

WELCOME

SQSS Panel

Tuesday 22 March 2022

Microsoft Teams

nationalgridESO

Introductions & Apologies for absence

Apologies

Alternates

Observers/Presenters

Patrick McNabb - National Grid ESO

William Kirk-Wilson – National Grid ESO

Neil Adams – National Grid ESO

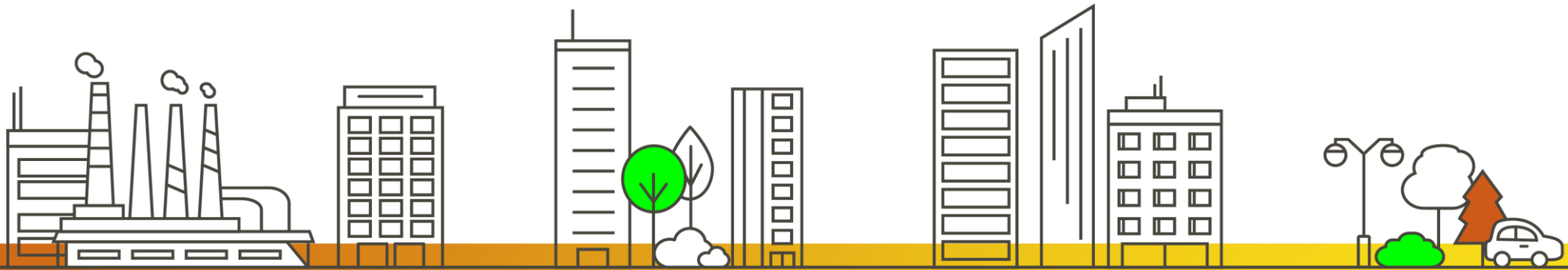
Can Li – National Grid ESO

Tariq Ajumal - National Grid ESO

Approval of Panel Minutes

Approval of Panel Minutes from the
Meeting held on:

Monday 13 December 2021



Actions Log

Review of the actions log



Standing Items/ impacts from other work

- Energy Code Reform
Rob Wilson
- Review of Modification Register (Tracker)
No active modifications
- [Link](#)

Authority Decisions



- No decisions received since the last Panel meeting
- No decisions pending

A landscape photograph of a mountain valley. In the foreground, a grassy field is illuminated by several bright, glowing yellow lines that curve across the terrain, suggesting energy or power. In the background, a large, rugged mountain with snow-capped peaks rises against a sky filled with dramatic, golden-hued clouds. The sun is visible, partially obscured by clouds, creating a warm, golden light across the scene.

SQSS review consultation update

Operability Policy Team

Outline

- The consultation process
- Feedback summary
- Next steps

The consultation process

- The consultation was **opened on 16th February and closed on 9th March** at 5pm
- The consultation was advertised through different comms and on the NG ESO website
- We have received X responses

The stakeholders were required to **provide feedback on the published SQSS review plan within the context of the following questions:**

1. Please provide your comments/feedback and suggestions related to the topics raised in Section 3.1 Offshore Transmission System.
2. Please provide your comments/feedback and suggestions related to the topics raised in Section 3.2 Demand Connection Criteria.
3. Please provide your comments/feedback and suggestions related to the topics raised in Section 3.3 Generation Connection Requirements.
4. Please provide your comments/feedback and suggestions related to the topics raised in Section 3.4 Main Interconnected Transmission System.
5. Please provide your comments/feedback and suggestions related to the topics raised in Section 3.5 Operational Standards in England and Wales.
6. Please provide your comments/feedback and suggestions related to the topics raised in Sections 3.6 Introduction of CATO.
7. Please provide your comments/feedback and suggestions related to the topics raised in Sections 3.7 Governance.
8. **Which of the proposed modifications will have the most significant impact** on your operations/investment plan? To what extent would that impact be?
9. **Are there any other areas** that require review and may act as a barrier for net zero in NETS SQSS?
10. **Do you agree with the priorities and the delivery timescales** described in Section 4? If not, please provide additional information that could allow us to revise the priorities.



Feedback summary

Stakeholders have provided positive feedback in terms of the topics selected for review and agreed that they represent the key issues the industry faces and the delivery plan.

“...agree with the priority order of the timeline described in Section 4 of the consultation...”

“...support the proposed review of the restriction on the loss of infeed risk of single offshore DC converter potentially to 1800 MW...”

“...support the prioritisation of this review in 2022/23...”

