for OFTOs under this model.

Model 3 would entail a major change in the philosophy behind STCP 01-1 and STCP 02-1.

Under all three models, there is a need to consider the provision of control capability and the expected standards of service (eg response times) alongside the provision of primary transmission equipment. There is merit therefore in defining service requirements for offshore transmission control facilities, potentially in a new STCP.

Appendix A – Switching Models

	Safety Switching	Operational Switching	Pros	Cons
Model 1	OFTO or subcontracted Third Party <i>(Following handover from the GBSO)</i>	OFTO or subcontracted Third Party <i>(Does not include direction of configuration by SO ie physical switching only)</i>	<ul style="list-style-type: none"> • Single Party • OFTO is unencumbered in meeting statutory safety obligations 	<ul style="list-style-type: none"> • Requires new control centre facilities for each OFTO • Additional interface creates an inefficient means for GBSO to direct flows • Additional interface creates an inefficient means for GBSO to manage reactive equipment • Additional assets required to segregate networks • Uniform standards Required for Control Facilities (eg UK based)
Model 2	OFTO or subcontracted Third Party <i>(Following handover from the GBSO)</i>	NGET	<ul style="list-style-type: none"> • Operational Interfaces minimised • Uses existing control centre facilities • Efficient means for GBSO to direct flows • Efficient means for GBSO to manage reactive equipment • No additional assets required to segregate networks • Consistent resilience standard for control centre facilities • OFTO is unencumbered in meeting statutory safety obligations 	<ul style="list-style-type: none"> • OFTO has local control only • Dual authorisations required
Model 3	NGET	NGET	<ul style="list-style-type: none"> • Operational Interfaces minimised • Uses existing control centre facilities • Efficient means for GBSO to direct flows • Efficient means for GBSO to manage reactive equipment • Additional assets required to segregate networks • Consistent resilience standard for control systems 	<ul style="list-style-type: none"> • NGET Involved in safety switching with no impact on flows over the GB Transmission System • NGET may need staff on site • OFTO relies on GBSO to meet statutory safety obligations

Appendix B – Changes to STC Clauses

Section C

Clauses relevant to Offshore Operational Models

		Redrafting Required		
		Model 1 – NGET Directs, OFTO performs Operational and Safety Switching	Model 2 – NGET Performs Operational Switching/OFTO Performs Safety Switching	Model 3 – NGET Performs all Switching
PART ONE: PROVISION OF TRANSMISSION SERVICES				
1	INTRODUCTION			
1.1	This Section C, Part One deals with the provision of Transmission Services by Transmission Owners to NGET and the obligations of NGET in relation to its operation of the GB Transmission System, and sets out:			
1.1.1	the process for each Transmission Owner to specify the technical limits that normally apply to its Transmission Services in a Services Capability Specification;			
1.1.2	the process for developing and implementing Services Restoration Proposals to restore Transmission Services in the event of any unplanned reduction in the technical limits actually applicable to the provision of Transmission Services from time to time; and			
1.1.3	provisions dealing with the co-ordination and direction by NGET of the flow of electricity onto and over the GB Transmission System in accordance with technical limits and Licence Standards.			
2	TRANSMISSION SERVICES			
2.1	In accordance with the provisions of this Code, each Transmission Owner shall provide services to NGET consisting of:			
2.1.1	making available those parts of its Transmission System which are intended for the purposes of conveying, or affecting the flow of, electricity, so that such parts are capable of doing so and are fit for those purposes;			
2.1.2	a means of enabling NGET to direct the configuration of those parts of that Transmission Owner's Transmission System made available to it and, consistent with such means, giving effect to any such direction from time to time; and		Redrafting may be required to reflect the fact that the primary 'means to direct' offshore can be by electronic interface	Redrafting may be required to reflect the fact that the primary 'means to direct' offshore can be by electronic interface
2.1.3	a means of enabling NGET to obtain information in relation to that Transmission Owner's Transmission System which information is needed by NGET to enable it to co-ordinate and direct the flow of electricity onto and over the GB Transmission System and, consistent with such means, providing such information to NGET,			
	(together here referred to as "Transmission Services").			
2.2.	Each Transmission Owner agrees with NGET to provide Transmission Services and to plan, develop, operate and maintain its Transmission System in accordance with its Transmission Licence and this Code, subject to any Transmission Derogations from time to time.			
2.3	NGET shall have the right to make use of the Transmission Services provided to it under this Code in pursuance of its activities and the discharge of its obligations under its Transmission Licence and the Act and only in pursuance of such activities or discharge of such obligations.			

