ESO Compliance Customer Seminar

26 June 2024

ESO

09:30 - 09:40

Nazia Manazar
Interim Compliance Connections
Operations Manager, ESO

Welcome and Housekeeping

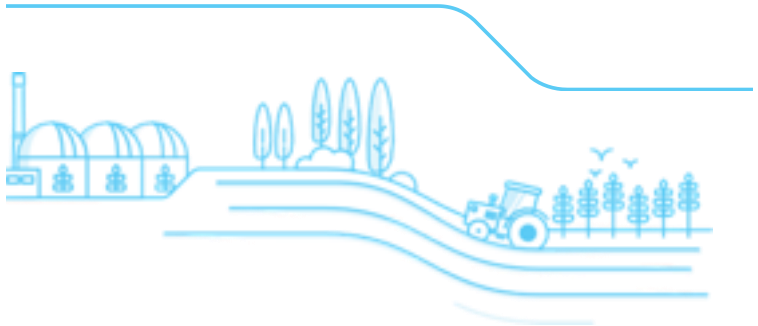
Housekeeping

Wi-Fi

‘Radisson Guest’ – delegates need to accept Wi-Fi terms and conditions.

Agenda

Slido
#1451365



9:00 – 9:30: Registrations

9:30 – 9:40: Welcome and housekeeping

9:40 – 10:00: Opening Remarks and Intro (Nicola Bruce / Nick Harvey – Main Room)

10:00 – 11:00: Breakout Sessions (Main Room, Room 4, and Room 5)

11:00 – 11:15: Coffee Break

11:15 – 12:15: Breakout Sessions (Main Room, Room 4, and Room 5)

12:15 – 13:15: Lunch

13:15 – 14:15: Breakout Sessions (Main Room, Room 4, and Room 5)

14:15 – 14:45: Coffee Break

14:45 – 15:15: Q and A (Slido Questions – Main Room)

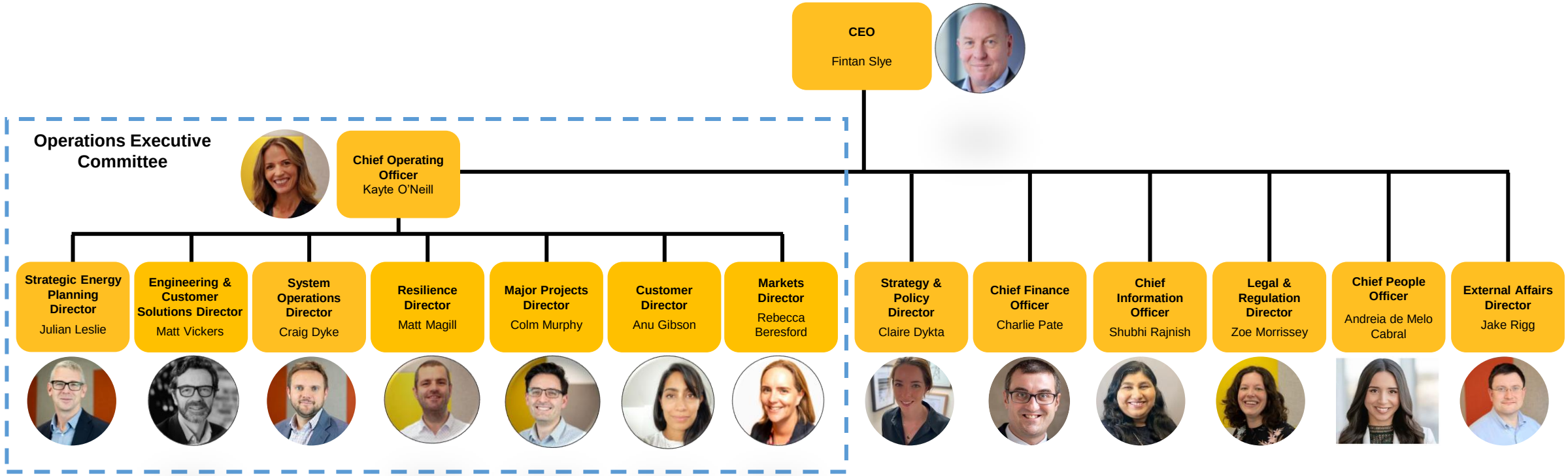
15:15 – 15:30: Review and Close (Main Room)

15:30 – 16:30: Networking

Nicola Bruce
Head of Connections Operations, ESO

Opening Remarks and Introduction

Leadership Structure



- Provides a long term view (1-15 years) of the direction and development of the GB energy systems.
- Real time planning, optimisation and operation of the GB electricity system.
- Plans and delivers large scale projects that impact GB electricity system users
- Develops markets and frameworks which enables electricity system users.
- Oversees & ensures the financial sustainability of the ESO.
- Ensures a responsible & efficient ESO for stakeholders.
- Builds & maintains external relationships and perception of ESO.
- Enables our customers to connect to and access the GB electricity system.
- Drives improvements in the security of the energy system, responsible for GB Elec & Gas Emergency Management.
- Drives ESO to be a customer centric organisation that serves everyone.
- Considers the long term (15 years +) strategic development of energy systems & responsible for ESO strategy.
- Drives a digital first approach to transforming the electricity system.
- Develops ESO to be net zero employer of choice.

The Senior Leadership Team

Connections Leadership Team

Nicola Bruce
Head of Connections Operations

This role has a huge customer focus, and will look to drive forward greater customer service by delivering on our existing processes, helping build stronger relationships with our TO delivery partners and meeting existing licence obligations.

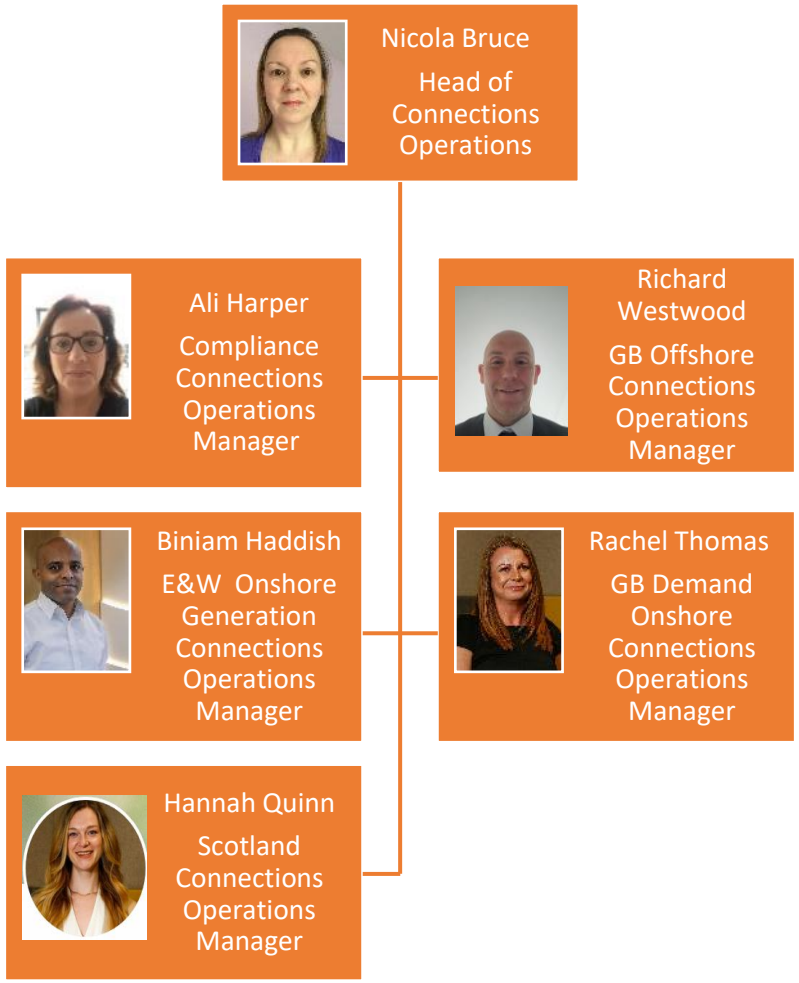
Robyn Jenkins
Head of Connections Change Delivery

Accountability for delivery of the Connections Portal Project and managing the coordination and delivery of all reform activities and creating new processes for the Connections operations team. This will include delivering on the 5 point plan commitments.

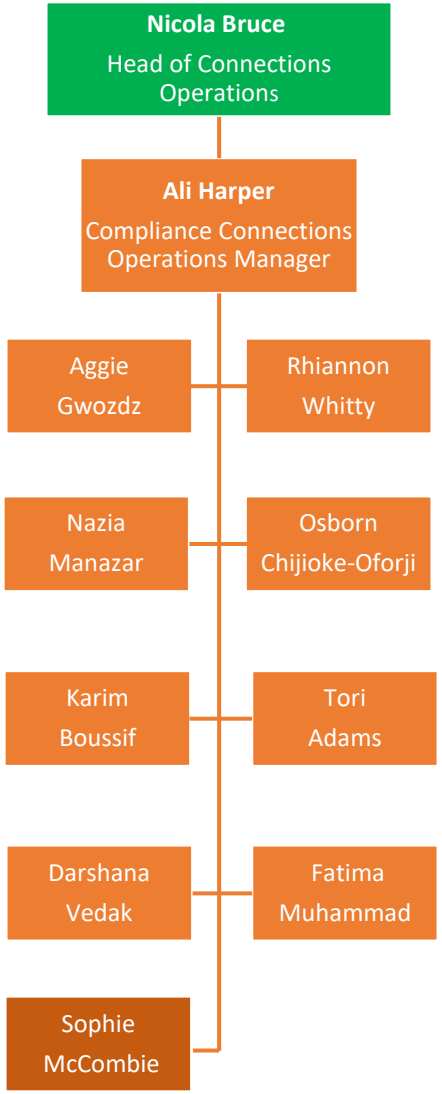
James Norman
Head of Connections Strategy

Delivering the next level of design of the reform, while thinking about the longer term strategic direction of the connections process and related policy development and how it interacts with other major reform programmes across the ESO. Accountable for whole system connection design and policy, including thinking on connection competition.

