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STCP Modification Proposal Form

PM0147: RMS and EMT Model Sharing Process (STCP 12-2 Issue 001)

Overview: This modification proposes to introduce a new procedure to govern the interactions between The Company and relevant Transmission Owners (TOs) relating to the exchange of RMS and EMT models

Modification process & timetable



Initial STCP Proposal

02 May 2025

Approved STCP Proposal

21 May 2025

Implementation

In line with modifications GC0168, and CM097.

Status summary: The Proposer has raised a modification and is seeking a decision from the Panel on whether the modification should be implemented.

This modification is expected to have a: High impact

Transmission System Operator, Transmission Owners

Proposer's assessment of materiality

A material change – Authority decision

Who can I talk to about the change?

Proposer:

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What is the issue?

As Great Britain's power system moves towards net zero carbon operation, the network is transitioning from large synchronous generators to a large number of smaller Inverter Based Resources (IBR) which are causing new and varying challenges to the power system, for example control interactions, low fault level, inverter instability, Transient Over Voltage (ToV), etc. National Energy System Operator (NESO) requires Root Mean Square (RMS) and Electromagnetic Transient (EMT) models from Transmission Owners (TOs) so that it can analyse and understand how these interactions affect the network under different system conditions. There are currently no requirements in the System Owner Transmission Owner Code (STC) for TOs to submit EMT and RMS models of their assets to the NESO and for the NESO to share these models with relevant Users as well as enabling the NESO to share Users' EMT and RMS models to TOs. This restricts the ability for the NESO to perform system studies, modelling and post fault analysis.

Why change?

NESO requires RMS and EMT models from TOs so that it can analyse and understand how these interactions affect the network under different system conditions.

What is the Proposer's solution?

Introduction of a new STC Procedure which specifies:

1. The exchange of models (RMS and EMT models together with associated documentation) between The Company and relevant TOs.
2. The process for NESO to consult with relevant TOs in their exchange of RMS and EMT models.
3. The process for NESO, where necessary, to share the relevant TO's RMS and EMT models with relevant Users connecting to their Transmission Systems. 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.

Legal text

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Please see Annex 1.

What is the impact of this change?

High impact on Transmission System Operator, Transmission System Owners (Onshore & Offshore).

Proposer's assessment against STC Objectives	
Relevant Objective	Identified impact
(a) efficient discharge of the obligations imposed upon Transmission Licensees by Transmission Licences and the Electricity Act 1989;	Positive TOs will have the ability to meet their licence obligations relating to operating the system securely.
(b) efficient discharge of the obligations imposed upon the licensee by the Electricity System Operator licence, the Energy Act 2023 and Electricity Act 1989;	Positive NESO will have the ability to meet their licence obligations relating to operating the system securely.
(c) development, maintenance, and operation of an efficient, economical, and coordinated system of electricity transmission;	Positive Provision of EMT and RMS models between Transmission Licensees, NESO and Users is a necessity for the maintenance, and operation of an efficient, economical, and coordinated system of electricity transmission especially against the background of new technologies and facilitating NET Zero
(d) facilitating effective competition in the generation and supply of electricity, and (so far as consistent therewith) facilitating such competition in the distribution of electricity;	Neutral
(e) protection of the security and quality of supply and safe operation of the National Electricity Transmission System insofar	Positive EMT and RMS models of TO assets will help NESO to

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as it relates to interactions between Transmission Licensees and the licensee*;	analyse the interactions between different plants and assets and operate the system securely.
(f) promotion of good industry practice and efficiency in the implementation and administration of the arrangements described in the STC;	Positive Model sharing promotes efficiency in the discharge of system analysis.
(g) facilitation of access to the National Electricity Transmission System for generation not yet connected to the National Electricity Transmission System or Distribution System; and	Positive The availability of EMT and RMS models from TOs will help NESO to analyse the impact of potential new connections to the system. This will identify any modifications and / or control measures required to operate the system.
(h) compliance with the Electricity Regulation and any Relevant Legally Binding Decisions of the European Commission and/or the Agency.	Neutral

* See *Electricity System Operator Licence*

Proposer's assessment against the STCP change requirements ¹	Proposer's assessment
(a) the amendment or addition falls within the terms and arrangements set out in condition E4 of the NESO Licence Standard Condition B12 of the Transmission Licence; and	Requirement met
(b) the amendment or addition does not impair, frustrate or invalidate the provisions of the Code	Requirement met
(c) the amendment or addition does not impose new obligations or liabilities or restrictions of a material nature on Relevant Parties which are not subsidiary to the rights and obligations of the Relevant Parties under the Code	Requirement met

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(d) the amendment or addition is not inconsistent or in conflict with the Code, NESO Licence or Transmission Licence Conditions or other relevant statutory requirements; and	Requirement met
(e) the Relevant Party Representatives deem that the amendment or addition is appropriate to support compliance with the Code	Requirement met

When will this change take place?

Implementation date:

In line with modifications [GC0168](#), and [CM097](#).

Implementation approach:

In line with modifications GC0168, and CM097.

Interactions

☒ Grid Code ☐ BSC ☒ CUSC ☐ SQSS
☐ European ☐ Other ☐ Other
 Network Codes modifications

This modification will interact with [CM097](#) which seeks to require TOs to provide NESO with EMT and RMS models to carry out the required analysis, and [GC0168](#) which seeks to require certain Users to provide NESO with EMT models to enable analyses such as system oscillation, inverter instability and ToV. This would enhance NESO's capability to conduct detailed system studies and improve the overall resilience and performance of the power system as it transitions to a net zero carbon operation.

Panel Determination

Party	Determination
National Energy System Operator (NESO)	To be updated following Panel determination

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National Grid (TO)	To be updated following Panel determination
Offshore Transmission Owners (OFTOs)	To be updated following Panel determination
Scottish Hydro Electric Transmission plc (SHET)	To be updated following Panel determination
SP Transmission Limited (SPT)	To be updated following Panel determination

Acronyms, key terms and reference material

Acronym / key term	Meaning
BSC	Balancing and Settlement Code
CUSC	Connection and Use of System Code
EMT	Electromagnetic Transient
IBR	Inverter Based Resource
NESO	National Energy System Operator
PM	Procedure Modification
RMS	Root Mean Square
SQSS	Security and Quality of Supply Standards
STC	System Owner Transmission Owner Code
TO	Transmission Owner
ToV	Transient Over Voltage

Annexes

Annex 01 – PM0147 – STCP 12-2 Issue 001 RMS and EMT Model Sharing Process – Legal Text