Feedback summary

Key examples from stakeholders' feedback

Coordination and consistency with HND work; DC bipole solutions.

Storage will reduce NGESO payments to curtail renewable generation. This reduced cost is of course carried through to the consumer. In addition, without appropriate levels of storage capability, at low renewable generation, NGESO will need to unnecessarily rely on fossil fuel generation. Hence, the dual role of storage should be embedded into SQSS.

Aligning SQSS Section 3 with P2/7 needs to consider future changes of P2/7; lay out main differences between the documents

Consider security contribution from DNO contracted and non-contracted Demand Side Response as well as embedded generation (clustered or individual).

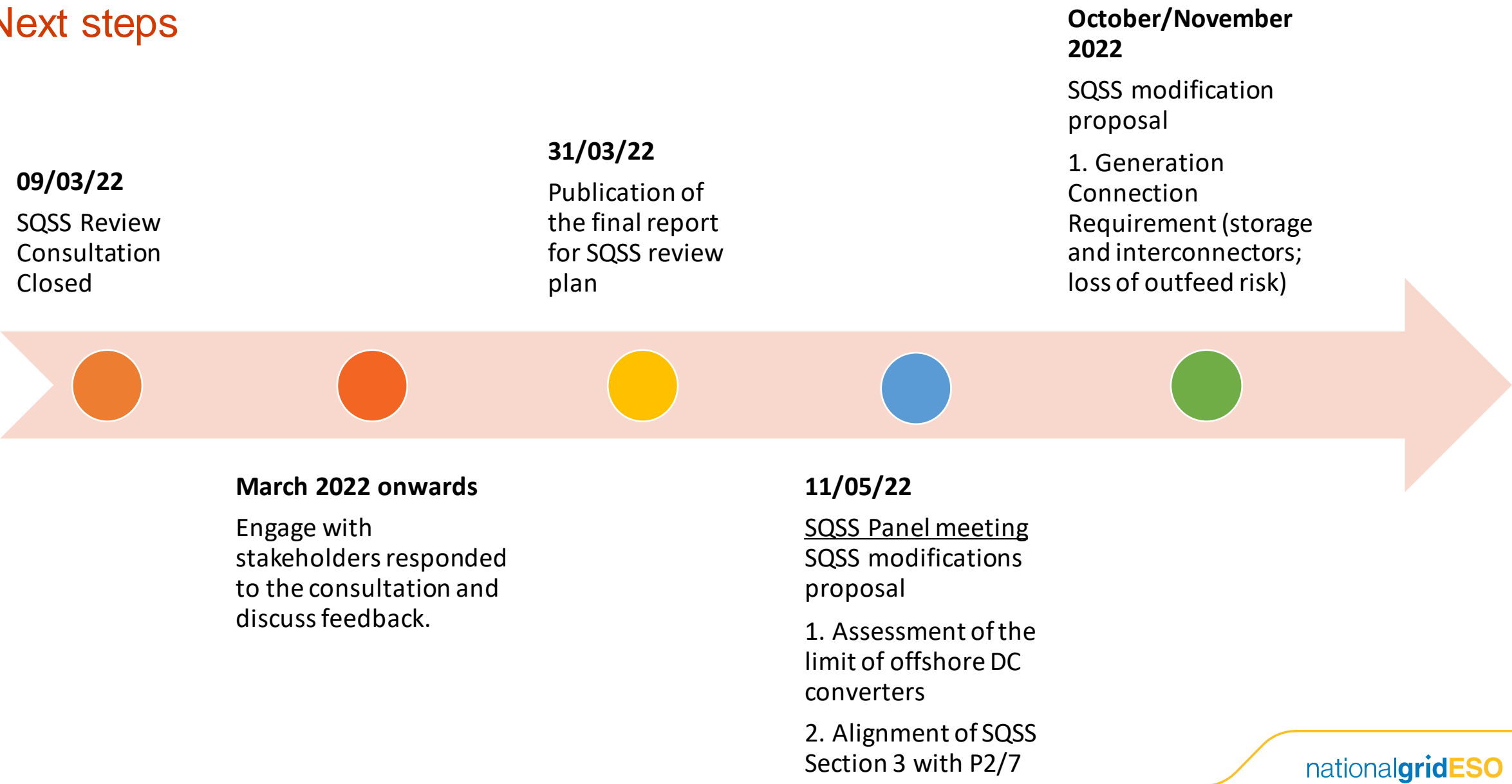
Generation connection requirements - the treatment of multi-purpose interconnector needs to be considered.

