STCP 08-3 Issue 005: Operational Tests and System Tests

CM089 – Electricity System Restoration Standard
19 April 2023

STC Procedure Document Authorisation

Party	Name of Party Representative	Signature	Date
National Grid Electricity System Operator Ltd			
National Grid Electricity Transmission			
SP Transmission Ltd			
Scottish Hydro-Electric Transmission Ltd			
Offshore Transmission Owners			

STC Procedure Change Control History

Issue 001	16/03/2005	BETTA Go-Live Version
Issue 002	26/05/2005	Issue 002 incorporating PA008
Issue 003	25/10/2005	Issue 003 incorporating PA034 and PA037
Issue 004	24/11/2009	Issue 004 incorporating changes for Offshore Transmission
Issue 005	01/04/2019	Issue 005 Incorporating changes for Offshore Transmission
Issue 006	04/04/2023	Issue 006 Incorporating changes for facilitation of the Electricity System Restoration Standard

1 Introduction

1.1 Scope

1.1.1 This procedure applies to the arrangements and processes across the NGESO-TO interface for System Tests or operational tests including System RestorationBlack Start Tests and Power Island tests including the facilitation of Distribution Restoration Zone tests where applicable as part of a Distribution Restoration Zone Plan. This procedure does not include tests associated with commissioning activities, which are the subject of STCP 19-4 Commissioning and Decommissioning.

1.1.2 System Tests or operational tests may involve single items of Plant and Apparatus through to whole sections of the National Electricity Transmission System.

1.1.3 System Tests or operational tests may be proposed by NGESO or the TO.

1.1.4 This procedure describes the data exchange requirements between NGESO and the TOs to facilitate planning and implementation of System Tests or operational tests.

1.1.5 This procedure applies to NGESO and each TO where, for the purpose of this document, the TOs are:

- NGET;
- SPT; and
- SHETL
- All Offshore Transmission Licence holders as appointed by OFGEM

In the event that specific conditions or exceptions are made in the document relating to an Onshore TO or Offshore TO these will be prefixed appropriately.

1.2 Objectives

1.2.1 This procedure specifies the following:

- the responsibilities of NGESO and the TO in relation to System Tests or operational tests, including System RestorationBlack Start Tests, and Power Island tests and the facilitation of Distribution Restoration Zone tests undertaken by Network Operators;
- the requirements for exchange of information across the NGESO -TO interface in relation to these Tests; and
- the means of communication to be used across the NGESO -TO interface.

1.2.2 This procedure is designed to enable the Parties to discharge their responsibilities under the STC and to ensure that responsibilities are clear.

2 Key Definitions

2.1 For the purposes of STCP 08-3:

2.1.1 **Operational Effect** is as defined in the Grid Code as at the Code Effective Date and for purposes of this STCP only, not as defined in the STC.

2.1.2 **Tests Proposer** means the Party proposing Tests.

2.1.3 **Tests Proposal** means an outline provided in writing of the actions proposed to be carried out as part of Tests involving Plant and Apparatus forming part of the National Electricity Transmission System.

3 Process

3.1 General

3.1.1 All Tests shall be planned to ensure all Plant and Apparatus remains within the applicable capability limits specified by the asset owner and carried out such that there is minimal impact on the National Electricity Transmission System. All Outage requests for Tests shall be progressed in accordance with STCP 11-1 Outage Planning.

3.1.2 System Restoration~~Black Start~~ Tests may involve energisation~~synchronisation~~ of Plant~~generation~~ to the National Electricity~~-~~ Transmission System or connection of Demand remote from the ~~Black Start~~Anchor Plant ~~Station~~ or synchronisation of Top Up Restoration Plant. In the case of a Distribution Restoration Zone test which includes Transmission equipment, this would be initiated by the Network Operator and may involve one or more Restoration Contractors who own and operate plant connected to the Network Operator's System. To facilitate these tests, the Network Operator will need to liaise with NGESO in which case there may be occasions where NGESO and the TO in coordination with the Network Operator configure the TO's network to facilitate the Distribution Restoration Zone test

3.1.3 Operation of some Plant and Apparatus may be temporarily transferred to the TO by formal agreement between NGESO and the TO as part of the Tests programme.

3.1.4 NGESO shall be responsible for obtaining the agreement with a User for Tests to proceed. If NGESO gives permission for the TO to act as the point of contact, the TO shall contact and advise the User that the TO has become the point of contact and that Tests shall commence shortly.

