

## Stage 03: Amendment Report

System Operator Transmission Owner Code  
(STC)

# CA047: Consequential Changes to Section K following implementation of Grid Code D/10 Frequency and Voltage Operating Range.

What stage is this document at?

01	Initial Amendment Report
02	Proposed Amendment Report
03	Amendment Report

This proposal seeks to modify the System Operator Transmission Owner Code (STC) to introduce consequential changes resulting from Grid Code D/10 Frequency and Voltage Operating Range.

This document assists the Authority in their decision of whether to implement the above modification

Published on: 20<sup>th</sup> June 2012



***The STC Committee recommends:***

That CA047 should be implemented as it better facilitates Applicable STC objectives (ii), (iii) and (v).



***High Impact:***

None



***Medium Impact:***

None



***Low Impact:***

Offshore Transmission Owners

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### Any Questions?

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## About this document

Further to the submission of Amendment Proposal CA047 and the subsequent wider industry consultation that was undertaken by STC Committee, this document is addressed and furnished to the Authority in order to assist them in their decision whether to implement Amendment Proposal CA047.

## Document Control

Version	Date	Author	Change Reference
1.0	20th June 2012	STC Committee	Final version for submission to Authority

CA047

Amendment Report

20th June 2012

Version 1.0

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## 1 Executive Summary

- 1.1 The Amendment Proposal CA047 is a consequential change following the implementation of Grid Code Modification – D/10 Frequency and Voltage Operating Range in July 2011. CA047 is proposing to amend the STC to reflect the introduction of limited operation requirements in certain frequency bands and to modify the under-voltage tripping times for Offshore Transmission Systems within Section K.
- 1.2 STC Amendment Proposal CA047 was proposed by NGET and was formally submitted to the STC Committee meeting on 25<sup>th</sup> January 2011.
- 1.3 Following consideration at the 25<sup>th</sup> January 2011 meeting, the STC Committee agreed that Proposed Amendment CA047 should proceed directly to the Assessment and Report Phase.
- 1.4 Following receipt of the STC Parties' assessments the STC Committee approved the Stage 2 Proposed Amendment Report to be issued inviting representations by the 29<sup>th</sup> May 2012. No responses were received to the wider industry consultation.

### **STC Committee Recommendation**

- 1.4 The STC Committee recommends that STC Amendment Proposal CA047 be approved for implementation.
- 1.5 Should the Authority approve STC Amendment Proposal CA047, it is provisionally recommended that the STC be modified 5 days after the Authority decision.

## 2 Description of Modification and its Effects

- 2.1 The Amendment Proposal seeks to make changes to Section K of the STC in order to include the consequential changes resulting from Grid Code Modification D/10 Frequency and Voltage Operating Range.
- 2.2 The Grid Code modification has highlighted a conflict in the STC between STC Section K 3.1.4 and Section K 3.1.2. Section K 3.1.4 states that to avoid unwanted island operations there is a requirement for Offshore Transmission Systems connected to Onshore Systems in Scotland to trip if the voltage measured at the Interface Point drops below 80% for more than 2 seconds. However, Section K 3.1.2 requires the Offshore Transmission System to remain connected to the Onshore Transmission System without tripping for 2.5 seconds.
- 2.3 It is therefore recommended that STC - Section K 3.1.4 (c) should be amended from “below 80% for more than 2 seconds” to “below 80% for more than 2.5 seconds”.
- 2.4 Whilst reviewing the STC text National Grid has identified a housekeeping grammatical error within Section K 3.1.4 (d). Within the Grid Code Connection Condition 6.3.15, it states that the obligation is at “the Connection Point or User System Entry Point”, the “or” was incorrectly transferred to the STC. It is therefore recommended that K3.1.4 (d) be amended from “Interface Point or above” to “Interface Point is above.”
- 2.5 Currently the STC obligation Section K 5.4 references Grid Code Connection Condition 6.1.3 and states that System Frequency could rise to 52Hz or fall to 47Hz and that each Offshore Transmission System or any constituent element must be capable of:

Continuous operation in the Frequency range 47.5Hz to 52Hz, and

For at least 20 seconds on each occasion the Frequency is below 47.5Hz
- 2.6 This obligation is now inconsistent with the revised obligations contained within Grid Code Connection Condition 6.1.3; it is therefore proposed to update the STC to reflect the introduction of limited operation requirements in certain frequency bands.
- 2.7 No Alternative Amendments to CA047 were submitted.

