

# Meeting summary

## Grid Code Development Forum – 6 September 2023

<b>Date:</b>	06/09/2023	<b>Location:</b>	MS Teams
<b>Start:</b>	09:00	<b>End:</b>	10:40

## Participants

Attendee	Company	Attendee	Company
David Halford	National Grid ESO (Chair)	Henrik Kodahl	Siemens Gamesa
Frank Kasibante	National Grid ESO (Tech Sec)	Nicola Barberis Negra	Orsted
Sami Abdelrahman	National Grid ESO (Presenter)	Suzanne Law	SSE
Jayaraman Ramachandran	National Grid ESO (Presenter)	Isaac Gutierrez	Scottish Power
Dechao Kong	National Grid ESO (Presenter)	Christer Danielsson	Hitachi Energy
Terry Baldwin	National Grid ESO	Ruth Kemsley	EDF Renewables
Steve Quinn	National Grid	Harry Burns	EDF Renewables
Eric Lewis	Energy Storage Consulting	Monica Crosa	RES Group
Ethan Glennie	Ocean Winds	Michael Burke	SSE
Graeme Vincent	SP Energy Networks	Giorgio Balestrieri	Tesla
Garth Graham	SSE	Stephen McKellar	Scottish Power Renewables
Paul Youngman	Drax	Frank Martin	Siemens Gamesa
Alan Creighton	Northern Powergrid	Cahir O'Neil	ESB
John Harmer	Waters Wye Associates	Adil Abdalrahman	Hitachi Energy
Harry Hutchinson	Gresham House	Francisco Jimenez Buendia	Siemens Gamesa
Oluwabukola Daniel	EDF Renewables		

## Agenda and slides

A link to the Agenda and Presentations from the September GCDF can be found [here](#).

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## GCDF

**Please note: These notes are produced as an accompaniment to the slide pack presented and provide highlights only of discussion themes and possible next steps.**

### Meeting Opening – David Halford (GCDF Chair) & Frank Kasibante (GCDF Tech Sec), NGESO

The meeting was opened, with an overview of the agenda items that will be covered.

### Presentation: Request for EMT Model for Existing Generators– Jayaraman Ramachandran & Sami Abdelrahman, NGESO

A presentation was shared in relation to a request for Generators to provide EMT Models to the ESO, the importance of EMT analysis, and options to address this request.

#### Discussion themes / Feedback

It was noted that in terms of the ESOs requirement for EMT Models for plant connected after September 2022 as a result of the GC0141 Grid Code Modification, there is a lack of clarity in terms of the requirements for these models. *It was confirmed that a Guidance Document in relation to the specification for EMT Models is available and published on the ESO website. This can be found [here](#).*

It was noted that if a Grid Code modification is raised then it is essential that there is manufacture representation on any Workgroups.

There were concerns from a number of attendees in relation to providing these models for older plant (there are some transmission connected plant approaching 95 years old), or where the User no longer has a relationship with the manufacturer. We need to be mindful that there may be circumstances where the User simply cannot obtain these models due to circumstances beyond their control as changes to the Grid Code could leave them non-compliant.

*This is something that the ESO are very much aware of and have been investigating various options to address the requirement for these models which is presented as part of the presentation today.*

It was noted that if Users will be required to produce EMT Models, there needs to be a very clear specification and guidance from the ESO in terms of how these models need to be presented.

*This is something that the ESO acknowledges and agrees with in to ensure a clear specification is available as was provided as part of the GC0141 modification in the form of a Guidance Document.*

It was asked whether the ESO would be happy to indemnify manufacturers in terms of the ESO handling their Intellectual Property as this may give some reassurance and help to address concerns around IP? Could there be an alternative where the information is passed direct from the manufacturer to the ESO (rather than the User providing the model to the ESO)? In relation to the GC0141 modification, the requirements related to more recent Users which would have a greater chance of still having a relationship with the manufacturer.

*We will take this point away and discuss further, but note that as part of the GC0141 modification, the responsibility for providing the models is with the User and not manufacturers as manufacturers are not parties to the Grid Code.*

For new plant that is currently in development, the provision for these models could be factored into the negotiations with the manufacturer, but there could be costs implications on legacy Users to obtain these models that could

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require new negotiations with the manufacturer. There is also the question in terms of whether the manufacturer will want to provide the information, and will it be in the correct format? It is vital that the potential commercial implications for Users are considered as there is no cost recovery model for this.

*The ESO takes these comments on board and would be part of the discussions within the Workgroup which would be held as part of the Grid Code modification.*

It was asked what if any penalties there would be if the User could not obtain these models due to the manufacture not being able to supply them or the manufacturer no longer in existence? Would a generic model be used for example?