3.1.5 The category of Tests (either minor or major) shall be agreed by the Parties involved as part of operational liaison. Major Tests are those considered sufficiently complex by a party to require a detailed Tests programme to be submitted in accordance with Section 3.2 below. Tests categorised as minor shall not require a detailed Tests programme to be submitted. Tests may include switching Plant out of service using Protection Apparatus. Tests relating to System Restoration would generally be completed in accordance with the relevant Restoration Plan as provided for in OC9.4.7.6.2 of the Grid Code and/or the general testing requirements of OC5.7 of the Grid Code.

3.2 Tests Procedure Preparation

Tests Proposal

3.2.1 If the Tests Proposer is a TO, then the following provisions shall apply:

3.2.1.1 The TO shall be responsible for providing the Tests Proposal to NGESO in accordance with this procedure.

3.2.1.2 The TO shall, as soon as reasonably practicable, submit a Tests Proposal to NGESO. Where practicable, this Tests Proposal shall be submitted to NGESO a minimum of 13 weeks prior to the date of the Tests. The TO shall endeavour to ensure sufficient detail is included in the Tests Proposal to allow the affected parties to assess the impact of the Tests on the National Electricity Transmission System and User Systems.

3.2.1.3 The TO shall be responsible for change control of the Tests Proposal and shall issue a revised Tests Proposal to NGESO, as soon as reasonably practicable. NGESO shall be responsible for liaising with an affected User or affected TO accordingly.

3.2.1.4 NGESO shall, as soon as reasonably practicable, provide to each affected User or other affected TO a copy of the Tests Proposal and all updates thereof.

3.2.1.5 NGESO and the TO shall assess the implications and agree the category of the Tests as soon as reasonably practicable. NGESO shall liaise with each affected User and/or affected TO and seek their agreement to the Tests Proposal and collate and co-ordinate their responses to the TO.

3.2.1.6 If the Tests Proposal is not acceptable to NGESO, an affected User or affected TO, NGESO shall refuse the Tests Proposal and shall immediately inform the TO. That TO may choose to revise and re-submit the Tests Proposal in accordance with this procedure or raise a dispute.

3.2.2 If the Tests Proposer is NGESO, then the following provisions shall apply:

3.2.2.1 NGESO shall, as soon as reasonably practicable, submit a Tests Proposal to each affected TO and/ or affected User in accordance with this procedure. Where practicable, this Tests Proposal shall be submitted to the TO a minimum of 13 weeks prior to the date of the Tests. NGESO shall endeavour to ensure sufficient detail is included in the Tests Proposal to allow the parties to assess the impact of the Tests Proposal on the TO assets and User Systems.

3.2.2.2 NGESO shall be responsible for change control of the Tests Proposal and shall issue to each affected TO and/or affected User, as soon as reasonably practicable, a copy of the Tests Proposal and all updates thereof. NGESO shall be responsible for liaising with each affected User or affected TO.

3.2.2.3 NGESO and each affected TO shall assess the implications and agree the category of the Tests as soon as reasonably practicable. NGESO shall liaise with each affected User and/or affected TO and seek their agreement to the Tests Proposal.

3.2.2.4 If the Tests Proposal is not acceptable to an affected User or affected TO, NGESO may choose to revise and re-submit the Tests Proposal to each affected TO and/or affected User in accordance with this procedure or raise a dispute.

Detailed Tests Programme

3.2.3 If the Tests Proposer is a TO, then the following provisions shall apply:

3.2.3.1 As soon as practical after agreement to the Tests Proposal, the TO shall provide an Outage request to NGESO detailing the Plant and Apparatus involved in accordance with STCP 11-1 Outage Planning and STCP 11-2 Outage Data Exchange.

3.2.3.2 The TO will provide, as soon as reasonably practicable, a draft Tests programme, taking account of any asset related issues, to a level of detail including, but not limited to, the content shown in Appendix B.

3.2.3.3 The TO shall be responsible for change control of the draft Tests programme and shall issue, as soon as reasonably practicable, revised draft Tests programmes, where appropriate, to NGESO. NGESO shall be responsible for liaising with the TO, any affected User and/or affected TO.

3.2.3.4 NGESO shall provide to each affected User and/or affected TO a copy of the draft Tests Programme and all updates thereof.

3.2.3.5 NGESO shall liaise on the implications of the Tests programme with each affected User and/or affected TO and seek their agreement to the Tests programme. NGESO shall collate and co-ordinate the responses to the TO.

