

# ***STCP 16-1 Issue 004 Investment Planning***

## ***STC Procedure Document Authorisation***

<b>Company</b>	<b>Name of Party Representative</b>	<b>Signature</b>	<b>Date</b>
National Grid Electricity Transmission plc			
SP Transmission Ltd			
Scottish Hydro-Electric Transmission Ltd			
Offshore Transmission Owners			

## ***STC Procedure Change Control History***

Issue 001	26/05/2005	First Issue following BETTA Go-Live
Issue 002	25/10/2005	Issue 002 incorporating PA034, PA037 and PA039
Issue 003	17/12/2009	Issue 003 incorporating PA048 and changes as a result of the Offshore regime
Issue 004	07/10/2011	Issue 004 incorporating PA061

## 1 Introduction

### 1.1 Scope

1.1.1 This procedure applies to NGET and each TO. For the purposes of this document, TOs are:

- SPT; and
- SHETL.
- all Offshore Transmission Licence holders as appointed by the Authority.

### 1.2 Objectives

1.2.1 This STCP describes the processes and procedures for investment planning and, individual project development across both the NGET -TO and TO -TO interfaces.

## 2 Key Definitions

### 2.1 For the purposes of STCP 16-1:

- 2.1.1.1 **Agreement Date** means the date by which NGET should have suitable agreements in place with the User for the purposes of undertaking the works. The agreement date stipulated by a TO shall be no less than 3 months before the date of commencement of the works
- 2.1.2 **Distribution Network Operator** means a holder of a Distribution Licence.
- 2.1.3 **Investment Planning Study Guidelines** means a document agreed between NGET and the TOs that specify various agreed details in relation to updating the Investment Plan, including the programme and assumptions made in the studies.
- 2.1.4 **Joint Planning Committee (JPC)** means the committee formed under section 4.1.1.
- 2.1.5 **Joint System Development Liaison group (JSDL)** means the groups formed under section 4.1.2.
- 2.1.6 **Operational Assessment** means an estimate of the system constraint costs against the Project Listings proposed by the relevant TOs.
- 2.1.7 **Project Listings** means a summary of proposed projects to modify the National Electricity Transmission System corresponding to a set of planning assumptions, i.e. to accommodate new connections, modification to existing connections, and National Electricity Transmission System reinforcements. Each entry on the Project Listing will have referenced a completed Project Listing Document (see Appendix B).
- 2.1.8 **Project Listing Document (PLD)** means a document describing a specific project or set of projects to modify the National Electricity Transmission System (see Appendix A and A1).
- 2.1.9 **Relevant Standards** means the National Electricity Transmission System Security and Quality of Supply Standard (NETS SQSS).
- 2.1.10 **Week 24 Data Submission** means that data which is submitted to NGET by Users in week 24 (as defined in Grid Code).
- 2.1.11 **Initial Outage Plan** means the outage plan developed in Years 3-6.

## 3 General Provisions

### 3.1.1 Nuclear Site Licence Provisions Agreement

When following this process where this may interact with, impact upon or fall within the boundary of a Nuclear Site Licence holder's site, or may otherwise have any form of affect

and/or implication for a nuclear power station consideration must be given to the relevant provisions of the applicable Nuclear Site Licence Provisions Agreement, the CUSC Bilateral Connection Agreement for that site, paragraph 6.9.4 of the CUSC and Section G3 of the STC to ensure compliance with all of these obligations.

## **4 Procedure**

### **4.1 Committees/Liaison Groups**

#### 4.1.1 Joint Planning Committee

4.1.1.1 The Joint Planning Committee (JPC), consisting of named representatives from NGET and each TO, shall facilitate the co-ordination between the Parties of investment planning and the production of the SYS. The JPC will provide the governance and framework for investment planning between the TO companies. The JPC shall meet bi-annually, however the frequency of the meeting can be varied with the agreement of all Parties.

