

Code Administrator Meeting Summary

Meeting name: GC0163 Workgroup Meeting 1

Date: 12/12/2023

Contact Details

Chair: Jonathan Whitaker – Jonathan.Whitaker@nationalgrideso.com

Proposer: Ronak Rabbani - ronak.rabbani@nationalgrideso.com

Key areas of discussion

The purpose of Workgroup Meeting 1 was for the Proposer to present the solution to the group to instigate any subsequent discussions, to agree the timeline proposed for the modification and agree the Terms of Reference (ToR) the Workgroup will adhere to.

Introductions

The Chair welcomed all attendees to the Workgroup and outlined the agenda for the meeting.

The Workgroup were asked to introduce themselves, after which the Chair gave some background to the timing of the modification (it was raised at October's Grid Code Panel).

Code Modification Process Overview (Workgroup Responsibilities, Workgroup Alternatives and Workgroup Vote)

The Chair shared an overview of the modification process, including the voting stages and the expectations of the Workgroup and its members.

Objectives and Timeline (Walk-through of the timeline for the modification)

The proposed timeline was shared by the Chair and the Workgroup were invited to raise any questions or concerns. None were raised and the Chair noted the timeline to be agreed.

Review and Agree Terms of Reference

The Chair shared the proposed Terms of Reference which were suggested by Panel for the Workgroup to address and can be seen in the meeting slides. These included points e) (consideration of unintended consequences of the change affecting system security) and f) (consideration of whether the solution would create any conflicts with the governance route).

A Workgroup member asked the group whether there was sufficient representation of manufacturers on the group (in relation to ToR c)), and another Workgroup member asked whether there had been nominated parties that couldn't attend this call (due to another meeting taking place for manufacturers in the wind sector). The Technical Secretary confirmed that all nominated parties were in attendance. The ESO representative and an ESO observer both commented that the modification has been widely socialized with industry via the both the Grid Code Development Forum and ESO's [GB Grid Forming Best Practice Group](#), so feedback from the range of stakeholders involved had been incorporated into the solution for GC0163. A Workgroup member raised whether those involved to date had considered how the relaxation of virtual impedance would affect any other parties (this was addressed later in the meeting via agreement to highlight the Workgroup Consultation to selected parties to review and respond to on this matter).

A Workgroup member, who is also an Original Engineering Manufacturer (OEM), noted that the proposed solution to make control implementation less restrictive is assumed to be beneficial to OEMs, so suggested that others may not have decided to be part of the Workgroup as they are comfortable with the intended outcome. In response to this, an ESO observer noted that when the related [GC0137\(Minimum Specification Required for Provision of GB Grid Forming \(GBGF\) Capability \(formerly Virtual Synchronous Machine/VSM Capability\)\)](#) was developed, the GB Grid Forming Best Practice Group did review the issue of impedance and found that the inclusion of virtual impedance (via software for example) alongside the unavoidable physical impedance on the system would provide cost savings that would pass through to the end consumer. It was also acknowledged that any unintended consequences should be mitigated against wherever possible, which the compliance process should address.

The Chair encouraged the Workgroup to suggest any additional parties to invite to future discussions.

ACTION 1 (All): Contact the Chair/Technical Secretary with details of suggested Workgroup invitees.

ACTION 2 (Chair): Invite necessary parties to the next Workgroup.

The Workgroup were invited to raise any comments or concerns about the ToR, but as none were raised the Chair accepted the ToR as agreed.

Proposer Presentation and Questions

The Proposer shared background information as to the origin of the proposal (see the meeting slides) and suggestions from the GB Grid Forming Best Practice Group that a combination of virtual and physical impedance would be of benefit to developers and potentially the end consumer in reducing costs and providing greater flexibility.

The proposed legal text changes to the Grid Code Glossary (for 'Internal Voltage Source' or IVS) and Grid Code section ECC 6.3.19.3 were shared with the group.

In response to a Workgroup member's question, it was clarified by an ESO engineer in the meeting that reference to 'grey box' versus a 'white box' definition was not critical to the solution (as the solution focusses on the performance requirement rather than this definition).

An ESO observer (a Subject Matter Expert) outlined the importance of the solution for allowing manufacturers more freedom by removing restrictions, and therefore making it easier and more efficient to meet the requirements. The benefits were expressed as cost savings (through to the consumer) and consistency with European proposals on grid forming (via [RFG 2.0](#) which based on the recent consultation is proposed to be introduced in 2025 with a three-year introduction period). It was noted that while the exact EU drafting is not finalized the GB Grid Forming Best Practice Group's work should ensure greater consistency between the proposed European proposals and for the GB grid forming requirements.

