

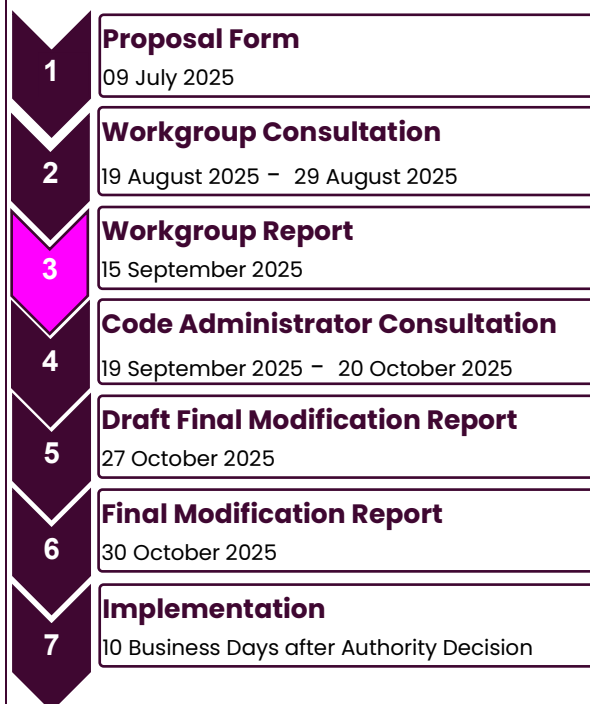
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Workgroup Report

GC0183: Generator and Interconnector Availability During a Severe Space Weather Event

Overview: This modification will make changes to the Grid Code to obligate Generators, Interconnector Owners and Restoration Contractors to notify NESO of their intended position in the event of severe space weather.

Modification process & timetable



Have 10 minutes? Read our [Executive summary](#)

Have 100 minutes? Read the full [Workgroup Report](#)

Have 160 minutes? Read the full Workgroup Report and Annexes

Status summary: The Workgroup have finalised the Proposer's solution. They are now seeking approval from the Panel that the Workgroup have met their Terms of Reference and can proceed to Code Administrator Consultation.

This modification is expected to have a: High impact on Generators, Interconnector Owners, Restoration Contractors and National Energy System Operator. **Medium impact** on Network Operators.

Modification drivers: System Operability and System Security.

Governance route	Urgent modification to proceed under a timetable agreed by the Authority (with an Authority Decision).
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Who can I talk to about the change?	Proposer: Helen Newman Helen.Newman@neso.energy 07860 319 716	Code Administrator Chair: Claire Goult Claire.Goult@neso.energy 07938 737 807
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Executive Summary

Space weather, particularly during periods of high solar activity, can induce electrical currents in power grids potentially damaging infrastructure and leading to instability or supply shortfalls. To address these risks, National Energy System Operator (NESO) and industry parties are developing a Space Weather Industry Protocol (SWIP) to guide operational decisions during severe space weather events, with plans for it to be shared from September 2025. This modification seeks to make changes to obligate Generators, Interconnector Owners and Restoration Contractors to notify NESO of their expected availability during severe space weather events.

What is the issue?

The Proposal covers the specific challenge around knowledge of Generator and Interconnector Owner availability and intentions to facilitate system operation by NESO in a severe space weather event.

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

Proposer's solution: Generators, Interconnector Owners and Restoration Contractors to be obligated to notify NESO and the market about their intended position during severe space weather events, after NESO issues a relevant notification.

Implementation date: 10 Business Days following an Authority Decision.

What is the impact if this change is made?

The purpose is to provide greater visibility for NESO of the operational status of key assets during a severe space weather event. This will support NESO in managing scenarios that have the potential to lead to a shortfall in electricity supply or instability of the GB Power System. Network Operators and Transmission Owners (through a separate System Operator Transmission Owner Code (STC) change which will be raised following the SWIP development and not as part of this modification) may need to inform NESO via a Space Weather Outcome Statement if their assets have experienced impacts as a result of space weather.

