SQSS Panel

Monday 3 June 2024

Online Meeting via Teams


WELCOME

Approval of Panel Minutes

Approval of Panel Minutes from the Meeting held

11 March and 9 April 2024

Action Log

ID	Month	Agenda Item	Description	Owner	Notes	Target Date	Status
40.8	March 2022	GC0117 & New Modifications	ESO to report on progress of GC0117 and if an SQSS modification is required, when this will be raised.	AJ	UPDATE: Workgroup Vote held and proceeded to CAC on 19 February 2024.	TBC	Open

Authority Decisions and Update (as at 22 May 2024)

No update since last panel.

Draft Final Modification Report

GSR031: Introducing Competitively Appointed Transmission Owners

Milly Lewis

Solution

- **Solution:** The objective of this modification is to implement changes to the SQSS to facilitate the introduction of CATOs. The changes, which are non-exhaustive, are made on the assumption that a CATO will be granted a Transmission Licence and will be categorised as an Onshore Transmission Owner. Our initial assessment indicated that this would include introducing the Competitively Appointed Transmission Owner concept to the SQSS Terms and Definitions, in addition to other consequential changes including but not limited to changes to Specifying the Standards that will apply to CATO assets in the respective incumbent TO areas.
- This will be achieved through the proposed high-level changes to the SQSS legal text.

Code Administrator Consultation Responses

Summary of Code Administrator Consultation Responses :

- Code Administrator Consultation was run from 12/04/2024 to 02/05/2024 and received 1 non-confidential response. Key points were:
  - Respondent supported the proposed implementation approach.
  - Agreed that the Original Proposal better facilitated applicable objective (i) and (iii) however did not believe that the Original Proposal better facilitated the other Applicable Objectives.
  - No legal text issues identified.

GSR031– the asks of Panel

- **VOTE** whether or not to recommend implementation

- **NOTE** next steps.

GSR031 Next Steps

Milestone	Date
Draft Final Modification Report presented to Panel	3 June 2024
Final Modification Report issued to Panel to check votes recorded correctly (5 working days)	4 June 2024 – 11 June 2024
Submission of Final Modification Report to Ofgem	12 June 2024
Ofgem decision date	To align with other CATO Modifications
Implementation Date	TBC

Any Other Business

AOB

- **Amendments to Security and Quality of Supply Standard Governance Framework – Matt Clover**

- **FRCR Update - Qi Zhong / Mingyu Sun**

Amendments to Security and Quality of Supply Standard Governance Framework – Matt Clover

In summer 2024 the Secretary of State is expected to designate NGESO (National Energy System Operator effective from the same date) as the Independent System Operator and Planner (ISOP). NESO's Electricity System Operator Licence will place an obligation on NESO to comply with the requirements of the Security and Quality of Supply Standard (SQSS).

Housekeeping modifications to SQSS version 2.7 have been proposed by the FSO Cross Code Work Group - these will be published by Ofgem in their statutory code change consultation on changes relating to the FSO. Changes to the Governance Framework fall outside of the scope of that group due to the voluntary nature of the Framework. Housekeeping modifications must be made in order to ensure that the Governance Framework is effective and coherent from the date that the Secretary of State designates the ISOP.

The modifications proposed are simply to ensure that the Governance Framework is consistent with the revised SQSS document referencing the correct legal entities and licences post-designation.

A brief overview of the housekeeping modifications are set out below.

SUMMARY OF CHANGES

Facilitate the implementation of the ISOP

Changes: the following changes will be incorporated into the National Electricity Transmission System Security and Quality of Supply Standard (NETS SQSS) Industry Governance Framework (Revised 28 March 2022)

Definitions

The following amendments will be made to the definitions at clause 1.1 and consequentially replaced accordingly throughout the document to update the legal entities and introduce new licences.

Amend existing definitions as follows:

Panel	**shall mean the SQSS Review Panel established by the ISOP,~~NGESO~~ NGET, SHET and SPT which shall be constituted in accordance with Section 4;**

Insert new definitions as follows

Electricity System Operator Licence or ESO Licence	**means a licence granted or treated as granted under section 6(1)(da) of the Electricity Act 1989**
Gas System Planner Licence or GSP Licence	means a licence granted or treated as granted under section 7AA of the Gas Act 1986;
ISOP	Independent System Operator and Planner, means a person designated by the Secretary of State under section 162 of the Energy Act 2023 as the holder of the ESO Licence, and the GSP Licence, for the time being that person is NESO;