Connections Operations



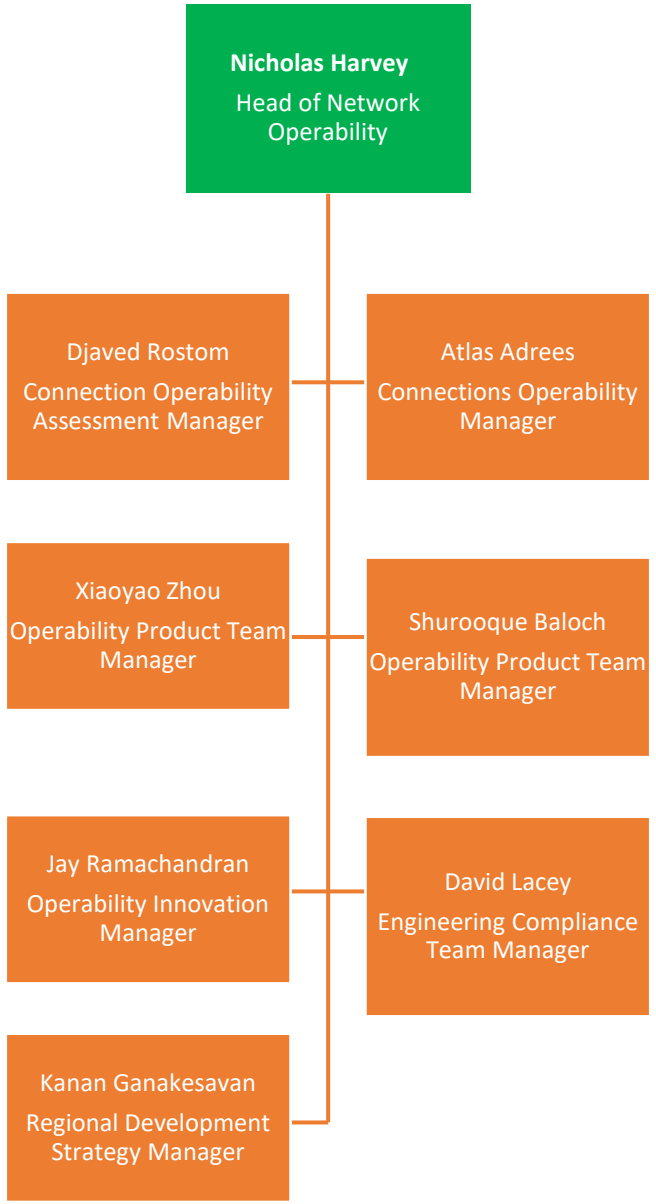
Connections Operations



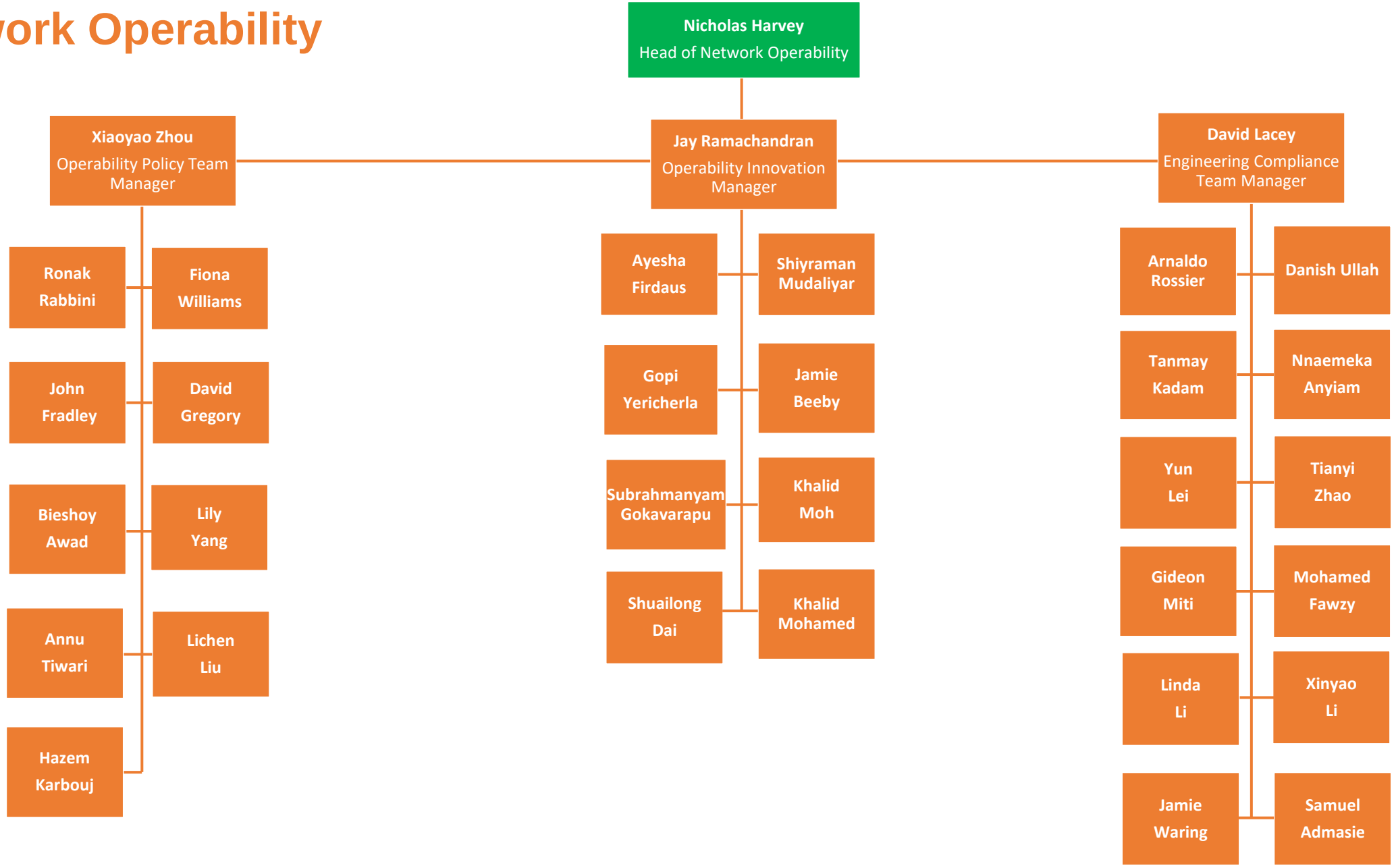
Nicholas Harvey
Head of Network Operability, ESO

Opening Remarks and Introduction

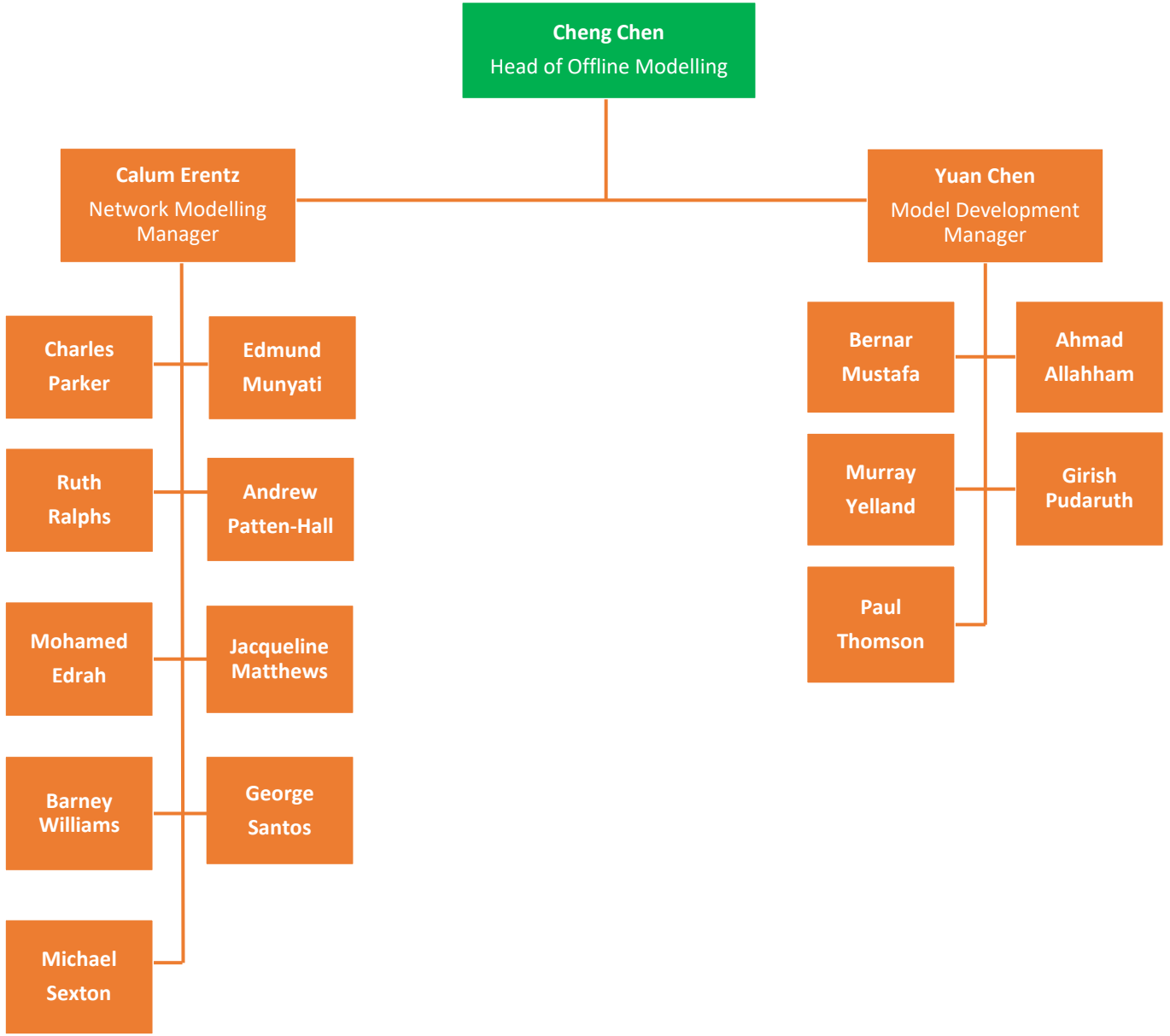
Network Operability



Network Operability



Offline Modelling

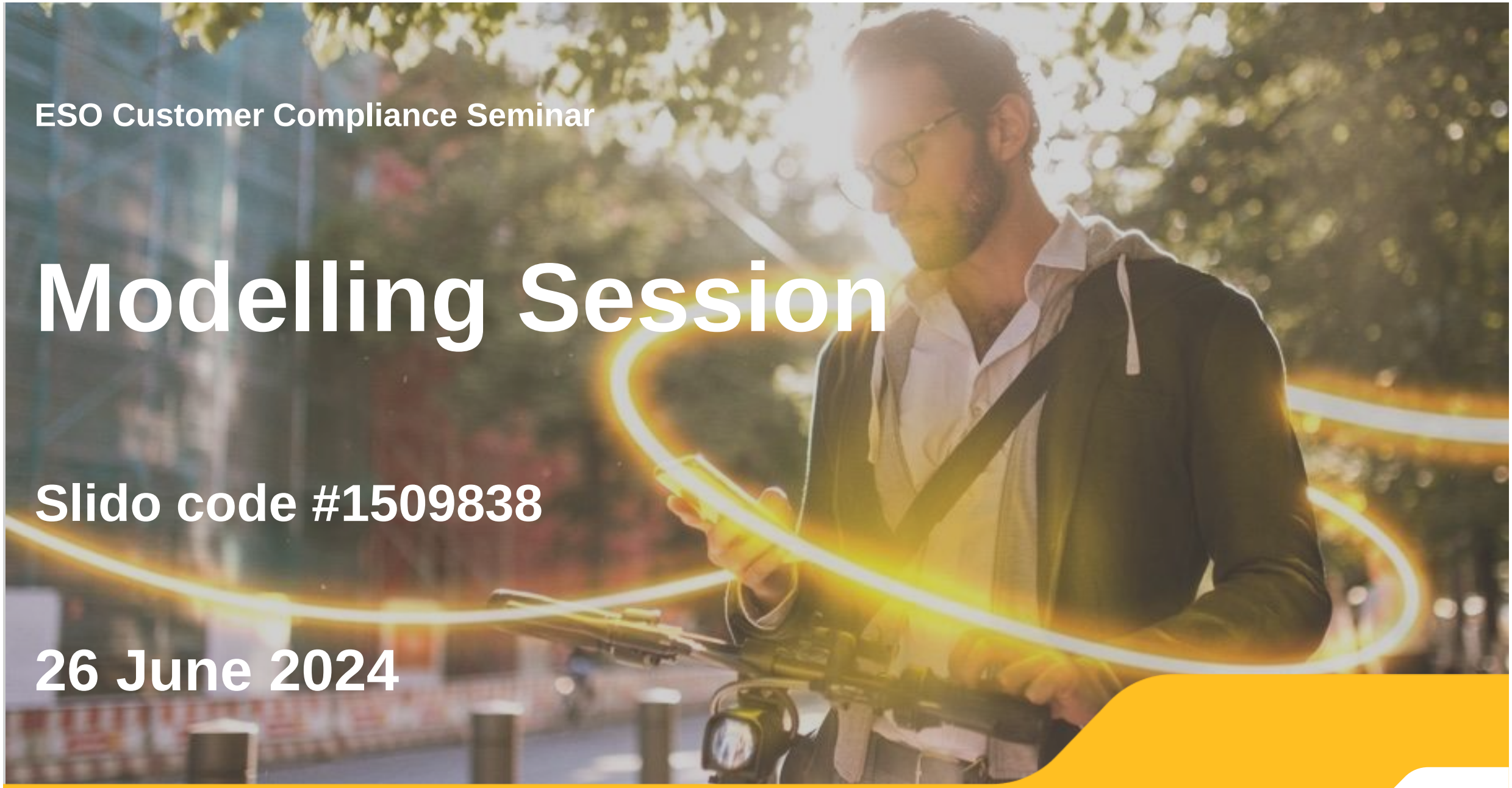


Breakout Sessions

10:00 – 11:00	Breakout Session 1
11:00 – 11:15	Coffee Break
11:15 – 12:15	Breakout Session 2
12:15 – 13:15	Lunch
13:15 – 14:15	Breakout Session 3
14:15 – 14:45	Coffee Break
14:45 – 15:15	Q & A – Slido Questions
15:30 – 16:30	Networking

Where?

- **All Things Modelling (Main Room) #1509838**
  - RMS Model
  - EMT Model
  - Engineering Compliance
  - Q & A
- **Compliance Conversations (Room 5) #1249041**
  - Compliance Process and Repeat Plan
  - UDFS process
  - DRC Process
  - BMU Registrations
  - Q & A
- **Policy Session (Room 4) #1754733**
  - Oscillations
  - Emerging Grid Code Development
  - GC0156 – Electricity System Restoration Standards
  - Q & A
- **Lunch (Foyer – Outside Main Room)**
- **Q & A (Main Room)**



ESO Customer Compliance Seminar

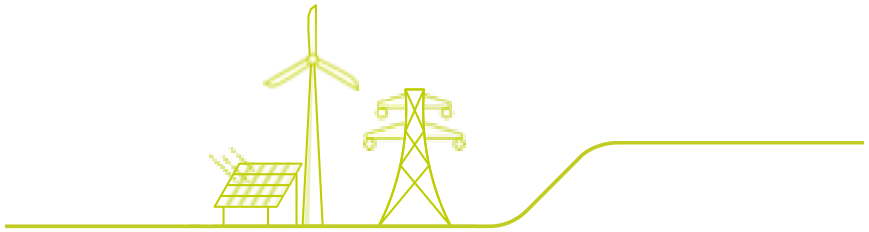
Modelling Session

Slido code #1509838

26 June 2024

ESO

Agenda



Content

- Grid Code Requirements.
- RMS Modelling.
- EMT Modelling.

Importance of Models

They support key activities the ESO undertake

- Network Development
- Outage Planning
- Operability Assessment
- Compliance Assessment
- Fault Investigations

Importance of Models

Therefore, ESO models of the GB network must accurately reflect the real system performance.

To achieve it, user models must be representative showing a dynamic performance at the point of connection which closely aligns with the users' system measured response.

Grid Code GC0141 – New Modelling Requirements

Background

Proposed by ESO to address OFGEM and BEIS concerns and actions set is response to the 2019 power cut incident.

Objective

Strengthen the compliance process.

Grid Code GC0141 – New Modelling Requirements

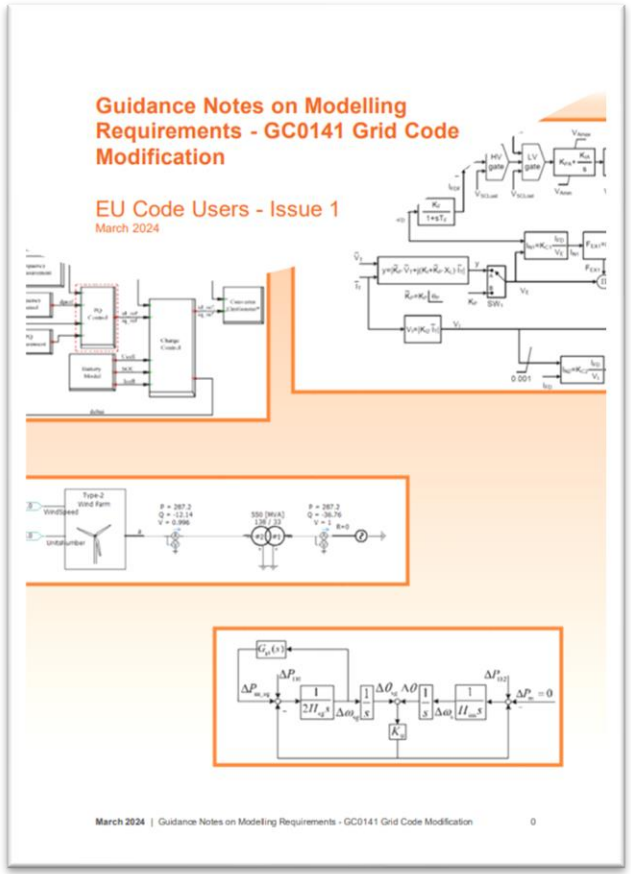
New requirements scope detailed under PC.A.9 of the Grid Code.