4.1.1.2 It is envisaged that agenda items for consideration at a meeting may include, for example:

- discussion of draft Investment Planning Demand backgrounds and the Investment Planning Ranking Orders by NGET ;
- the agreement of tolerances for the Boundary of Influence studies;
- agreement for the sharing of information and commitment of necessary resources to facilitate the Investment Planning and SYS Models by Parties;
- resolution of modelling issues, including contingencies and tolerances for consistency checking;
- review and consistency checking of the NETS Models for Investment Planning and SYS production;
- the production of Project Listings and supporting Project Listing Documents (PLDs) by all Parties;
- production and progress of planning requests
- the Operational Assessment performed by NGET ;
- the programme for annual production of Project Listings and supporting PLDs. (NB this is envisaged as an annual process but could be updated on an ad-hoc basis); and review of progress with proposed and issued Grid Code and/or SQSS derogations.
- Reports and feedback from any Sub Groups of the JPC.

4.1.1.3 Further to the JPC meeting, sub groups of the JPC will meet each quarter to ensure that the governance and principles of investment planning agreed by the JPC is in place across all TO companies. It is envisaged that two sub groups may be required, one to discuss issues of investment planning and modelling and a separate sub group to look at the long term placement of outages and associated Operational Assessment.

4.1.1.4 Each JPC meeting will include an update from the associated Sub Groups to include relevant discussions, actions and agreements. Relevant JPC members will receive the minutes of the appropriate Sub Groups.

4.1.1.5 It is envisaged that the Investment Planning Sub Group may meet between 2 and 4 times a year as appropriate. Agenda items for consideration at a meeting of the Investment Planning Sub Group may include, for example:

- The production of draft Investment Planning Demand backgrounds and the Investment Planning Ranking Orders by NGET ;

- Review of the tolerances for the Boundary of Influence studies;
- Review of information shared and confirmation of the key milestones to be met by each TO for the purpose of investment planning and the production of SYS and ODIS models.
- application of modelling issues, including contingencies and tolerances for consistency checking;
- review and consistency checking of the NETS Models for Investment Planning and SYS production in detail;
- the review of Project Listings and supporting Project Listing Documents (PLDs) by all Parties;
- Review of planning requests
- Review of TORIs
- review of outstanding and expected derogations against the NETS SQSS or grid code.
- Feedback and guidance from the JPC.

#### 4.1.1.6 Operational Assessment Sub Group

It is envisaged that this group may meet between 2 and 4 times a year as appropriate. Agenda items for consideration at a meeting of the Operational Assessment Sub Group may include, for example:

- Review of Initial Outage Plans using long term planning data as agreed at Investment Planning Sub Group meetings
- Discussion of outage placement
- Discussion of Operational Assessment report
- Discussion on how costs may be reduced and programmes optimised.
- Feedback and guidance from the JPC.

4.1.1.7 It is not expected that all Parties will attend each JPC sub group meeting. Attendance at the sub groups of the JPC will be necessary only where the discussion is relevant to the TO and as determined by the boundary of influence.

4.1.1.8 The meetings described above may be supplemented with ad-hoc meetings as required. The JPC and its associated sub groups do not preclude separate bilateral TO-TO, or TO-NGET meetings.

4.1.1.9 The JPC may appoint other sub-groups as appropriate to consider specific issues. It is envisaged that such sub-groups, for example, may be set up to consider:

- dynamic models of new generators;
- System stability; or
- modelling consistency issues.

#### 4.1.2 Joint System Development Liaison Group

4.1.2.1 A Joint System Development Liaison group (the JSDL) may be formed with a User for the purpose of investment planning co-ordination. Such groups shall be organised by NGET and formed at the request of NGET or a TO.

4.1.2.2 The JSDL shall consist of named representatives from the relevant User, NGET and the relevant TO or TOs. The JSDL shall meet twice a year, although the frequency of

the meetings can be varied with the agreement of all members of the JSDL. The agenda at the meeting may include, for example:

- all parties' relevant projects from the Project Listings, including infrastructure and asset replacement projects;
- Information about Grid Supply Points (DNOs only);
- Information about Outages; or
- Information about general issues.
- Information about embedded generation activity

## **4.2 Production of Investment Planning Project Listings**

4.2.1 The JPC shall, at the first meeting of the calendar year, discuss and agree the programme, and key milestones for delivery of, the annual investment plan, which shall be documented in the agreed Investment Planning Study Guidelines.

4.2.2 The Parties shall review the Boundaries of Influence and produce the Hybrid NETS Investment Planning Model and Summer Minimum NETS Investment Planning Model in accordance with STCP 22-1 Production of Models for NETS System Planning.