Thorough review of the backgrounds in Section 4.

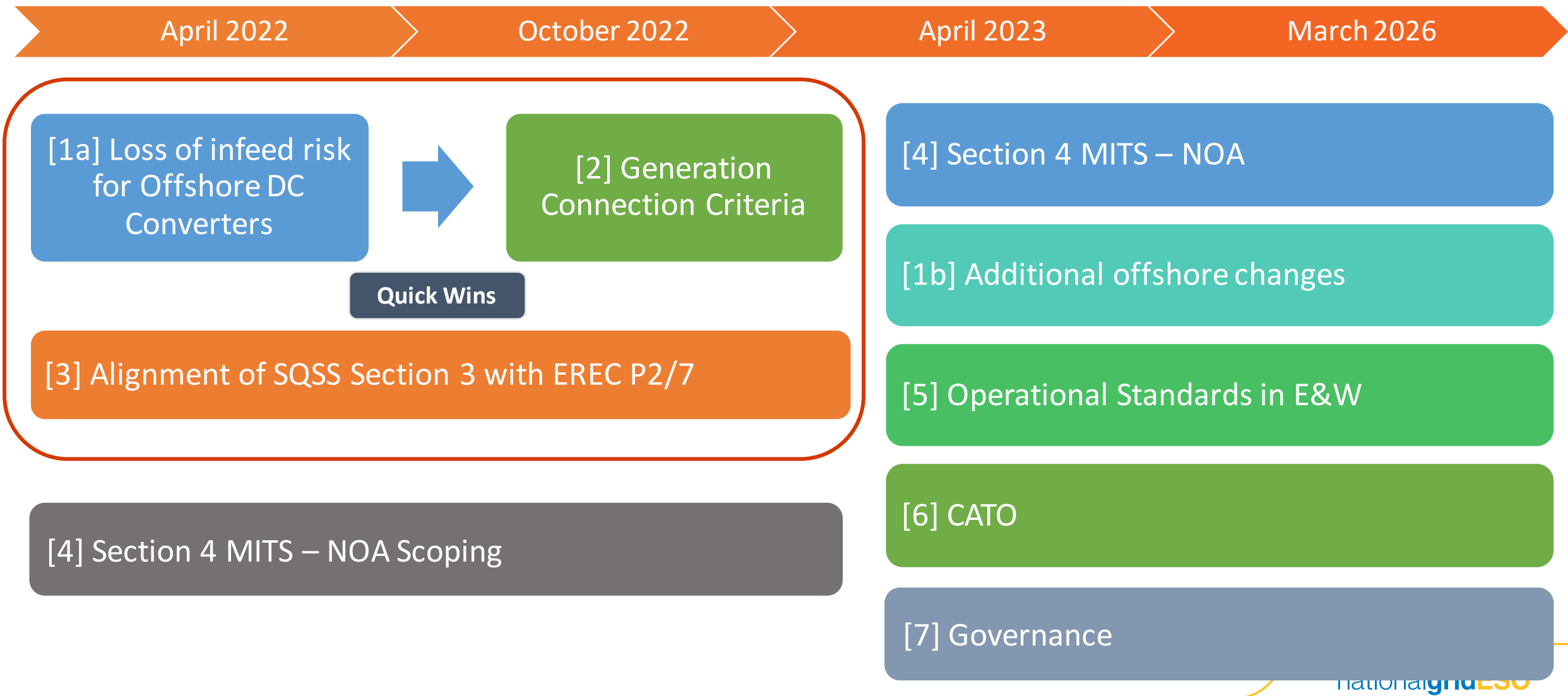
Relaxation of the operational standard in England and Wales needs to be carefully assessed for short, medium and long-term security impacts on customers and infrastructure.

Additional topics: Grid forming converters, value of lost load, etc.

Next steps



SQSS Review Plan





Frequency Risk and Control Report (FRCR)

April 2022 edition

Agenda

1. Summary of FRCR and consultation questions
2. Summary of Responses
3. Final recommendations in response to consultation feedback

Introduction

- Following 9th August 2019, the ESO have worked with industry to implement changes to the codes and frameworks which govern the management of frequency risks on the system. The outcome was the publication of the first FRCR in 2021.
- FRCR aims to set out the right balance between risk and cost to the consumer.
- This is reviewed and updated at least annually.

