















# **STCP27-01 Issue ~~001~~002 System Performance Monitoring Requirements**

## **STC Procedure Document Authorisation**

<b>Company</b>	<b>Name of Party Representative</b>	<b>Signature</b>	<b>Date</b>
National Grid Electricity Transmission (NGET)			
SP Transmission Ltd			
Scottish Hydro-Electric Transmission Plc			
Offshore Transmission Owners			
<u>National Grid Electricity System Operator (NGESO)</u>			

## **STC Procedure Change Control History**

Issue 1		
Issue 2		
Issue 3		



## 1 Introduction

### 1.1 Scope

- 1.1.1 The provision of synchronised system performance data is essential for the effective and secure operation of the National Electricity Transmission System. This document defines the Synchronised Data to be provided to ~~NGET~~NGESO by the TOs for the purposes of system performance monitoring both for Real-Time Interrogation and Post-Event analysis.
- 1.1.2 This procedure applies to ~~NGET~~NGESO and each TO for the provision of Synchronised Data.
- 1.1.3 For the purposes of this document, the TOs are:
- ◁ TO in England and Wales (NGET)
  - ◁ SPT; and
  - ◁ SHET; and
  - ◁ Offshore Transmission Licence Holders as appointed by Ofgem that are not radially connected.

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 The objective of this document is to provide for:
- ◁ the provision of the Synchronised Data described in Appendix B to ~~NGET~~NGESO by each TO for the purposes of real-time system performance monitoring and post-Event system performance monitoring (in addition to the requirements for Post Event Analysis and Reporting set out in STCP 03-1);
  - ◁ the installation of devices for the measurement of Synchronised Data by the TOs; and
  - ◁ the requirements to ensure all data is to be securely and reliably transmitted.

### 1.3 Background

- 1.3.1 This policy will provide ~~NGET~~NGESO and TOs with appropriate and accurate Synchronised Data to monitor asset and overall system performance thus permitting secure operation, optimum utilisation of the system and the ability to clearly evidence the cause and sequencing of system Events. Continual monitoring and benchmarking of the system's performance, in line with the expected behaviour from offline models, is now essential to the secure operation of the power network. Increased visibility and understanding of emerging system conditions in real-time is also necessary.
- 1.3.2 The Synchronised Data provided pursuant to this STCP will be used in post-Event analysis to validate the system's performance in line with the Security and Quality of Supply Standard (SQSS) and in comparison with the expected system behaviour as determined by system models. In addition, the information gathered is essential in assessment of future networks as outlined in the System Operability Framework (SOF).

- 1.3.3 With a view to providing enhanced visibility of system conditions, the Synchronised Data provided pursuant to this STCP will have sufficient accuracy and resolution to be used in real-time by the Electricity National Control Centre (ENCC) for the following types of monitoring:
- ◁ Dynamic and transient stability monitoring
  - ◁ Oscillatory stability analysis
  - ◁ Frequency monitoring
  - ◁ NPS and phase unbalance
  - ◁ Enhanced state estimation
- 1.3.4 With a view to enhancing post-Event analysis in accordance with STCP 03-1, the post-Event data provided pursuant to this STCP will have sufficient accuracy and resolution to be used for the following types of monitoring:
- ◁ Frequency events and RoCoF/inertia studies
  - ◁ Stability studies – the source/cause of oscillations and the impact to the wider system
  - ◁ Greater understanding of the systems performance to enable greater utilisation of system assets and improvements to system models:
  - ◁ System performance trends
  - ◁ Waveform perturbation

## 2 Key Definitions and Interpretation

### 2.1 *For the purposes of STCP27-1:*

- 2.1.1 **Event** is as defined in STCP 03-1.
- 2.1.2 **Measurement Point** means any point at which a TO is capable of measuring Synchronised Data in accordance with 3.1.1.
- 2.1.3 **Real-Time Interrogation** means live streaming of data, as specified in Appendix B, in accordance with IEEE C37.118 (the IEEE Standard for Synchrophasor Measurements for Power Systems).
- 2.1.4 **Synchronised Data** means data which has been time-stamped at source.

## 3 Procedure

### 3.1 *Installation of Devices for the Measurement of Synchronised Data*

- 3.1.1 Where and to the extent not already installed, each TO shall install devices for the measurement of Synchronised Data specified in Appendix B:
- ◁ at or in the vicinity of each agreed Grid Supply Point; and
  - ◁ where and to the extent agreed between ~~NGET~~NGESO and the relevant TO, at each point where an Interconnector or Generator is directly connected to the National Electricity Transmission System.