4.2.3 Each Party shall perform analysis on these Models based on the requirements of the Relevant Standards, including any sensitivity analysis considered relevant. Both the deterministic and economic requirements of the Relevant Standards shall be taken into account in any analysis.

4.2.4 Each Party shall consider future infrastructure reinforcements when considering any non-compliance with the Relevant Standards identified by the security analysis. Each Party shall also consider any new connection or asset replacement projects that are required, and will look to co-ordinate any future infrastructure reinforcements with such projects. Each Party shall also consider enduring changes to the capability of existing assets.

4.2.5 Each Party shall provide a Project Listing and associated PLDs to other relevant TOs for each project within their Boundary of Influence to facilitate the co-ordination of TOs' Transmission Investment Plans and the NGET Investment Plan, and Outage planning. This will be in accordance with Section D of the STC.

4.2.6 For each Party's projects, that Party shall produce an initial PLD, in such detail as is reasonably practicable and appropriate at the time, which may include the following items:

- project name;
- brief narrative;
- any changes to node and line data
- schematic diagram;
- key dates (including commissioning date, date by which stage by stage drawings will be available and date of initial Commissioning Panel meeting); and,
- outline Outage requirements (circuits, duration, order and Emergency Return to Service Times).
- and Agreement Date (if applicable)
- mathematical models in Laplace transform block diagram format to represent any dynamic control schemes present in the Transmission System. For the avoidance of doubt this includes equipment designed to meet the dynamic voltage control requirements of STC Section K, HVDC converter installations and series capacitors.

- 4.2.7 Where a TO identifies a number of options for system reinforcement or modification that meet the deterministic and economic requirements of the Relevant Standards, they may request additional data from NGET in order to complete a more detailed economic comparison of the options. This request will be in the form of a planning request as set out in Appendix C. Additional data may include estimates of MWh & MVARh costs, constraint volumes and constraint locations.
- 4.2.8 NGET shall provide any data to the TO as reasonably requested in 4.2.7, to facilitate economic comparison of TO options. The data will not however, be detailed about the economics of any particular generator.
- 4.2.9 The TOs shall provide a Project Listing and associated PLDs to other TOs for each of the Parties.
- 4.2.10 All Parties shall review projects which fall within their Boundary of Influence that have been provided by other Parties in 4.2.5. Parties shall review and provide comments on these projects to consider whether they are co-ordinated, economic, and efficient.

### **4.3 Production of Planning Requests.**

- 4.3.1 In accordance with section 2.4.1. of section D of the STC any party may submit to another party a request to consider network changes to improve working methods or reduce costs to the industry.
- 4.3.2 The planning request will be submitted in the format shown in Appendix C.
- 4.3.3 The technical and operational impacts of the requested change will be discussed through the Investment Planning Sub Groups. The Operational Assessment Sub Group will consider the impact of the request on the Initial Outage Plan and associated Operational Assessment.

### **4.4 Operational Assessment**

- 4.4.1 NGET shall develop Initial Outage Plans using information from the PLDs for Years 3-6. A Provisional Outage Plan will then be developed in accordance with section 3 of STCP 11-1 for Year 2. Parties will record information about Initial Outages in the NGET outage database as in Appendix B of STCP 11-1. The Initial Outage Plan will be updated at least twice each year.
- 4.4.2 NGET shall use the Initial Outage Plan to perform an Operational Assessment. The Operational Assessment will be discussed at a meeting which follows the Investment Planning Sub Group forums.
- 4.4.3 The initial Operational Assessment will be based on the Investment Planning Background with any additional sensitivities agreed by the JPC and the appropriate JPC sub group. The Operational Assessment shall be based on node and line data and include:
- a calculation of constraint costs during the construction phase, based on the Outage information provided in the PLDs; and,
  - an estimate of enduring constraint costs, based on average circuit availabilities and plausible planned Outage scenarios.
  - PLDs will be included for construction and asset replacement to ensure all outages are captured as far as practicable in longer term timeframes.
  - The TO will inform NGET of any maintenance work with significant outages not captured by the construction and asset replacement PLDs; including protection change works.
- 4.4.4 NGET shall prepare separate Operational Assessment reports for each TO based on the results of the Operational Assessment. NGET shall send to the TO a first draft of its Operational Assessment report. The Operational Assessment report will make suggestions and comments on:

- level of constraint volumes and forecast costs
  - volume of work across a boundary or within a year.
  - problematic Outages and Outage combinations;
  - problematic transmission reinforcements;
  - operational complexity issues; and
  - outages that impact on Users.
- 4.4.5 All Parties shall consider the first draft of their Operational Assessment report and the reviews carried out under 4.4.4. Where suggested changes to the timing of Outages can be accommodated without a detrimental impact on the TOs capital programme, the relevant PLD will be updated, and revised TO Models, Project Listing and revised PLDs provided to NGET, by the TOs.
- 4.4.6 Where appropriate the relevant PLDs and planning requests will be updated where suggested to deliver work in a more economic and efficient manner.
- 4.4.7 If required, NGET shall re-perform the Operational Assessment to reflect any agreed changes to the investment plan. Where necessary, NGET shall then revise and send to the relevant TO its Operational Assessment report.
- 4.4.8 If NGET is not satisfied that the comments made in the draft Operational Assessment report have been properly considered by a TO, NGET can contact the TO to set out the concerns.
- 4.4.9 Affected Parties can hold a meeting in order to try and resolve any disagreement. If the disagreement is resolved, then the TO shall update their investment plan and associated documents or NGET acknowledge the TO's final investment plan and documentation.
- 4.4.10 Any updated Project Listing, PLDs, planning requests will be sent to all relevant Parties by NGET as appropriate.
- 4.4.11 If Parties cannot resolve the dispute, any of the Parties may refer the matter to the Authority, in accordance with the STC.
- 4.4.12 Based on the determination of the Authority, any changes required to the TOs Project Listing or PLDs will be re-issued to all affected Parties as appropriate.
- 4.4.13 The Initial Outage Plan will become part of the Provisional Outage Plan as governed by STCP 11-1. In week 6 each year the Initial Outage Plan for Year 3 shall become the Provisional Outage Plan for Year 2 and each Initial Outage Plan beyond Year 3 to Year 6 will similarly be rolled forward and a new Year 6 Plan will be started. The formal handover of plans for Years 3 to 6 will be facilitated by the Operational Assessment Sub Group.

#### **4.5 Customer Impacts**

- 4.5.1 NGET shall provide information on longer-term Project Listings on the National Electricity Transmission System that could affect Users, as part of the JSDLs' regular meetings. The information will be provided in the same form that it appears in the final PLD.
- 4.5.2 NGET shall review the final PLD and identify developments on the National Electricity Transmission System that could impact on Transmission Connection Assets.
- 4.5.3 NGET shall follow appropriate CUSC processes to gain agreement with the affected User(s) prior to the commencement of works and in accordance with 4.7.3. and 4.7.4. of this document.

#### **4.6 Quarterly Investment Plan Update**

- 4.6.1 Each TO shall make a formal update to its Investment Plan every quarter (including Project Listing, any changed PLDs and appropriate TO Models). Any material

changes in between the quarterly updates (including schemes changing status from planned to firm and new schemes being added to the plan) shall be notified as soon as possible via an email to NGET and the appropriate TO if within Boundary of Influence. Any Party may request further details about proposed changes, e.g. updated models or PLDs if required. Planning requests should be included in the long term investment plan.

#### **4.7 Changes to Planning Assumptions**

4.7.1 At any time, NGET may produce new Planning Assumptions either as a consequence of a TO requesting additional information from NGET (this may follow the TO receiving notification from NGET of a disconnection notice), or if NGET decides it is appropriate to produce new Planning Assumptions. In such cases, the Parties shall agree which parts of the process in section 4.2 shall be followed to produce revised Project Listings and their associated revised or new Project Listing Documents.

#### **4.8 Detailed Option Development**

##### **4.8.1 Economic Analysis**

4.8.1.1 Any party can submit a planning request to NGET to facilitate a more detailed Operational Assessment for a proposed reinforcement.

4.8.1.2 NGET shall provide economic data at the request of the TO. For the avoidance of doubt, the data will not be detailed about the economics of any particular User.