Appendix B – Changes to STC Clauses

Section C

Clauses relevant to Offshore Operational Models

		Redrafting Required		
		Model 1 – NGET Directs, OFTO performs Operational and Safety Switching	Model 2 – NGET Performs Operational Switching/OFTO Performs Safety Switching	Model 3 – NGET Performs all Switching
3	SERVICES CAPABILITY SPECIFICATION			
3.1	Each Transmission Owner shall separately have and maintain, at all times, a specification of its Transmission Services (here referred to as "Services Capability Specification") and shall:			
3.1.1	maintain its Services Capability Specification (in accordance with Section D, Part One, sub-paragraph 2.8.2) by including, without limitation, information describing the parameters and levels within and to which its Transmission Services have been planned to be provided, or such higher levels up to which its Transmission Services are normally capable of being so provided, to NGET: such information to include and identify the technical limits that would normally apply to the provision of its Transmission Services (such technical limits as identified in the Service Capability Specification here referred to as the "Normal Capability Limits" applicable to those Transmission Services); and	Service Capability Specification will need to included the service level provided by the OFTO control facility	Service Capability Specification will need to included the service level provided by the OFTO control facility	
3.1.2	submit a copy of its Services Capability Specification to NGET and immediately submit to NGET copies of any amendments made to it under paragraphs 3.2 or 3.3.			
3.2	Each Transmission Owner shall keep its Services Capability Specification under review at all times and may:			
3.2.1	propose a change to the form of its Services Capability Specification at any time, any such change to be agreed between the Transmission Owner and NGET (any failure to agree shall be referable to the Authority as a Dispute in accordance with Section H, paragraph 4.1); and			
3.2.2	amend the content of its Services Capability Specification, including amendments to any Normal Capability Limits:			
3.2.2.1	in the case of the correction of typographical errors only, at any time by submitting copies of such amendments to NGET; and			
3.2.2.2	in all other cases, pursuant to Section D, Part One, sub-paragraph 2.8.2.			
3.3	NGET may propose a change to the form of a Transmission Owner's Services Capability Specification at any time, any such change to be agreed between the Transmission Owner and NGET. Any failure to agree shall be referable to the Authority as a Dispute in accordance with Section H, paragraph 4.1.			
3.4	In addition to the obligation to submit a copy of its Services Capability Specification and copies of any amendments to NGET under this paragraph 3, a Transmission Owner shall provide to NGET such other information as may reasonably be requested by NGET from time to time in order to support the full and effective enjoyment of the rights of NGET pursuant to paragraph 2. Any dispute as to the reasonableness of such request shall be referable to the Authority as a Dispute in accordance with Section H, paragraph 4.1.			
4	TRANSMISSION SERVICES LIMITS			
4.1	Each Transmission Owner shall provide Transmission Services to NGET, pursuant to paragraph 2, in accordance with its Services Capability Specification (including to any Normal Capability Limits) except, and only to the extent that:			
4.1.1	the provision of such Transmission Services is reduced due to an Outage in			