Workgroup conclusions: The Workgroup concluded unanimously that the Original better facilitated the Applicable Objectives than the Baseline.

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Interactions

Changes to the Balancing Mechanism Reporting Service (BMRS) may be needed. The modification also has an interaction with Grid Code modification [GC0164](#), which seeks to simplify Operating Code No.2. Consideration is also being given to whether the STC should be amended due to the Space Weather Industry Protocol, rather than as a direct result of this ([GC0183](#)) Grid Code modification. BSC interaction with the opening of the [CPI614](#) (Reporting Space Weather Events on Insights) consultation on 09 September 2025.

What is the issue?

What is the defect the Proposer believes this modification will address?

Space weather refers to the environmental conditions in space. It can have a significant effect on the functionality of power grids because the rapid fluctuations in the Earth's magnetic field induce an electric field in the Earth's surface. This electric field then drives electrical currents to flow through conductive structures; these are known as geomagnetically induced currents (GICs). This can potentially lead to damage to some assets across the electricity system, depending on the asset design, location and geology.

The Sun experiences 11-year cycles of solar activity; the peak of this is called the solar maximum. The solar maximum of the current cycle was reached in 2025. During the solar maximum and the following 2–3 years, solar storms that lead to GICs are statistically more likely. Over the last 12 months, NESO and industry stakeholders have been working together in the space weather subgroup to better understand the effects on the GB electricity system and is currently drafting a Space Weather Industry Protocol (SWIP).

The intention is that this will be shared with affected parties in September 2025 and will provide guidelines for operational decision making during an anticipated or actual severe space weather event. Following discussions around the protocol, a risk has recently been recognised that some Generators, Interconnector Owners and Restoration Contractors may potentially alter the operational status of their assets, depending on the notification and severity of a space weather event. For example, some assets may

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cease operations entirely whilst others might reduce output (Generation) or flow (Interconnector). If this occurs, it could potentially lead to a shortfall in supply or, in the worst case, system instability.

Why change?

The change is necessary to enable NESO and market participants to understand the intended positions of Generators, Interconnector Owners and Restoration Contractors during a severe space weather event. This will ensure NESO can effectively manage the system in real-time.

The Original Proposal form can be found in **Annex 01**.

What is the solution?

Proposer's Original solution

Make an amendment to the Grid Code to obligate Generators, Interconnector Owners and Restoration Contractors to issue a 'Space Weather Outage Declaration' to NESO (and advise the market, via their Regulation for Energy Markets Integrity and Transparency (REMIT)/information submissions), setting out their anticipated availability during and after a severe space weather event, following a space weather notification being issued by NESO and posted on the BMRS.

What is in and out of scope?

The Proposal covers the specific challenge around knowledge of Generator and Interconnector Owner availability and intentions in order to facilitate system operation in a severe space weather event.

Any anticipated impacts (or any associated risks) of severe space weather on the wider energy system are out of scope of this modification.

Industry engagement and feedback

NESO have been engaging with industry over the last 12 months via the space weather subgroup and more recently via the 'Space Weather Industry Protocol' Workgroup on examining issues associated with space weather.

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It was through discussions in this Workgroup that the risk to system stability was identified. This proposed Grid Code modification has been discussed in the SWIP Workgroup and received the full support of stakeholders including EDF, SSE Generation, National Grid Ventures, National Grid Electricity Distribution, Electricity Networks Association, Northern PowerGrid, NESO, and the Department for Energy Security and Net Zero (DESNZ).

An outline of this proposal was presented to the [July Grid Code Development Forum](#) to gain stakeholder feedback.

In addition, NESO has provided space weather awareness updates to the Operational Transparency Forum, the latest of which was on 25 June 2025 ([PowerPoint Presentation slides 13–25](#)).

Legal Text

Details of the Legal Text discussions can be found on pages 10–18 of this document.

Workgroup members agreed the final Legal Text for GC0183 for the following sections:

- [Glossary and Definitions](#)
- [Operating Code 2](#)
- [Operating Code 7](#)
- [Balancing Code 1](#)

The Legal Text for this change can be found in **Annex 05**.