4.8.1.3 NGET shall provide comments on the project to the relevant TO. This will include for example:

- minor changes to timing to enable best fit with other projects;
- changes to design to minimise constraints;
- any impact on NGET assets; and
- estimate of impact, if any, on User assets.

4.8.1.4 Following receipt of any comments from NGET, the TO shall assess NGET's comments, and revise the project and appropriate investment plan accordingly. At the TO's discretion the status of the project within Project Listings will then be flagged as "firm". At this stage the scheme can still be changed. Any resulting changes in Initial Outages shall be discussed by the Operational Assessment Sub Group in accordance with STCP 11-1 Outage Planning.

##### **4.8.2 Changes to NGET assets**

4.8.2.1 If changes to NGET assets are required as a result of a TO project, NGET shall consider the necessary works in accordance with its Investment Planning process. Should these be considered appropriate, NGET may include them within the NGET Project Listings. These works will be added to NGET Project Listings and flagged as "firm".

##### **4.8.3 Changes to Transmission Connection Assets**

4.8.3.1 Where changes to Transmission Connection Assets identified in the PLD by the TO are due to asset life expiry, NGET shall issue a Replacement Notice to the User in accordance with the CUSC. NGET shall request a TO Construction Offer from the TO, in accordance with STCP 18-1

4.8.3.2 Where changes to Transmission Connection Assets identified in the PLD by the TO are triggered by the increased capability of the NETS Transmission System (i.e. change in supply voltage, increase in fault levels, etc) NGET shall issue a Modification Notification to the User, in accordance with the CUSC. Following receipt of a Modification Application from the User, NGET shall request a Construction Offer

from the TO in accordance with STCP 18-1. This offer shall be issued no sooner than 6 months after the Asset Replacement Notice in section 4.7.3.1.

4.8.3.3 For the avoidance of doubt, and subject to sub-paragraph 4.7.3.4, a TO shall not undertake any Modification unless and until NGET has notified such TO that NGET has either agreed such Modification with the affected User or that any dispute between NGET and the User in relation to such Modification has been determined by the Authority pursuant to the CUSC.

4.8.3.4 Each TO shall take all reasonable steps to avoid exercising its rights pursuant to this sub-paragraph 4.7.3.4 but, in the event that it has reasonable grounds to believe, given its Transmission Licence and statutory duties, that a Transmission Connection Asset should be replaced prior to notice being received pursuant to sub-paragraph 4.7.3.2, the TO shall consult with NGET as far as reasonably practicable but shall be entitled to replace such Transmission Connection Asset.

#### **4.8.4 User works required**

4.8.4.1 If User works are identified by the TO and notified in the PLD, NGET shall submit a Modification Notification to the User in accordance with the CUSC. In the event that a Modification Application is received from the User, NGET shall submit a Modification Application to the TO in accordance with STCP 18-1

4.8.4.2 For the avoidance of doubt, and subject to sub-paragraph 4.7.4.3, a TO shall not undertake any Modification unless and until NGET has notified such TO that NGET has either agreed such Modification with the affected User or that any dispute between NGET and the User in relation to such Modification has been determined by the Authority pursuant to the CUSC.

4.8.4.3 Each TO shall take all reasonable steps to avoid exercising its rights pursuant to this sub-paragraph 4.7.4.4 but, in the event that it has reasonable grounds to believe, given its Transmission Licence and statutory duties, that a Transmission Connection Asset should be replaced prior to notice being received pursuant to sub-paragraph 4.7.4.2, the TO shall inform NGET and consult with NGET as far as reasonably practicable but shall be entitled to replace such Transmission Connection Asset.