## 3 Impacts & Assessment

### 3.1 STC Parties' Assessments

#### 3.1.1 National Grid

National Grid is supportive of Amendment Proposal CA047, and has carried out an assessment of the Amendment Proposal.

The implementation of CA047 would not have any physical impact on National Grid's Transmission system or require changes to the IS Systems. No additional works or monies would be required to implement the proposed change.

#### 3.1.2 Offshore Transmission Owners (OFTOs)

The OFTOs are supportive of Amendment Proposal CA047 and do not believe the implementation of CA047 will have any physical impact on any currently operational Offshore Transmission systems. The change has the potential to impact on future projects, although the impact is expected to be minimal. It is unlikely to have any material financial, technical or programme impact.

#### 3.1.3 Scottish Hydro-Electric Transmission Limited (SHETL)

SHETL is supportive of Amendment Proposal CA047. The implementation of CA047 would not have any physical impact on SHETL's Transmission system or require any changes to the IS systems.

#### 3.1.4 SP Transmission Limited (SPT)

SPT is supportive of Amendment Proposal CA047. The implementation of CA047 would not have any physical impact on SPT's Transmission system or require any changes to the IS systems.

### 3.2 Impact on STC/STCPs

The Amendment Proposal will require changes to the following parts of the STC:

- Section K – Technical, Design and Operational Criteria and Performance Requirements for Offshore Transmission Systems

### 3.3 Impact on Greenhouse Gas emissions

The proposed amendment will not have an impact on Greenhouse Gas Emissions.

### 3.4 Assessment against STC Objectives

The STC objective(s):

- efficient discharge of the obligations imposed upon transmission licensees by transmission licences and the Act;
- development, maintenance and operation of an efficient, economical coordinated system of electricity transmission;
- facilitating effective competition in the generation and supply of electricity, and (so far as consistent therewith) facilitating such competition in the distribution of electricity;

- (iv) protection of the security and quality of supply and safe operation of the national electricity transmission system insofar as it relates to interactions between transmission licensees; and
- (v) promotion of good industry practice and efficiency in the implementation and administration of the arrangements described in the STC; and
- (vi) facilitation of access to the national electricity transmission system for generation not yet connected to the national electricity transmission system or distribution system.

The STC Committee considers that CA047 would better facilitate the STC objectives (ii), (iii) and (v) and has a neutral impact on (i),(ii), (vi).

The amendment of the frequency ranges to meet the standard capabilities of globally available generation plant, whilst avoiding any detrimental affect on to the security of the transmission system, avoids over investment in future generation equipment and avoids introducing a barrier to market entry and therefore better facilitates STC objectives (ii) and (iii).

By amending the STC as described above this will address the consequential change that has arisen as a result of a Grid Code Modification and therefore better facilities STC objective (v).

### 3.5 Impact on Industry Documents

#### 3.5.1 Impact on core industry documents

The proposed amendment does not impact on any core industry documents

#### 3.5.2 Impact on other industry documents

The proposed amendment does not impact on any other industry documents

## 4 Recommendations

- 4.1 The STC Committee believes that amendment of the STC on the basis of CA047 would better facilitate achievement of the applicable objectives as detailed in Section 3.4. The STC Committee recommends that the Authority should approve Proposed Amendment CA047 for implementation.
- 4.2 Should the Authority approve Proposed Amendment Proposal, it is recommended that the STC be modified 5 business days after the Authority's decision.

### STC Amendment Proposal Form

CA047

#### **1. Title of Amendment Proposal**

Consequential Changes to Section K following implementation of Grid Code D/10 Frequency and Voltage Operating Range.