The 2022 edition of the FRCR assesses the costs and benefits of securing against the risk of simultaneous events, as recommended by Ofgem's investigation into the power disruption on 9th August.


- We consulted on the 2022 version of FRCR between 21st February and 4th March and received four responses.

Proposal

- The implementation of our frequency strategy (since 2019) has resulted in a **reduced risk of low frequency demand disconnection events (LFDD)**.
- Implementation of our existing policy means that at least **74% of simultaneous events are already secured by the ESO** when securing to 49.2Hz.
- Securing for the additional 26% would **increase ESO response costs by a factor of ~3**.
- For this increase to be considered good value for money, **peak simultaneous events would need to occur once every 2.5 years**.
- **We do not currently consider the cost of securing for simultaneous events to represent good value for money** for end consumers, given the frequency with which we know simultaneous events occur in reality.

Consultation

Milestone	Date
Consultation period	21 February – 4 March 2022
Webinar during industry consultation on combined report and methodology	28 Feb 2022
SQSS Panel meeting – decision on recommendation of FRCR	22 March 2022
Submission of FRCR to Ofgem	1 April 2022

 We are here

Consultation questions

#	Question
1	Overall, do you agree that the FRCR represents appropriate development in determining the way that the ESO will balance cost and risk in maintaining security of supply while operating the system?
2	Do you agree that the FRCR has been prepared appropriately? Please elaborate.
3	<p>Do you agree with and what is your feedback on the specific recommendation in the FRCR?</p> <p>Recommendation: Simultaneous events</p> <p>Continue with the current ESO FRCR 2021 policy and take no further actions to secure additional simultaneous events.</p>
4	Do you have any suggestions for further areas that can be addressed in future editions of the FRCR?
5	Do you have any other comments?

Summary of responses

We received four responses from: Northern Powergrid, EDF, Scottish Power Renewables and RWE. There was broad support for the overall recommendation. The table below summarises the responses received

Consultation question	Summary	ESO action
Overall, do you agree that the FRCR represents appropriate development in determining the way that the ESO will balance cost and risk in maintaining security of supply while operating the system	Three respondents agreed, with one stating "probably", acknowledging this is a complex area and suggesting there may be merit in demonstrating how the summary results presented are derived. One respondent provided a general, high level position of agreement with the approach across all questions.	Explore option for analysis to be peer reviewed.
Do you agree that the FRCR has been prepared appropriately?	Three respondents agreed, with one respondent providing a general, high level position of agreement with the approach across all questions.	Clarify in final version of report to address specific feedback.
Recommendation: Simultaneous events Continue with the current ESO FRCR 2021 policy and take no further actions to secure additional simultaneous events.	All 4 respondents agreed with the overall proposal. Two respondents provided further considerations, including a suggestion that BMU+VS events should be considered and disagreed with the statement that BMU+VS events are 1 in 30 year frequency. The other respondent agreed that covering all simultaneous events would not be cost effective but questioned where the optimal coverage level would be.	The impact of simultaneous events will be kept under review in future FRCR reports.
Do you have any suggestions for further areas that can be addressed in future editions of the FRCR	Two respondents provided no further comments. The other two provided suggestions on considering the length of LFDD events and not just the frequency with which they might occur. It was also suggested that the ESO should consider the impact of smaller frequency deviations on power quality.	N/A
Do you have any other comments?	Three respondents provided no further comments, with one providing specific amends on the report.	Clarify in final version of report to address specific feedback.