**Appendix A: Project Listing Document.**

<b>Project Listing Document</b>												<b>Ver 3.1</b>							
Project Number																			
Project Name																			
Description																			
Scheme Driver																			
Project Status																			
Document Reference																			
Planning Background																			
Version Number of Document																			
Project List Item Authorisation																			
Company																			
Representative																			
Date																			
Does this scheme trigger the replacement of Transmission Connection Assets?												Yes		Date user agreement required			No Site Start Date		
Will the scheme trigger User works?																			
Material Impact																			
Comments																			
<b>Schematic Diagram</b>																			
<b>Indicative Outages (where appropriate)</b>																			
Enter OUTLINE outage needs by circuit, in weeks (use format <b>ww.d</b> ) for the appropriate outage years																			
Circuit																			
Circuit ID																			
2008/09																			
2009/10																			
2010/11																			
2011/12																			
2012/13																			
2013/14																			
2014/15																			
2015/16																			
2016/17																			
Key Programme Dates																			
Site Start																			
Final Commissioning Date																			
Stage by stage drawings available																			
First commissioning panel																			
<b>Node &amp; Line Data</b>																			
Data type																			
Circuit Identification																			
From																			
To																			
ID																			
Circuit Length																			
Parameters (% on 100MVA base)																			
R1																			
X1																			
B1																			
R0																			
X0																			
B0																			
Rating (MVA)																			
Wint																			
Spr/Aut																			
Sum																			
Wound Components																			
Data																			
Circuit Identification																			
From																			
To																			
ID																			
Tap range data																			
Number																			
+%																			
-%																			
Parameters (% on 100MVA base)																			
R1																			
X1																			
R0																			
X0																			
Ratings (MVA)																			
Wint																			
Spr/Aut																			
Sum																			
Laplace transform diagram of control scheme.																			

**Appendix B: Project Listing**

**Project Listing**

Planning Background	SYS 20Oct2010	
Version	1	
Last Updated	19/May/2010	
Comments		

Project Number	Project Name	Company	Material Impact	Scheme Driver	Commissioning Date	Project Status	Version	Last Updated	Replacement?	User Works?

**Appendix C: Planning request pro forma**  
**Planning Request NGET 20\*\*/00\*\***

<u>Requesting Party:</u>
<u>Party to whom request is being made:</u>
<u>Date Request made:</u>
<u>Description of requested change</u> (including reference to relevant Investment Plan where appropriate):
<u>Reason for the Planning Request</u>
<u>Outages requested</u>
<u>Assessment of Operational Impact</u>
<u>Note of any Health and Safety Issues as a result of this request.</u>
<u>Note of impact to any third party.</u>

Planning request to be submitted to appropriate Investment Planning data co-ordinator:

National Grid [IP.DATA@uk.ngrid.com](mailto:IP.DATA@uk.ngrid.com)

SHETL [Beta.rtsdata@scottish-southern.co.uk](mailto:Beta.rtsdata@scottish-southern.co.uk)

SPT [IP.Data@sppowersystems.com](mailto:IP.Data@sppowersystems.com)

## ***Appendix D: Abbreviations & Definitions***

### ***Abbreviations***

DNO	Distribution Network Operator
NETS SQSS	NETS Security and Quality of Supply Standard
JPC	Joint Planning Committee
JSDL	Joint System Development Liaison Group
PLD	Project Listing Document
SHETL	Scottish Hydro-Electric Transmission Ltd
SPT	SP Transmission Ltd
SRS	Site Responsibility Schedules
STC	System Operator Transmission Owner Code
SYS	Seven Year Statement
TO	Transmission Owner

### ***Definitions***

#### **STC definitions Used:**

Authority  
CUSC  
Customer  
Distribution Licence  
Emergency Return To Service  
National Electricity Transmission System  
Grid Code  
Modification  
NGET  
NGET Investment Plan  
Offshore Transmission Owner  
Outage  
Party  
Planning Request  
Seven Year Statement  
Transmission Connection Assets  
Transmission Investment Plan  
TO Construction Offer  
TO Construction Agreement  
Transmission Investment Plan  
User

**Grid Code Definitions Used:**

Grid Supply Points

**CUSC Definitions Used:**

Bilateral Agreement

Modification Notification

Modification Application

Modification Offer

Replacement Notice

**Definitions used in the document that are covered in other STCPs:**

Boundary of Influence – as defined in STCP 22-1.

Commissioning Panel – as defined in STCP19-4

Host TO – as defined in STCP18-1

Hybrid GB Investment Planning Model - as defined in STCP 22-1

Investment Planning – as defined in STCP22-1

Summer Minimum GB Investment Planning Model - as defined in STCP 22-1

TO Model - as defined in STCP 22-1

Ranking Order – as defined in STCP 22-1

Transmission Owner Reinforcement Instruction (TORI) – as defined in STCP 18-1.

Provisional Outage Plan – as defined in STCP 11-1

Draft Outage Plan – as defined in STCP 11-1