Main Points

- User to provide RMS and EMT models of their connections
- Model submissions 3 months ahead of ION and 1month ahead on LON

Guidance Notes on Modelling Requirements

Aim at setting the expectations on what ESO is looking for model submission(s)



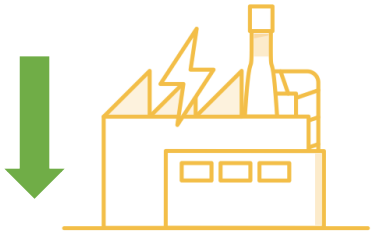
https://www.nationalgrideso.com/document/316631/download

Guidance Notes on Modelling Requirements

Summary of Requirements

- Specify the type of users PC.A.9 requirements are applicable to.
- Specifies the software and version the models need to come implemented in.
- The documentation required with the models
- Model of the complete user system.
- Explanation on the use of generic models.
- Model validation report and accuracy requirements
- Model sharing and IP issues.

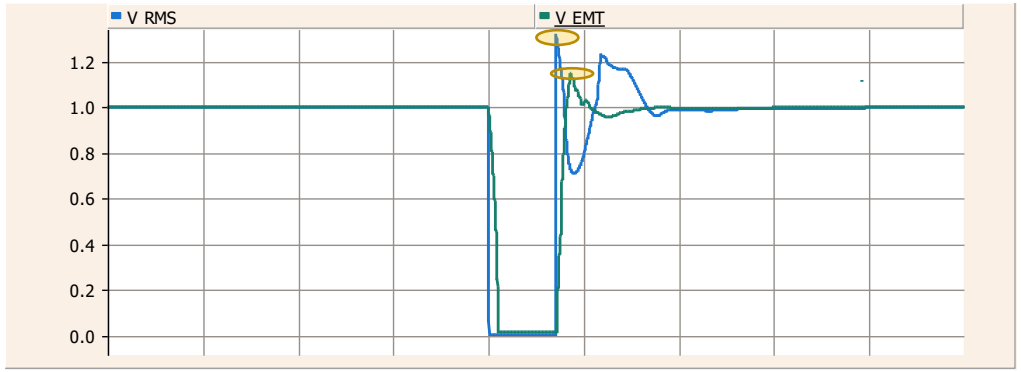
Purpose of EMT Model - I



Less dispatchable generation (Conventional Synchronous)

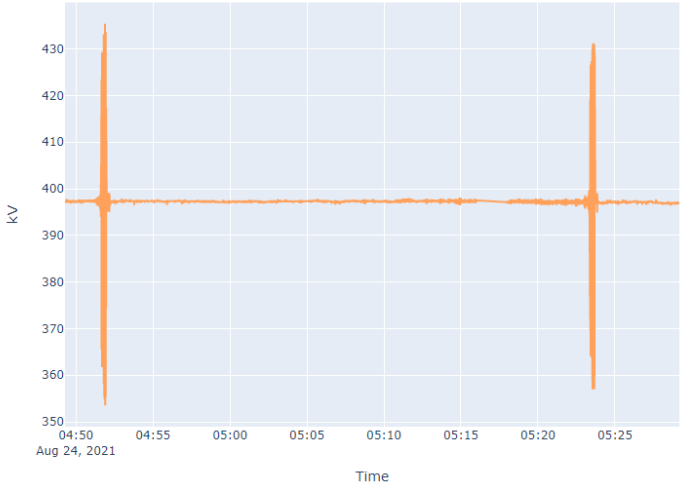
More variable sources of generation

More non-synchronous generation (Inverter Based Resources)



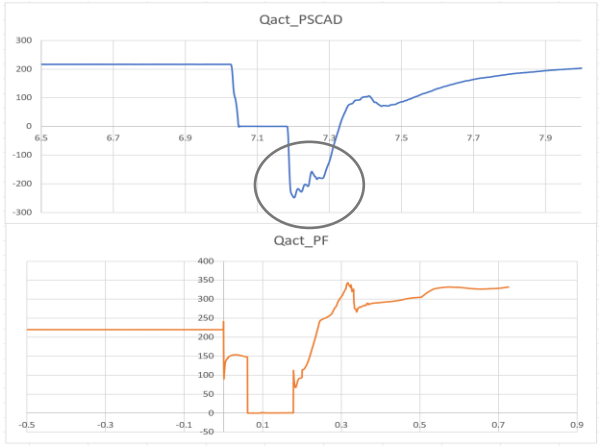
For a non-synchronous generator unit, TOV is higher in RMS (1.3 p.u.) compared with EMT (1.14 p.u.), for an IBR source

EMT models required to analyse the fault ride through capability of IBR resources



With the high penetration of Inverter Based Resources (IBR), control interaction between different sources needs to be analysed to secure the system operation.

Purpose of EMT Model - II

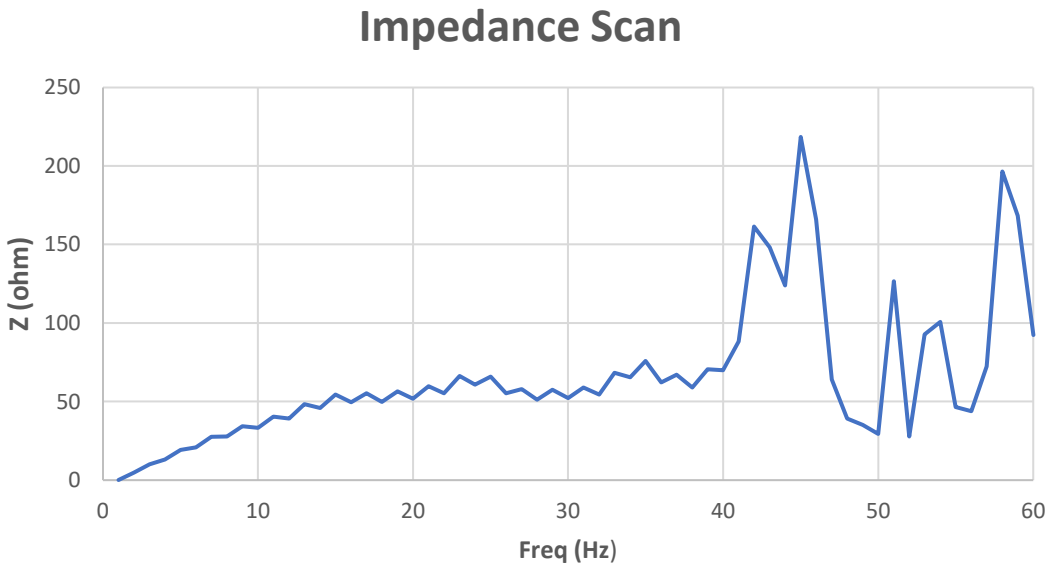


Transformer saturation characteristics and their impact need to be analysed with EMT model

The correct representation of Inverter Based Resources (IBR) controller's behaviours, such as Phase Locked Loop (PLL), are required to analyse the converter stability. PLL tracks the instantaneous voltage and hence EMT is the suitable tool rather than RMS analysis.

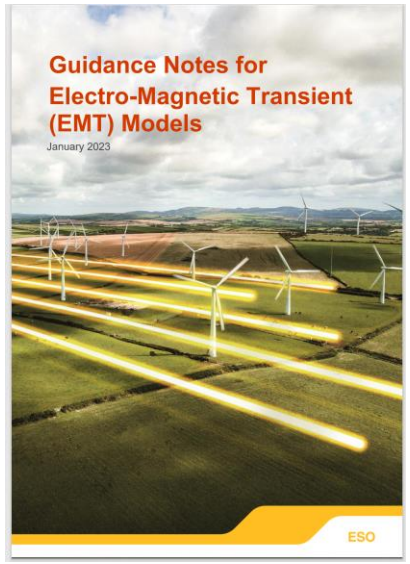
To carry out compliance analysis for technologies such as Grid Forming Converters (GFM), EMT analysis is required.

GB System has number of Line Commutated Converter (LCC) type HVDCs. To carry out the commutation failure analysis for this type of plants, EMT analysis is required.



To carry out dynamic impedance scan analysis for the IBR resources, EMT models are required.

EMT Model Requirements



[download (nationalgrideso.com)]

Efficiency | Usability | Fidelity | Documents | Maintenance

EMT Model Guidance

- PSCAD Version 5
- Intel Fortran Compiler V19.2 or higher
- Visual Studio 2019 and newer
- Encrypted model
- 32 Bit Compiler
- Initialisation within 4 to 6 seconds (Currently 3 seconds)
- Both 32 and 64 Bit Compiler models (for future)

Use of EMT Models

ESO Teams

Engineering Compliance team uses the submitted Users' models to verify the plant compliance requirements

Voltage step change, frequency analysis, fault ride through capabilities, plant behaviour for different system strength (different SCL)

Operability Innovation team, Network Operability, uses the submitted EMT models to develop GB-wide EMT models and to carry out wider system network analysis, System event investigation analysis

Operability Product team, Network Operability, uses models to evaluate their performance of the plants participating in the stability pathfinder projects

Transmission Owners

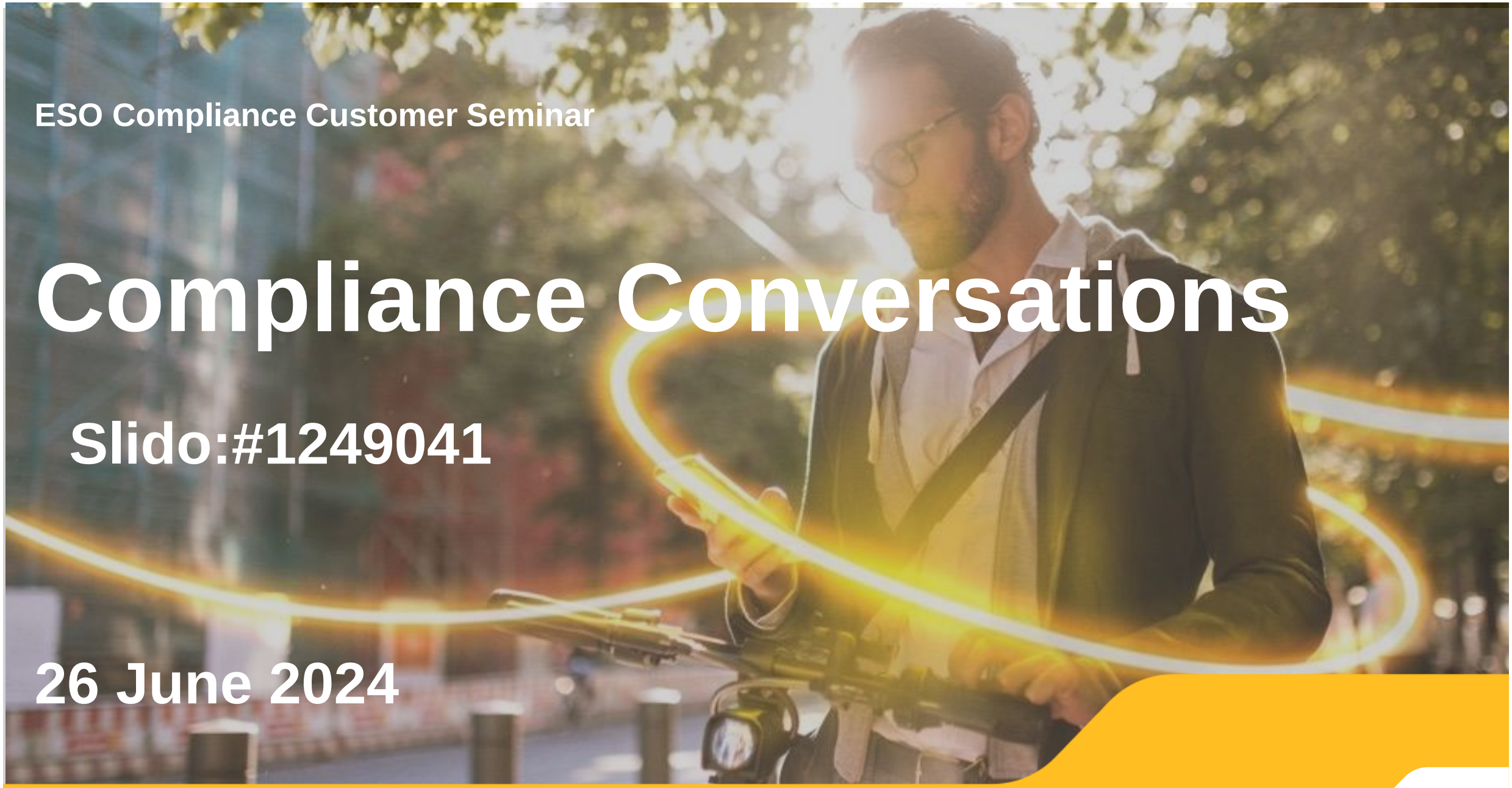
Users' models submitted to the ESO will be shared with the relevant TOs

TO uses these models to build the wider system EMT model, for investigating the system event, new connection impacts and wider system analysis

Users

Users connecting to the system would like to carry out analysis with the wider system model with other Users models

This process is not yet in place, as we are still in the process of collecting EMT models through Grid Code modification and STC modifications.



