

National Grid ESO
 Faraday House
 Gallows Hill
 Warwick
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nationalgrideso.com

30th July 2024

Ref: Dynamic Modelling – Compliance Requirements

Dear Colleague,

The purpose of this letter is to remind Users about the importance of providing dynamic models to The Company (“ESO”) in a timely manner and to provide clarification of the Grid Code requirements relating to model submissions.

What’s required:

The following table defines the requirement to provide RMS and EMT dynamic models, for all UK Users, according to Connection Type and Technology:

User Connection Type	Technology	RMS Model	EMT model
<i>Directly Connected</i>	<i>Non- Synchronous Generator</i>	Yes	Yes
	<i>Synchronous Generator</i>	Yes	Yes (1)
<i>Bilateral Embedded Generator Agreement (BEGA) - Large</i>	<i>Non- Synchronous Generator</i>	Yes	Yes
	<i>Synchronous Generator</i>	Yes	Yes (1)
<i>Bilateral Embedded Generator Agreement (BEGA) - Medium</i>	<i>Non-Synchronous Generator</i>	Yes	No
	<i>Synchronous Generator</i>	Yes	No
<i>Bilateral Embedded Generator Agreement (BEGA) - Small</i>	<i>Non-Synchronous Generator</i>	No (2)	No
	<i>Synchronous Generator</i>	No (2)	No
<i>Bilateral Embedded Licence Exemptible Large Power Station Agreement (BELLA)</i>	<i>Non - Synchronous Generator</i>	Yes	Yes
	<i>Synchronous Generator</i>	Yes	Yes (1)
<i>Licence Exemptible Embedded Medium Power Stations (LEMPS)</i>	<i>Non-Synchronous Generator</i>	Yes	No
	<i>Synchronous Generator</i>	Yes	No

NOTE (1): Not required as part of the normal compliance process, unless specified in the Connection Agreement; however, where the Company deems it necessary to undertake further analysis of the connection (as specified on the Company website), EMT models may still be requested.

NOTE (2): Not required as part of the normal compliance process, unless specified in the Connection Agreement; however, where the Company deems it necessary to undertake further analysis of the connection, RMS models may still be requested.

Key Requirements:

All Users, as detailed in the above table, are required to provide The Company with RMS and EMT models to comply with PC.A.9 of the Grid Code.

All models are required to be provided to The Company using the normal User Data File Structure (UDFS) submission process.

Unless otherwise specified in the Bilateral Agreement, **the timescale for fulfilling the model submission requirements is 3 months prior to the issue of the Interim Operational Notification (ION) and 1 month prior to the issue of a Limited Operational Notification (LON).**

All models submitted to the ESO are required to represent the entire User system and should be submitted in the correct format and software version.

RMS and EMT models must comply with the performance requirements specified in PC.A.9.8 and PC.A.9.9 respectively.

Following commissioning, Users are required to provide additional evidence to demonstrate that the models have been correctly tuned and adequately represent the plant's tested dynamic performance. This should be submitted no later than 3 months after the compliance tests have been accepted by the ESO and prior to a Final Operational Notification (FON) being issued.

Why this is important:

A Grid Code modification (GC0141) was introduced in response to actions and concerns raised by the Office of Gas and Electricity Markets (Ofgem) and the Government's Department for Business, Energy, and Industry Strategy (BEIS) following a serious power outage that took place on 9th August 2019. The power outage resulted in over 1 million consumers losing their electricity supply, as a consequence of unexpected generation loss for a correctly cleared fault on the Transmission system.

The modelling requirements now in the grid code, as defined by this modification, are necessary for the ESO to meet its licence obligations to ensure that the System can be operated in a stable and secure manner.

The timely submission of dynamic models by the User, is a critical step in achieving this, allowing the ESO to assess the impact of a new connection on System performance prior to it entering operation.

Support from the ESO:

The Compliance Team will re-iterate modelling requirements during the inaugural compliance meeting and periodically seek to understand progress throughout the Compliance Process; however, it is the User's responsibility to ensure that the modelling requirements are fully understood and met. This should be discussed with the assigned Compliance Engineer at the beginning of your project compliance process.

A new guidance document '[Guidance Notes on Modelling Requirements - GC0141 Grid Code Modification](#)' has been developed to provide comprehensive support to help you meet the modelling requirements set out in the grid code. This is available on the ESO website and has been used as the basis of presentations delivered at recent ESO Connection and Compliance Seminar events.

Further explanation and support for your questions can also be provided by your project compliance engineer or alternatively requested via:

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Engineering Compliance Manager
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Non-Compliance:

Please note that the Engineering Compliance Team are happy to provide support and guidance on the above modelling requirements, as necessary for your project; however, failure to comply with them will result in the ESO not being able to release the Interim Operational Notification to the User and may prevent power being exported on to the System, until these requirements have been fulfilled.

Your sincerely

Matthew Vickers

Director – Engineering & Customer Solutions