Appendix B – Changes to STC Clauses

Section C

Clauses relevant to Offshore Operational Models

		Redrafting Required		
		Model 1 – NGET Directs, OFTO performs Operational and Safety Switching	Model 2 – NGET Performs Operational Switching/OFTO Performs Safety Switching	Model 3 – NGET Performs all Switching
	accordance with Section C, Part Two;			
4.1.2	its Transmission Services are not, other than by reason of an Outage, physically capable of being provided or are not capable, for immediate safety reasons or pursuant to environmental obligations, of being provided in accordance with the Services Capability Specification (referred to as a "Services Reduction"); or			
4.1.3	the Transmission Owner has notified NGET of technical limits applying in excess of Normal Capability Limits pursuant to paragraph 4.14.			
4.2	Each Transmission Owner shall at all times act in accordance with Good Industry Practice in providing Transmission Services to NGET.			
4.3	The technical limits to which NGET has been notified that Transmission Services are actually capable of being provided from time to time (being the Normal Capability Limits or such other technical limits as apply due to an Outage, a Services Reduction or any higher limits notified under paragraph 4.14) shall be referred to as the "Operational Capability Limits" applicable to those Transmission Services.			
4.4	A Transmission Owner shall notify NGET immediately in the event that it becomes aware at any time that the relevant Operational Capability Limits have been exceeded by NGET.			
4.5	Each Transmission Owner shall monitor, in accordance with Good Industry Practice, the provision of its Transmission Services and notify NGET (except in such circumstances as may from time to time be agreed between the Transmission Owner and NGET), as a matter of urgency, as soon as such Transmission Owner becomes aware:		Monitoring responsibilities will need to be clearly delineated.	If the TO has no switching responsibility, it's unlikely to have a capability to monitor equipment in real time which is comparable to onshore TOs.
4.5.1	of a Services Reduction (including notifying NGET of the revised technical limits that apply to such Transmission Services due to the Services Reduction); or			
4.5.2	of a risk, materially beyond the normal level of risk, of an imminent Services Reduction (here referred to as a "Services Reduction Risk").			
4.6	As a part of, or otherwise at the same time as, notice to NGET under paragraph 4.5, unless it is not reasonably practicable to do so (in which case a Transmission Owner shall do so as soon as reasonably practicable thereafter), a Transmission Owner shall notify NGET of:			
4.6.1	in the case of a Services Reduction Risk, and where so requested by NGET, relevant data or information for the relevant Transmission Services including the technical limits that would apply as a consequence of the relevant Services Reduction if it were to occur;			
4.6.2	the reasons for any Services Reduction (or, where relevant, a Services Reduction Risk) including, without limitation, information in relation to any Event which caused or contributed to, or which may cause or contribute to, the Services Reduction or Services Reduction Risk;			
4.6.3	additional relevant information including the likely duration of any Services Reduction (or, where relevant, Services Reduction Risk); and			

Appendix B – Changes to STC Clauses

Section C

Clauses relevant to Offshore Operational Models

		Redrafting Required		
		Model 1 – NGET Directs, OFTO performs Operational and Safety Switching	Model 2 – NGET Performs Operational Switching/OFTO Performs Safety Switching	Model 3 – NGET Performs all Switching
4.6.4	unless otherwise agreed with NGET, such Transmission Owner's proposal, in reasonable but not excessive detail, (referred to here as a "Services Restoration Proposal") for, as appropriate:			
4.6.4.1	any interim works or other actions which are able to be undertaken by such Transmission Owner to minimise the effect of the Services Reduction or Services Reduction Risk and including, where relevant, any revised Operational Capability Limits that would apply during the period of such Services Reduction or Services Reduction Risk;			
4.6.4.2	restoring the Transmission Services such that they are provided in accordance with their Services Capability Specification (and to their Normal Capability Limits); and			
4.6.4.3	otherwise removing, mitigating or dealing with a Services Reduction Risk,			
	including, in the case of sub-paragraphs 4.6.4.2 and 4.6.4.3, where necessary and appropriate, by proposing to amend the content of its Services Capability Specification (including any Normal Capability Limits) pursuant to Section D, Part One, paragraph 2.8.2.			
4.7	Nothing in sub-paragraph 4.6.4 shall prevent the Parties from agreeing in advance Services Restoration Proposals to apply generally to particular types of Services Reductions or Services Reduction Risks. If such a Services Restoration Proposal is proposed in advance by a Party, any failure to agree shall be referable to the Authority as a Dispute in accordance with Section H, paragraph 4.1.			
4.8	On or as soon as reasonably practicable after notification by the Transmission Owner of a Services Reduction (or, where relevant, a Services Reduction Risk) pursuant to paragraph 4.5, NGET and the relevant Transmission Owner shall discuss the Services Reduction (or, where relevant, Services Reduction Risk) and, in particular, agree any Services Restoration Proposal(s) notified under sub-paragraph 4.6.4 or agree that any Services Restoration Proposal(s) agreed in advance under paragraph 4.7 apply. Any failure to agree shall be referable to the Authority as a Dispute in accordance with Section H, paragraph 4.1.			
4.9	A Party which has agreed a Services Restoration Proposal pursuant to paragraph 4.8 may at any time notify (either verbally or in writing) each other Party involved in such Services Restoration Proposal of any modification which it considers is required to be made to such Services Restoration Proposal in order to deal more appropriately with the Services Reduction or Services Reduction Risk. NGET and the relevant Transmission Owner shall discuss and agree any such modification. Any failure to agree a proposed modification shall be referable to the Authority as a Dispute in accordance with Section H, paragraph 4.1.			
4.1	A Transmission Owner shall give effect to any Services Restoration Proposal agreed with NGET pursuant to paragraph 4.8 (as modified from time to time pursuant to paragraph 4.9).			