ESO Compliance Customer Seminar

Compliance Conversations

Slido:#1249041

26 June 2024

ESO

ESO Customer Connections Seminar

Compliance Process & Repeat Plan

Slido: #1249041

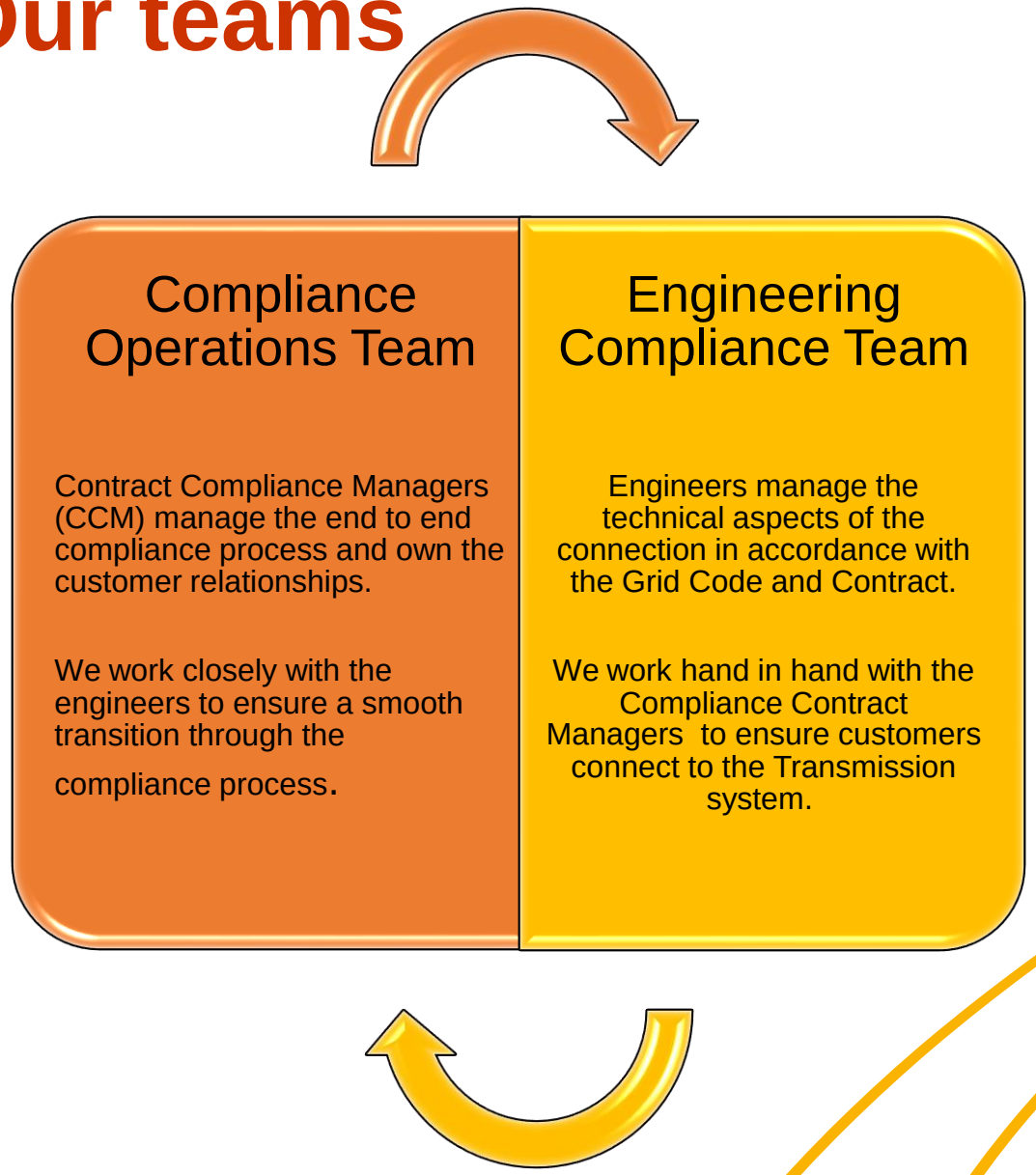
26 June 2024

Osborn Chijioke-Oforji
Connections Compliance Manager

ESO

Compliance – Our teams

We ensure Customers that want to connect to the Transmission System comply with the necessary codes and contractual clauses.



Compliance Process

The customer signs a contract with ESO agreeing to a connection date via the connections contract team.

The ESO meet with customers to go through the compliance process, explain any risks and answer any technical questions.

6 -18 months prior to commissioning, the ESO meet regularly with customers to ensure all data is exchanged for the connection to the transmission system.

See notes below

EON / ION / FON

The ESO issue a formal notification to the Customer, and TO's, when all compliance milestones have been met.

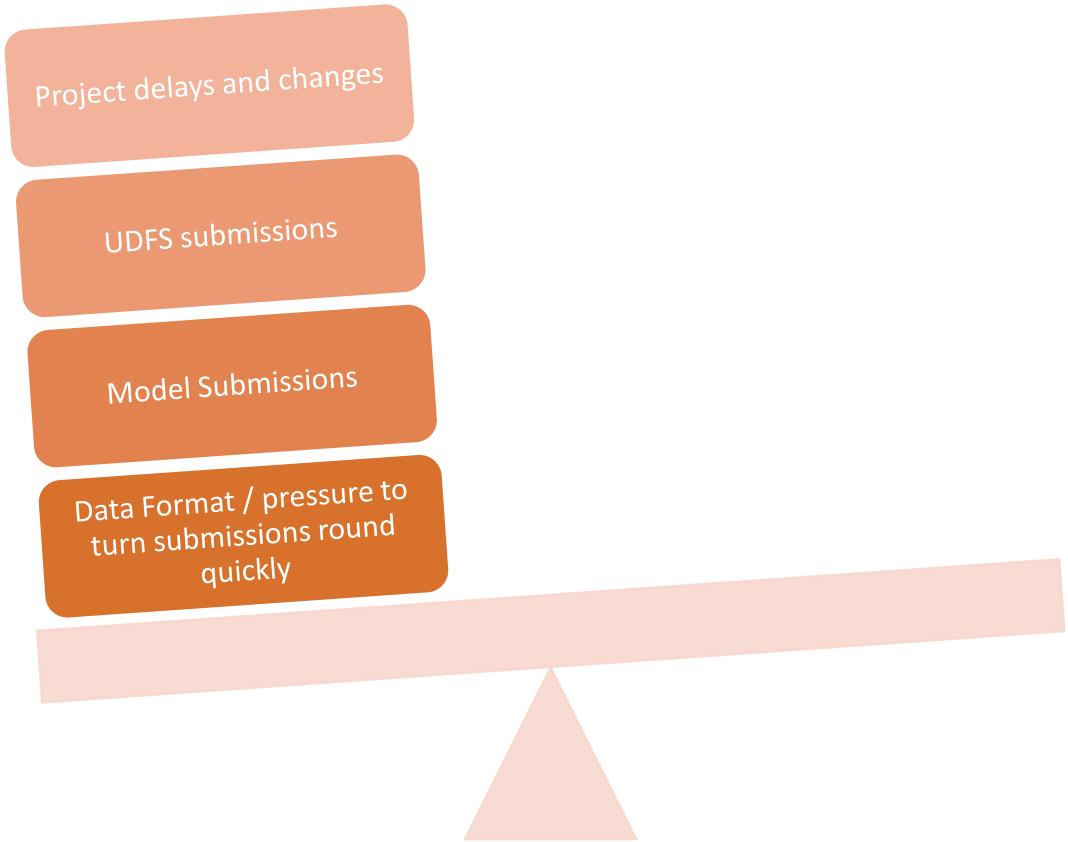
The ESO monitor performance and reach out to reconfirm compliance every 5 years.

Compliance – Risks to your project (where we see delays!)

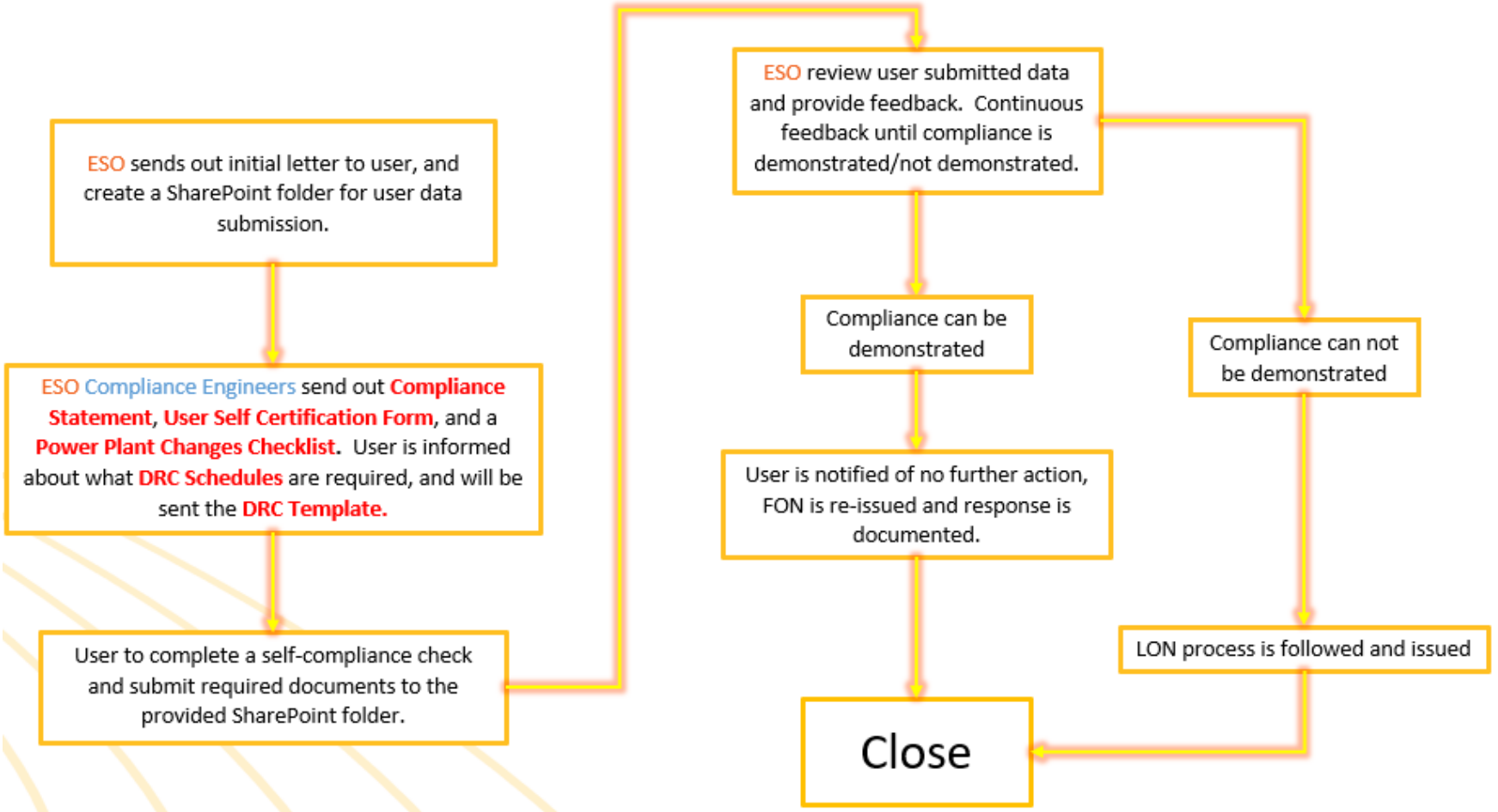
Key Challenges

ESO Perspective

Let us hear your perspective



Compliance Repeat Plan



ESO Customer Connections Seminar

Data Registration Code (DRC)

Slido: #1249041

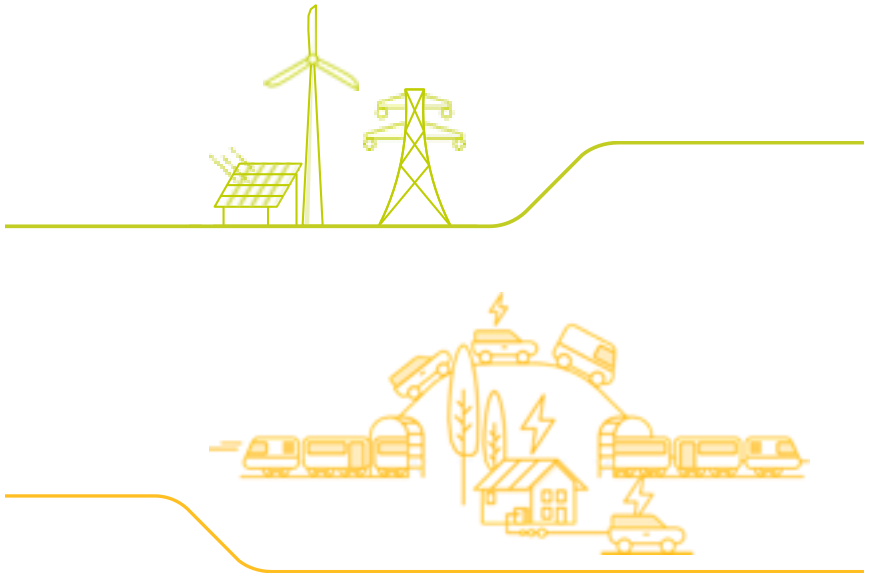
26 June 2024

Calum Erentz
Network Modelling Manager

Agenda

1. DRC Overview
    - What the DRC is and why it is important
    - Who the DRC applies to and when it is submitted
    - DRC submission process (current)
2. The future of DRC submissions
    - Demonstration
    - Key points
    - Benefits
3. Q&A - will be covered at the end

We will not be covering the details of the Grid Code



DRC Overview

What the DRC is and why it is important

- 20 schedules originally designed to simplify the Grid Code data submission process for users
- Consists of predominantly Planning Code (PC) and Operational Code 2 (OC2) clauses

- Allows users to demonstrate compliance as part of the connections processes, provide updates on an ad hoc basis / annually by week 24, and 5 yearly under the compliance repeat plan
- Allows ESO and Transmission Owners to accurately model the GB network to ensure Security and Quality of Supply Standard (SQSS) is maintained and enable effective outage planning for maintenance and investment works

Who the DRC applies to and when it is submitted

DRC requirements are determined by role(s) under DRC.6.2

Users:

- Generators
- Distribution Network Operators (DNOs)
- Restoration Contractors (who do not fall under the categories above)

Submission timescales (Grid Code requirements):

- Connection application process (enable offer)
- Connection compliance process (prior to ONs)
- Ad-hoc following a change
- Annually by week 24
- 5 yearly under the 'self-check' compliance repeat plan

Role	Schedule
Generators with Large Power Stations	1, 2, 3, 4, 9, 14, 15, 16, 19
Generators with Medium Power Stations (see notes 2, 3, 4)	1, 2 (part), 9, 14, 15, 19
Generators with Small Power Stations directly connected to the National Electricity Transmission System	1, 6, 14, 15, 19
Generators undertaking OTSDUW (see note 5)	18, 19
All Users connected directly to the National Electricity Transmission System	5, 6, 9
All Users connected directly to the National Electricity Transmission System other than Generators	10,11,13,17
All Users connected directly to the National Electricity Transmission System with Demand	7, 9
A Pumped Storage Generator, a Generator in respect of one or more Electricity Storage Modules and an Externally Interconnected System Operator and Interconnector Users	12 (as marked)
All Suppliers	12
All Network Operators	12, 16
All BM Participants	8
All DC Converter Station owners	1, 4, 9, 14, 15, 19
Restoration Contractors	2, 3, 6, 16

DRC submission process (current)

PROCESS	DATA SUBMITTED	SUBMISSION DOCUMENT	SUBMISSION ROUTE
Connection application (to enable assessment and offer)	Specific parts of applicable schedules	Excel pro-forma	Connections portal
Connection compliance (prior to ONs)	All applicable schedules	DRC word document	User UDFS SharePoint folder
Ad hoc/annual (week 24)	All applicable schedules (where changes have been made) OR no change statement	DRC word document	Email to .box
Compliance repeat plan	All applicable schedules related to the repeat plan	DRC word document	User Compliance Repeat Plan SharePoint folder

The Future of DRC Submissions

ESO

DRC Generator Portal – Demonstration

Click Here

DRC Generator Portal - Key Points

Why are we doing this?

