Final Modification Report

GSR027 - Review of the NETS SQSS Criteria for Frequency Control that drive reserve, response and inertia holding on the GB electricity system

Overview: The ESO needs to review, in consultation with the industry, the NETS SQSS requirements that drive reserve, response and inertia holding on the GB electricity system. This was a specific action from the Energy Emergency Executive Committee (E3C) and Ofgem final reports into the power outage of 9 August 2019.

Modification process & timetable

1. **Proposal form**
   - 15 July 2020
2. **Workgroup Consultation**
   - 16 September 2020 - 30 September 2020
3. **Workgroup Report**
   - 13 October 2020
4. **Code Administrator Consultation**
   - 23 October 2020 - 6 November 2020
5. **Draft Final Modification Report**
   - 10 November 2020
6. **Final Modification Report**
   - 23 November 2020
7. **Implementation**
   - 1 April 2021

Have 5 minutes? Read our Executive summary

Have 30 minutes? Read the full Final Modification Report

Have 40 minutes? Read the full Final Modification Report and annexes.

Status summary: This Report has been submitted to the Authority for them to decide whether this change should happen.

Panel Recommendation: The Panel has recommended by majority that the Proposer's solution is implemented.

This modification is expected to have a:
High impact: National Grid ESO, Consumers (and consumer organisations)
Medium impact: Generators, Interconnectors, Network Operators
Low impact: Transmission Owners

Governance route	This modification has been assessed by a Workgroup and Ofgem will make the decision on whether it should be implemented.	
Who can I talk to about the change?	**Proposer:** Robert Wilson, National Grid ESO robert.wilson2@nationalgrideso.com Phone: 07799 656402	**Code Administrator Chair**: Paul Mullen paul.j.mullen@nationalgrideso.com Phone: 07794 537028

Executive Summary

Actions from the Energy Emergency Executive Committee (E3C) and Ofgem final reports into the power outage of 9 August 2019 require the ESO to review, in consultation with industry, the NETS SQSS requirements for reserve, response and inertia holding on the GB electricity system.

The intention of modification GSR027 is to enable the development of the ESO's policy on reserve, response and inertia holding, to consider what level of risk should be mitigated and therefore what costs should be incurred and to enable the best value for money to be delivered for consumers.

What is the issue?

On 9 August 2019, there was a combined near-simultaneous loss of two large generators, as well as consequential losses of Distributed Energy Resources. These events caused a significant frequency disturbance and triggered the subsequent disconnection, loss of power and disruption to more than one million consumers. An action from the E3C and Ofgem reports into the incident required the ESO, in consultation with industry, to review reserve, response and inertia holding policies.

What is the solution and when will it come into effect?

Proposers solution – the Original:

Changes to the SQSS legal text to amend certain definitions and provisions including unacceptable frequency conditions and Loss of Power Infeed, and to give standing to the Frequency Risk and Control Report (FRCR)	**Create a Governance framework** to set out a requirement for the ESO to develop a FRCR methodology and, in line with this, to periodically produce a FRCR in accordance with an agreed process. The FRCR methodology and FRCR will be regularly reviewed and updated in consultation with interested parties and will be subject to recommendation by the SQSS panel and, for the FRCR, approval by the Authority

Being produced to support these changes:

Creation of an illustrative FRCR Methodology to allow the reader to better understand the SQSS legal text, intended process and governance arrangements giving a feel for the practical application / implementation of the FRCR. *The ESO are not specifically seeking approval from Ofgem on this as part of GSR027; however, the ESO will be seeking comments on this illustrative methodology from Ofgem as part of their GSR027 decision.*

Other solutions:

- None put forward by the Workgroup.

Implementation date:

The proposed implementation date for the changes to the SQSS legal text and the Governance Framework to take effect is 1 April 2021.

To meet this date, GSR027 needs to be approved by Ofgem in December 2020 to allow enough time for the statutory consultation on the necessary licence changes to update the version of the SQSS with which licensees are required to comply.

Workgroup conclusions

The Workgroup concluded by majority (12 out of 13 votes) that the Original better facilitated the Applicable Objectives than the Baseline.

Panel Recommendation

The Panel has recommended by majority that the Proposer's solution is implemented.

What is the impact if this change is made?

This modification will impact National Grid ESO, Consumers (and consumer organisations), Generators, Interconnectors, Network Operators and Transmission Owners.

The impact of any power outage is widespread societal disruption. However, consumers will also ultimately pay for any enhancements to reserve and response holding requirements that could lessen the risk of such disruption. This modification seeks to find a way to balance cost and risk in an acceptable way to deliver the best value to consumers in an engaged and transparent way.

