

GC0141 – Compliance Process and Modelling Grid Code Modification

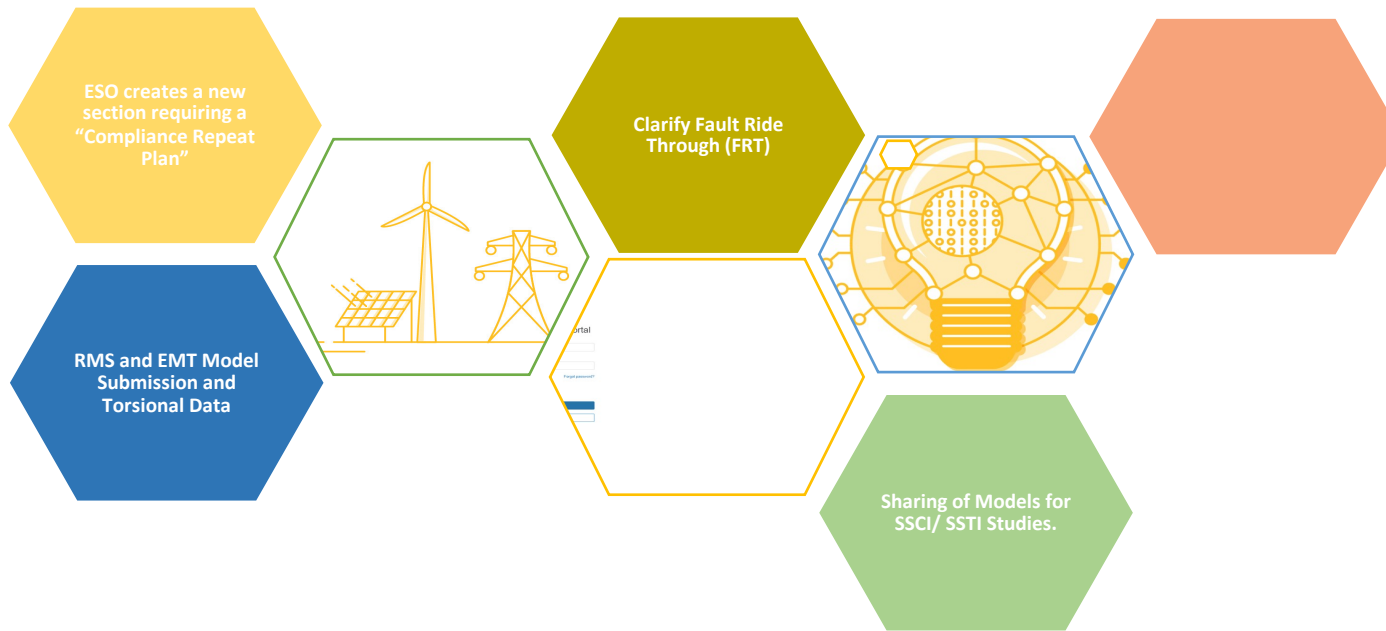


GDCF

11 January 2023

Introduction

GC0141 Grid Code modification intends to improve modelling, clarify Fault Ride Through (FRT) compliance requirements and improve the compliance process for complex connections.



Decision Brief

Proposed topics and approved decision

Topics	Approved Decision
<i>Independent Engineer</i>	Not required
<i>Compliance Repeat Plan</i>	A user to submit a mandatory compliance statement and self-certification of compliance, confirming Grid Code compliance in full every 5 Years.
<i>RMS & EMT Models</i>	ESO amending the Grid Code Planning Code to specify the type of modelling required (Root Mean Square (RMS) or Electromagnetic Transient (EMT))
<i>Sharing for SSTI/SSCI</i>	ESO to allow it to share relevant modelling information submitted by a User to another User, and that the User receiving the information can only use it to complete the analysis required by ECC.6.3.17.1 and EEC.6.3.17.2 (SSTI and SSCI studies)
<i>Torsional Data</i>	Generating Units with a Completion Date before 1 April 2015, are required to provide the data in accordance with good industry practice and without undue delay when requested by the ESO. Generating Units with a Completion Date after 1 st April 2015 is a mediator requirement.
<i>FRT Definitions & Retrospective Requirements</i>	Amend the definition so that Users are required to remain connected and stable for up to 30 minutes following an applicable fault or disturbance
<i>Enhanced FRT Studies</i>	Power Park Modules (PPMs) and HVDC systems must repeat the required simulation studies for foreseeable running arrangements (to be agreed between the ESO and the User)