#### **2. Description of the Proposed Amendment (mandatory field)**

This Proposed Amendment is being raised as a consequential change as a result of Grid Code Modification - D/10 Frequency And Voltage Operating Range<sup>1</sup>. Connection Condition 6 of the Grid Code was modified 18<sup>th</sup> July 2011, to ensure that the Grid Code obligations relating to the voltage and fault ride through ranges are clear, unambiguous and are appropriately consistent with international obligations.

##### **Fault Ride Through Capability**

As highlighted in the Grid Code Modification, there is a similar conflict in the STC between the obligation to trip if the voltage measured at the Interface Point drops below 80% for more than 2 seconds and the fault ride through obligation in STC - Section K 3.1.2 which requires the Offshore Transmission System to remain connected to the Onshore Transmission System without tripping for 2.5 seconds. It is therefore recommended that STC - Section K 3.1.4 (c) should be amended from "below 80% for more than 2 seconds" to "below 80% for more than 2.5 seconds"

In addition to the consequential change this proposal also seeks to address a housekeeping error identified by National Grid in 3.1.4.(d), and recommends that it should be amended from "Interface Point or above" to "Interface Point is above".

##### **Frequency Obligations**

STC - Section K 5.4 currently references Grid Code CC.6.1.3 and states that System Frequency could rise to 52Hz or fall to 47Hz and that each Offshore Transmission System or any constituent element must be capable of:

- Continuous operation in the Frequency range 47.5Hz to 52Hz and
- For at least 20 seconds on each occasion the Frequency is below 47.5Hz

This obligation is now inconsistent with the revised obligations contained within Grid Code CC.6.1.3; it is therefore proposed to update the STC to reflect the introduction of limited operation requirements in certain frequency bands. These proposed changes have been reflected in the attached proposed legal text.

The Grid Code Working Group for D/10 recommended that the Grid Code should be modified because it was assessed to have no impact on system security and may be beneficial for the procurement of generation plant.

#### **3. Description of Issue or Defect that Proposed Amendment seeks to Address (mandatory field)**

Following the implementation of Grid Code Modification - D/10 Frequency and Voltage Operating Range, it is proposed to amend the STC to reflect the introduction of limited operation requirements in certain frequency bands and to modify the under-voltage tripping times in Section K paragraph 3.1.4 (c) which apply to Offshore Transmission systems connected to Onshore System in Scotland to align with the Grid Code Changes.



<p><b>4. <u>Impact on the STC</u></b></p> <p>Section K paragraphs 3.1.4 &amp; 5.4.</p>
<p><b>5. <u>Impact on other frameworks e.g. CUSC, BSC</u></b></p> <p>None</p>
<p><b>6. <u>Impact on Core Industry Documentation</u></b></p> <p>None</p>
<p><b>7. <u>Impact on Computer Systems and Processes used by STC Parties</u></b></p> <p>None</p>
<p><b>8. <u>Details of any Related Modifications to Other Industry Codes (where known)</u></b></p> <p>Grid Code D/10 Frequency and Voltage Operating Range changes implemented 18<sup>th</sup> July 2011.</p>
<p><b>9. <u>Justification for Proposed Amendment with Reference to Applicable STC Objectives (mandatory field)</u></b></p> <p>(b) development, maintenance and operation of an efficient, economical coordinated system of electricity transmission;</p> <p>(c) facilitating effective competition in the generation and supply of electricity, and (so far as consistent therewith) facilitating such competition in the distribution of electricity;</p> <p>(e) promotion of good industry practice and efficiency in the implementation and administration of the arrangements described in the STC;</p> <p>The amendment of the frequency ranges to better meet the standard capabilities of globally available generation plant, whilst avoiding any detrimental affect on to the security of the transmission system, avoids over investment in future generation equipment and avoids introducing a barrier to market entry and therefore better facilitates STC objectives (b) and (c).</p> <p>By amending the STC as described above this will address the consequential change that has arisen as a result of a Grid Code Modification and therefore better facilities STC objective (e).</p>