3.2.3.6 NGESO and the TO shall each assess the implications on the Tests programme:

- NGESO shall assess the National Electricity Transmission System implications;

- the TO shall assess the implications of the Tests programme on that TO assets and advise NGESO of any asset related issues;
- NGESO and the TO shall agree any changes required to the Tests programme; and
- NGESO will liaise with each affected User and/or affected TO to confirm their agreement to the Tests programme changes.

3.2.3.7 When all issues raised have been addressed to the reasonable satisfaction of all parties and the draft Tests programme agreed by all parties, the agreed Tests programme shall be issued by the TO to NGESO. This shall normally be at least 15 Business Days prior to the commencement date of Tests unless otherwise agreed.

3.2.3.8 NGESO shall provide as soon as reasonably practicable to each affected User and/or affected TO a copy of the agreed Tests programme and all updates thereof.

3.2.3.9 In the event that NGESO is informed that a party has identified a need for essential changes to the agreed Tests programme, NGESO shall inform the relevant TO as soon as reasonably practicable. That TO shall be responsible for change control and, as soon as reasonably practicable, issue an amended Tests programme to NGESO. Any essential changes made must be agreed and acknowledged by NGESO. NGESO shall be responsible for liaising with each affected User and/or affected TO to obtain their agreement to the Tests programme changes.

3.2.3.10 In the event that that there is a dispute regarding the acceptability or otherwise of a Tests programme or associated Outage the Tests shall not take place until the dispute has been resolved.

3.2.4 If the Tests Proposer is NGESO, then the following provisions shall apply:

3.2.4.1 On agreement of the Tests Proposal, NGESO shall agree an Outage request with each affected TO for the Plant and Apparatus involved in the Tests. Each TO shall then submit any required Outage requests as soon as practicable, and in accordance with STCP 11-1 Outage Planning and STCP 11-2 Outage Data Exchange.

3.2.4.2 NGESO will provide to each affected TO, as soon as reasonably practicable, a draft Tests programme to a level of detail, including but not limited to the content shown in Appendix B.

3.2.4.3 NGESO shall be responsible for change control of the draft Tests programme and shall provide to each affected TO and each affected User, as soon as reasonably practicable, a copy of the Tests programme and all updates thereof.

3.2.4.4 NGESO shall liaise on the implications of the Tests programme with each affected User and/or affected TO and seek their agreement to the Tests programme.

3.2.4.5 NGESO and each affected TO shall assess the implications of the Tests programme. NGESO shall assess the National Electricity Transmission System implications and convey the implications to all affected parties. Each TO shall assess the implications of the Tests programme on that TO's assets and advise NGESO of any asset-related issues. NGESO and the TO shall agree any changes required to the Tests programme. NGESO will liaise with each affected User and/or affected TO and confirm their agreement to the Tests programme changes.

3.2.4.6 When all issues raised have been addressed to the reasonable satisfaction of all parties, and the draft Tests programme agreed by all parties, the agreed Tests programme shall be issued by NGESO to each affected TO and/or affected User. This shall normally be at least 15 Business Days prior to the commencement date of Tests, unless otherwise agreed.

3.2.4.7 In the event that NGESO is informed that a party has identified a need for essential changes to the agreed Tests programme, NGESO shall be responsible for change control and issue of the amended Tests programme. Any essential changes made must be agreed and acknowledged by NGESO and each affected TO, as soon as reasonably

practicable. NGESO shall be responsible for liaising with each affected User and/or affected TO to obtain their agreement to the Tests programme changes.

3.2.4.8 In the event that that there is a dispute regarding the acceptability or otherwise of a Tests programme or associated Outage, the Tests shall not take place until the dispute has been resolved.

Planning Process Associated with Tests Requirements

3.2.5 If the Tests Proposer is a TO, then the following provisions shall apply:

3.2.5.1 Plant or Apparatus switched out of service by operation of Protection Apparatus in preparation for maintenance work shall be treated as an Outage request under STCP 11-1 Outage Planning. The Outage booking shall include the comment 'Switch out by protection'.

3.2.5.2 NGESO shall assess the National Electricity Transmission System implications of the Tests (including the proposed time, date and extent of the Tests Proposal) and convey the implications to all affected parties. NGESO shall liaise with and co-ordinate the responses to the TO from each affected User and affected TO. The TO shall assess the asset implications of the Tests and both the TO and NGESO shall agree the acceptability or otherwise of the Tests as part of normal operational liaison.