Interactions

No further code changes are thought to be necessary to progress this specific action from the Ofgem and E3C reports in to the 9 August 2019 event.

Contents

What is the issue?

What is the issue?

On 9 August 2019, there was a combined near-simultaneous loss of two large generators, as well as consequential losses of Distributed Energy Resources. These events caused a significant frequency disturbance and triggered the subsequent disconnection, loss of power and disruption to more than one million consumers. An action from the E3C and Ofgem reports into the incident required the ESO, in consultation with industry, to review its reserve, response and inertia holding policies. The specific actions that ESO need to address are set out below:

E3C final report	Ofgem final report
Action 5: The ESO, in consultation with industry, should undertake a review of the SQSS requirements for holding reserve, response and system inertia. This review should consider: • the explicit impacts of distributed generation on the required level of security; • whether it is appropriate to provide flexibility in the requirements for securing against risk events with a very low likelihood, for example on a cost/risk basis; and • the costs and benefits of requiring the availability of additional reserves to secure against the risk of simultaneous loss events. Timing: The ESO should put forward modification proposals to the SQSS by April 2020.[1]	5.7. *Action (1):* The ESO, in consultation with the industry, should undertake a review of the SQSS requirements for holding reserve, response and system inertia. 5.7.1. This review should consider: -the explicit impacts of distributed generation on the required level of security -whether it is appropriate to provide flexibility in the requirements for securing against risk events with a very low likelihood, for example on a cost/risk basis -the costs and benefits of requiring the availability of additional reserves to secure against the risk of simultaneous loss events 5.7.2. The ESO, as the party required to operate to the standard, should carry out this review and raise modification proposals to the SQSS Panel by April 2020.[2] This would provide the appropriate channels for industry scrutiny and transparency, and for an ultimate Ofgem decision on any required changes to the standard

The NETS SQSS defines the conditions under which unacceptable frequency conditions should not occur. This drives the volume, the type of, and ultimately the cost of response, reserve and inertia services procured by the ESO to avoid such conditions. GSR027 will review the criteria for unacceptable frequency conditions in the NETS SQSS to ensure that

[1] GSR027 was raised at SQSS Panel on 27 April 2020. SQSS Panel asked for a Workgroup to be formed to assess this Modification proposal.

[2] GSR027 was raised at SQSS Panel on 27 April 2020. SQSS Panel asked for a Workgroup to be formed to assess this Modification proposal.

an appropriate balance can be reached between the costs of managing system frequency, which is eventually borne by the consumer, and the risks mitigated in doing so.

Why is it an issue?

Assessments of the power outage of 9 August 2019 have been clear that the level of reserve, response and inertia holding and security of supply, and the costs associated with providing this, are societal questions. The GB electricity system is changing fundamentally to one in which a greater proportion of generation is connected to the distribution system, is of smaller sizes, and is predominantly made up of renewable generators (wind and solar). The time is right to carry out this review of the ESO's reserve, response and inertia holding policies[3].

At the 1st Workgroup on 28 July 2020, the Proposer shared a detailed presentation to help the Workgroup understand the issue to be resolved and the proposed solution – these slides can be found in Annex 3.

What is the solution?

Proposer's solution:

In Scope:

Changes to the SQSS legal text to amend certain definitions and provisions including unacceptable frequency conditions and Loss of Power Infeed, and to give standing to the Frequency Risk and Control Report (FRCR)	**Create a Governance framework** to set out a requirement for the ESO to develop a FRCR methodology and, in line with this, to periodically produce a FRCR in accordance with an agreed process. The FRCR methodology and FRCR will be regularly reviewed and updated in consultation with interested parties and will be subject to recommendation by the SQSS panel and, for the FRCR, approval by the Authority

Being produced to support these changes:

Creation of an illustrative FRCR Methodology to allow the reader to better understand the SQSS legal text, intended process and governance arrangements giving a feel for the practical application / implementation of the FRCR. *The ESO are not specifically seeking approval from Ofgem on this as part of GSR027; however, the ESO will be seeking comments on this illustrative methodology from Ofgem as part of their GSR027 decision .*

[3] While these policies are in themselves not part of the SQSS, the volume of reserve and response held is a direct result of the requirements set out in the SQSS to avoid unacceptable frequency conditions for a range of system conditions including and taking into account an assessment of the loss of power infeed risk.