<b>Details of Proposer</b> Organisation's Name	National Grid Electricity Transmission plc
Capacity in which the Amendment is being proposed (i.e. STC Party or other Party as designated by the Authority pursuant to STC section B7.2.2.1 (b))	STC Party/Code Administrator
<b>Details of Proposer's Representative</b> Name Organisation Telephone Number Email Address	Louise McGoldrick National Grid Electricity Transmission plc 01926 655422 <a href="mailto:Louise.McGoldrick@uk.ngrid.com">Louise.McGoldrick@uk.ngrid.com</a>
<b>Details of Representative's Alternate</b> Name Organisation Telephone Number Email Address	Audrey Ramsay National Grid Electricity Transmission plc 01189 363633 <a href="mailto:Audrey.Ramsay@uk.ngrid.com">Audrey.Ramsay@uk.ngrid.com</a>
<b>Attachments (Yes/No): Yes</b>  Appendix 1 – Legal Text to support this proposal	

**Notes:**

1. Those wishing to propose an Amendment to the STC should do so by filling in this "Amendment Proposal Form" that is based on the provisions contained in Section 7.2 of the STC.
2. The Committee Secretary will check that the form has been completed, in accordance with the requirements of the STC, prior to submitting it to the Committee. If the Committee Secretary accepts the Amendment Proposal form as complete, then she/he will write back to the Proposer informing them of the reference number for the Amendment Proposal and the date on which the Committee will consider the Proposal. If, in the opinion of the Committee Secretary, the form fails to provide the information required in the STC, then he/she may reject the Proposal. The Committee Secretary will inform the Proposer of the rejection and report the matter to the Committee at their next meeting. The Committee can reverse the Committee Secretary's decision and if this happens the Committee Secretary will inform the Proposer.

The completed form should be returned to:

Lucy Hudson  
STC Committee Secretary  
Regulatory Frameworks  
National Grid  
National Grid House  
Warwick Technology Park  
Gallows Hill  
Warwick, CV34 6DA

Or via e-mail to: [lucy.hudson@uk.ngrid.com](mailto:lucy.hudson@uk.ngrid.com)

## Annex 2 - Proposed Legal Text

The following amendments shall be made to Section K of the STC

3.1.4 To avoid unwanted island operation, Offshore Transmission Systems connected to Onshore Systems in Scotland shall be tripped for the following conditions:

- (a) frequency above 52Hz for more than 2 seconds;
- (b) frequency below 47Hz for more than 2 seconds;
- (c) voltage as measured at the Interface Point below 80% for more than 2.5 seconds; and
- (d) voltage as measured at the Interface Point ~~is~~ above 120% (115% for 275kV) for more than 1 second.

Deleted: or

The times stated in (a) and (b) above are maximum trip times. Shorter times may be used to protect the integrity of an Offshore Transmission System or Power Stations connected to it.

5.4 As stated in Grid Code CC.6.1.3, the System Frequency could rise to 52Hz or fall to 47Hz. Each Offshore Transmission System or any constituent element must be capable of:

5.4.1	<u>Frequency Range</u>	<u>Requirement</u>
	<u>51.5Hz - 52Hz</u>	<u>Operation for a period of at least 15 minutes is required each time the Frequency is above 51.5Hz.</u>
	<u>51Hz - 51.5Hz</u>	<u>Operation for a period of at least 90 minutes is required each time the Frequency is above 51Hz.</u>
	<u>49.0Hz - 51Hz</u>	Continuous operation is required
	<u>47.5Hz - 49.0Hz</u>	<u>Operation for a period of at least 90 minutes is required each time the Frequency is below 49.0Hz.</u>
5.4.2	<u>47Hz - 47.5Hz</u>	Operation for a period for at least 20 seconds is required each occasion the Frequency is below 47.5Hz.

For the avoidance of doubt, disconnection, by frequency or speed based relays is not permitted within the frequency range 47.5Hz to 51.5Hz, unless NGET has agreed to any Frequency-level relays and/or rate-of-change-of Frequency relays which will trip such Offshore Transmission System and any constituent element within this Frequency range, under the relevant Offshore TO Construction Agreement or Transmission Interface Site Specification.