A Workgroup member questioned the impact of the solution on other users, for example if software fails, and whether the solution would set a precedent for virtual impedance to be introduced to other parts of the system. The ESO observer confirmed that in relation to other users, analysis techniques and compliance terms reviewed as part of the GB Grid Forming Best Practice Group's work (as well as the European compliance) should mitigate impact on others. In relation to virtual impedance's use in other areas of the system, it was confirmed that the scope for GC0163 was narrowly set to grid forming only and didn't prevent physical impedance from still being used (GC0163 will just allow virtual impedance to be used within the Grid Forming solution whereas it is currently prohibited). It was noted that physical impedance will always be a significant part of the system and cannot be totally replaced by virtual impedance.

Workgroup members expressed that from an OEM perspective, manufacturers welcomed this change which would introduce more flexibility along with the compliance and testing measures. An OEM Workgroup member (for Static Synchronous Compensators - STATCOMs) noted that virtual impedance allows STATCOMS to perform better for the grid. An OEM Workgroup member (for wind turbines) noted that a reasonable ratio of virtual to physical impedance was needed as available studies imply that too much virtual impedance would cause instability. They suggested that performance tests would be important for compliance to check that the right ratio has been applied.

A Workgroup member questioned whether there will be simulations to offer guidance on the virtual: physical ratio to apply, to which the ESO observer recommended the Workgroup review the GB Grid Forming Best Practice Group's [guide](#) for the implications to users and examples of operating zones for good performance.

A Workgroup member asked whether the ESO were considering Electromagnetic Transient (EMT)-type modelling/simulations for proof of stability, to which the ESO confirmed to be the case as EMT modelling is a requirement in the Grid Code ([PC.A.9](#)).

The Chair checked with the Workgroup members involved with the initial Panel discussions for this modification that discussions had been sufficient to address Panel's questions. This was confirmed, with the caveat that wider consultation was needed to gauge if any other parties may be affected by the solution. It was agreed that the Chair would reflect the discussions in the Workgroup Consultation document and share it with the Workgroup ahead of the next Workgroup meeting (16 January 2024), and other key stakeholders could be consulted for input as appropriate.

Cross Code Impacts

The Chair invited the Workgroup to raise any cross-code implications that are applicable but haven't been considered. No suggestions were made.

Any Other Business

A Workgroup member alternate tabled a related point regarding reactive current injection and asked for the Workgroup’s view as to whether this was in scope for GC0163. ESO representatives clarified that it would be out of scope for this modification but would be included in a wider grid forming modification being raised in 2024.

The Chair suggested that the Workgroup member alternate ensure they are on the Grid Code distribution list to receive notification of nominations opening for the new modification (or contact Code Governance for help enrolling on that distribution list).

The Chair thanked the Workgroup for their contributions before closing the meeting.

Next Steps

- Workgroup meeting summary to be circulated – Workgroup to provide feedback as to whether it’s an accurate representation of the discussion.
- Chair to circulate a draft version of the Workgroup Consultation prior to Workgroup 2 for review.
- Next Workgroup to be held on 16 January 2024.

Actions

Action number	Workgroup Raised	Owner	Action	Comment	Due by	Status
1	WG1	All	Contact the Chair/Technical Secretary with details of suggested Workgroup invitees.		ASAP, 12 Jan latest	Open
2	WG1	Chair	Invite necessary parties to the next Workgroup.		WG2	Open

Attendees

Name	Initial	Company	Role
Jonathan Whitaker	JW	Code Administrator, ESO	Chair
Elana Byrne	EB	Code Administrator, ESO	Tech Sec
Ronak Rabbani	RR	ESO	Proposer
Terry Baldwin	TB	ESO	ESO Rep
Alistair Frew	AF	Drax	Workgroup member
Christer Danielsson	CD	Hitachi Energy	Workgroup member

Daniel Duckwitz	DD	SMA	Workgroup member alternate
Isaac Gutierrez	IG	Scottish Power Renewables	Workgroup member
Sigrid Bolik	SB	Siemens PTI Consulting	Workgroup member
Tusitha Abeyasekera	TA	Vestas	Workgroup member
Xiaoming Li	XL	Zenobe	Workgroup member
Antony Johnson	AJ	ESO	Observer
Xiaoyao Zhou	XZ	ESO	Observer