Not in Scope due to time constraints:

A final proposed **FRCR Methodology**, which will lay out a transparent and objective method to help determine the right balance between the two competing objectives of reliability and cost, focusing on the risks, impacts and controls for managing system frequency and which will set out what will be covered by the FRCR. **Target is for this to be approved by Ofgem (or for Ofgem to confirm that it is 'minded to approve') in ~ January 2021 to come into effect on 1 April 2021.**
The **FRCR,** which will provide a transparent and consulted upon assessment of the risk of unacceptable frequency conditions (as defined in the SQSS) occurring, as required by the proposed modification to the SQSS, and their impact on Security of Supply inherent in the operation of the National Electricity Transmission System. **It is intended that the ESO will formally submit the FRCR on 1 April 2021 for Ofgem approval in a short time frame having already run the required FRCR consultation prior to 1 April 2021.** **Please note that the ESO will continue to follow current practices to control frequency risks in compliance with the current version of the SQSS until the first FRCR is approved.**

Workgroup Considerations

The Workgroup convened six times[4] to discuss the proposed change and assess the proposed solution in terms of the Applicable SQSS Objectives.
Changes to the SQSS legal text – *set out in Annex 4 of this document*

The changes seek to:

- In section 5 and section 9, update the list of the secured events under which "unacceptable frequency conditions" should not occur;
- Clarify the SQSS obligations (e.g. those related to Loss of Power Infeed, Unacceptable Frequency Conditions);
- Update related definitions; and
- Give standing to the FRCR and the FRCR Methodology.

Some Workgroup members were keen that the proposed SQSS legal text better reflects the role that interconnectors (along with generation and demand) losses can have in terms of frequency deviations, and therefore the ESO has clarified this within the updated proposed legal text.

Some Workgroup Members were concerned that the consequential loss of distributed energy resources was not explicitly set out within the "Loss of Power Infeed" definition. The ESO Workgroup Member believes it is inappropriate to place a blanket obligation, as part of GSR027, on the ESO to manage all loss of Distributed Energy Resources, as this would significantly blur the line between operation of the National Electricity Transmission System (the ESO's role) and the operation of distribution networks (DSOs). Some Workgroup members also noted that the consequential loss of Distributed Energy Resources due to RoCoF and Vector Shift is a time-limited problem, and so should not codified as a long-

[4] 4 meetings prior to Workgroup Consultation and 2 thereafter

term expectation under the "Loss of Power Infeed" definition. The Workgroup, including the ESO Workgroup Member, noted that obtaining additional data on Distributed Energy Resources is the right direction of travel. However, this is a future consideration and not within the scope of GSR027. Assessment of consequential Distributed Energy Resource losses are included in the assessments that are required in the FRCR Methodology and is referenced in the proposed legal text.

A Workgroup Member argued (and reaffirmed in their Workgroup Consultation Response) that they do not believe that replacing part of SQSS with an external process is in the interest of Users or consumers. He added that that a minimum frequency control requirement should remain in the SQSS and changes to SQSS should only be considered once any analysis has been completed.

However, the ESO Workgroup member responded that:

- The rationale for a one-off change to the SQSS, to clarify definitions and give standing to the FRCR, was to ensure that improvements in reliability and/or cost are realised as quickly as possible and that an efficient process is enabled that can respond quickly and transparently to system changes;
- The FRCR Methodology and FRCR will both always be subject to consultation, SQSS panel recommendation and Ofgem approval; and
- The aim is that the FRCR is only a variation from the agreed baseline (the current SQSS arrangements) provided by the SQSS detailing transparently the risks that will be secured and is not a replacement or change to the SQSS criteria in itself. If any enduring changes to the baseline were identified as necessary, these would be required to go through the usual SQSS Modification Process.

Workgroup Members sympathised with the views expressed; however they did not feel strongly enough to favour moving away from the proposed external process, and agreed that a change to SQSS as proposed is appropriate.

Create a Governance framework / SQSS Appendix H– *set out in Annex 5 of this document*

The Governance framework sets out requirements for:

- The production of a FRCR methodology (including the form of the FRCR which will also be consulted on and approval sought from the Authority), and which will underpin the production of the FRCR.
- The periodic production of a FRCR which will be consulted on and approval sought from the Authority.

This follows the approach used in the Network Options Assessment (NOA) process in which a methodology is approved separately and is then used to produce the annual NOA report.

The Workgroup developed the following table setting out the pros and cons (this is also set out in Annex 6 of this document) regarding where to house the Governance framework for the FRCR Methodology and FRCR.