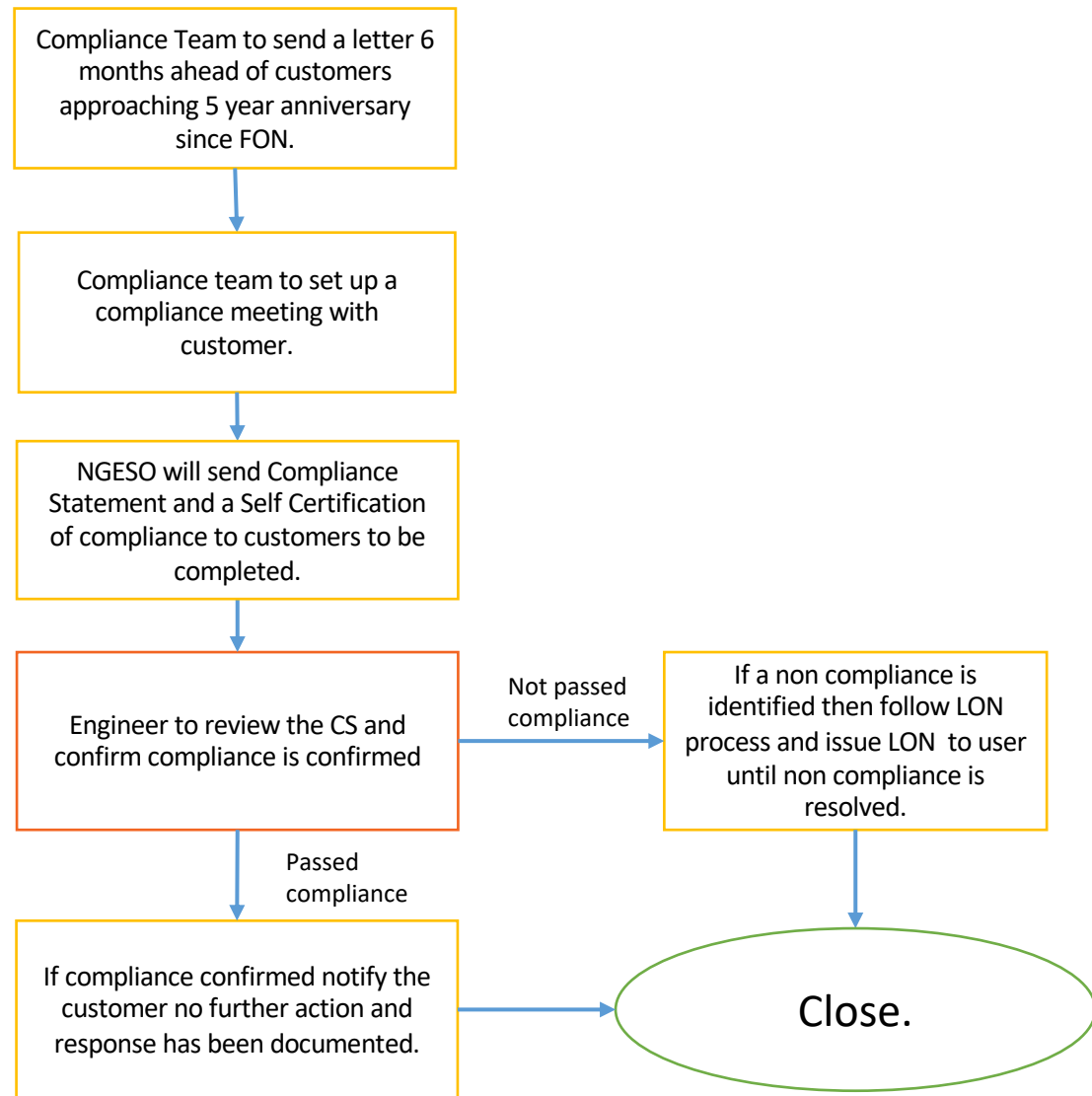
Compliance Repeat Plan

GC0141 creates a new section requiring a “Compliance Repeat Plan” for users to confirm compliance with their Grid Code obligations to National Grid ESO every 5 years.

- National Grid ESO will provide guidance on how the dates for older stations confirming continued compliance should be managed and spread so that portfolio users (and ESO) do not face an impractical influx of work.



- National Grid ESO will notify the provider with a six-month reminder to ensure compliance is met within the five-year requirement to ensure ample notice for preparation and delivery.



RMS,EMT Modelling Requirements

PC.A.9 specifies the models needed, including software tool types, and the minimum level of associated data that the user is expected to provide to the Company on both RMS and EMT platforms. PC.A.9 also includes details on the models' performance requirements.

This will be part of the compliance process and NGENSO will not issue an ION/EON before this model is submitted.

Provision of Torsional/Shaft Data - PC.A.5.3.2

- User connected prior the 1st of April 2015, are required to provide the data in accordance with good industry practice and without undue delay when requested by the ESO.
- User connected after 1st April 2015 is a requirement.

RMS,EMT Model and Torsional Data Submission

DRC Schedule 1 contains a section to allow exchange of mechanical parameters (shaft data) with ESO. A shaft report (normally produced by manufacturers) should be submitted / referenced. The report should contain system diagram(s) showing major components and use the standard units as specified in DRC Schedule 1 as well as the following information.

Reduced Shaft system model input parameters (example given in diagrams):

- Number of poles