Summary of responses

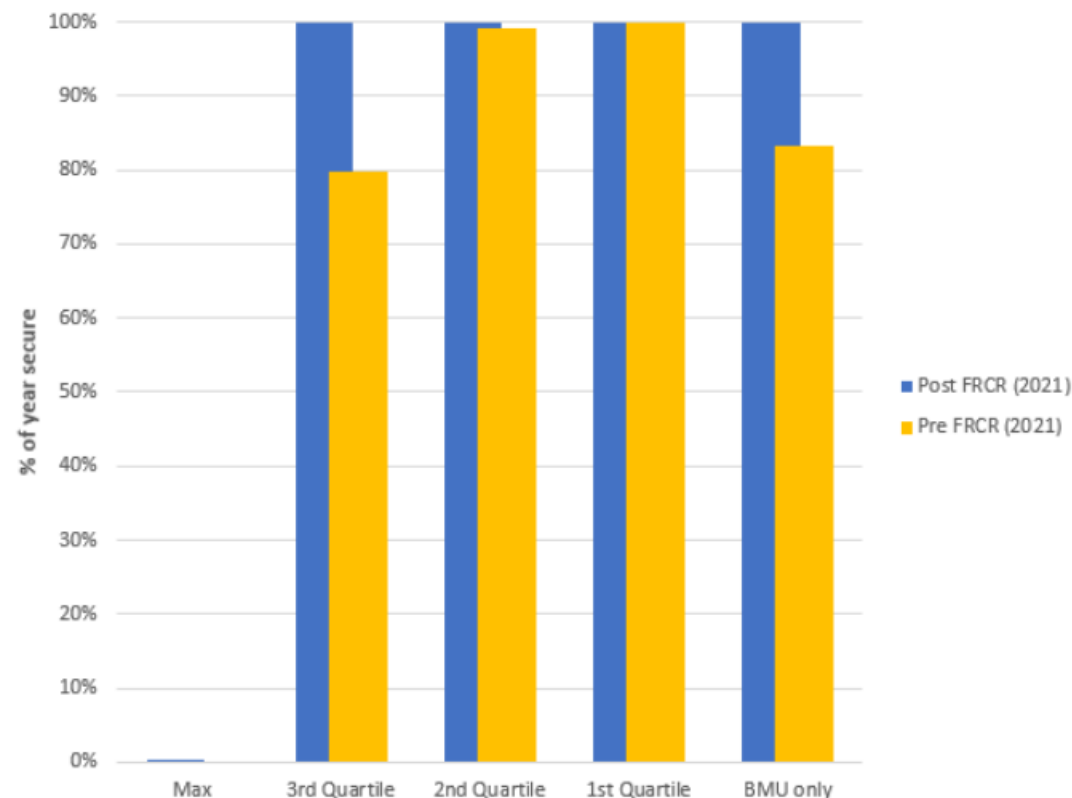
	Northern Power Grid	EDF	ScottishPower Renewables	RWE
Overall, do you agree that the FRCR represents appropriate development in determining the way that the ESO will balance cost and risk in maintaining security of supply while operating the system?	Probably. Sought clarity on how results are derived.	Yes	Yes	no comment
Do you agree that the FRCR has been prepared appropriately?	Yes	Yes	Yes	no comment
Recommendation: Simultaneous events Continue with the current ESO FRCR 2021 policy and take no further actions to secure additional simultaneous events.	Yes	Yes	Yes, but consider that BMU+VS events should be included. Challenge the 1 in 30 yr frequency of BMU+VS event	Yes, agreed overall. Sought clarity on what the optimum coverage of simultaneous events might be.
Do you have any suggestions for further areas that can be addressed in future editions of the FRCR	Reiterated comments from 2021 - Consider impact of length of LFDD events, not just frequency of which they occur	Include the power quality issue of how smaller frequency deviations impact users, and how often they occur.	None	None
Do you have any other comments?	Provided specific comments on report	None	None	None

Policy Review

Event category	Cost to mitigate (per year)	Cumulative cost (per year)	Remaining risk 49.2Hz	Remaining risk 48.8Hz
System-Wide	£ 330m	£ 330m	1-in-14 years	1-in-28 years
BMU-only	£ 0m	£ 330m	1-in-14 years	1-in-28 years*
BMU+VS outage	£ 57m	£ 387m	1-in-16 years	1-in-29 years
BMU+VS intact	£ 1400m	£ 1800m	1-in-19 years	1-in-30 years

* 1-in-30 years forms the upper limit as we define the largest simultaneous event occurring at this rate (which is never mitigated)

Current Policy



Pre-FRCR policy meant the ESO would typically cover the smaller infeed loss ($\leq 1000\text{MW}$ to 49.5Hz) or the larger infeed loss ($\sim 1260\text{MW}$ to 49.2Hz)*.

BMU-only risks would not be allowed to cause a consequential RoCoF loss as the total loss was too large to secure with existing response services.

This meant bids were taken to reduce infeed losses below the 0.125Hz/s RoCoF trigger level

Post-FRCR policy allows BMU-only losses to cause a consequential RoCoF loss if the loss can be contained within 49.2Hz .

This means the ESO holds more response to manage larger losses which reduces intervention.

Comparing pre and post-FRCR policies in relation to simultaneous events coverage shows that current policy provides broad coverage of simultaneous events.

Only the largest simultaneous events would require additional operational actions to secure.