Location of 'Process' Text – Pros/Cons

Issue	Location of text		
	Licence Condition	Annex to SQSS	Grid Code
Overall principle	Aligns with NOA approach – the NOA process and capacity market are similar in style	The SQSS is a standard not a code and does not have defined governance rules or ownership by a licensee.	Could start to bring SQSS into Grid Code
Status of 'standard'		The requirement on licensees is to comply with the SQSS (and being the version as quoted in the licence which therefore needs updating to implement any change).	Recognised code with clear governance processes and licensee ownership
Number of locations for documentation	Fragmented	All in one place	Fragmented – and adds another code into this
Ofgem direction	Easier for Ofgem to maintain control if they wish; and is more in line with other direct requirements on a licensee	Ofgem could direct a change to any code, although a little less obvious how this would work with the SQSS	Ofgem could direct any changes required
Transparency	A licence change would require a consultation and hence be transparent - but might lack visibility to wider stakeholders	Putting text in the SQSS is more transparent to stakeholders and follows a recognised process	Recognised process for any changes
Governance for subsequent changes	Would need further licence changes	Could be done using industry code modification processes	Could be done using industry code modification processes
Complexity	Would need Ofgem to progress a more complex licence change including consultation on this. Would need coordination to approve the SQSS change referring to the methodology simultaneously.	Approved with a single Ofgem decision (although any change to the SQSS still needs a simple licence change to update the version and then take effect)	Still need to change SQSS and therefore licence to reference the process so multiple decisions required
Timescales	Likely to take longer unless Ofgem progressed it in parallel	Likely to be quicker even though updating the SQSS still needs a licence change	Possibly quicker although with coordination issues

The vast majority of the Workgroup believed it was most appropriate to include this Governance framework as an appendix to the SQSS as this would be the most obvious home for an SQSS related change. The majority of Workgroup Consultation respondents (6 out of 8) agreed. **The Workgroup concluded that the Governance framework would be housed as an appendix to the SQSS and will become SQSS Appendix H.**

There was minority support for this Governance framework to be included within the transmission licence conditions as this is similar to the NOA process. One respondent to the Workgroup Consultation supported this view.

A Workgroup Member also suggested the Grid Code[5] as a possible home, as the Workgroup Member felt that the governance arrangements for the Grid Code were easier for stakeholders to engage with. However, some Workgroup Members argued that having SQSS related processes within the Grid Code would add unnecessary complexity for stakeholders. Future consideration may be given to the governance arrangements for the SQSS, including whether it could be incorporated as a standard referenced in the Grid Code but this is not within the scope of GSR027. There was no support for this option expressed by respondents to the Workgroup Consultation.

The ESO Workgroup Member clarified that there is no difference in the obligation on the ESO to deliver and comply with the FRCR whichever of the above options is chosen.

Illustrative FRCR Methodology – *set out in Annex 7 of this document*

Ofgem has made clear that they need to make their decision on GSR027 in December 2020 and to achieve this they need to receive the Final Modification Report by the 3rd week in November 2020. In light of this requirement from Ofgem, the question for the Workgroup was what could be done in terms of analysis within this constrained timeframe. The

[5] Workgroup agreed that the wording would be essentially the same as that which would sit as an Annex to the SQSS and therefore have not specifically developed the legal text for this

Workgroup recognised that neither the final FRCR Methodology nor the FRCR will be complete by the 3rd week in November.

However, the Workgroup agreed that it would be difficult for Ofgem to make a decision on the proposed GSR027 changes without a feel for the practical application / implementation of the FRCR. Therefore, the ESO has proposed an illustrative FRCR Methodology, which seeks to lay out an objective framework to determine the right balance between the two competing objectives of a reliable supply of electricity at an affordable price; focusing on the risks, impacts and controls for managing the system frequency. This methodology sets out the approach which will be used to complete the analysis required to produce the FRCR.

Consultation and ongoing engagement with industry stakeholders is key to developing the FRCR Methodology and FRCR in an open and transparent way. The role of the ESO is to analyse the risks, impacts and controls, their impact on reliability and cost, and present a recommendation for where the right balance might lie. This will enable Ofgem to make an informed decision on the right balance between reliability of electricity supplies and cost to end consumers.

The ESO Workgroup Member stated that version 1 of the FRCR would look at quick wins and meaningful change whilst not biting off too much at once and would focus on the following key areas:

- establishing a clear, objective, transparent process for assessing reliability vs. cost;
- making the assessment of the risk from the inadvertent operation of Loss of Mains protection transparent; and
- identifying quick, short-term improvements for reliability vs. cost, including the frequency standard that different size loss risks are assessed against.

The events, losses, impacts and controls to be considered in future versions are set out in Section 8 of the illustrative FRCR Methodology. This includes reviewing the frequency fluctuation limits that are stated within the SQSS[6],, which addressed the concerns of some Workgroup Members, who noted that the SQSS relates not only to security of supply but also to the quality of supply.

In Section 10 of the illustrative FRCR Methodology, the ESO have clarified the input data they would need to complete the FRCR. The ESO will either have the data they need or will make working assumptions if all the required information was not available. The ESO noted in future versions of the FRCR that they may need to ask for more up to date data[7] on e.g. Network equipment fault probability.