SUMMARY OF CHANGES

Licensee	**shall mean the holder for the time being of a Transmission Licence or the ISOP as the holder of the ESO licence, and in each case being a party that is required by their licence to comply with the Security and Quality of Supply Standard, and shall be construed accordingly;**
National Energy System Operator or NESO	shall mean National Energy System Operator Limited with company number 11014226 as the designated ISOP and holder of the ESO Licence and the GSP Licence;

Delete existing definitions as follows:

NGESO	**Shall mean National Grid Electricity System Operator Limited with company number 11014226**

2. Appropriate amendment of ‘Transmission Licensee’

   Throughout the document, various instances of ‘Transmission Licensee’ have been amended to incorporate the new term ‘Licensee’ to include the ISOP.

3. Appropriate amendment of ‘Transmission Licence’

   Throughout the document, various instances of ‘Transmission Licence’ have been amended to incorporate the new term ‘ESO Licence’ to refer to the ISOP’s new licence.

Frequency Risk and Control Report (FRCR) 2024

ESO

June 2024

Qi Zhong / Mingyu Sun

Agenda

1. Summary of FRCR 2024 Recommendation and Consultation Questions
2. Summary of Industry Responses / Feedback
3. Final Recommendations in Responding to Consultation Feedback

Introduction

- FRCR aims to set out the right balance between risk and cost most beneficial to the GB consumers.
- This is reviewed and updated annually.
- We consulted on the 2024 version of FRCR between 10th April and 17th May.
- We received 5 responses, from National HVDC Centre, Statkraft, Sygensys, Tesla and Zenobe.

Proposal

The 2024 edition of the FRCR assesses the minimum inertia requirement and the benefits of holding additional response.

Policy recommendation in FRCR 2024:

- Maintain the minimum inertia requirement at 120 GVA.s.
- Secure all BMU-only risks as baseline. Do not apply additional controls to secure all BMU+VS and simultaneous events.
- Consider additional DC-Low requirement to further reduce residual risks.

Consultation Timeline

Milestone	Date
Consultation period	10th April – 17th May 2024
Webinar during industry consultation on combined report and methodology	1st May 2024
SQSS Panel meeting – decision on recommendation of FRCR	3rd June 2024
Submission of FRCR to Ofgem	30th June 2024

 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	Do you agree with and what is your feedback on the specific recommendation in the FRCR? **Recommendation: Maintain minimum inertia requirement at 120 GVA.s** **Recommendation: Consider additional DC-Low requirement**
4	Do you agree ESO to propose lower minimum inertia requirement before FRCR 2025?
5	Do you have any other comments?

Summary of Responses

We received five responses from: National HVDC Centre, Sygensys, Statkraft, Tesla and Zenobe. **There was broad support for the overall recommendations.** Table below summarises the responses received.

Consultation question	Summary
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	1 respondent agrees. 2 comment on the need for additional information in order to make an informed decision, calling for increased transparency of data used for analysis. 1 respondent was concerned that the system, whilst evolving to have an increasing complexity in interactive operational issues, that they had not been considered properly, or it wasn't clear how it they were considered. 1 requested other risks to be considered into future FRCR.
Do you agree that the FRCR24 has been prepared appropriately?	1 respondent agrees. 1 agrees with methodology but needs further details of FRCR data to comment. 1 respondent also calls for more details on the data to be able to comment and calls for more transparency. 1 does not agree and calls for future FRCRs to look more into cascade failures. 1 is concerned about the RoCoF levels with frequency bands and general system operability given a more complex system.
Recommendation: Maintain minimum inertia requirement at 120 GVA.s	3 respondents agree, one of which would like further information if the minimum inertia level was to be lowered beyond 120 GVA.s. 1 respondent thinks that the minimum inertia level remaining at 120 GVA.s is not ambitious enough to reach our net zero goal. 1 respondent requires further clarification on the interaction of the inertia figures and the procurement of frequency response services.
Recommendation: Consider additional DC-Low Requirement	All 5 respondents agree.
Do you agree ESO to propose lower minimum inertia requirement before FRCR 2025	1 respondent agrees. 2 respondents call for more analysis before implementation. 2 do not agree, one calling for more analysis and one to have gained more operational experience with the minimum inertia level at 120 GVA.s and additional information on the impact of pathfinder and stability market procurement.
Do you have any other comments	Wide range of comments across the 5 respondents, please see details in Appendix – Industry Responses.

