

# Meeting summary

## Grid Code Development Forum – 5 June 2024

<b>Date:</b>	05/06/2024	<b>Location:</b>	MS Teams
<b>Start:</b>	09:00	<b>End:</b>	10:00

## Participants

Attendee	Company	Attendee	Company
Jamie Webb	National Grid ESO (Chair)	John Harrower	SSE
David Halford	National Grid ESO (Tech Sec)	Suzanne Law	SSE
David Lacey	National Grid ESO (Presenter)	Bukky Daniel	EDF
Arnaldo Rossier	National Grid ESO	Ross Strachan	EDF Renewables
Frank Kasibante	National Grid ESO	Harry Burns	EDF Renewables
Gordon Frazer	National Grid ESO	Paul Youngman	Drax
Terry Baldwin	National Grid ESO	Alastair Few	Drax
Hazem Karbouj	National Grid ESO	Sigrid Bolik	Siemens
Ife Garba	National Grid ESO	Carlos Ara Belles	Siemens
Sarah Carter	National Grid ESO	Maryam Begum	Cummins
Ajay Pandey	National Grid ESO	Chanura Wijerante	RES Group
Alan Creighton	Northern Powergrid	Lisa Waters	Waters Wye Associates
Mike Kay	P2 Analysis	Mireia Barenys	Lightsource BP
Julie Richmond	Scottish Power	David Mlynski	Outlook Energy
Isaac Gutierrez	Scottish Power	Paul Crolla	Muirhall Energy
Andrew Larkins	Sygensys	Cahir O'Neill	ESB
Graeme Vincent	SP Energy Networks	Nicola Barberis Negra	Orsted
Benjamin Marshall	SSE	Sean Gauton	Uniper
Jennifer Geraghty	SSE	Arsalan Zaidi	Ofgem
Cathal Martin	SSE	Paul Drew	Ofgem

## Agenda and slides

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

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## GCDF

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**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 – Jamie Webb (GCDF Chair) & David Halford (GCDF Tech Sec), NGENSO

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

### Presentation: System Event Investigation Findings – Quality Assurance – David Lacey, NGENSO

A presentation was shared in relation to the findings from System Event investigations, and potential Grid Code modifications to ensure quality assurance measures are in place for site commissioning activities.

#### Discussion themes / Feedback

A forum member commented that in terms of providing single line diagrams for plant, this is provided to the ESO as is specified. In terms of operational scenarios, there are no requirements stated at the moment, so it was welcomed that this was being covered as part of the proposals.

It was noted that in terms of the requirements for models, it was felt that the ESO is still trying to understand what these requirements are as there has been scenarios where Users have submitted models, but the ESO then request further information which increases costs for Users. Clarity is key when producing guidance.

In respect of the possible requirement for an Independent Engineer to oversee commissioning activities, it was noted that this could cause complexities in terms of ensuring Non-Disclosure Agreements are signed and the involvement of a third party in the process.

*The ESO representative acknowledged that there has been issues in terms of the requirements for models, with a [Guidance Note](#) published recently to help clarify these requirements. A [seminar](#) is also being held by the ESO on the 26<sup>th</sup> June which will also focus on model requirements as one of the topics.*

A forum member stated that in terms of models, we need to think about the models that we're getting at the moment, as in respect of RMS models, we are getting models which are fitted to a standard, but not the models that vendors are generating in RMS, specific to their individual technologies. There are limitations to these generic models even if properly tuned, they will not be as accurate as vendor specific ones. However, they do have the benefit of allowing system studies to be performed in sensible times, whereas vendor specific RMS models due to their complexity do not run very well in the ESO GB network model with the existing computation power available. There was an opportunity under Grid Code Modification – GC0141, and maybe this needs to be revisited to receive the suppliers version of their EMT model in RMS in order to understand the relative limitations between the two, although this would complicate the process it would give you a greater degree of confidence and understanding of how much the generic models might deviate from the vendor model performance and therefore user system behaviour. If we move into EMT, the models are essentially black box so you're not going to see any of the settings in terms of tuning, so a modification could be raised seek to extract that, but it does operate counter to the Intellectual Property and confidentiality sensitivities of the vendors themselves, so this feels like quite a significant requirement.

In terms of operating conditions, in an example of a significant offshore wind farm with approximately 30 or more turbines, there would probably be 6 or more parallel A/C cables, which could all work in different permutations and assemblance of dynamic devices onshore, which will have different modes of operation in the same way as the wind farms. This makes it difficult in terms of identifying issues without applying new techniques, and formalising small

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signal analysis within the process of tuning and making it more clear in terms of what tuning's being done and a more iterative conversation with ESO around what that tuning needs to capture is it is probably an important point for quality.