- Feedback from customers
- Remove schedule/parameter identification burden
- Digitalisation strategy
- Single submission route and database
- Phase 1 applies to generators users only due to upcoming changes under GC0139 (DNOs)

Is this allowable under the GC?

- DRC.5.2.3 states: Where a computer data link exists between a User and The Company, data may be submitted via this link. The Company will, in this situation, provide computer files for completion by the User containing all the data in the corresponding DRC schedule.

Roll out

- UAT planned for Q3/Q4 2024 (please see me at the end if you'd like to take part)
- Go live date – April 2025
- Registration form will be made available under the connections process and to existing users as part of the initial onboarding

DRC Generator Portal - Benefits

The DRC Generator portal offers:

- A more user friendly digital online system
- 24/7 access for users to login and review/amend their data
- A ‘living’ record of current asset data available to users and ESO
- Automatic schedules assignment based on asset role(s)
- Automatic schedule content based on asset type and subtype (where relevant and possible)
- Clear identification of both UDFS (one off) and annual requirements
- Clear identification of data shared with transmission owners (CUSC related)
- ‘No change’ option retained for annual submissions – noting that a full submission will be required under the 5 yearly compliance repeat plan

ESO Customer Connections Seminar

Registration

Slido:#1249041

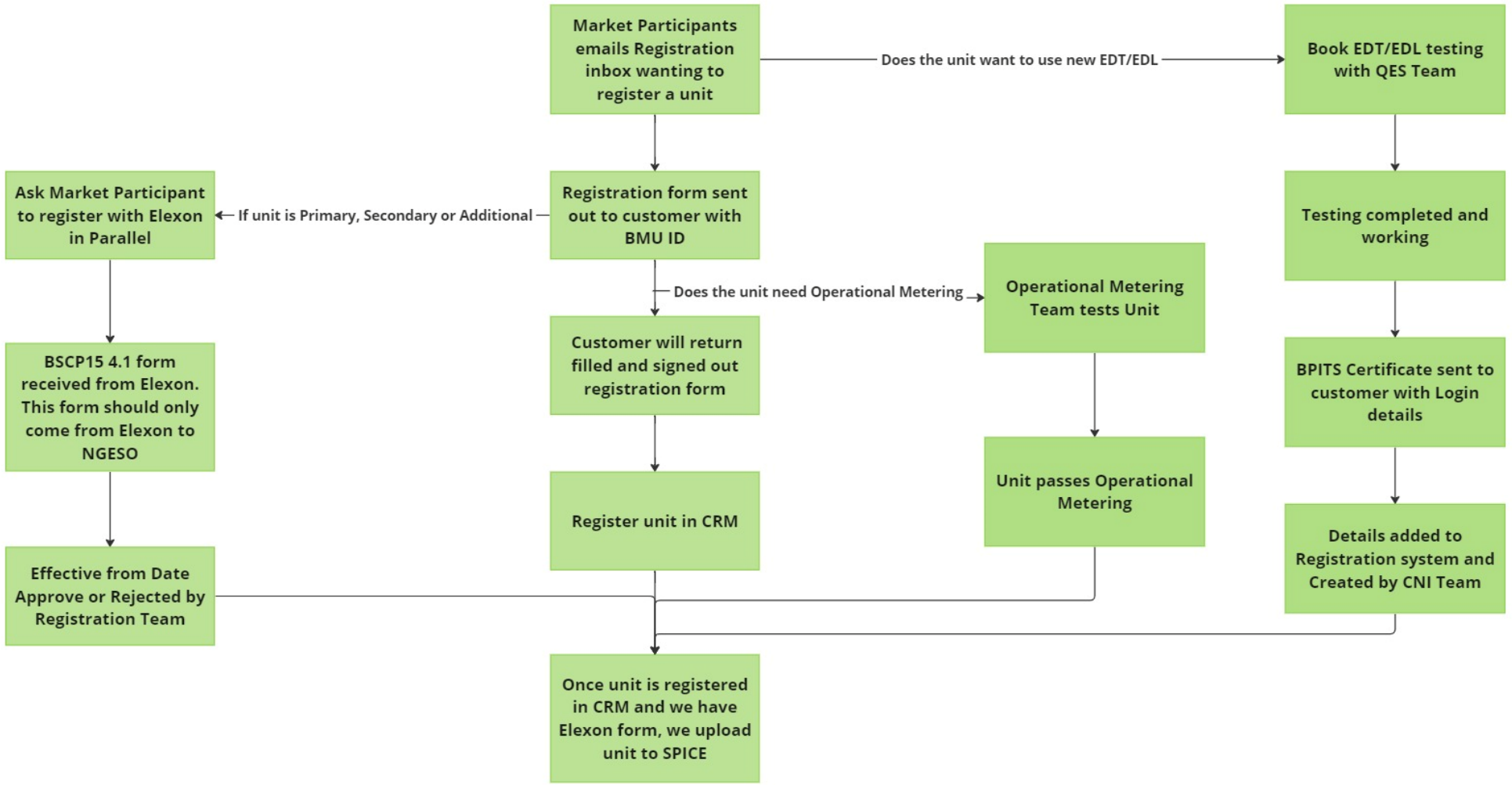
26 June 2024

Stuart Brace
Systems Change Manager

Agenda

1. Registration Process
2. Sort Static Process

A Brief Registration Run Through



Registration FAQs

1. **What is the time frame for registering a unit?**

   The time frame can vary from unit to unit. The registration team ask for a minimum of a 6 month lead time to complete the process with NGESO and Elexon.

2. **How long can EDT/EDL testing last?**

   Our QES Team (EDT/EDL Testing team) require a 3 week lead time. This can increase during busy periods. The QES team will schedule a testing day with the customer. They can pass on this date, but if there are issues then this can increase the time.

3. **Does my unit need Ops Metering?**

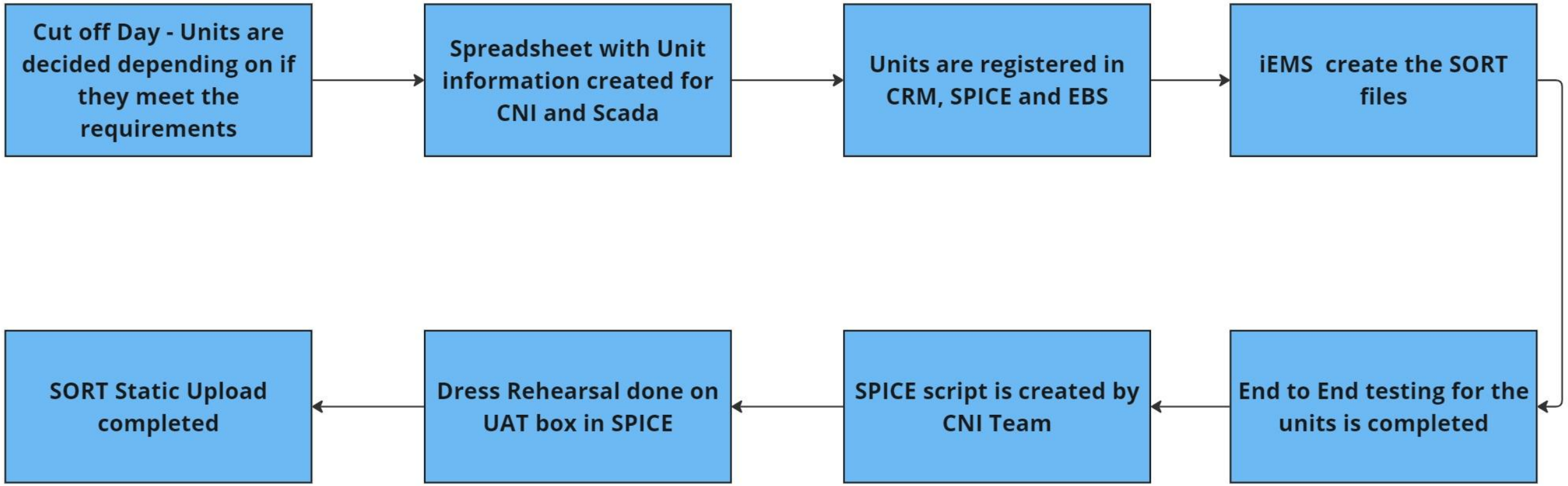
   Most units will need Ops Metering. The best people to answer this question is our Operational Metering Team - box.smallbmuopsmeter-eso@nationalgrid.com

4. **Does my unit need to go into SORT?**

   If the unit uses a Control Point (EDL) then it will need to go into SORT. SORT is how the Control Room dispatch and instruct a unit via the Control Point.

SORT Static

SORT STATIC


Cut off Day - Units are decided depending on if they meet the requirements
Spreadsheet with Unit information created for CNI and Scada
Units are registered in CRM, SPICE and EBS
iEMS create the SORT files
End to End testing for the units is completed
SPICE script is created by CNI Team
Dress Rehearsal done on UAT box in SPICE
SORT Static Upload completed

SORT FAQs

1. **What is a SORT Static?**

   A SORT Static is an bi-monthly planned upload where new units are put into our system called SORT. SORT is used by the Control Room to dispatch and instruct units via their Control Point.

2. **What is the difference between Cut-Off date, Upload Date and Back-Up Date?**

   The Cut-Off date is a date 3 weeks before the Upload Date in which the customer needs to meet all the criteria to be included into the Upload. The Upload Date is the date the SORT Static will take place. The Back-Up Date is a date that the Control Room & CNI team will use if the SORT Static can't take place on the Upload Date.

3. **What do I need to do by the cut-off date?**

   There is criteria that needs to be met to be included into the SORT Static. By the cut-off date we will need:

   - The NGESO Registration Form filled out, signed and returned to us.

   - BSCP15 4.1 form from Elexon

   - Operational Metering tested and working

   - If unit is using new EDT/EDL this will need to be tested and passed BPITS. If the unit is using existing units this step can be ignored.

4. **Why is the SORT Static every two months?**

   There is a few factors as to why it's every two months. One is that we have to take the system away from the Control Room as they can't use the system whilst we upload the new units. These dates are planned a year in advance to make sure there's no schedule conflicts with outages. Another reason is there is a lot of work behind the scenes to make a SORT Static happen which is why the cut-off date and upload date are 3 weeks apart.

ESO Compliance Customer Seminar

26 June 2024

Slido: #1754733

ESO Customer Connections Seminar

Sub-synchronous oscillations

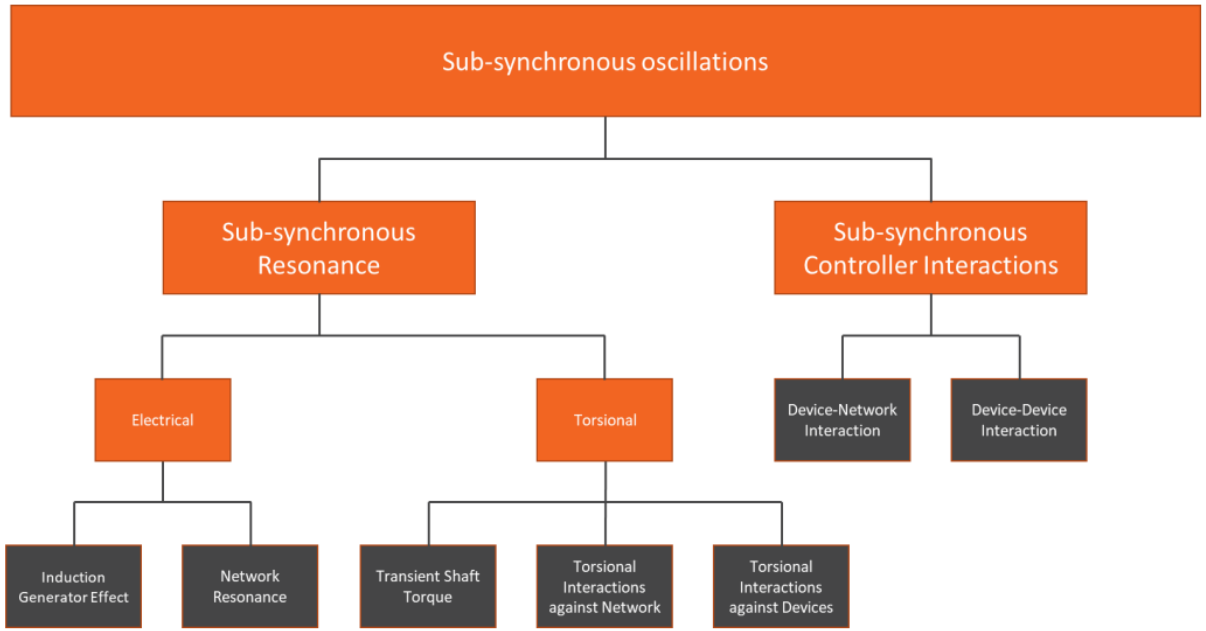
Slido: #1754733

26 June 2024

Xiaoyao Zhou

What is a sub-synchronous oscillations?

- Not a new phenomenon.
- Not associated with a specific technology.
- **Definition**: Sub-synchronous oscillations are power system oscillations at frequencies that are less than the power frequency of 50Hz in Great Britain.
- If left undamped, sub-synchronous oscillations can cause equipment damage, disconnection of generation and in the worst-case scenario loss of supply.
- Classification of sub-synchronous oscillations is shown in the figure. More info in the reference in the footnotes.