Summary of Responses & ESO Replies

Main Questions / Concerns	ESO Replies
General Data transparency & Model clarification	• We have responded and explained individual questions and directed them to detailed FRCR methodology document. • We have clarified the typical dataset that was included in FRCR report and explained other market information could be found from ESO data portal. We acknowledge Ofgem Data Best Practice Guidance and are unable to share any further data / detailed model when consulting FRCR due to system security and resilience concerns. • We acknowledge system event shared via OTF will be better aligned with updated transparency rule for future. We will use the opportunity for better industry engagement.
Assumption on events likelihood and future work	• We have clarified that event likelihoods has been updated in FRCR report. • Current assumptions of simultaneous events covers the history well. • Assessment of events likelihood will be updated in future FRCR.
Concerns of system operability / stability / regional issues under lower inertia condition and other changing environment, e.g. IBR	• We have engaged with the respondents to clarify their concerns. • We have clarified that system operability are managed by other workstreams within the ESO and communication to industry is out of FRCR process and is current via Operability Strategy Report (OSR). • As the ESO, we work together with markets to provide operational need to assure system security when the system becomes more volatile; we are developing our offline and monitoring tools to better understand system behaviour; we are initiating innovation projects and collaborating with industry so we achieve net zero operation. We are establishing a comms workstream for better communication for future. • Actions and mitigations from all system operability aspects will be included in future FRCR development.
Delayed implementation of FRCR 2023 – 120 GVA.s policy and concerns of achieving 102 GVA.s	• We acknowledge the delay of 120 GVA.s implementation. • We have communicated progress via OTF and we are finalising the operational readiness within the ESO before we are going to communicate further reducing minimum inertia policy to 120 GVA.s. • We emphasise that we will continue to monitor system conditions and sharing ops experience of running at 120 GVA.s and will consult with industry when we further reduce to 102 GVA.s.

ESO Responses

- We acknowledged their responses & engagement with FRCR / ESO.
- Due to the wide range of questions and topics, we addressed FRCR related questions & queries to individual parties. We also offered 1-2-1 meeting opportunities to discuss wider issues with relevant SMEs attendance.
- By 31 May, we had meetings with National HVDC Centre and Sygensys, and received further responses from Statkraft. We will continue engaging with industry until submission to Ofgem.
- With National HVDC Centre, we agreed to collaborate and run EMT analysis. Work has been arranged out FRCR process.
- **This year, we plan to publish all ESO responses along with industry responses.**

Key Results & Recommendations

- Maintain the minimum inertia policy of 120 GVA.s following the fully implementation of FRCR 2023. No changes to the current policy regarding securing BMU-only loss risks.
- Increase DC-low requirements by up to 100 MW to offset further vector shift risk.
- When operational experience allows, consult with industry on the reduction of the minimum inertia policy level towards 102 GVA.s with potential savings of up to £49m.

Scenario	140 GVA.s	120 GVA.s	110 GVA.s	102 GVA.s
Cost for system-wide controls (***NB: system-wide controls include inertia and all response costs***)	£374m	£242m	£209m	£193m
Incremental saving		**£132m**	**£33m**	**£16m**

Implementation

- Monitor system conditions and implement 120 GVA.s minimum inertia policy when ready, completing the implementation of FRCR 23.

- Pending approval from Ofgem on FRCR24, we will:

  - ✓ Increases DC-Low requirement by up to 100MW. We will communicate through the Operational Transparency Forum and ESO usual comms mechanism.
  - ✓ Continue to monitor and analysis on system conditions. Engage with SQSS panel and Ofgem re further reduction of minimum inertia policy when it is prudent to do so.
  - ✓ Consult with the industry on the further reduction of the minimum inertia policy.

Ask of panel & next steps

- Recommendation of FRCR sought from Panel.

  - ❑ 12th June - completion of post consultation engagements.
  - ❑ 19th June - approval of recommendations from Panel.

- Submission to Ofgem required by 30th June.