- Reduced number of masses of the multi mass model (typically 5 to 8 masses)
- Moment of inertia J [kgm^2] for each mass
- Stiffness constants between each mass K [Nm/rad]
- Damping constants D [Nms/rad]
- Relative steam power in [pu] for different turbine sections

Mechanical eigenfrequencies and eigenvectors as calculated by the manufacturer including the verification between the reduced and the original multi-mass shaft system model. Any assumptions / assumed constants should also be stated in the report.

<u>MECHANICAL PARAMETERS</u> (PC.A.5.3.2(a))			
The number of turbine generator masses		<input type="checkbox"/>	DPD II
Diagram showing the Inertia and parameters for each turbine generator mass for the complete drive train	Kgm^2	<input type="checkbox"/>	DPD II DPD II
Diagram showing Stiffness constants and parameters between each turbine generator mass for the complete drive train	Nm/rad	<input type="checkbox"/>	DPD II DPD II
Number of poles		<input type="checkbox"/>	DPD II
Relative power applied to different parts of the turbine	%	<input type="checkbox"/>	DPD II
Torsional mode frequencies	Hz	<input type="checkbox"/>	DPD II
Modal damping decrement factors for the different mechanical modes		<input type="checkbox"/>	DPD II

Sharing of Models for SSCI/ SSTI Studies

The requirement of Model sharing for SSCI and SSTI studies is detailed in ECC.6.3.17.

NGESO has also updated the guidance documents in our website.

Clarify Fault Ride Through (FRT)



The modification on FRT requires Generators to stay connected for up to 30 minutes following a transmission system fault. This is to ensure operational reserve has been restored before the system is ready to cope with a further loss of power infeed (secondary frequency response timescales).

Q&A



Please ask any questions in the meeting chat

nationalgridESO