Appendix B – Changes to STC Clauses

Section C

Clauses relevant to Offshore Operational Models

		Redrafting Required		
		Model 1 – NGET Directs, OFTO performs Operational and Safety Switching	Model 2 – NGET Performs Operational Switching/OFTO Performs Safety Switching	Model 3 – NGET Performs all Switching
4.11	If the Parties are unable to reach agreement on any Services Restoration Proposal or any proposed modification to such Services Restoration Proposal, a Transmission Owner shall nevertheless give effect to its Services Restoration Proposal (including any modification which such Transmission Owner, in its discretion, considers is required), subject to any subsequent determination of a relevant Dispute referred to the Authority pursuant to paragraphs 4.7, 4.8 or 4.9.			
4.12	Each Transmission Owner shall take reasonable and appropriate preparatory steps, including, without limitation, having appropriate replacement Plant and Apparatus available, to minimise the duration or effect of Services Reductions and Services Reduction Risks and shall:			
4.12.1	notify NGET of such steps from time to time or when otherwise reasonably requested by NGET; and			
4.12.2	comply with any reasonable request from NGET to take or modify preparatory steps as specified in such request.			
4.13	Any dispute in relation to the adequacy of the preparatory steps taken by a Transmission Owner pursuant to paragraph 4.12 or the reasonableness of a request by NGET shall be referable to the Authority as a Dispute in accordance with Section H, paragraph 4.1 (in the event of a dispute under this paragraph 4.13, a Transmission Owner may take such preparatory steps as it considers, in its discretion, are reasonable and appropriate, subject to the subsequent determination of any Dispute referred to the Authority pursuant to this paragraph 4.13).			
4.14	For the avoidance of doubt, nothing in the Code shall prevent a Transmission Owner, in its discretion, from notifying NGET (including, without limitation, in response to a request from NGET) that technical limits temporarily apply in respect of specified Transmission Services in excess of their Normal Capability Limits. In any such event the Transmission Owner shall at the same time also notify NGET of any conditions that apply to the use of such Transmission Services at technical limits above their Normal Capability Limits.			
5	CONFIGURATION ON NGET'S DIRECTIONS			
5.1	A Transmission Owner may only configure such parts of its Transmission System as are made available pursuant to sub-paragraph 2.1.1 of this Section C, Part One, in accordance with directions given by NGET, except:		Redrafting may be required to reflect that fact that the primary 'means to direct' offshore can be by electronic interface	Philosophy of this section changes if the OFTO does not have significant switching capability.
5.1.1	where otherwise agreed with NGET; or			
5.1.2	for safety purposes or pursuant to environmental obligations in accordance with Section G, paragraph 2.			
5.2	Notwithstanding sub-paragraph 5.1.1, but subject at all times to Section G, paragraph 2, each Transmission Owner shall comply with any reasonable direction by NGET to configure any part of its Transmission System.			
5.3	Any direction from NGET to a Transmission Owner pursuant to paragraphs 5.1 and 5.2 shall be in the form agreed with such Transmission Owner from time to time.			