*In an example where there is a small area containing 10 IBR units and we are not able to obtain actual models for all of them, a generic representation can be used and allow us to use any system event to identify whether it reflects what we witnessed in the system in order to improve the model, but this could be very time consuming if we have a number of generic models.*

It was asked if any potential future Grid Code Change would apply to all User including Interconnectors and HVDC both future and legacy?

*Yes, those assumptions are correct.*

It was asked if any potential Grid Code changes will apply to commercial providers of STATCOMs (as opposed to those owned by the TOs which will be bound by the STC Code)?

*This is something we will take away and discuss further.*

In terms of converting RMS Models to EMT, this isn't a straightforward process as on occasions you may need test data for the Grid Code compliant test to properly develop the EMT Model using the RMS Model.

*We do agree and acknowledge this and will depend on the type of analysis that the ESO would need to complete. Ideally, being able to get the EMT Model would be the ideal scenario, but this could be an option for older plants where the EMT Model is not available.*

In terms of the various options that have been presented to address the requirement for the models, could there be an option where the ESO, User, and the Manufacturer have joint discussions in relation to the provision of the EMT Model similar to the 'Joint Investigations' section of the Grid Code currently as part of section OC10? This could be a 'Joint Investigation' for example, where the User uses their reasonable endeavours to facilitate meetings between the parties as this will enable the ESO to understand from the manufacturer if these models cannot be provided and the reasons for that.

*This is an option that we will take away and investigate further.*

It was noted that in Spain, a collective approach is being taken (mainly for Wind Turbines), where rather than specific Users having individual models, the manufacturer develops model for a specific technology which can be used by all Users.

*This ESO note this point, but we also need to bear in mind that plant parameters may have been tuned differently for different sites, and without this specific data the behaviour of the actual system will differ from the model.*

It was asked if any consideration had been given in terms of the minimum power level for the provision of these models?

*As part of the options, we have been investigating, this is something that has been considered in term of requesting models based on specific capacity types.*

It was mentioned whether there might some relationship with the Grid Code Modification – GC0117, that is looking to harmonise Power Station thresholds across GB, although this proposed change will not be retrospective.

**The ESO will take the comments and suggestions raised at today's presentation and return to a future GCDF with further refined option for discussion prior to a modification being raised.**

## **Presentation: Grid Forming – Dechao Kong, NGENSO**

A presentation was shared by the ESO in relation to proposed minor amendments to the Grid Code for Grid Forming. This proposed change is to remove the text which prevented the use of virtual impedance for the internal voltage source within a grid forming converter.

### Discussion themes / Feedback

It was asked which parties has been involved in the GB Grid Forming Best Practice Group?

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The group consisted of over 60 stakeholders, which included TSOs, international developers, manufacturers, generators, and academic bodies. A full list of participants can be found in the [‘Acknowledgements’ section of the Best Practice Guide](#)

What was the involvement of the stakeholders e.g., were they consulted, was it a working group etc?

*Formal working groups were held with Terms of Reference defined, minutes or equivalent from meetings captured and supporting documents produced.*

It was asked if the planned changes to the Grid Code just relates to future plant that is due to connect?

*Yes, that is correct.*

It was noted that there is a substantial amount of Legal Text that is being proposed to be removed as part of this change which came from the European Network Code work, and at the time, it was decided that this text would be useful to include for the avoidance of doubt. Why does the ESO feel that it is no longer necessary to include this text now?

*As widely agreed, that the Grid Forming Inverter can be represented as an Internal Voltage Source between an equivalent impedance. Our thinking is that such equivalent impedance includes a combination of physical and virtual impedance and specific guidance could be provided during the specific GBGF-I project delivery to provide clarification on what specific physical and virtual impedances are on a case-by-case basis.*

Does this not go against GB Law in terms of moving away from the legal obligations to harmonise and standardise?

*ESO note these comments, and this is something that we will go away and discuss further prior to raising for formal proposal and modification.*

## AOB

Attendees were reminded that the GCDF can be used by any industry party to present potential Grid Code changes and future agenda items are welcomed.

The Chair thanked the attendees and presenters for their contributions and closed the meeting.

**The next GCDF will be held on the 4<sup>th</sup> October 2023 with the 27<sup>th</sup> September being the deadline for agenda items and presentations.**

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## Action Item Log

### Action items: In progress and completed since last meeting

ID	Agenda Item	Description	Owner	Notes	Target Date	Status
2309	Bulk Despatch Optimiser	What is the definition of a ‘Small BMU Zone’?	Bernie Dolan	The definition of the ‘Small BMU Zone’ are Units < 50MW	September	Closed

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