3.2.5.3 NGESO and each affected TO shall use reasonable endeavours to ensure that sufficient information is exchanged and facilities are provided where reasonably requested in order to support the planning and implementation of the Tests, and ensure that System conditions for the period of the Tests can be sufficiently modelled and monitored. NGESO shall be responsible for obtaining information reasonably requested by the TO from a User.

3.2.5.4 Prior to commencement of the Tests, the viability of the Tests' requirements shall be regularly reviewed by NGESO and the TO and the Tests may be subject to a delay at any time. Parties shall each use reasonable endeavours to ensure that any such delay is kept to a minimum. Where Tests are delayed, the process to agree alternative Test~~s~~ arrangements shall follow the process outlined in this procedure. NGESO shall be responsible for keeping the TO informed of any delays associated with or advised by other parties.

3.2.5.5 The TO shall confirm the asset Operational Capability Limits and notify NGESO of any Services Reduction Risks on assets associated with the proposed Tests.

3.2.6 If the Tests Proposer is NGESO, then the following provisions shall apply:

3.2.6.1 NGESO shall assess the National Electricity Transmission System implications of the Tests (including the proposed time, date and extent of the Tests) and convey the implications to all affected parties. NGESO shall liaise with and co-ordinate the response from each affected User and affected TO. Each affected TO shall assess the asset implications of the Tests and both the TO and NGESO shall agree the acceptability or otherwise of the Tests as part of normal operational liaison.

3.2.6.2 NGESO, and each affected TO shall use reasonable endeavours to ensure sufficient information is exchanged and facilities are provided, where reasonably requested, in order to support the planning and implementation of the Tests and to ensure that System conditions for the period of the Tests can be sufficiently modelled and monitored. NGESO shall be responsible for obtaining information reasonably requested by the TO from a User.

3.2.6.3 Prior to commencement of the Tests, the viability of the Tests' requirements shall be regularly reviewed by NGESO and the TO. This may result in Tests being delayed. Parties shall each use reasonable endeavours to ensure that any such delay is kept to a minimum. Where Tests are delayed the process to agree an alternative Tests programme must follow the process outlined in this procedure. NGESO shall be responsible for keeping the TO informed of any delays associated with other parties.

3.2.6.4 The TO shall confirm the asset Operational Capability Limits and notify NGESO of any Services Reduction Risks on assets associated with the proposed Tests.

3.3 Operational Process

3.3.1 NGESO shall be responsible for operational liaison and obtaining agreement from an affected User or affected TO for Tests to proceed:

3.3.1.1 Information exchange for Outages required as part of a Tests Programme shall take place in accordance with the requirements of STCP 11-1 Outage Planning.

3.3.2 NGESO shall co-ordinate the Tests. Where operation of Plant and Apparatus is transferred to the TO as part of the agreed Tests programme, NGESO shall inform each affected User and/or each affected TO prior to the transfer of operation.

3.3.3 In the Control Phase, the Tests shall be carried out in accordance with the requirements of STCP 1-1 Operational Switching and the Tests programme. NGESO shall inform each affected User and/ or each affected TO at the start of the Tests.

3.3.4 When Tests have commenced, any change in System, site or Test conditions that could affect or invalidate the Tests or have an Operational Effect must be communicated to other parties as soon as reasonably practicable. The Tests shall be suspended until all parties involved have assessed the implications of the change in System, site or Tests conditions. Where operation of Plant and Apparatus had been transferred to the TO, this shall be transferred back to NGESO. NGESO shall co-ordinate any communications with each affected User or affected TO on agreement reached to complete, delay or cancel the Tests programme and inform of the transfer of operation of Plant and Apparatus back to NGESO.

3.3.5 Tests may be suspended or cancelled by any party during periods of predicted or actual local adverse weather conditions. The TO shall be made aware by NGESO, as soon as reasonably practicable, of requests by an affected User or affected TO for suspension or cancellation of Tests.

3.3.6 In the event of a failure of communications between the TO and NGESO or the Tests site during the Tests, then the Tests programme shall be suspended on completion of the agreed instruction until satisfactory communications are restored and agreement is reached to continue with the Tests programme.

3.3.7 When Tests are complete, or operation of Plant and Apparatus is transferred back to NGESO due to a suspension or cancellation of the Tests, NGESO shall inform any affected User or affected TO, as soon as reasonably practicable.