Appendix B – Changes to STC Clauses

Section C

Clauses relevant to Offshore Operational Models

		Redrafting Required		
		Model 1 – NGET Directs, OFTO performs Operational and Safety Switching	Model 2 – NGET Performs Operational Switching/OFTO Performs Safety Switching	Model 3 – NGET Performs all Switching
5.4	Operational Switching			
5.4.1	Notwithstanding that a Transmission Owner is not a party to the CUSC and is not thereby required to comply with the Grid Code, a Transmission Owner shall comply with section OC7.6 of the Grid Code (as amended from time to time) and any Local Switching Procedure agreed pursuant to that section.			This clause may not apply offshore if OFTO has no switching capability
5.4.2	NGET shall comply with, and shall procure that a User shall comply with section OC7.6 of the Grid Code and any Local Switching Procedure agreed pursuant to that section where and to the extent that such section applies to NGET and the User.			
6	NGET OBLIGATIONS			
6.1	In co-ordinating and directing the flow of electricity onto and over the GB Transmission System, NGET shall:			
6.1.1	take all reasonably practicable steps to determine, and shall ensure, that it does so in accordance with Licence Standards; and			
6.1.2	in complying with Licence Standards, ensure that neither:			
6.1.2.1	Operational Capability Limits; nor			
6.1.2.2	such technical limits or other conditions as NGET becomes aware are necessary and safe in accordance with Good Industry Practice (including, without limitation, any conditions notified to it pursuant to paragraph 4.14),			
	are exceeded or would be exceeded on the occurrence of a Secured Event.			
6.2	NGET shall not be in breach of paragraph 6.1 where an Unsecured Event causes or would cause Operational Capability Limits or other relevant limits to be exceeded.			
6.3	In the event that NGET shall at any time become aware that Operational Capability Limits or, where relevant, other conditions notified to it pursuant to paragraph 4.14 are being or have been exceeded, then NGET shall, in accordance with Licence Standards, where applicable, immediately:			
6.3.1	direct or configure the relevant Transmission System or take such other steps as are appropriate so that such Operational Capability Limits or other conditions are no longer being exceeded;			
6.3.2	inform the relevant Transmission Owner including, without limitation, by providing (in reasonable but not excessive detail) details of and reasons for the Operational Capability Limits or other conditions being exceeded; and			
6.3.3	without prejudice to any other rights and remedies arising under this Code, identify and carry out (in consultation with the Transmission Owner where appropriate) such actions as are reasonably necessary and appropriate to ensure that such event shall not re-occur.			
6.4	NGET shall (except to the extent otherwise agreed with the relevant Transmission Owner) notify a Transmission Owner, as a matter of urgency, if NGET becomes aware (otherwise than from such Transmission Owner) of any Event or circumstance which is or is likely to materially affect such Transmission Owner's provision of Transmission Services in accordance with its Services Capability Specification, including of any current or likely Services Reduction or Services Reduction Risk.			

Appendix B – Changes to STC Clauses

Section C

Clauses relevant to Offshore Operational Models

		Redrafting Required		
		Model 1 – NGET Directs, OFTO performs Operational and Safety Switching	Model 2 – NGET Performs Operational Switching/OFTO Performs Safety Switching	Model 3 – NGET Performs all Switching
PART THREE:OTHER				
4	EVENT REPORTING AND JOINT INVESTIGATIONS			
4.1.	Notification of Events and Significant Incidents by Transmission Owners			
4.1.1	Each Transmission Owner shall, as soon as it becomes aware of any Event on its Transmission System which has had or may have an Operational Effect on the GB Transmission System or a User System, notify NGET (either verbally or in writing), as a matter of urgency, to the extent that such information is not otherwise provided to NGET pursuant to Section C, Part One, paragraphs 4.4, 4.5 or 4.6.			
4.1.2	NGET shall, as soon as it becomes aware of any Event on the GB Transmission System or a User System which has had or may have an Operational Effect on a Transmission Owner's Transmission System, notify such Transmission Owner (either verbally or in writing) as a matter of urgency.		Monitoring responsibilities will need to be clearly delineated.	Monitoring responsibilities will need to be clearly delineated.
4.1.3	Each Party may (irrespective of whether or not it has received a notification under sub-paragraph 4.1.1 or 4.1.2), in its discretion, determine that an Event is a Significant Incident and request that, where relevant, NGET or any Transmission Owner(s) whose Transmission System(s) has been or may be affected by the Significant Incident prepare and submit a report in accordance with sub-paragraph 4.1.4.			
4.1.4	Each Party (the "Responding Party") shall, if requested to do so by another Party (the "Requesting Party") pursuant to sub-paragraph 4.1.3, prepare and submit a written report to the Requesting Party as soon as reasonably practicable in relation to a Significant Incident which shall include, without limitation, the following information:			
4.1.4.1	a description of the Significant Incident (including, without limitation, any associated Services Reduction or Service Reduction Risk);			
4.1.4.2	the time and date of the Significant Incident;			
4.1.4.3	the location(s) of the Significant Incident;			
4.1.4.4	Plant and/or Apparatus directly involved (and not merely affected by the Event(s) giving rise to the Significant Incident);			
4.1.4.5	a response to any question(s) raised by the Requesting Party in relation to the Event or Significant Incident; and			
4.1.4.6	any other information reasonably requested by the Requesting Party in relation to the Event or Significant Incident.			
4.1.5	Each Party shall, where reasonably requested to do so by another Party, assist in answering any questions from or otherwise providing information (in the case of NGET) to a User or in the case of any Party, to any other Party, in relation to an Event or Significant Incident on such Transmission Owner's Transmission System.			