[6] Section 8.3 of the illustrative FRCR Methodology states:

Further investigations of frequency deviations closer to 50 Hz	• how smaller deviations impact users, and how often they should be allowed to occur

[7] Section 8.5 of the illustrative FRCR Methodology:

Respondents to the Workgroup Consultation offered suggestions on the current wording of the illustrative FRCR Methodology and the "Key Points" column in Annex 9 summarises these. The ESO Workgroup Member has addressed these points as part of the latest update to the illustrative FRCR Methodology and also noted there will be further iterations and wider consultation on the FRCR Methodology over the coming months.

Frequency Risk and Control Report (FRCR) Outputs

The Workgroup also discussed which information in the FRCR should have a restricted circulation and which should be public domain. Underpinning this discussion was the need to balance transparency with providing information that may compromise supply security.

In Section 7.2 of the illustrative FRCR Methodology, the ESO have set out their thoughts on what would be in the published FRCR and the full version of the FRCR. This is summarised below:

Published FRCR	Full FRCR
• the expected total cost per year of all frequency controls; and • the expected level of reliability achieved for each impact.	• the specifics of which events or categories of events will and will not be secured with targeted controls

Appendix H15 of the SQSS will set out that the ESO must publish the FRCR. Appendix H16 of the SQSS will place an obligation on the ESO to exclude from the published FRCR *any information that could cause security concerns or that would or might seriously and prejudicially affect the commercial interests*.

FRCR Methodology Approver and FRCR Approver

The Workgroup agreed that there would need to be a "FRCR Approver", who would also determine the information that should be included in the published FRCR. The Workgroup proposed 2 options for who the "FRCR Approver" could be, which were:

- The SQSS Panel and Ofgem and BEIS; or
- An independent industry body appointed by Ofgem.

There was no conclusive view on this question expressed by respondents to the Workgroup Consultation.

Following the Workgroup Consultation, the Workgroup concluded that both the FRCR Methodology and the FRCR would need "approval" as it would be inappropriate to prepare a FRCR without some check that the FRCR Methodology itself was fit for purpose. The

Improvements in statistical data inputs	• whether there is the opportunity for better quality or more accurate input data on the probability of the various types of faults, and how to reflect any uncertainties

Workgroup agreed the following model, which is line with current SQSS governance procedures:

Milestone	Details of Approval	Reference in Governance Framework / SQSS Appendix H
FRCR Methodology submitted to SQSS Panel	Recommendation from the SQSS Panel that the proposed FRCR methodology is used in the subsequent production of a FRCR or direct National Grid ESO to further review	H8(a) and H8(b)
FRCR submitted to SQSS Panel	Recommendation from SQSS Panel that the proposed FRCR be onwards submitted to the Authority for approval or direct National Grid ESO to further review	H18(a) and H18(b)
FRCR submitted to the Authority	Approve the FRCR or direct National Grid ESO to further review	H19(a) and H19(b)

The Workgroup discussed the ability of the SQSS Panel, as part of their new duties to recommend the FRCR Methodology and FRCR, to make sure that they represented a broad enough range of stakeholders. The ESO Workgroup Member suggested some additional words to add to the end of clauses H8 and H18 of the Governance Framework (the new SQSS Appendix H) to ensure this as follows:

The SQSS Panel may, where it wishes and with the assent of the Authority, appoint additional representatives, a suitable body or representation to carry out its tasks under this clause.

The Workgroup considered this and, whilst understanding the principles and concern being addressed, believed this would have to be treated with care to both avoid expanding the SQSS Panel by default and to ensure that any 'broadening' was specific to the matters within GSR027. The Workgroup further concluded that the following words (already included in clauses H8 and H18 of the new SQSS Appendix H) gave the SQSS Panel this ability and was clearer in not eroding the role of the SQSS Panel or fundamentally changing its membership:

In making its recommendation the SQSS Panel will give due regard to its expertise in the matters covered by the proposed FRCR and will seek appropriate advice and guidance where required.

The Workgroup therefore proposed to clearly set out in the Final Modification Report that, in order, to recommend the FRCR Methodology and FRCR, the SQSS panel is expected to engage more broadly than would usually be the case for a SQSS modification. Although this is not defined prescriptively, the expectation is for the SQSS Panel to consider involving trade associations, consumer representatives or other industry code panels (such as the Grid Code Panel), and that demonstrating this would be a likely condition of the onwards approval by the Authority of the FRCR.

Other Considerations

Provision of Mandatory Services - A Workgroup Member argued that GSR027 provided an opportunity to review a current imbalance that some market participants are mandated to provide services to the NETS but others are paid if they provide such services. The ESO Workgroup Member noted this concern, and reiterated that they are committed to an open, transparent and competitive market. However, this is not within the scope of GSR027.

