

STCP 12-2 Issue 001: RMS and EMT Model Sharing Process

STC Procedure Document Authorisation

Company	Name of Party Representative	Signature	Date
The Company			
National Grid Electricity Transmission plc (NGET)			
SP Transmission plc (SPT)			
Scottish Hydro-Electric Transmission plc (SHETL)			
Offshore Transmission Owners (OFTO)			
Competitively Appointed Transmission Owners (CATO)			

STC Procedure Change Control History

Issue 001	DD/MM/YYYY	First version

1 Introduction

1.1 Scope

1.1.1 This procedure governs the interactions between The Company and relevant Transmission Owners (TOs) to enable efficient analysis and operational activities with the Root Mean Square (RMS) and Electro Magnetic Transient (EMT) models .

1.1.2 This includes:

- The process of the exchange of RMS and EMT models between The Company and relevant TOs.
- RMS and EMT model requirements and the approach and process for retrospective submission.
- The process for The Company to consult with relevant TO(s) in their administration of the RMS and EMT models exchanged by relevant TOs.
- The process for The Company, where necessary, to share the TOs' RMS and EMT models with relevant Users connecting to their Transmission Systems.

1.1.3 This procedure therefore defines critical activities and their timing for The Company, as defined in the STC and meaning the licence holder with system operator responsibilities, and any relevant TOs.

1.1.4 For the purposes of this document, the TOs are:

- NGET;
- SPT;
- SHETL;
- OFTOs; and
- CATOs.

1.2 Objectives

1.2.1 The objective of this procedure is to ensure that The Company and relevant TOs remain fully coordinated in managing and exchanging RMS and EMT models. It should be noted that TOs are required to submit RMS and EMT models in accordance with the requirements specified in Appendix B of this document and STC section D part 2.2.6.

1.3 Background

1.3.1 The Company requires Root Mean Square (RMS) and Electromagnetic Transient (EMT) models from TOs so that it can analyse and understand how these interactions affect the network under different system conditions.

2 Key Definitions

2.1 For the purposes of STCP 12-2:

2.1.1 **Model Co-ordinator** means the contact(s) provided by each Party (TO or The Company) responsible for managing the receipt and provision of EMT and RMS models in accordance with this STCP12-2.

2.1.2 **Root Mean Square (RMS)** model provides a representation of the AC 'phasor domain' behaviour of power system elements in steady state or in a simplified positive sequence dynamic sense.

2.1.3 **Electro Magnetic Transient (EMT)** model provides a full time-domain representation of a power system based on a level of detail that can accurately represent the range of

frequencies from 0.1 Hz to kHz range, encompassing both the detail of sub-cycle controls, and the phase-by-phase response to unbalanced disturbances.

3 Procedure

3.1 Model Sharing

3.1.1 Each Party shall provide Model Co-ordinator(s) for the receipt and provision of models. The method of sharing is to be agreed between the sending and receiving Parties.

3.1.2 Sending Party - When the RMS and EMT models are shared, the Model Co-ordinator shall ensure:

For RMS models and separately for EMT models, the following requirements shall apply:

- the plant models are the latest versions available.
- the models are validated, by provision of an agreed accompanying validation report.
- the EMT models are a true and accurate reflection of plant as built and shall be consistent with the detailed requirements specified in Appendix B of this document.
- the RMS models are a true and accurate reflection of plant as built and shall be consistent with the detailed requirements specified in Appendix B of this document.
- details of the shared models are recorded in accordance with the requirements of this STCP (refer to 3.2).
- the information passed between STC Parties is limited to that permitted under the STC; and
- TOs shall provide EMT and RMS models at least 3 months before commissioning of the plant and apparatus.

3.1.3 Receiving Party - When receiving the RMS and EMT model, the Model Co-ordinator shall ensure that:

- the model submitted accurately represents the Plant and Apparatus at the Connection Point in accordance with this STCP and is fit for use (i.e., the model is not corrupted, includes supporting files such as library, object, DLL files, etc that are required to run the models).
- the model package contains relevant documentation such as a user manual, dynamic performance study (DPS) reports, validation reports.
- receipts are recorded in accordance with the requirements of this STCP.

3.1.4 The Parties will review this process of model sharing periodically.

3.2 Version Control

3.2.1 As an updated version of the model becomes available to either Party, it will be issued to all relevant Party(s) via the Model Co-ordinator.

3.2.2 The model may be updated based on the comments from the recipient Party and/or updated based on any changes or modifications to the existing model version. Therefore, each Party should be made aware of the version updates upon the acknowledgement of version change.

3.2.3 Documentation of the updates from the previous version shall be provided.

3.2.4 Exchanges will be recorded and acknowledged as outlined below:

3.2.4.1 The issuing Model Co-ordinator shall:

- record the date and time of issue; and
- record the name of recipients of the exchange.

3.2.4.2 On receipt of a model, the receiving Model Co-ordinator shall:

- acknowledge receipt of the model indicating their acceptance/rejection of the model contained therein. Acceptance of receipt is tacit agreement to use the model by the recipient for the purpose(s) it has been shared. If rejecting the model, reason(s) for the rejection shall be provided.
- record the name of issuing contact along with date and time received; and
- manage the archiving of superseded models.

3.3 *Model Verification*

3.3.1 This section relates to checking the consistency of the model held by each Party against the formal submission process.