Appendix B – Changes to STC Clauses

Section G

Clauses relevant to Offshore Operational Models

		Redrafting Required		
		Model 1 – NGET Directs, OFTO performs Operational and Safety Switching	Model 2 – NGET Performs Operational Switching/OFTO Performs Safety Switching	Model 3 – NGET Performs all Switching
SECTION G: GENERAL PROVISIONS				
2	SAFETY AND ENVIRONMENT			
2.1	General			
2.1.1	For the avoidance of any doubt, nothing in or pursuant to this Code shall:			
2.1.1.1	be taken to require a Party to do anything which could or would be unsafe or contrary to that Party's environmental obligations; nor			
2.1.1.2	prevent a Party from doing anything which could or would be unsafe or contrary to that Party's environmental obligations to omit to do.			
2.1.2	A Transmission Owner shall notify NGET in the event that, and as soon as, such Transmission Owner:			
2.1.2.1	becomes aware that, for safety purposes or pursuant to environmental obligations of such Transmission Owner, the Transmission Owner is reasonably likely to configure, or has urgently had to configure, any part of its Transmission System or otherwise take any steps other than in accordance with a direction from NGET; or			
2.1.2.2	becomes aware that, for safety purposes or pursuant to environmental obligations of such Transmission Owner, it is reasonably likely to be, or has been, prevented, restricted or delayed from complying with a direction from NGET in relation to the configuration of any part of its Transmission System.			
2.1.3	Each Party shall use its best endeavours to identify and remove or lessen the likelihood of any circumstances arising in which such Party might seek to place reliance upon the provisions of paragraph 2.1.1 including, without limitation, by discussing such issues with the other Parties where appropriate.			
2.2	User and Transmission Owner Safety Requirements			
2.2.1	Notwithstanding that a Transmission Owner is not a party to the CUSC and is not thereby required to comply with the Grid Code, a Transmission Owner shall comply with:			This section may not apply offshore if OFTO has no switching capability
2.2.1.1	Operating Code No 8, Appendix 2 of the Grid Code ("OC8B"); and			
2.2.1.2	(in carrying out its obligations under Section D, Part Two, paragraph 11), Appendix 1 of the Connection Conditions of the Grid Code,			
	(each as amended from time to time).			
2.2.2	NGET shall comply with, and shall procure that a User shall comply with, OC8B and Appendix 1 of the Connection Conditions of the Grid Code where and to the extent that such section applies to NGET and the User.			
2.2.3	Each Transmission Owner shall provide to NGET a copy of and any updates to its Safety Rules as applicable from time to time.			

Appendix B – Changes to STC Clauses

Section G

Clauses relevant to Offshore Operational Models

		Redrafting Required		
		Model 1 – NGET Directs, OFTO performs Operational and Safety Switching	Model 2 – NGET Performs Operational Switching/OFTO Performs Safety Switching	Model 3 – NGET Performs all Switching
2.2.4	NGET shall ensure that no busbar Protection, mesh corner Protection, circuit-breaker fail Protection relays, AC or DC wiring (other than power supplies of DC tripping associated with a Generating Unit itself) may be worked upon or altered by Generator personnel in the absence of a representative of the Transmission Owner or written authority from the Transmission Owner to whose Transmission System the Connection Site at which such works are to be undertaken is connected.			
2.2.5	Where a Transmission Owner owns the busbar Protection at the Connection Point Site, NGET shall ensure that no busbar Protection, circuit-breaker failure Protection relays, AC or DC wiring (other than power supplies of DC tripping associated with the Network Operator or Non-Embedded Customer's Apparatus itself) may be worked upon or altered by the Network Operator or Non-Network Operator or Non-Embedded Customer's personnel in the absence of a representative of the Transmission Owner or written authority from the Transmission Owner.			
2.2.6	A Transmission Owner shall use its best endeavours to provide a representative or to submit a written authority to NGET on request from NGET for the purposes of paragraphs 2.2.4 and 2.2.5.			
2.2.7	Unless otherwise agreed pursuant to paragraph 2.2.9, a Transmission Owner entering and working on its Plant and/or Apparatus on a User Site will work to such User's Safety Rules as advised by and forwarded to the Transmission Owner by NGET.			
2.2.8	Unless otherwise agreed pursuant to paragraph 2.2.10, NGET shall procure that a User entering and working on that User's Plant and/or Apparatus on a Transmission Owner Site will work to the Transmission Owner's Safety Rules, which Safety Rules, the Transmission Owner shall forward to the User directly as directed by NGET and notify NGET that it has done so.			
2.2.9	A Transmission Owner may, with a minimum of six weeks notice, apply to NGET for permission to work according to its own Safety Rules when working on its own Plant and/or Apparatus at a User Site rather than the User's Safety Rules. NGET shall consult with the relevant User and, subject to NGET and the User's agreement that the Transmission Owner's Safety Rules provide for a level of safety commensurate with those set out in paragraph 2.2.7, NGET will notify the Transmission Owner in writing that, with effect from the date requested by the Transmission Owner, the Transmission Owner may use its own Safety Rules when working on the Transmission Owner's Plant and/or Apparatus on that User Site, which Safety Rules, the Transmission Owner shall forward to the User directly as directed by NGET and notify NGET that it has done so. Until such written approval from NGET, the Transmission Owner will continue to use the Safety Rules in accordance with paragraph 2.2.7.			