* Could be as large as 1400MW to cover the largest BMU group on a double circuit

Simultaneous Events

- FRCR 2022 calculates that an additional £370M per year spend would be required to secure all simultaneous events through the procurement of additional response.
- Comparing this additional spend against the CPAE for the BMU+VS category (which we do not take additional actions to secure) leads to a likelihood threshold for insecure simultaneous events
- Insecure simultaneous events that cause a deviation below 49.2Hz would need to happen once every 2.5 years to be good value risks to secure
- Insecure simultaneous events do not occur often enough to be good value risk to secure under current system conditions

Ask of panel & next steps

- Recommendation of FRCR sought from Panel.
- Submission to Ofgem required by 1st April.



New Modification: **GSR028 - Making the SQSS Gender Neutral**

ESO Code Administrator

22 March 2022

Making the SQSS Gender Neutral

- The Code Admin team are looking to remove all gender specific references and terminology within our Codes and make them gender neutral. As part of this journey we have already implemented changes to the CUSC and Grid Code (CMP380 and GC0153). A further modification to make changes to the STC will also be raised in March 2022.
- The following changes will be required to the SQSS and Industry Governance Framework. Along with some other minor typographical amendments:

Current Term	Future Term	Parts of the standard impacted
Chair/Chairman	Chairperson	Industry Governance Framework
He	They	Industry Governance Framework
His	Their	Paragraph 1.17 SQSS and the Industry Governance Framework

Note: Chair' will be amended to 'Chairperson' to align the language with Standard Condition C14 1A(i) of the Transmission Licence.

Additional Housekeeping Changes

We would also like to use this modification to make two additional housekeeping changes:

- 1) As part of the implementation for GSR026, the figure below in table 6.4 should have been revised from 1.0pu to 1.09pu.

Table 6.4 Steady State Voltage Limits and Targets in Operational Timescales

(a) Voltage Limits on Transmission Networks			
Nominal Voltage	PU Value (1pu relates to the Nominal Voltage)	Minimum (percentage of Nominal Voltage)	Maximum (percentage of Nominal Voltage)
Greater than 300kV	0.90pu-1.05pu	-10%	+5% Note 7
200kV up to and including 300kV	0.90pu-1.09pu	-10%	+9%
132kV up to and including 200kV	0.90pu-1.10pu	-10%	+10%
(b) Voltage Limits at Interfaces to Distribution Networks and Non-Embedded Customers			
Nominal Voltage			
132kV	0.90pu-1.10pu	-10%	+10%
At less than 132kV	0.94pu-1.06pu	-6%	+6%

- 2) The link to the SQSS Modification Proposal form in Annex 3 of the Industry Governance Framework, no longer works and needs updating.

Governance Route

As this modification already has a fully developed solution, which will only be making minor administrative changes to the SQSS, it should proceed straight to Code Administrator Consultation.

In addition to this, this modification:

- Will not impact parties; and it will not amend or impose any new obligations on them.
- It does not have a material impact on any of the governance and modification procedures.
- It does not cause any discrimination between parties but removes any existing bias or discrimination within the standard.
- GSR026 also previously went straight to Code Administrator Consultation.

Implementation

The Industry Governance Framework should be implemented at the earliest opportunity, within 5 working days of a Panel decision.

Changes to the SQSS will need to be implemented in line with the Authority timeline. As the proposed changes are minor, it has been considered that the Authority may hold off from running a licence consultation. In the meantime, a draft version of the SQSS would be published on the ESO website with a covering note explaining the changes within it.

Critical Friend Feedback: GSR028

Code Administrator comments	Amendments made by the Proposer
None	None

Timeline for GSR028 – Proposed Timeline for NETS SQSS change

Milestone	Date	Milestone	Date
Modification Presented to Panel	22 March 2022	Final Modification Report issued to Panel to check votes are recorded correctly (5 working days)	16 May 2022
Code Administrator Consultation (20 working days)	28 March 2022 – 26 April 2022	Implementation Date	In accordance with Ofgem Timelines
Draft Modification Report issued to Panel (5 working days)	03 May 2022		

Timeline for GSR028 – Proposed Timeline for NETS SQSS Industry Governance Framework change

Milestone	Date
Modification Presented to Panel	22 March 2022
Implementation Date	Within 5 working days of Panel decision

GSR028 – the asks of Panel

- **AGREE** to the proposed governance route(s) for this modification
- **NOTE** the proposed timeline



SQSS Panel: Offshore Coordination Project

March 2022

The BEIS-led Offshore Transmission Network Review (OTNR) is taking forward actions to deliver an integrated network

The ESO is a project partner and will deliver relevant parts within each workstream.