European Considerations - There is also a requirement to ensure consistency with the frequency management requirements set out in the European System Operation Guideline (Regulation (EU) 2017/1485 (SOGL)). The provisions of SOGL establish a framework for the maintenance of the secure operation of the interconnected transmission system in real time. As SOGL is European law, this takes precedent over GB frameworks. However, in application to GB it was drafted to be consistent with the current SQSS provisions.

Workgroup Consultation Summary

The Workgroup held their Workgroup Consultation between 16 September 2020 and 30 September 2020 and received 8 non-confidential responses. The full non-confidential responses and a summary of the responses can be found in annexes 8 and 9. The Workgroup met twice to discuss the responses received and noted the following trends within the industry's responses:

- Respondents were largely supportive (6 out of 8) of the proposed change with only one respondent arguing that a change to the SQSS is not necessary at this time;
- One respondent believed that the FRCR Methodology should be included in the SQSS and therefore subject to SQSS governance. This ESO Workgroup Member has subsequently discussed this matter with the respondent but they maintain their view that having the FRCR Methodology outside the SQSS achieves a greater degree of flexibility than would be possible within the SQSS whilst still meeting the over-riding requirement of GSR027 to improve engagement and transparency; and
- The majority of respondents (6 out of 8) agreed with the Workgroup's conclusion to house the Governance framework as an Appendix to the SQSS.

Legal text

The legal text for this change can be found in Annex 4.

What is the impact of this change?

Who will it impact?

National Grid ESO

The impact on the ESO of this modification and creation of the accompanying process will be the ability to respond to changing system needs in a more agile way. The goal is to ensure optimum value for money for consumers in answering the societal questions of what risks to security of supply should operational costs be incurred against and to be able to do this in a transparent, engaged and consulted manner.

Consumers (and consumer organisations)

The end consumer has two key requirements - a reliable supply of electricity at an affordable price.

There is a natural tension between those two requirements: - higher reliability requirements result in higher costs to meet them. Therefore, the ESO are trying to facilitate the electricity industry to make an informed decision on finding the right balance between those two objectives.

Generators and Interconnectors

This process may lead to changes in services required to meet system needs and therefore Balancing Services Use of System (BSUoS) costs.

The FRCR will provide more information to market participants about the likelihood and nature of operational risks and how these will be managed.

Network Operators

The review should take account of the frequency related provisions of the Grid Code and Distribution Code, particularly those relating to distributed energy resources. The review will provide additional transparency on the likelihood of the DNOs LFDD scheme being required to operate and facilitate the ongoing review of the GB LFDD arrangements.

Transmission Owners

Potential interactions with Transmission Owners' investment planning or outage planning timescales and the NOA process.

Other:

Those who pay BSUoS charges

Any additional costs or cost saving would ultimately be passed through to consumers but would be directly paid by the ESO to reserve, response and stability service providers, which would be recovered from the payers of BSUoS charges.

Workgroup Vote

The Workgroup met on the 8 October 2020 to carry out their Workgroup Vote. The full Workgroup Vote can be found in Annex 10. The table below provides a summary of the Workgroup members view on the best option to implement this change.

The Applicable SQSS Objectives are:

SQSS

i) facilitate the planning, development and maintenance of an efficient, coordinated and economical system of electricity transmission, and the operation of that system in an efficient, economic and coordinated manner;
ii) ensure an appropriate level of security and quality of supply and safe operation of the National Electricity Transmission System;
iii) facilitate effective competition in the generation and supply of electricity, and (so far as consistent therewith) facilitating such competition in the distribution of electricity; and
iv) facilitate electricity Transmission Licensees to comply with their obligations under EU law.

Which option is the best? (Baseline or Original proposal).

Workgroup Member	Company	BEST Option?	Which objective(s) does the change better facilitate? (if baseline not applicable)
Rob Wilson / Rob Westmancoat	National Grid ESO	Original	(i) and (ii)
Dr. Isaac Gutierrez / Paul Crolla	Scottish Power Renewables (UK) Limited	Original	(i)
Andrew Russell / Simon Lord	Engie	Original	(i) and (ii)
Michael Gordon / Mike Lee	Transmission Investment Services Limited	Original	(i) and (ii)
Andy Vaudin / Paul Mott	EDF	Original	(i) and (ii)
Mark Duffield	National Grid Interconnectors	Original	(i) and (ii)

Chris Proudfoot / Alastair Frew	Drax Group	Original	(i) and (ii)
Alan Creighton	Northern Powergrid	Original	(i) and (ii)
Le Fu	NGET	Original	(i) and (ii)
Robert Longden / Tom Edwards	Cornwall Insight Ltd.	Original	(i) and (ii)
Cornel Brozio / David Adam	SP Energy Networks (SPT)	Baseline	n/a
Grace March	Sembcorp	Original	(i) and (ii)
Garth Graham / Andrew Colley	SSE Generation Ltd.	Original	(i) and (ii)

The Workgroup concluded by majority that the Original better facilitated the Applicable Objectives than the Baseline.