3.3.2 The model being shared shall meet the requirements outlined in Appendix B of this document as stated in 3.1.2. Where a Party has a concern over the accuracy or consistency of the model and related documentation pertinent to them and held by another Party, they may request an explanation and, if required, an updated version of the model. The timing and duration of any such response will be by mutual consent. In the absence of an agreement, a Party may raise a dispute in accordance with the dispute resolution processes outlined in the STC.

3.3.3 Model consistency checks will be undertaken at the following points:

1. Each sending party will provide to the receiving party, a record of the latest versions of the model, and or documentation that they are using.
2. These records will be examined by the receiving party who will provide confirmation or otherwise that the correct information is being utilised.
3. Where inconsistencies are discovered, an updated model and/or documentation will be issued, and the receiving party must notify when their existing files have been updated as described within this STCP.

All correspondence in relation to the above will be through the Model Co-ordinators.

3.4 *Retrospective Submission of Models*

3.4.1 TOs shall provide retrospective EMT and RMS models within 9 months of a request from The Company unless otherwise agreed.

3.4.2 If for any existing Plant and Apparatus, a model is not available as required by this STCP 12-2, then the following routes shall be discussed, and a suitable approach can be selected by mutual agreement between the Parties following the order outlined below:

1. TOs to enquire with the plant developer/manufacture for model availability.
2. TOs to work with the manufacturer to develop the detailed EMT/RMS model.
3. TOs to work with the manufacturer to develop the detailed EMT/RMS model through an external consultant.
4. TOs to develop a generic model of the plant as per the Terms of Reference (ToR) of the Joint Planning Committee Modelling Group (JPCMG).

3.5 *Model Sharing with Users*

- 3.5.1 The company shall share the TOs models with Users who are required to carry out simulation studies and demonstrate the compliance with connection conditions for their plant and apparatus.

4 Maintenance of this STCP

4.1 *Coordination between relevant Parties*

- 4.1.1 The Company and the relevant TO may consult with one another from time to time on matters related to a User's RMS and/or EMT model.

4.2 *Implementation*

- 4.2.1 The Company shall take reasonable steps to consult relevant TOs to ensure that the objective of this process can be realised and the process in Appendix A shall be followed by the relevant Parties with the aim of meeting the obligations set out in the STC Sections (Schedule 3 and Section D).

Appendix A: Flow Diagram

Note that the process diagram shown in this Appendix A is 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. The same process can be reversed with regards to The Company sharing the models with TOs.

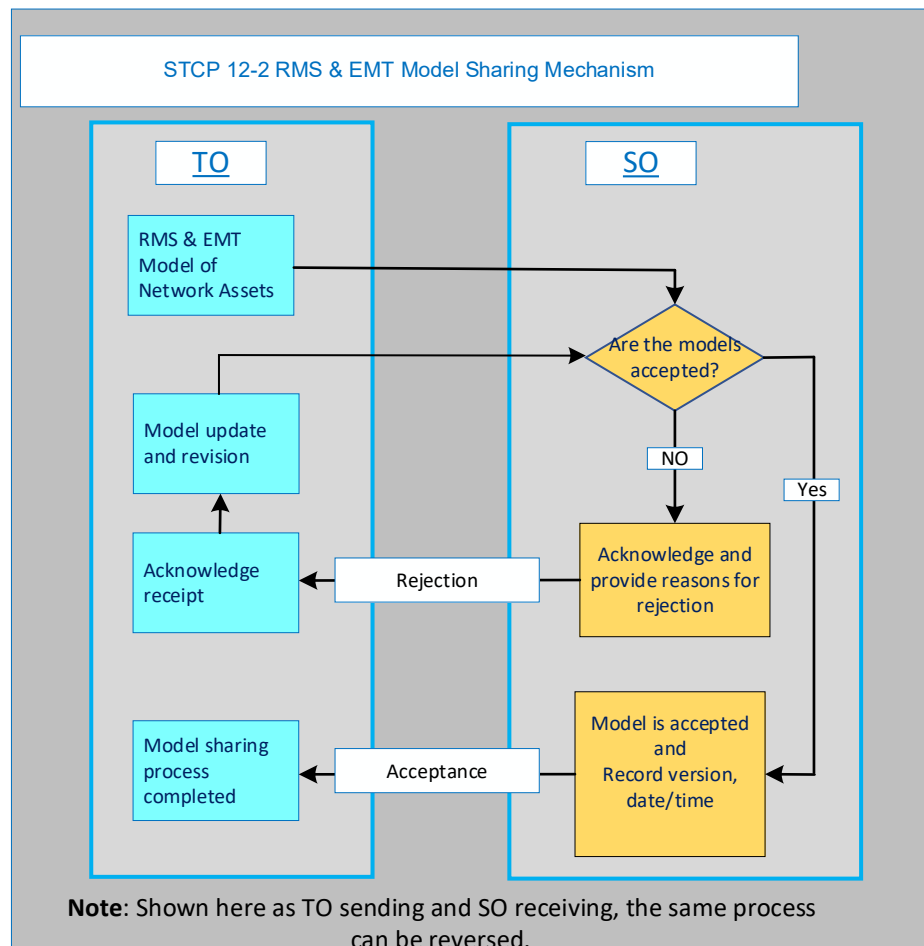


Figure 1 - RMS & EMT Model Sharing Mechanism