1

Early Opportunities

- Identify inflight projects which could be coordinated by leveraging flexibility within the existing regime or by making small changes to current processes
- Some projects are likely to be too far in the development process to implement changes without major commercial consequences

2

Pathway to 2030

- Support the achievement of 40GW of offshore wind generation by 2030 through exploring opportunities for centralised planning, and the delivery of onshore and offshore grid infrastructure
- Focus on a subset of existing planned and possibly new projects with connections planned in the late 2020s and early 2030s

3

Enduring Regime

- Developing options for the enduring regime as well as designing and implementing regulatory changes to current frameworks required to enable coordination
- The enduring regime is expected to apply to projects coming through from future seabed leasing rounds

Pathway to 2030

Final Holistic Network Design (HND) Recommendations

2030 Holistic Network Design: Summary Report

1. Options & Recommended Design

2. Industry Code, Standard and Licence Recommendations

3. Stakeholder Approach, Engagement and Feedback

4. Methodology (published ahead)

5. Glossary

6. How HND is meeting Central Design Group ToR

The recommended HND will consist of:

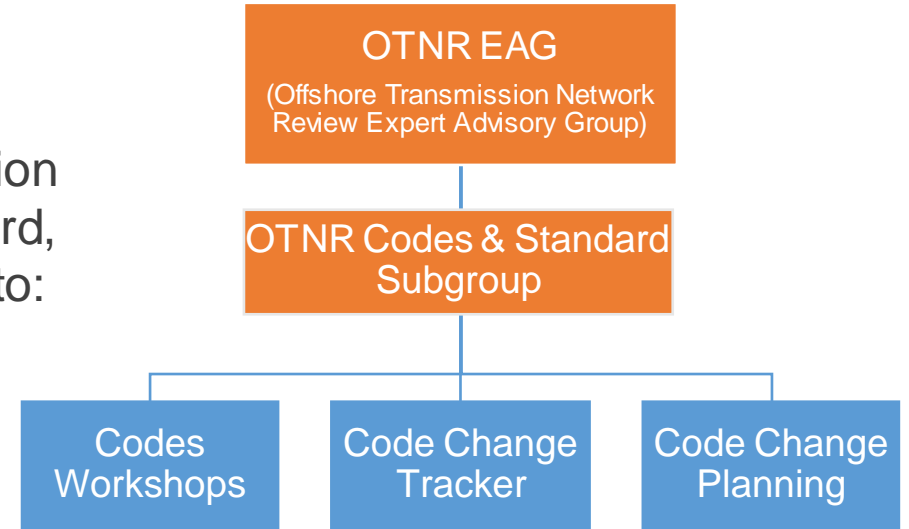
- A coordinated Offshore Network Design, including recommended options and alternatives considered
- Recommended onshore reinforcements to support the proposed offshore network design
- A proposed set of Network Design Rules
- Proposed changes to industry commercial and technical codes

The outcome of the HND will then be translated into connection offers for in scope generators

Industry Codes and Standards Update

In November 2021, we hosted five workshops covering the Connection and Use of System Code, the Security and Quality of Supply Standard, the Grid Code and the System Operator Transmission Owner Code to:

- share our initial views on the challenges and opportunities
- commence discussion with industry
- establish next steps and the priority of topics.



Industry views collated at the workshop are helping shape the work on codes and standards.

- We set up a Codes and Standards subgroup in November 2021 to project manage the work relating to codes and standards.
- We will publish an *Industry Code, Standard and Licence Recommendation Report* in parallel with the HND, to outline our recommendations on changes needed to the Codes, Standards and Licences to facilitate the HND.

Potential Deviation 1 - 1800MW infeed risk

Largest infrequent infeed loss permitted for offshore connections will increase from 1320MW to 1800MW

- Recommended in the Offshore Coordination Project Phase 1 Report.
- The 'Central Design Group' agreed this approach in September 2021 in respect of the HND.

Potential Deviation 2 - DC converters

7.7.2 DC Circuits on an offshore platform

7.7.2.1 following a *planned outage* or a *fault outage* of a single *DC converter* on the *offshore platform*, the *loss of power infeed* shall not exceed the *normal infeed loss risk*;

DC Converter

Any apparatus used as part of the *national electricity transmission system* to convert alternating current electricity to direct current electricity, or vice-versa. A *DC Converter* is a standalone operative configuration at a single site comprising one or more converter bridges, together with one or more converter transformers, converter control equipment, essential protective and switching devices and auxiliaries, if any, used for conversion. In a bipolar arrangement, a *DC Converter* represents the bipolar configuration.