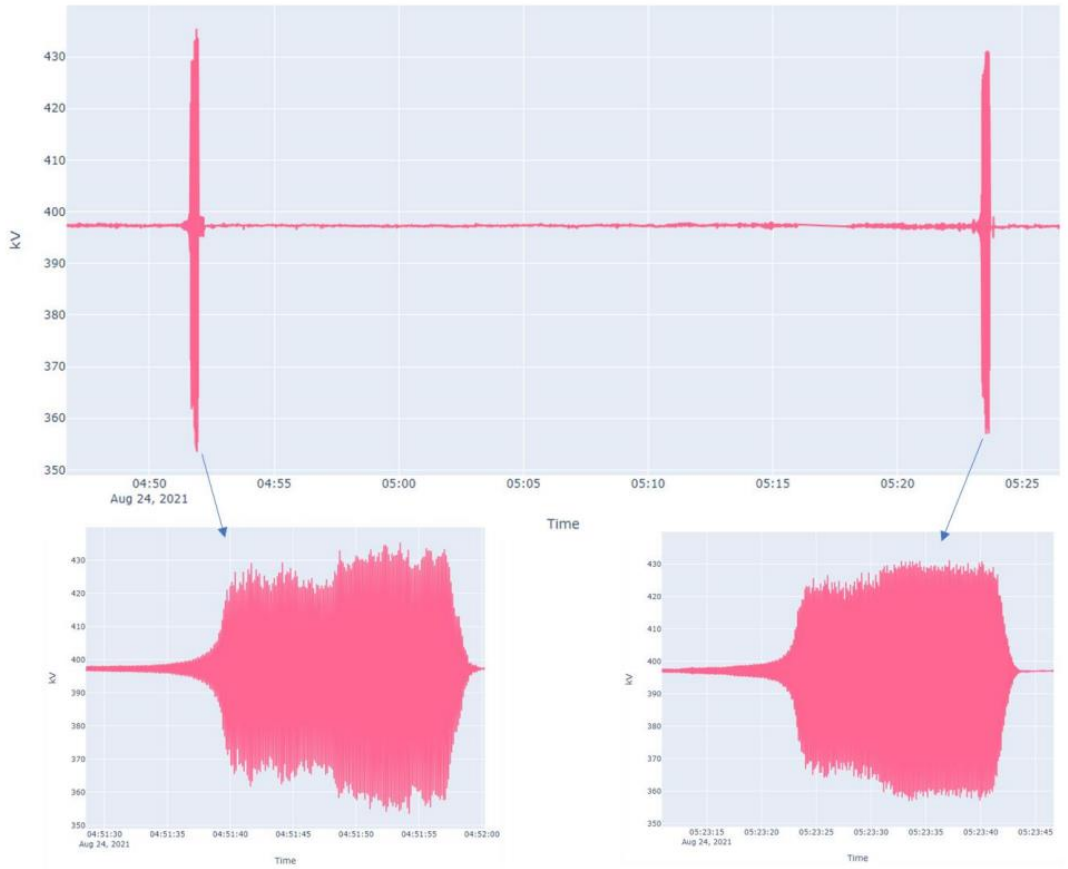


Classification of sub-synchronous oscillations [1].

[1] CIGRE JWG C4/B4.52 Technical Brochure Reference 909, “Guidelines for Subsynchronous Oscillation Studies in Power Electronics Dominated Power Systems”, June 2023.

Past events

- A few sub-synchronous oscillations occurred since 2021. Range of frequency 3-20Hz. None of these events resulted in loss of supply.
- Not associated with a specific technology, short circuit level or the level of inertia.
- Example from 2021 oscillations is shown in the figure.
- Further details on Summer 2023 event is described in our paper.



Sub-synchronous voltage oscillations (8Hz) recorded in GB transmission system, North Scotland, in 2021.

2023 SSOs: What happened

During June and July 2023, 8Hz Sub-synchronous Oscillation (SSO) occurred on five separate days, all centred in the Scottish network. The SSO was in the range 5 – 9Hz, mainly at about 8Hz (approximately 1/6th of 50Hz nominal frequency)

The SSO events caused disturbances on the power system which included the tripping of generation, tripping of an interconnector and HVDC link, and in one case a transmission circuit trip.

The ESO initiated defensive measures and started an investigation after the first event. A dedicated project team was established after the second event.

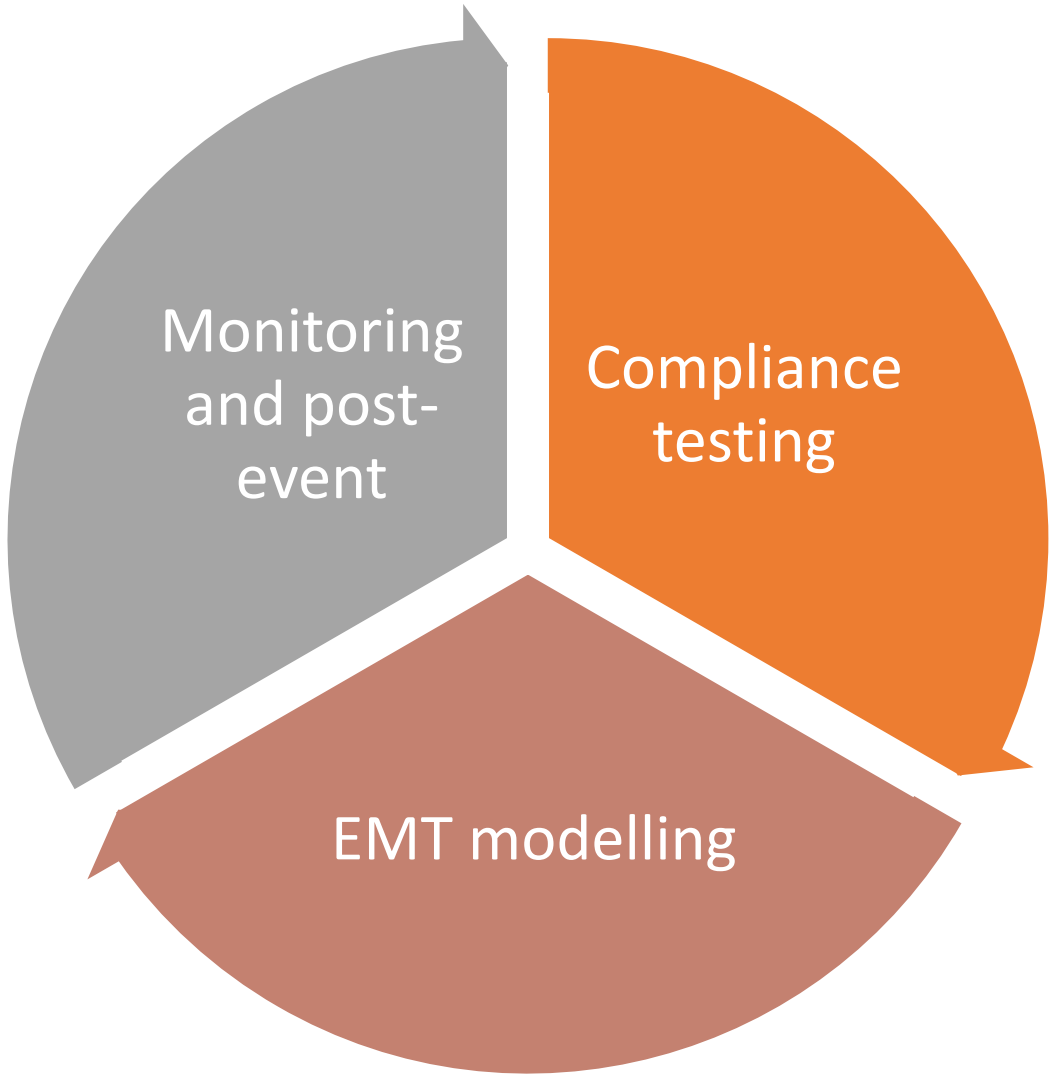
The project team led the investigation, co-ordinated the response across ESO and managed communication with relevant parties.

The most likely cause of the SSO was identified in mid-July.

The project team was stood down on 24th July 2023 and responsibility for concluding work transferred back to the relevant teams.

Changes have been made and there have been no further undamped SSO events in 2023.

Mitigations to the risk of oscillations

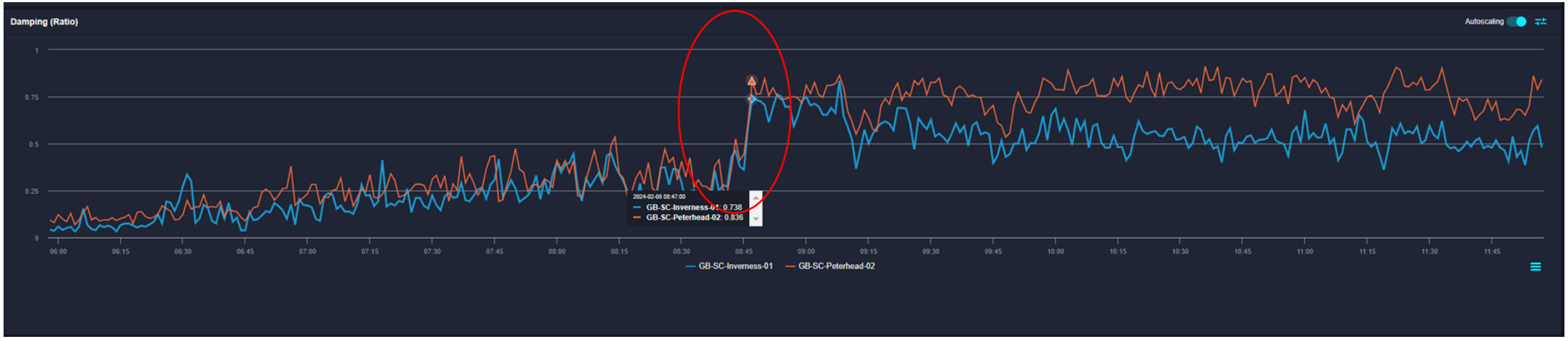


Real time monitoring

- We are building and integrating a Wide Area Monitoring System (WAMS) with oscillation monitoring functions.

- We are collaborating with SSEN-T on INSIGHT project, a Strategic Innovation Fund project that aims to create a virtual, real-time alert and control system that can highlight oscillatory instabilities on the network and then automatically inform control actions required to dampen/remove them.

- We tested a new monitoring system which relies on measurements on the distribution system, collecting data at a high frequency. The system proved effective and significantly improved the real time visibility of system damping and sub-synchronous oscillations.



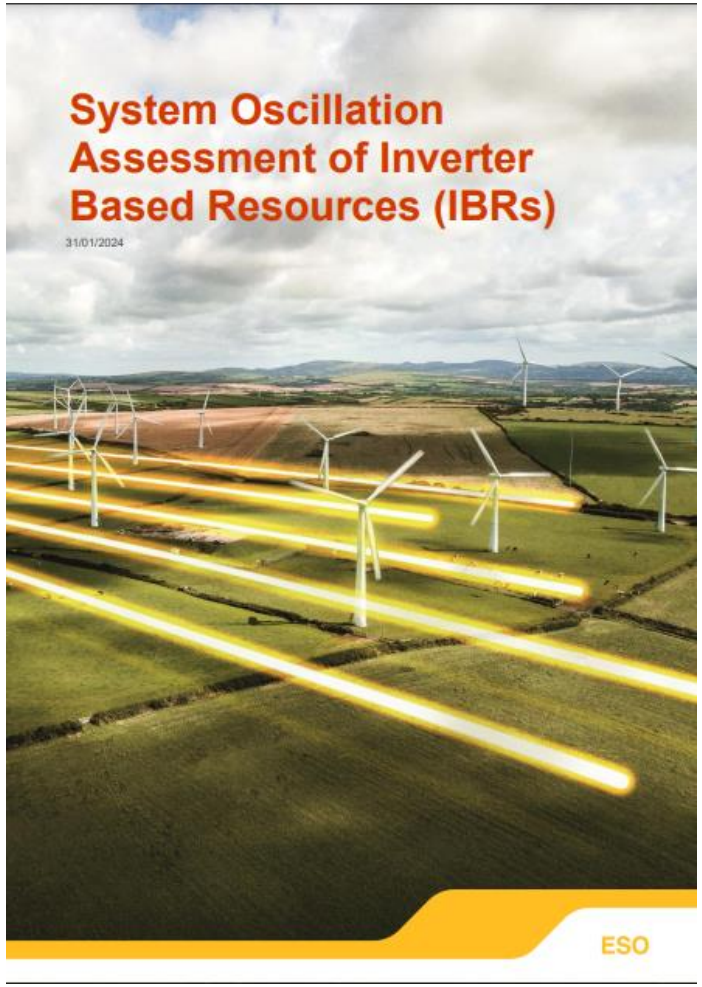
Compliance testing

- The oscillation assessment guidance has been published recently on the back of sub-synchronous oscillations investigation.

- The guidance describes a set of small signal studies which should be carried out by Users as part of the connection compliance process to demonstrate good damping performance.

    - Step change
    - Small signal injection study
    - Frequency scan
    - Eigenvalue analysis

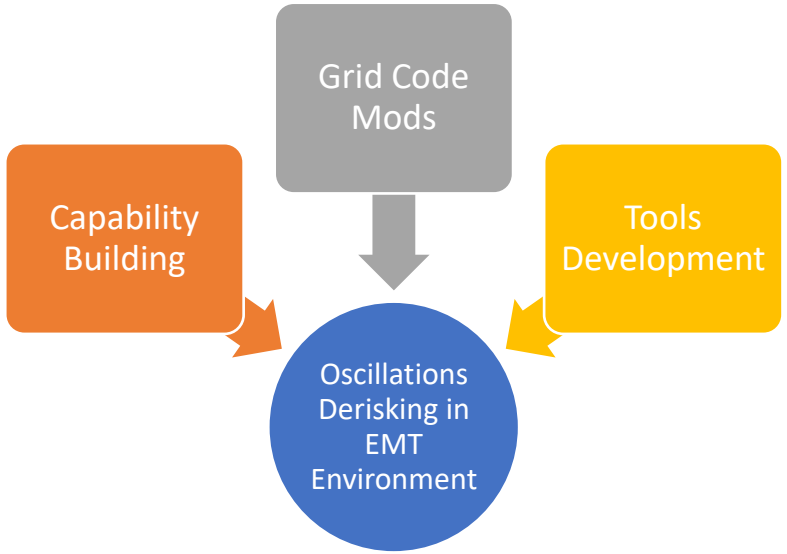
- Quality Assurance Issues based on previous events: ESO suggested proposals to give further confidence that suitable quality assurance measures are in place for site commissioning activities. More can be found here.