4 Other Considerations

4.1.1 Tests shall normally only be carried out by NGESO or a TO on Plant and Apparatus in operational service when the results of off-load Tests would not be sufficiently rigorous in the reasonable opinion of either Party to confirm the continued satisfactory performance of the Plant or Apparatus involved.

4.1.2 NGESO and the relevant TO shall give consideration to relevant existing operating restrictions or notified Services Reductions or Services Reduction Risks when evaluating a Tests Proposal or Tests programme.

4.1.3 No Tests shall take place that could result in operation of an Operational Intertripping scheme unless this is the stated purpose of the Tests and agreement has been reached with all affected parties.

4.1.4 Where testing of an Operational Intertripping scheme is not the stated purpose of testing, then no Tests shall take place involving a circuit associated with an Operational Intertripping scheme unless the Operational Intertripping scheme is not required in service in the opinion of NGESO for the duration of the Tests. The scheme must be deselected from service by a means agreed with all affected parties.

Appendix B: Flow Diagrams

Note that the Process Diagrams shown in this Appendix B are for information only. In the event of any contradiction between the process represented in this Appendix and the process described elsewhere in this STCP, then the text elsewhere in this STCP shall prevail.

STCP 8-3 Operational/System Tests
External / Test proposer
SO
TO
C
In Control Phase Tests proposer contacts SO to start Operational / System Tests
Affected Users/ affected TO informed (as appropriate)
SO contacted by Tests propooser. Operational / System Tests in accordance with agreed Tests programme and STCP 1-1 'Operational Switching'
2.13 TO and SO carry out Tests programme in conjunction with Tests proposer
Is there a change in the system, site or testing conditions ?
No
Affected Users/ affected TO informed
Tests proposer informed
SO informed
Yes
Yes
TO informed
Tests proposer, SO and TO assess implications of changes
Agree to complete,delay or cancel Tests ?
Complete
Affected Users/affected TO informed Tests to be recommenced
Delay
Detailed Tests programme completed
SO informed
After delay period SO / TO agree to continue Tests
Cancel
Affected Users/ affected TO informed
SO informed
Affected Users/ affected TO informed
SO informed
SO / TO restore transmission system to normal running
End

Appendix B: Tests Programme

B1 A detailed Tests programme for major testing shall:

B.1.1 have a unique identifier allocated by the Tests Proposer and indicate the current version and issue number;

B.1.2 define the means of communication and location of all parties involved in the Tests;

B.1.3 follow an agreed change control process for changes to the Tests programme;

B.1.4 specify any associated documentation and diagrams forming part of the Tests programme and ensure these shall be accessible to all recipients of the Tests programme;

B.1.5 identify the Plant and Apparatus subject to the Tests and any other Plant and Apparatus that could be affected;

B.1.6 identify any Operational Effects or potential Operational Effects associated with the Tests;

B.1.7 identify any Services Reductions or Services Reduction Risks associated with the Tests;

B.1.8 outline the initial conditions of the Plant and Apparatus subject to the Tests;

B.1.9 detail any temporary protection settings or Protection Apparatus required for the purposes of the Tests together with the settings applied; and,

B.1.10 provide a detailed Tests schedule with location, action, any expected result and/or Operational Effect identified for each item of the Tests programme.

B2 For complex Tests breakpoints should be identified where the Tests programme can be suspended and restarted without undue risk and with minimum disruption.

Appendix C: Abbreviations & Definitions

Abbreviations

SHETL	Scottish Hydro-Electric Transmission Limited
SPT	SP Transmission Ltd
STC	System Operator Transmission Owner Code
TO	Transmission Owner

Definitions

STC definitions used:
Apparatus
~~Black Start~~
Distribution Restoration Zone Plan
National Electricity Transmission System
NGESO
NGET
Operational Capability Limits
Outage
Party
Plant
Restoration Contractor
Restoration Plan
Service Reduction
Service Reduction Risk
System
System Restoration
Tests
Transmission Owner
User

Grid Code definitions used:
Anchor
Anchor Restoration Contract
~~Demand~~
~~Black Start Tests~~
~~Black Start Stations~~
Control Phase
Demand
Distribution Restoration Zone
Network Operator
Operational Effect
Operational Intertripping
Power Island
Protection Apparatus
Restoration Plan
System Tests
Top Up Restoration Contract
Top Up Restoration Plant

Definition used from other STCPs:
NGET Outage Database – STCP11-1