Code Administrator Consultation Summary

The Code Administrator Consultation was issued on the 23 October 2020 and closed at 5pm on 6 November 2020. 5 responses were received with all of these being non-confidential. A full summary of these responses can be found in Annex 13 and the full responses can be found in Annex 14.

3 respondents were supportive of the proposed change and proposed implementation. In summary:

- All 3 respondents noted that the proposed approach provides the balance between cost and risk mitigation; and
- 1 respondent stated that setting out the process for the production of a periodic report that will be consulted on and approved on outside the SQSS "is a much more agile and accessible solution that will allow the balance between cost and risk to be adjusted continually".

The other 2 respondents did not support the proposed change nor proposed implementation.

- 1 respondent argued that a change to the SQSS is not necessary at this time and proposed that the first FRCR is published before changes to the SQSS are considered.
- 1 respondent had a general concern regarding the "change from a deterministic to a probabilistic approach and the potential consequential and unintended consequences that could arise". The same respondent added that GSR027 should be submitted to Ofgem only when the FRCR is fully developed to allow for a thorough review and proper consultation of the proposed changes.

Panel recommendation vote

The Panel met on the 18 November 2020 to carry out their recommendation vote.

They assessed whether a change should be made to the SQSS by assessing the proposed change and any alternatives against the Applicable Objectives.

Vote 1: Does the Original facilitate the objectives better than the Baseline?

Panel Member: **Rob Wilson, National Grid ESO**

	Better facilitates AO (i)?	Better facilitates AO (ii)?	Better facilitates AO (iii)?	Better facilitates AO (iv)?	Overall (Y/N)
Original	Yes	Yes	Neutral	Neutral	Yes

Voting Statement

This modification allows a transparent and engaged solution to be developed to agree the risks that the ESO will mitigate operationally balancing cost and security of supply to provide value for money to consumers.

Of particular importance is that it is a flexible solution that allows the ESO to respond to the rapid changes being undergone by the system and the electricity industry as a whole – for example in the electrification of transport, the continued shift to renewable and largely embedded generation, and the move to more interactive demand - which a solution entirely within the SQSS would not have addressed.

The Panel, and Ofgem, retain control of the process through the requirements for the methodology and FRCR to be consulted on, recommended and approved.

Panel Member: **Le Fu, National Grid Electricity Transmission**

	Better facilitates AO (i)?	Better facilitates AO (ii)?	Better facilitates AO (iii)?	Better facilitates AO (iv)?	Overall (Y/N)
Original	Yes	Yes	Neutral	Neutral	Yes

Voting Statement

The proposed modification introduces a transparent and engaging process to enable ESO achieving the balance between safe operation of the network and cost to achieve it via holding frequency response and reserve. Thus it better facilitates the Applicable SQSS Objective (i) and (ii).

Panel Member: **Malcolm Barnacle (Alternate), Scottish Hydro Transmission**

	Better facilitates AO (i)?	Better facilitates AO (ii)?	Better facilitates AO (iii)?	Better facilitates AO (iv)?	Overall (Y/N)
Original	Yes	Yes	Neutral	Neutral	Yes
Voting Statement					
The FRCR should continue to be developed in detail during the progress of the modification to mitigate concerns around dilution of the frequency restoration time scale criteria.					

Panel Member: **Cornel Brozio, Scottish Power Transmission**

	Better facilitates AO (i)?	Better facilitates AO (ii)?	Better facilitates AO (iii)?	Better facilitates AO (iv)?	Overall (Y/N)
Original	No	No	Neutral	Neutral	No
Voting Statement					
As outlined in the various SPEN GSR027 consultation responses, we do not believe that the case for this SQSS change has been made. The SQSS is intended to provide a minimum frequency control standard. However, the proposed change would effectively replace the standard with an external process. A proper evaluation of costs and risks should precede an SQSS change. An SQSS change is not required for the publication of the FRCR.					

Panel Member: **David Lyon, OFTO Representative**

	Better facilitates AO (i)?	Better facilitates AO (ii)?	Better facilitates AO (iii)?	Better facilitates AO (iv)?	Overall (Y/N)
Original	Neutral	Neutral	Neutral	Neutral	Yes
Voting Statement					
No statement given.					