Link to the guide

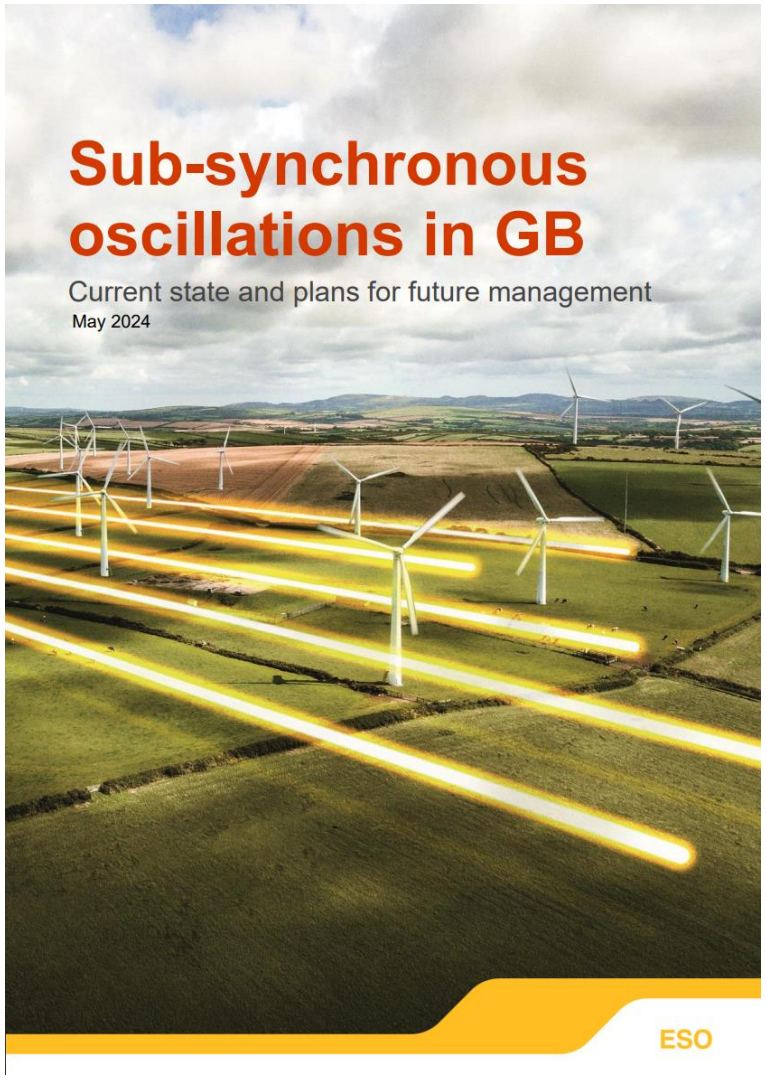
EMT modelling

- Accurate EMT modelling allows us to analyse and investigate various phenomena including oscillations.
- GC0144 (approved): Plants connected on or after September 2022 is required by Grid Code to share with ESO at the compliance stage an EMT model that accurately represents the connected plant.
- GC0168 (proposed): Require certain Users to provide the ESO with EMT models.
- Capability building: New team and infrastructure to accommodate the computation need from EMT models.
- EMT Tools development to de-risk oscillations: example, Automated Identification of Sub-Synchronous Oscillations (SSO) Events.



New paper has been published!

- If left undamped, sub-synchronous oscillations can cause equipment damage, disconnection of generation and in the worst-case scenario loss of supply.
- Not a new phenomenon.
- Not associated with a specific technology.



Link to the paper

ESO Customer Connections Seminar

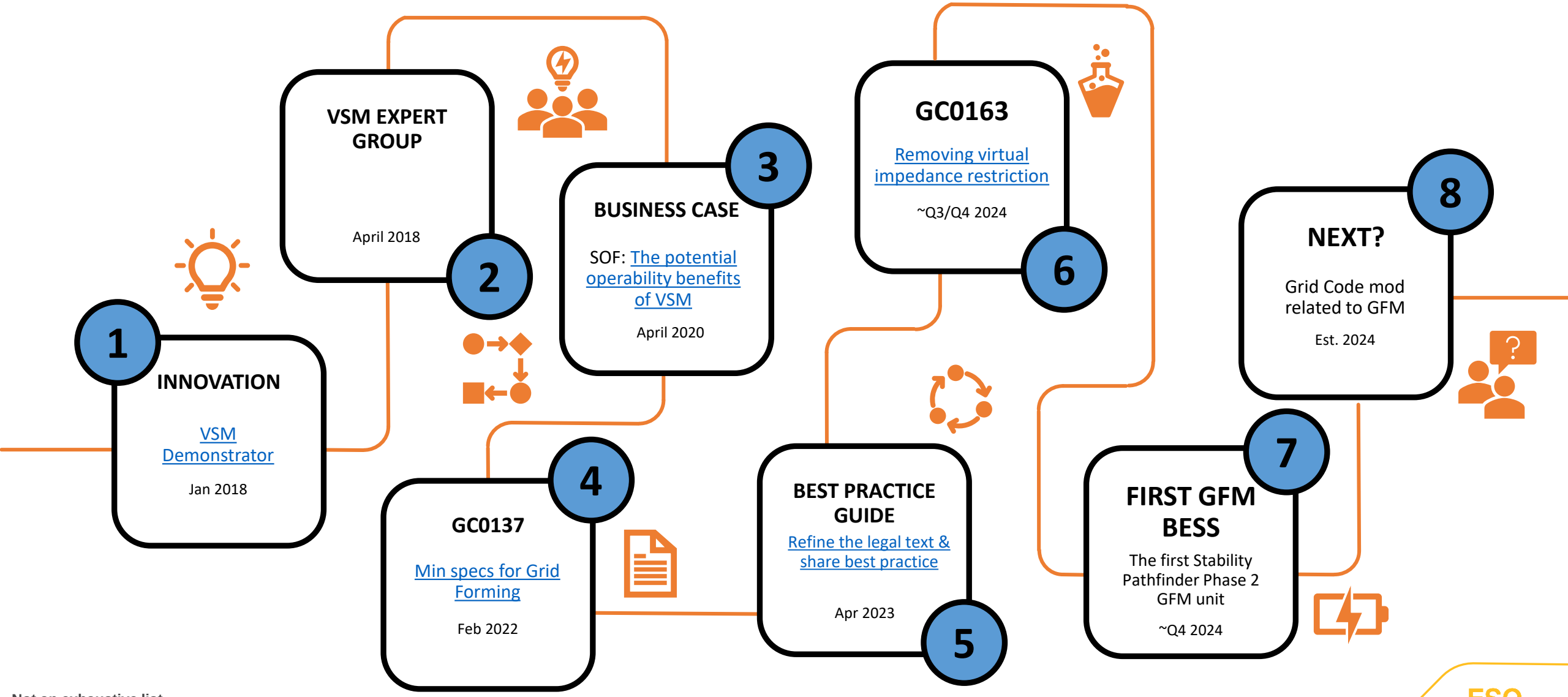
Grid Code Modifications – Grid Forming Converters

Slido: #1754733

26 June 2024

Hazem Karbouj

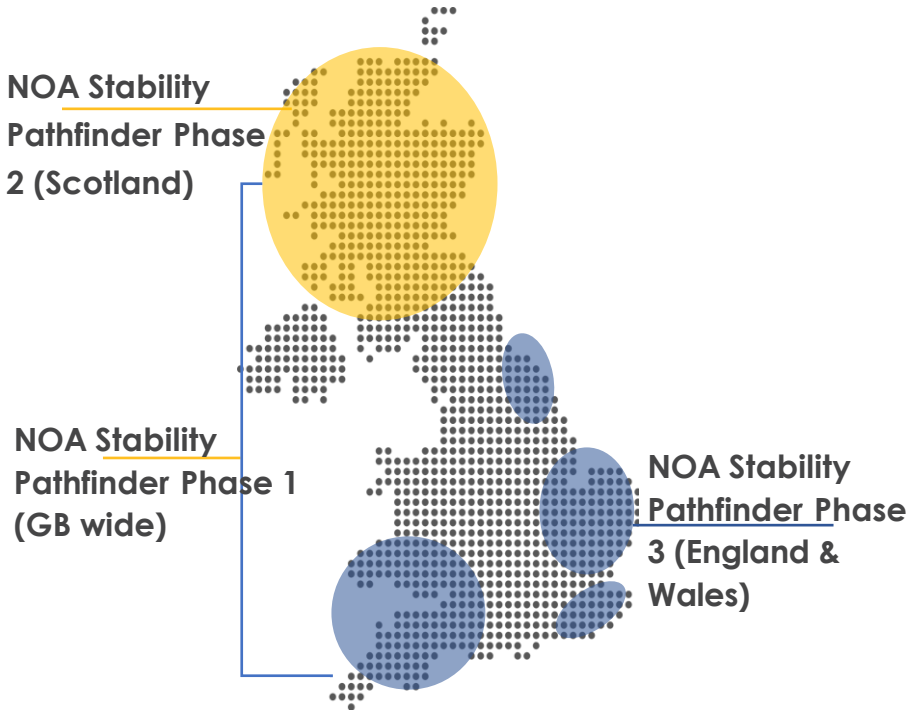
Grid Forming Journey



Not an exhaustive list

Ongoing GFM projects

	Stability Pathfinder Phase 1	Stability Pathfinder Phase 2	Stability Pathfinder Phase 3
Requirement	Inertia and dynamic voltage GB wide	Inertia, SCL and dynamic voltage	Inertia, SCL and dynamic voltage
Status	Tender concluded in Jan 20 with most units now live	Tender concluded in Apr 22. Go-live from Apr 24	Tender period - Commercial window now closed. Go-live expected from 2025
Participating technology	All Synchronous Compensators	5 Synchronous and 5 Grid Forming Converter based	29 Synchronous based
Procurement regions	GB wide	Scotland	England and Wales
Procurement volume	12.5 GW.s of inertia	8.4 GVA of SCL 6 GW.s of inertia	7.5 GVA of SCL 15 GW.s of inertia



https://www.nationalgrideso.com/future-energy/projects/pathfinders/stability

Stability Market Design Overview

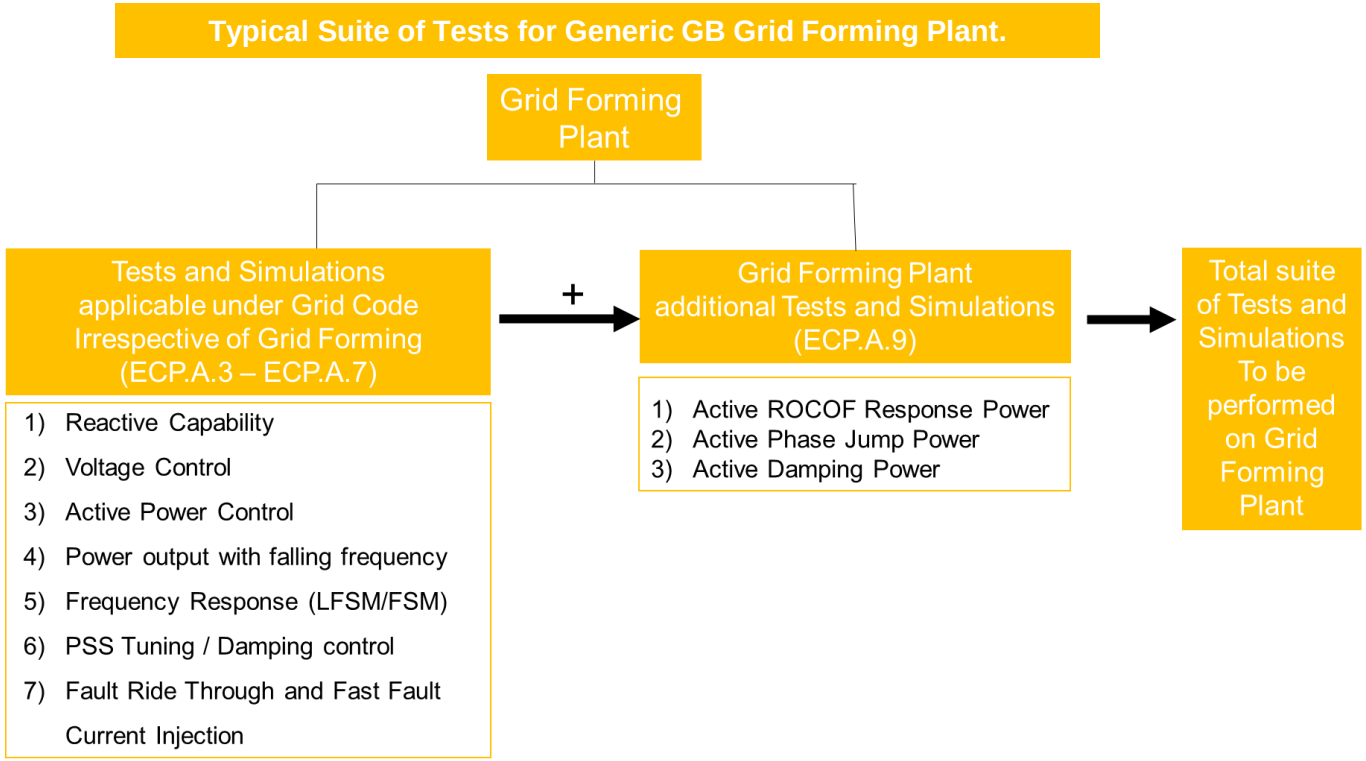
- To maintain compliance and reduce costs associated with managing stability, we are conducting an innovation project with AFRY to explore designing new markets to procure stability services. More details can be found here.
- Phase 1 concluded in 2022 and recommended that a blend of long and short-term competitive procurement is the optimal approach.
- Phase 2 concluded in 2023 built on Phase 1 and provided more detailed evaluation of eligibility rules, contract structure and procurement strategy.