Appendix B – Changes to STC Clauses

Section G

Clauses relevant to Offshore Operational Models

		Redrafting Required		
		Model 1 – NGET Directs, OFTO performs Operational and Safety Switching	Model 2 – NGET Performs Operational Switching/OFTO Performs Safety Switching	Model 3 – NGET Performs all Switching
2.2.10	NGET may (on behalf of a User), with a minimum of six weeks notice, apply to a Transmission Owner and consult with that Transmission Owner regarding permission for work to be carried out to the User's Safety Rules when work is carried out by such User on the User's Plant and/or Apparatus at the Transmission Owner's Site rather than the Transmission Owner's Safety Rules. If the Transmission Owner and NGET agree that the User's Safety Rules provide for a level of safety commensurate with those set out in paragraph 2.2.8, NGET will notify the User in writing, copied to the Transmission Owner, that, with effect from the date requested by the User, the User may use its own Safety Rules when working on such User's Plant and/or Apparatus on that Transmission Owner's Site, which Safety Rules, NGET shall procure that the User shall forward to the Transmission Owner directly. Until such written approval from NGET, NGET shall procure that the User shall continue to use the Transmission Owner's Safety Rules in accordance with paragraph 2.2.8.			
2.2.11	If, pursuant to paragraph 2.2.9, NGET notifies a Transmission Owner that the Transmission Owner's own Safety Rules shall apply, this shall not imply that the Transmission Owner's Safety Rules will apply to entering the User's Site and access to the Transmission Owner's Plant and/or Apparatus on that User's Site. A User has responsibility for the whole of its User Site and entry and access will always be in accordance with such User's Site access procedures.			
2.2.12	If, pursuant to paragraph 2.2.10, NGET notifies a User that the User's own Safety Rules shall apply, this shall not imply that, for such Transmission Owner's Site, the User's Safety Rules will apply to entering the Transmission Owner's Site, and access to the User's Plant and/or Apparatus on that Transmission Owner's Site. A Transmission Owner has responsibility for the whole of its Transmission Owner Site and entry and access will always be in accordance with such Transmission Owner's Site access procedures.			
4	LIMITATION OF LIABILITY			
4.1	This paragraph 4, insofar as it excludes or limits liability, shall override any other provision in the Code provided that nothing in this paragraph 4 shall exclude or restrict or otherwise prejudice or affect any of:			
4.1.1	the rights, powers, duties and obligations of any Party which are conferred or created by the Act, that Party's Transmission Licence, or the Regulations; or			
4.1.2	the rights, powers, duties and obligations of the Authority or the Secretary of State under the Act, any Transmission Licence or otherwise howsoever.			
4.2	Subject to any liquidated damages provisions of any TO Construction Agreement and to the indemnities provided for under paragraphs 3.3 and 4.3 of this Section G, each Party agrees and acknowledges that no Party (the "Party Liable") nor any of its officers, employees or agents shall be liable to any other Party, for loss arising from any breach of the Code or TO Construction Agreement, other than for loss directly resulting from such breach and which, at the date hereof, was reasonably foreseeable as not unlikely to occur in the ordinary course of events from such breach in respect of:			