Industry Responses

Agree with no concern	Agree with concerns	Disagree with concerns	Disagree with major concerns	Disagree

	National HVDC Centre	Sygensys	Statkraft	Tesla	Zenobe
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	The method for National frequency containment relating to swing equation calculation is consistent with past FRCR and clearly articulated. However, its less clear how evolving risks associated with the trajectory towards a lower inertia system supported in containment by more complex layers of services supported by a wider range of technologies is secured across a range of growing scenarios and uncertainties (see section 6- other comments for further discussion)	The GB system has an enviable record of reliability. The FRCR process contributes to that, however I have a concern that some threats to system security may be underestimated in FRCR 2024 and should be considered in future updates, as suggested in FRCR 2024 Section 8 "Future considerations".	Somewhat disagree. The report states that "There would be no additional risks to the system as the residual risks for 49.2 Hz events would remain at 1-in-27 year and 1-in-30 year for 48.8 Hz events under different minimum inertia levels" However, the change in the likelihood of events during adverse conditions and due to the increasing penetration of non-synchronous technologies in the whole system has not been considered. We believe these could have a significant impact on these risk estimates.	Yes.	It is difficult for us to provide a detailed opinion without understanding in detail how ESO have calculated cost/risk differentials involved in procuring dynamic containment instead of inertia. To assess any change or proposal, we expect more transparency, with supporting analysis and databooks.
Do you agree that the FRCR24 has been prepared appropriately?	See points above as unpacked in section 6- other comments. We would additionally note from the detailed comments there is a danger that too much focus on nadir of containment, without consideration of the rate of change of frequency within each frequency band of containment may lead to an under-estimate of the risk- the most important aspect of frequency containment from a resilience perspective being the ability to ultimately contain an acceptable range of scenarios avoiding larger demand disconnection for a reasonable range of sensitivities to those scenarios. It would be helpful to examine whether those layers of defence remain robust as the inertia level falls against the performance of a more IBR concentrated system.	I think that FRCR does not adequately address the risks associated with the probability and impact of coincident events leading to a cascade failure and further work will be required in future updates.	Data, calculations and analysis used in the FRCR are not clear, shared and transparent.	Yes, except FRCR 2024 does not explain the reasons for the delays in implementing FRCR 2023. NGESO should be more transparent and justify the delay.	We agree with the overall methodology set out in the flow chart, but it lacks detail. We cannot give detailed consideration to this question without understanding exactly how ESO has calculated the results provided.

Industry Responses

Agree with no concern	Agree with concerns	Disagree with concerns	Disagree with major concerns	Disagree

	HVDC Centre	Sygensys	Statkraft	Tesla	Zenobe
Recommendation: **Maintain minimum inertia requirement at 120GVA.s**	Further clarification is needed a) as to what this minimum inertia figure represents- as that relates directly to the scenarios being captured and how concurrent they would be b) what the certainty of inertia of non BMU elements actually is c) to what extent DR and other products are implicitly procuring inertia and d) what the handshake between inertia and frequency response is and should be as there is cost benefit assessment necessary beyond the first 1sec of any event between the two that should be considered here.	Agreed	Agree	NGESO's proposal of keeping the minimum inertia limit to 120 GVA.s for this whole year doesn't seem ambitious enough and poses risks to reaching the original 2025 Net Zero goal of 102 GVA.s.	We agree that minimum inertia should be maintained at 120GVAs from summer 2024. We would like to understand the rationale for further reducing inertia procurement in future, as proposed. We would like ESO to communicate their thinking and analysis on the interactions between dynamic containment and inertia.
Recommendation: **Consider additional DC-Low Requirement**	Considering the comments above and their more detailed unpacking below we would agree that there is further argument for additional DC low.	Agree	Agree	Yes	We agree that ESO should procure a further 100MW DC-Low in order to balance cost and risk.

Industry Responses

Agree with no concern	Agree with concerns	Disagree with concerns	Disagree with major concerns	Disagree

	HVDC Centre	Sygensys	Statkraft	Tesla	Zenobe
Do you agree ESO to propose lower minimum inertia requirement before FRCR 2025.	No. in our view based on the comments above and their detailed unpacking there remains uncertainty over how risks evolve across a lowering inertia strategy. We note that ESO has initiated research on some of these areas and the outputs of this work and consideration of the other concerns highlighted should be considered further ahead of reducing national inertia. It is not even clear whether a national inertia objective alone is the appropriate objective as the total level of inertia available falls. In our view it would be helpful to separately map the trajectory towards lower inertia in parallel to the initiatives that inform that approach and the evolution of the metrics of resilience.	Issues related to coincident (cascade) events should be addressed first.	Disagree. Extensive analysis and monitoring of system performance needs to be done before reaching this decision.	Yes	We do not agree, as we think ESO should develop more operational experience before committing to consult on reducing their inertia procurement. In the interest of transparency, we request that ESO share the impact of Pathfinders and Stability Market procurement on the cost reduction from reduced inertia procurement.
Do you have any other comments	See points unpacked below the table to avoid otherwise inefficient formatting *[Comments included discussions on the importance of increased monitoring of demand inertia, both nationally and locationally and concerns over the impacts of embedded generation on locational frequency and RoCoF.]*	See following information *[Comments for consideration in future FRCRs included the need for greater transparency of incident reporting, looking at cascade trips, sharing information used on fault statistics and whether FRCR considers aspects under the System Defence Plan and welcomes future FRCR look at LFSMs.]*	There are reports available for industry and the Grid Code Panel to monitor the effectiveness of technical requirements in the Grid Code and Distribution Code. However, we don't see any evidence that ESO has reviewed or considered this data in the FRCR	We believe that assuming a constant value of minimum inertia (in line with the FRCRs) is not cost effective. The ESO demonstrates in the report that the "safe level of inertia" is determined by the amount of DC(L) that has cleared in the market, and this varies every day. We encourage the ESO to adopt a more dynamic strategy and define the safe level of inertia according on the DCL auction clearing.	None