It's also important that any changes in tuning e.g., changes between Factory Acceptance Testing and commissioning are also captured, as well as any changes that are as a result of software changes due to new modes being switched on.

In terms of the role of an independent engineer, this was something that was discussed and put forward as an option as part of the GC0141 modification but was rejected as part of the final determination. This feels like a major change and could create complexities as already mentioned. Could other resources be utilised to fulfil these requirements without having to use an independent engineer?

Further discussions took place in relation to models and from synchronous generators and converter-based plant such as HVDC's, with converter-based plant much more complex e.g., a HVDC could have over 500 layers of sub-module configuration which will vary by vendor, which is then overlaid with inner and outer control loops and attempting to fit this into a standard model which may reflect the performance of the tuning but not reflect the actual tuning. When creating RMS models, vendors deviate from the WEEC standards and use their approach which is more closely mirrors their own technology.

Open models from vendors would be difficult to source due to Intellectual Property issues, so maybe an option would be to obtain a portfolio of models e.g., a WEEC model that can be more easily used in PowerFactory, but you have the more accurate representation of what this looks like in RMS and a black box model in PSCAD?

A forum member expressed concerns in relation to the potential requirements for providing evidence of quality management systems, submitting a copy of the Factory Acceptance Tests (FAT), and ESO representation during site commissioning where required. What the ESO be doing with these submissions e.g., will the ESO be reviewing the FAT and making a decision in terms of whether this is suitable or not?

In relation to the potential requirement for an Independent Engineer, what would need to be the qualifications of the engineer and how many of these types of engineers are available and could delays in commissioning occur due to the lack of availability?

*The proposer agreed that further discussion would be required in relation to these points, but the intention would be that the ESO would not be witnessing the complete end to end commissioning of any plant and would use a risk-based approach and focus on certain aspects of the commissioning.*

*In terms of the submission of FAT and quality plans, the purpose behind this is to make sure a supplier has appropriate change control procedures in place, with the recognition that there will be varying degrees of standards, with the aim to ensure there are consistency in terms of standard that the ESO would expect.*

There was further discussion by a forum member in relation to the accuracy of models and the risks that this presents to system security, with a number of sub synchronous oscillation events that have taken place. This is a global issue and there are learnings that we could take from our countries in relation to model accuracy. We need to ensure that modelling for all end applications is improved over time but recognising the significance between small signal modelling for stability and large signal modelling for fault ride through, Inverter based resources are very different to synchronous machines as these are software-controlled devices which are highly non-linear and change modes during fault ride through. We also have to recognise that there are challenges in terms representing this as their software control devices will change during their lifetime and the performance of them will change as parameters are updated.

*The proposer recognises these challenges, but the focus of these potential changes is around quality assurance procedures.*

The forum member agreed that quality assurance is important as one of the key elements that have been seen in other countries relate to ongoing maintenance and installation updates to plants e.g., where a component has failed and replaced but has been set to default parameters.

A forum member commented that in relation to the proposals to improve quality assurance, it feels like unless the process is very clearly defined for Users, this could require significant resource from the ESO in terms of introducing a form of accreditation process. In regard to the potential proposal of introducing an Independent Engineer, this could prove very challenging for Users in terms of ensuring availability for all parties that would need be involved in the process. The accuracy of the data should be more important that what is actually witnessed.

What does the proposer mean in terms of "Operational Configurations"?

*The proposed stated that in terms of operational configurations, this would refer to more co-located type of plants, wind farms with multiple power park modules. It's about making sure the ESO understands the way the plant is going to operate and have the simulations to demonstrate compliance for these various modes.*

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It was agreed that the ESO would take the comments and discussions from today's session and consider the next steps before any modification is raised. It was agreed that the ESO will need to work with Users a to ensure any potential solutions are achieved in a collaborative way.

## AOB

The dates for the 2024 GCDF sessions are available on the [GCDF webpage](#)

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 3<sup>rd</sup> July 2024 with the 26<sup>th</sup> June 2024 being the deadline for agenda items and presentations.**

## Action Item Log

Action items: In progress and completed since last meeting.

ID	Agenda Item	Description	Owner	Notes	Target Date	Status
2401	DSM Data Collection	Provide breakdown of respondents to questionnaire in terms of technology type	Jesus Sanchez Cortes		May 2024	Complete
2402	Frequency Event Overview	Please provide the link to the ESO overview of the Frequency Event that took place on the 22 <sup>nd</sup> December 2023	David Halford		May 2024	Complete