		Long Term (Y-4)	Mid Term (Y-1)	Short Term (D-1)
Purpose		– Procure capacity in advance (LT), to signal the need for new assets – Allow financing of new build capacity (and enhanced capability, TBD) through LT contracts	– Procure capacity in advance (MT), to adjust LT procurement in case necessary – Allow MT financing of new, incremental and existing capability able to provide stability	– Procure capacity to fulfil residual of total requirements for Stability closer to real time (ST) – Allow remuneration of marginal costs for providing Stability.
Timeline	*Procurement lead time*	– Y-4	– Y-1	– D-1
	Contract duration	– 10+ y	– 1 y	– Service windows
Product	*Contract type*	– Baseload availability	– Baseload availability	– 4 h (EFA blocks)
	Contract obligations	– e.g. 90% availability	– e.g. 90% availability	– 100% availability

Stability Market – Next Steps

- The first Mid-term Y-1 stability market has been launched in Summer 2023.
- The first round of Y-1 Stability Market for delivery year 2025/2026 has been launched and we are currently in the Invitation to Tender stage.
- More information can be found on Mid-term (Y-1) Stability Market Webpage.

Tests and Simulations for Compliance Purpose



Active ROCOF Response Power

- Correct Operation of the Grid Forming Plant without Saturating (ECP.A.9.1.9.2)
- GFM Plant's Withstand Capability under Extreme System Frequencies (ECP.A.9.1.9.3)
- GFM's Ability to Supply Active ROCOF Response Power over the full System Frequency range (ECP.A.9.1.9.4)

Active Phase Jump Power

- GFM's Ability to Supply Active Phase Jump Power under normal operation (ECP.A.9.1.9.5)
- GFM's Ability to Supply Active Phase Jump Power under extreme conditions (ECP.A.9.1.9.6)
- GFM's Ability to Supply Active Phase Jump Power, Fault Ride Through and GBGF Fast Current Injection during a Faulted Condition (ECP.A.9.1.9.7)

Active Damping Power

- GFM's Ability to Contribute Active Damping Power (ECP.A.9.1.9.8)

Simulation and Tests for Compliance Purpose

Typical Suite of Simulation and FAT Tests for Generic GB Grid Forming Plant.

Test Ref.	Test Description	Simulation Test	FAT Test
1	To supply Active ROCOF Response Power to the Total System as a result of a System Frequency Change	Yes	Yes
2	To supply Active ROCOF Response Power and Assess Withstand Capability under extreme System Frequencies	Yes	Yes
3	To supply Active ROCOF Response Power over the full System Frequency range	Yes	Yes
4	Active Phase Jump power under normal operation	Yes	Yes
5	Active Phase Jump power under extreme conditions	Yes	Yes
6	Active Phase Jump Power, FRT and Fast Current Injection in Faulted Condition	Yes	Yes
7	Active Damping Power Contribution	Yes	Yes

Site Commissioning Test

- Check performance of GBGF-I plant against nature system frequency changes during connection/disconnection.
- No test as relevant to active phase jump power/active damping power contribution.

Performance Monitoring

- Signal Requirements in line with GC ECC 6.6.1

GC0163: Removing the virtual impedance restriction

- This modification was suggested by the Grid Forming Best Practice work group.
- The modifications allows GFM impedance to include a combination of physical and Virtual Impedances.
- This will enable a manufacturer to design and build a system which has a much greater level of flexibility whilst also resulting in cost savings.
- The modification has progressed through an industry consultation.
- Subject to Ofgem approval, the change could be part of the Grid Code by Q3/Q4 2024.

What's next?

- Grid Forming Best Practice guide has proposed various suggestions to modify the Grid Code in key areas such as modelling requirements, definitions and compliance testing.

- We will soon launch an expert group ahead of raising a formal Grid Code modification.

- The work group will consider requirements arising from:
  - The Great Britain Grid Forming Best Practice Guide
  - Stakeholder comments and suggestions
  - The industrial experience gained from the Stability Pathfinder work / Compliance Process
  - Developments in Europe

- The modification will also discuss whether Grid Forming Capability should be required on certain types and sizes of plants.

ESO Customer Connections Seminar

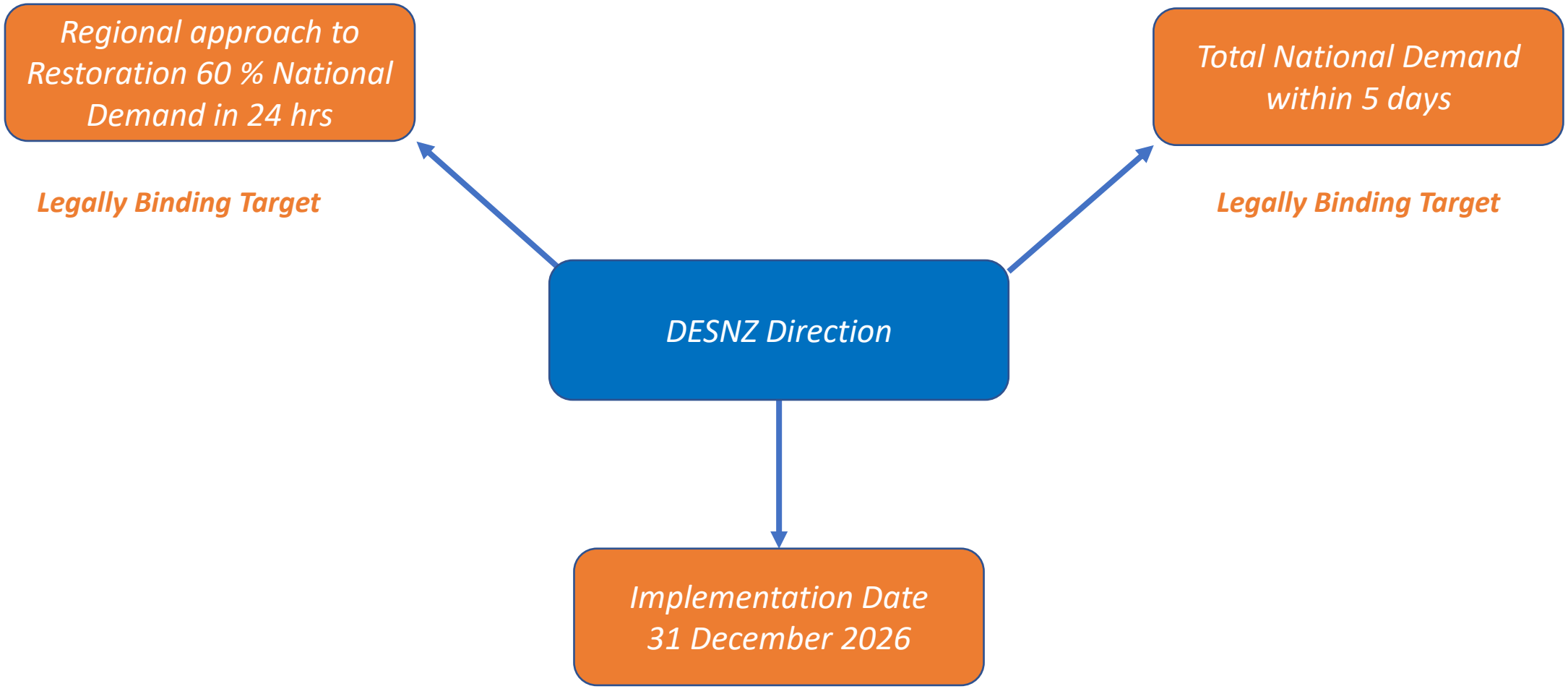
Electricity System Restoration Standard (ESRS)

Slido:#1754733

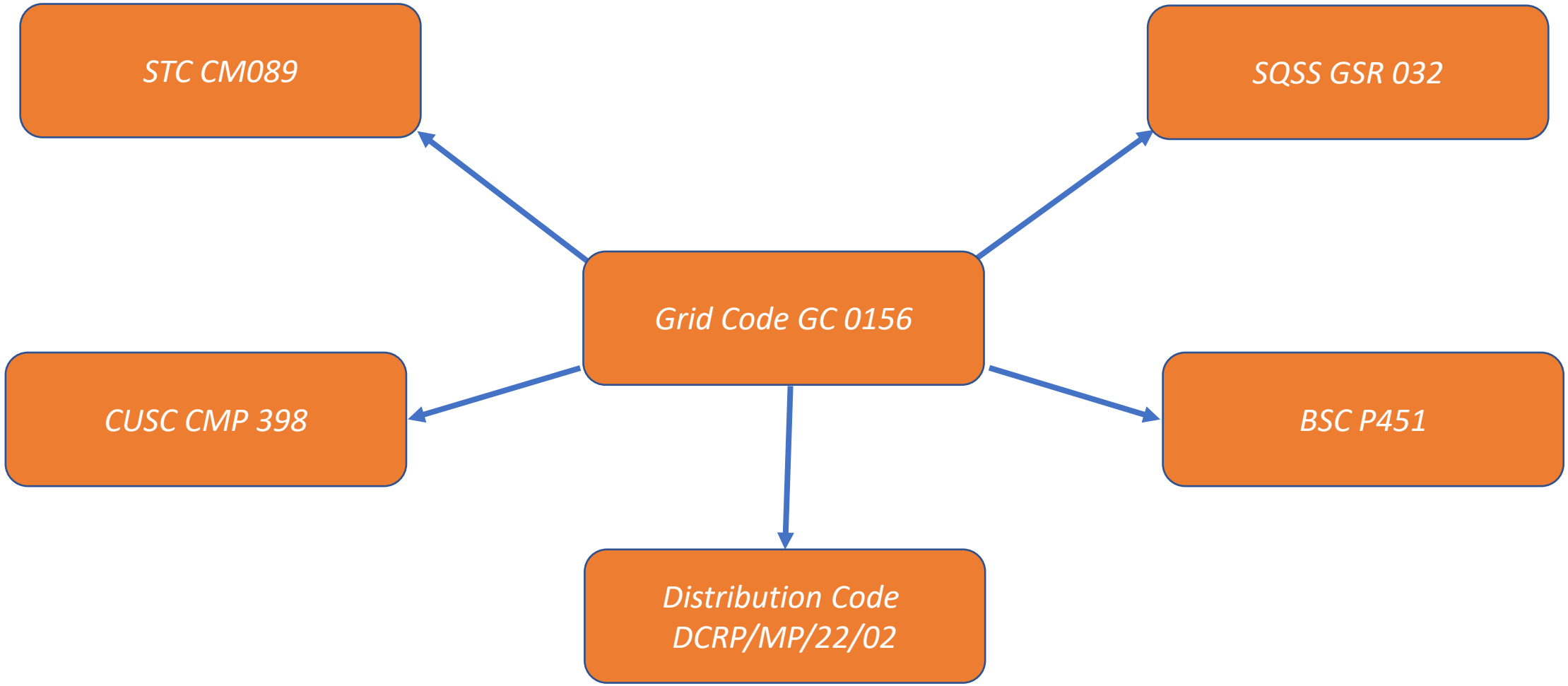
26 June 2024

Hazem Karbouj

Electricity System Restoration Standard (ESRS)



Code modifications



Code modifications impact on Generators

- PC.A.5.7.3 From 31 December 2026 onwards, all **Users** and **Restoration Contractors** are required to confirm annually they comply with the applicable requirements of OC5.7. In the case of **Generators**, **HVDC System Owners**, **DC Converter** owners, **Non-Embedded Customers**, and **Network Operators** this confirmation shall be provided in their Week 24 submission. From 1*st* January 2024 until 31*st* December 2026, evidence to support the work **Generators**, **HVDC System Owners**, **DC Converter** owners, **Non-Embedded Customers**, and **Network Operators** are carrying out to achieve these requirements on or after 31 December 2026 shall be provided in their Week 24 submission.

- OC5.7.4.2 **The Company** in coordination with **Users** and **Restoration Contractors** will undertake desk top and computer exercises and tests at the specified frequencies defined in Part III of **DRC** Schedule 16 to confirm: (i-xii resilience obligations captured in OC5.7.4.2)

Generators Assurance Activities

Generators are to report on the following assurance activities **annually** via **week 24 submissions**

- **Resilience to Total or Partial shutdown** (Their plant and apparatus should be such that their plant can be shut down in a safe manner in a Partial or Total Shutdown and remain in a safe state without external supplies for up to **72 hours**)
- **Voice Systems Resilience test or equivalent.** (min of **72 hrs resilience** under Restoration event. Demonstrate by fulfilling Restoration Auxiliary Power Source Test)
- **Critical Tools and Facilities control systems resilience demonstration** – power resilience including power resilience demonstration & connectivity and alarm event handling . (min of **72hrs resilience** under restoration event. Demonstrate by fulfilling Restoration Auxiliary Power Source Test)
- **Control systems resilience demonstration** – diagram & topology
- **Cyber-Security** (compliance with Network & Information Systems **(NIS) regulations**)
- **Telephony services test** as per CC/ECC.6.5.4. (end-to-end confirmation of voice route by a **live test** at least once per year.)
- **Restoration Procedure review** (For Generators**, loss of network procedures**. Internal organisational review of all relevant restoration related procedures to ensure these are up to date.)

CMP 398 WACM 1, 72 hour cost recovery

CMP 398 was proposed by SSE Gen. Solution WACM1 was an alternative proposal by the ESO, it introduces a process run by the ESO to validate claims for CAPEX as a result of cost incurred due to the obligations set out in GC0156.

A draft guidance note was issued in March to Industry for consultation and in May the final guidance note was issued to industry outlining how the claims process will work as well as the timing and thresholds. Link below:

www.nationalgrideso.com/document/317971/download

Guidance note breakdown

Claims assessment

- Claims would be assessed by the ESO

Type of claims

- CUSC parties can claim CAPEX incurred in complying with new obligations set out in GC0156.

Claims Window and Payment Structure

- Claims can only be submitted during the claims' submission month, which would be in September 2024, September 2025 and December 2026.
- From 31st December 2026 (the end of the final claims window), no further claims would be accepted.
- When a claim is approved, the ESO would pay the claim in 12 equal monthly payments over the following 12-month period that begins in April the year after submission of the claim.

New CUSC Parties

- CUSC parties that sign a BCA with the ESO after the date of implementation of GC0156 (04/03/2024), are not permitted to submit a claim.

Q & A Slido Questions: #1451365

Slido available in all breakout sessions

Nicola Bruce
Head of Connections Operations, ESO

Nicholas Harvey
Head of Network Operability, ESO

Closing Remarks

Thank you for attending

Join us for networking

Your feedback matters