- 3.1.2 Such installation shall take place as soon as reasonably practicable and in any event before 31 March 2026 or, if later, the final day of the RIIO-2 price control period applying to NGETNGESO in accordance with its Transmission Licence.

### **3.2 TO Data Provision for GB System Performance Monitoring**

- 3.2.1 After each TO has completed the installation of devices for the measurement of Synchronised Data in accordance with 3.1, each TO shall provide NGETNGESO with the Synchronised Data specified in Appendix B. NGETNGESO shall provide a secure method for collection of the Synchronised Data.
- 3.2.2 Each TO shall provide the Real-Time Interrogation data specified in Appendix B in respect of sites of operational importance notified by NGETNGESO from time to time.
- 3.2.3 Any Real-Time Interrogation data to be provided by each TO to NGETNGESO under this STCP shall comply with IEEE C37.118 (the IEEE Standard for Synchrophasor Measurements for Power Systems).
- 3.2.4 Each TO shall provide the post-Event data specified in Appendix B upon receipt of a reasonable request from NGETNGESO. When making such a request to a TO, NGETNGESO shall:
- ◁ specify the Measurement Point in respect of which the data shall be provided; and
  - ◁ give all reasonable assistance required by the TO in relation to the request.
- 3.2.5 Any post-Event data to be provided by any TO to NGETNGESO under this STCP shall be provided in accordance with the procedures set out in STCP03-1.
- 3.2.6 Any Synchronised Data received by NGETNGESO from a TO shall not be transmitted from NGETNGESO to any other TO(s) without the approval of the relevant TO.

### **3.3 Accuracy and Reliability of Real Time Interrogation Data**

- 3.3.1 Each TO shall inform NGETNGESO before initiating any work that may interrupt its ability to provide the Real-Time Interrogation data specified in Appendix B, or may impact the accuracy or reliability of that data.
- 3.3.2 Where appropriate, each TO shall, in accordance with all applicable procedures, suppress or inhibit the transmission of Real-Time Interrogation data from out of service transmission equipment, where this could lead to the inaccurate representation of system conditions or excessive transmission of status information to NGETNGESO. Any such actions to suppress or inhibit the transmission of Real-Time Interrogation data shall be removed, unless otherwise agreed between NGETNGESO and the TO, prior to the transmission equipment being returned to service.
- 3.3.3 In the event of a fault in any device for the measurement of Synchronised Data, the relevant TO shall ensure such device is restored for the transmission of Real-Time Interrogation data as soon as reasonably practicable. The relevant TO shall complete a first investigation in respect of the fault within 10 Business Days and shall notify NGETNGESO as soon as reasonably practicable thereafter of the anticipated date on which the device shall be restored.
- 3.3.4 Each TO shall, where reasonably practicable, install suitable telecoms infrastructure to facilitate the TO's interrogation of the Synchronised Data prior to making such data available to NGETNGESO (where appropriate) under STCP 03.1.

## ***Appendix A: Abbreviations & Definitions***

### ***Abbreviations***

GSP	Grid Supply Point
RoCoF	Rate of Change of Frequency
SHET	Scottish Hydro-Electric Transmission PLC
SPT	SP Transmission Limited
TO	Transmission Owner or Offshore Transmission Owner
NPS	Negative Phase Sequence

### ***Definitions***

#### ***STC definitions used:***

Event  
Generator  
Grid Supply Point  
Interconnector  
National Electricity Transmission System  
~~NGET~~NGESO  
Transmission Licence

**Appendix B: Data Requirements**

<b>Real Time Interrogation data RMS</b>	<b>Further details</b>
	Time synchronisation at source (minimum 1µs accuracy)
Magnitude and phase angle of 3 phase voltage and current	Time synchronised and minimum update rate of 25Hz
Frequency	Time synchronised and minimum update rate of 25Hz
<b>Post-Event data</b>	
Magnitude and phase angle of 3 phase voltage and current	Time synchronised and minimum update rate of 25Hz
Frequency	Time synchronised and minimum update rate of 25Hz
Waveform data (voltage and current in 3 phase where available)	6.4kHz minimum
MW	Update rate of 25Hz
MVA <sub>r</sub>	Update rate of 25Hz
Hz	Update rate of 25Hz