- The present SQSS definition of DC Converter means the use of bipole design for radial connections larger than 1800MW is not compliant.
- If the definition was changed to permit each pole to be treated as a separate converter it would count as two circuits.

Potential Deviation 3 - parallel offshore network as part of the MITS

Main Interconnected Transmission System (MITS)

This comprises all the 400kV and 275kV elements of the *onshore transmission system* and, in Scotland, the 132kV elements of the *onshore transmission system* operated in parallel with the *supergrid*, and any elements of an *offshore transmission system* operated in parallel with the *supergrid*, but excludes *generation circuits*, transformer connections to lower voltage systems, *external interconnections* between the *onshore transmission system* and *external systems*, and any *offshore transmission systems* radially connected to the *onshore transmission system* via single *interface points*.

- If the offshore network becomes part of the MITS additional SQSS chapters come into effect, such as chapter 4.

For deliverability of the 2030 designs, even if the offshore designs become MITS, the fixed SQSS planning rules will not be applied, but instead left to a CBA

Q&A?

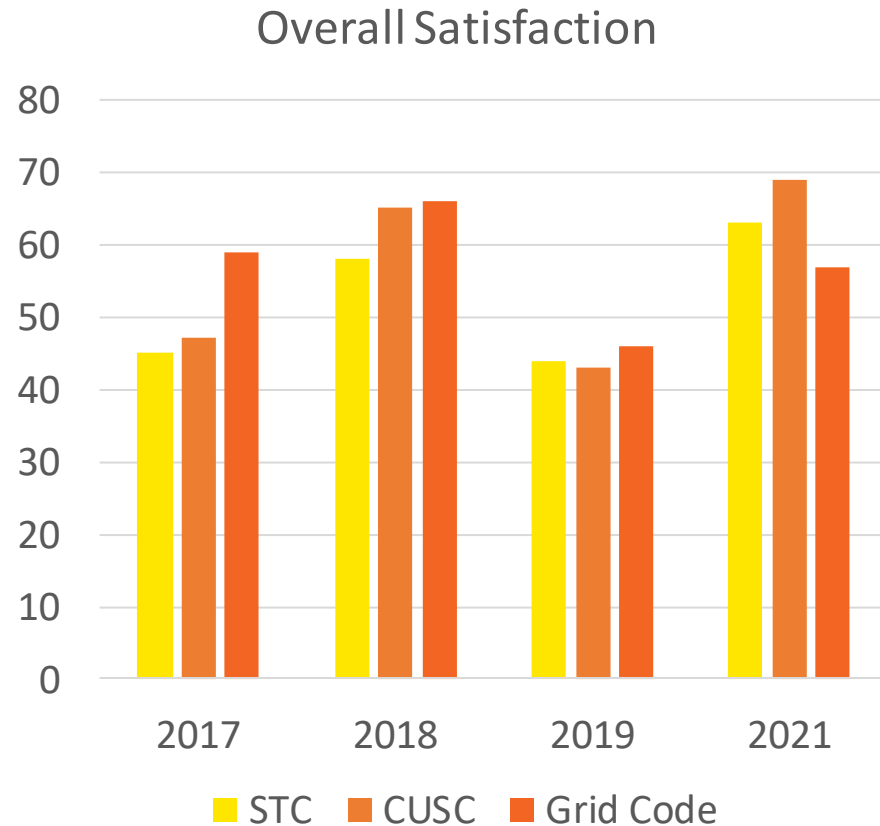


Code Administrator Update

CACOP Feedback

22 March 2022

Code Administrators' Performance Survey



- We are very proud to see such a positive increase in satisfaction across all three of our Codes since the survey was last held in 2019.
- We scored high on perceived improvements provision of support and facilitation of meetings
- Improvement areas: keeping people informed about our codes, making our information easier to interpret, ease of finding on the website.
- March: ESO wide survey
- We will build this feedback into our next Deliverables Plan for 2022-23 which we will share in the coming months.
- [Code Administrators' Performance Survey – ESO Code Administrator Results Summary](#)



AOB

- **None**
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Date of next meeting

Wednesday - 11 May 2022

Panel Papers Day – 03 May 2022

Modification Submission date – 26 April 2022

Close