Panel Member: **Simon Lord, Generator Representative**

	Better facilitates AO (i)?	Better facilitates AO (ii)?	Better facilitates AO (iii)?	Better facilitates AO (iv)?	Overall (Y/N)

Original	Yes	Yes	Neutral	Neutral	Yes

Voting Statement

In general we support the approach but much of the detail will sit outside of the SQSS and the obligation will be on the ESO to run an inclusive and open consultation process being prepared to on board views and analysis from others in the industry that may challenge their traditional thinking.

The key cost benefit question is not covered as this is effectively a facilitating modification. If we spend more on system protection (reserve response inertia voltage etc) we are less likely to have system stability issue, spending a smaller amount will bring the benefits of lower consumer cost. We would expect this topic to be included in the FRCR methodology and consultations.

Planning for a 1 in 100 year event is challenging especially in a rapidly changing worlds with technology, changing demand use and different sources of generation. If events are truly random a challenging event could happen a number of times in any specific year. This SQSS change whilst effectively a blank sheet of paper does bring a concern that it may result in the ESO planning for what we know and will effectively reduce the resilience of the system to deal with unplanned events as happen on the 9th August.

Planning for what we know is just the “day job” for the ESO its planning for what we don’t know that the skill here and it needs to be to be combined the ongoing black start review.

The ESO is at the moment driving down the route of optimising against specific risks (known risks) and is arguably is missing the opportunity to plant for unknown and unplannable events that in the medium term will reduce the system’s resilience and ability to react to any but the planned events.

Hopefully this process will allow the ESO to review its approach and broaden its thought process accordingly.

Panel Member: **Alan Creighton, Distribution Network Operator Representative**

	Better facilitates AO (i)?	Better facilitates AO (ii)?	Better facilitates AO (iii)?	Better facilitates AO (iv)?	Overall (Y/N)
Original	Yes	Yes	Neutral	Neutral	Yes

Voting Statement

The proposed solution will help establish the appropriate level of reserve, response and inertia holding via a transparent process.

Vote 2 – Which option is the best?

Panel Member	BEST Option?
National Grid ESO	Original
National Grid Electricity Transmission	Original
Scottish Hydro Transmission	Original
Scottish Power Transmission	Baseline
OFTO Representative	Original
Generator Representative	Original
Distribution Network Operator Representative	Original

Panel conclusion

The Panel, by majority recommended that the Proposer's solution should be implemented.

When will this change take place?

Implementation date:

The proposed implementation date for the changes to the SQSS legal text and the Governance framework to take effect is 1 April 2021.

To meet this date, GSR027 needs to be approved by Ofgem in December 2020 to allow enough time for the statutory consultation on the necessary licence changes to update the version of the SQSS with which licensees are required to comply.

Acronym table and reference material

Acronym	Meaning
Baseline	The current version of the SQSS
DER	Distributed Energy Resources
DNO	Distribution Network Operator
ESO	Electricity System Operator
E3C	Energy Emergency Executive Committee
FRCR	Frequency Risk Control Report – *as defined in this document*
GB	Great Britain
LFDD	Low Frequency Demand Disconnection
Loss of Mains protection	Protection on DER designed to detect a Loss of Mains condition to prevent the formation of islanded networks for local faults
NETS SQSS	National Electricity Transmission System Security and Quality of Supply Standard
Rate of Change of Frequency (RoCoF) loss	The loss of generation from DER due to the inadvertent tripping of Loss of Mains RoCoF relays, caused by an event on the electricity transmission system
System Inertia	A measure of the stored rotational energy in the system (measured in MVAs). Directly affects the rate of change of frequency during a fault
Vector Shift loss	The loss of generation from DER due to the inadvertent tripping of Loss of Mains Vector Shift relays, caused by an event on the electricity transmission system

Reference material:

Ofgem final report on 9th August 2019 power outage, January 2020.

E3C final report on 9th August 2019 power outage, January 2020.

Annexes

Annex	Information
Annex 1	GSR027 Proposal Form *(presented to SQSS Panel on 27 April 2020)*
Annex 2	GSR027 Terms of Reference
Annex 3	Proposer's Presentation *(on the issue and solution at 1st Workgroup Meeting)*
Annex 4	GSR027 SQSS Legal Text
Annex 5	Governance framework – Appendix to SQSS
Annex 6	Pros and Cons of where to house the Governance framework

Annex 7	Illustrative Methodology for FRCR
Annex 8	GSR027 Workgroup Consultation Responses summary
Annex 9	GSR027 Workgroup Consultation Responses
Annex 10	GSR027 Workgroup Vote
Annex 11	GSR027 Code Administrator Consultation Responses summary
Annex 12	GSR027 Code Administrator Consultation Responses