Appendix B – Changes to STC Clauses

Section G

Clauses relevant to Offshore Operational Models

		Redrafting Required		
		Model 1 – NGET Directs, OFTO performs Operational and Safety Switching	Model 2 – NGET Performs Operational Switching/OFTO Performs Safety Switching	Model 3 – NGET Performs all Switching
4.2.1	physical damage to the property of any other Party or its respective officers, employees or agents; or			
4.2.2	the liability of any other Party, its officers, employees or agents to any other person for loss in respect of physical damage to the property of that or any other person, subject, for the avoidance of doubt, to the requirement that the amount of such liability claimed by such other Party should be mitigated in accordance with general law.			
	provided that the liability of any Party in respect of all claims for such loss shall not exceed £5million per incident or series of related incidents.			
4.3	Nothing in this Code shall exclude or limit the liability of the Party Liable or restrict the ability of any Party to claim in respect of fraudulent misrepresentation or death or personal injury resulting from the negligence of the Party Liable and the Party Liable shall indemnify and keep indemnified each other Party from and against all such and any loss or liability which any such other Party may suffer or incur by reason of any claim on account of fraudulent misrepresentation or death or personal injury resulting from the negligence of the Party Liable or any of its officers, employees or agents.			
4.4	In consideration of the rights conferred upon each Transmission Owner under the Code, the right of any of the Transmission Owners to claim in negligence, other tort, or otherwise howsoever against a CUSC Party (other than NGET) in respect of any act or omission of such CUSC Party (other than NGET) in relation to the subject matter of the CUSC is hereby excluded and each Transmission Owner agrees not to pursue any such claim save that nothing in this paragraph 4.4 shall restrict the ability of a Transmission Owner to claim in respect of fraudulent misrepresentation or death or personal injury resulting from the negligence of the CUSC Party (other than NGET).			
4.5	Subject to any liquidated damages provisions of any TO Construction Agreement, and to the indemnities provided for under paragraphs 3.3 and 4.3 of this Section G, the Party Liable nor any of its officers, employees or agents, shall not in any circumstances whatsoever be liable in relation to the Code or its obligations under the Code, to another Party for:			
4.5.1	any loss of profit, loss of revenue, loss of use, loss of contract or loss of goodwill; or			
4.5.2	any indirect or consequential loss; or			
4.5.3	loss resulting from the liability of another Party to any other person howsoever and whensoever arising, save as provided in sub-paragraph 4.2.1 and 4.2.2.			

Appendix B – Changes to STC Clauses

Section G

Clauses relevant to Offshore Operational Models

		Redrafting Required		
		Model 1 – NGET Directs, OFTO performs Operational and Safety Switching	Model 2 – NGET Performs Operational Switching/OFTO Performs Safety Switching	Model 3 – NGET Performs all Switching
4.6	The rights and remedies provided by the Code to the Parties are exclusive and not cumulative and exclude and are in place of all substantive (but not procedural) rights or remedies express or implied and provided by common law or statute in respect of the subject matter of the Code, including, without limitation, any rights any Party may possess in tort which shall include actions brought in negligence and/or nuisance. Accordingly, each of the Parties hereby waives to the fullest extent possible all such rights and remedies provided by common law or statute, and releases a Party which is liable to another Party or other Parties, its or their officers, employees and agents to the same extent from all duties, liabilities, responsibilities or obligations provided by common law or statute in respect of the matters dealt with in the Code and undertakes not to enforce any of the same except as expressly provided herein.			
4.7	Each of the paragraphs of this paragraph 4 shall:			
4.7.1	be construed as a separate and several contract term, and if one or more of such paragraphs is held to be invalid, unlawful or otherwise unenforceable the other or others of such paragraphs shall remain in full force and effect and shall continue to bind the Parties; and			
4.7.2	survive termination of the Code and/or the Framework Agreement.			
4.8	Each Party acknowledges and agrees that each of the other Parties holds the benefit of paragraphs 4.2 to 4.6 above for itself and as trustee and agent for its officers, employees and agents.			
4.9	Each Party acknowledges and agrees that the provisions of this paragraph 4 have been the subject of discussion and negotiation and are fair and reasonable having regard to the circumstances as at the Code Effective Date.			
4.10	For the avoidance of doubt, nothing in this paragraph 4 shall prevent or restrict any Party enforcing any obligation (including suing for a debt) owed to it under or pursuant to the Code.			