ESO Responses & Further Actions

Industry Party	Main Concerns / Questions	ESO Actions
National HVDC	• Other system operability assessment to be interacted with FRCR policy to address system security under lower inertia conditions. • Comments regarding FRCR assumptions.	• Had a meeting on 14 May. • Acknowledged their engagement. Agreed to work together by reviewing December 2023 system events including running EMT analysis. • FRCR concerns addressed in the meeting.
Sygensys	• Clarified comments did not aim to impact FRCR approval. • Requested more transparent information sharing on OTF and “call for actions” in collaborating with industry. • Requested more events / incidents / near-miss reporting, share higher resolution data including DER data. • Re FRCR, requested to consider new risk types, include SSO risks, review LFSM capacity, consider under delivery of responses, include system defence plan into future FRCR. • Requested to clarify FRT requirements in GC155.	• Had a meeting on 31 May. • Acknowledged their engagement. Agreed to clarify information transparency rule in future OTF. • Confirmed events were all reported via GC105 and GC151. Action to review recent report contents. Clarified further reporting requirement change shall go through GCRP. • Responded FRCR questions. • FRT concerned was taken away to GC155.
Statkraft	• Questioned representativeness of existing event likelihood. • Questioned about inertia cost and concerned on data, calculation transparency. • Requested ESO to monitor system performance over longer period before reducing inertia further. • Questioned how FRCR interact with GC105 and GC151. Expected FRCR to include system strength in the future.	• Event likelihood was reviewed in FRCR 2024 including simultaneous events likelihood. A comprehensive review is planned for future FRCR. • Shared link of detailed FRCR methodology and pointed out stability pathfinder and Y-1 market to drive inertia cost reduction. • Clarified ESO position - Subject to system conditions and operational readiness, we may propose operating at these lower inertia levels before completion of FRCR 2025. • System events reported through GC105 and GC151 were reflected in FRCR 2024. System strength are considered by other workstreams and communicated out of FRCR.

ESO Responses & Further Actions

Industry Party	Main Concerns / Questions	ESO Actions
Tesla	• Generally agreed FRCR 2024 recommendation. • Concern of delayed implementation of 120 GVA.s. and consequential risk to reaching 102 GVA.s net zero goal. • Proposed ESO to consider dynamic minimum inertia and interactions between dynamic inertia and dynamic DC setting.	• Acknowledged the delay of implementing 120 GVA.s. All progress of moving towards lower inertia had been and would be communicated via OTF. • ESO would move the minimum inertia towards 102 GVA.s as soon as practical whilst operating system securely and efficiently. • Setting a minimum inertia and lowering that in a controlled manner allows us to monitor for any operability issues and enables the steady growth of balancing service markets. As a prudent system operator we consider security, cost and their balancing as a whole when meeting net zero.
Zenobe	• Requested ESO to share more details on methodology and data to help understand. • Concerned how low inertia would affect system stability. • Requested to clarify how reduced inertia will affect stability markets, pathfinders and the cost implications.	• Detailed methodology, typical data used in analysis were included in the report. We are unable to publish raw dataset or detailed model due to system security concerns. • System stability is out of FRCR scope. Within ESO there is other workstream to look into this problem and ensuring system operability. • Shared the information of Y-1 stability market and offered meeting to clarify the concerns.

Activities ahead of the next Panel Meeting

Modification Proposal Deadline for Month Panel	19 June 2024
Papers Day	26 June 2024
Panel Meeting	10 July 2024 Teams

Close

Milly Lewis
Chair, SQSS Panel