Workgroup considerations

The Workgroup convened 5 times to discuss the issue as identified by the Proposer within the scope of the defect, develop potential solutions, and evaluate the proposal in relation to the Applicable Code Objectives.

Background, Risk and Mitigation Overview

The Proposer outlined the modification's background, including associated risks and mitigation strategies, and highlighted the following key points to Workgroup members:

- The Sun experiences 11-year cycles of solar activity; the peak of this is called the solar dmaximum. The solar maximum of the current cycle was reached in 2025.

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- During the solar maximum and the following 2–3 years, solar storms that lead to GICs¹ are statistically more likely.
- GICs can potentially lead to damage to some assets across the electricity system, depending on location, geology and asset design.
- A Space Weather Industry Protocol (SWIP) is currently being drafted by NESO and stakeholders.
- The SWIP Workgroup has recognised a risk that some Generators, Interconnector Owners and Restoration Contractors may potentially alter the operational status of some assets. For example, some assets may cease operations whilst others might reduce output or flow.
- This change in operational status could lead to a shortfall in electricity supply or instability of the GB electricity system.
- To mitigate this risk, NESO will need to understand the intended positions of Generators, Interconnector Owners and Restoration Contractors in the event of a severe space weather event to ensure the system can be effectively managed in real-time.

The Proposer explained that following initial discussions with industry at the SWIP Workgroup and the Grid Code Development Forum, two possible routes for the proposal were identified:

Physical Notification (PN)

Area of code: [BC1.4.2 (a) (2) Day Ahead Submissions]

Purpose: To obligate Generators, Interconnector Owners and Restoration Contractors to notify NESO of their position within X number of hours of a space weather notification being received.



Outage Declaration

Area of code: TBC

Purpose: In the event of a space weather notification being issued by NESO, Generators and Interconnector Owners will issue an Outage Declaration to NESO setting out their anticipated availability during and after a severe space weather event.



¹ Geomagnetically induced currents (GICs) are electrical currents induced at the Earth's surface by rapid changes in the geomagnetic field caused by space weather events.

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The Proposer indicated to the Workgroup that neither of these two options would be taken forward as the following option is now considered to be more suitable.

Space Weather Output Usable Declaration

Make an amendment to the Grid Code to obligate Generators, Interconnector Owners and Restoration Contractors to issue a 'Space Weather Output Usable Declaration' to NESO (and advise the market, via their REMIT (Regulation for Energy Markets Integrity and Transparency) / information submissions), setting out their anticipated availability during and after a severe space weather event, following a space weather notification being issued by NESO.



Space weather Generator and Interconnector Briefing

A Workgroup member shared insights regarding the subject matter. It was explained that space weather refers to the environmental conditions in space which are influenced by the Sun and solar wind. It includes phenomena such as solar flares, coronal mass ejections (CMEs) and geomagnetic storms. These events can disrupt satellites, power grids and more.

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The following information was presented to the Workgroup: risk context, wider impacts, examples of impact, risk factors, solar cycles, typical timescales, and the importance of working closely with the Met Office. The full presentation can be found in **Annex 04**.

Space Weather Industry Protocol (SWIP)

A Workgroup member noted that the industry has collaborated closely with the Met Office over the past 15 years to enhance understanding of space weather and its impacts. This collaboration has recently included the development of the proposed SWIP which led to the submission of GC0183. Another Workgroup member enquired about the timeline for the implementation of the SWIP.

The Proposer stated that the SWIP is nearly complete and will be sent to Workgroup members of the drafting group for review before a possible industry-wide release by the end of September 2025. There will be two versions: one for parties with Critical National Infrastructure (CNI) and another, partially redacted for other industry stakeholders.

A Workgroup member questioned whether development timescales, for the SWIP, would impact this modification or if the SWIP is entirely independent. Another Workgroup member clarified that GC0183 is not dependent on the SWIP and that GC0183 does not overlap with it, though both are intended to be aligned in terms of notification wording to maintain consistency. GC0183 is primarily to provide information to NESO to understand the intended position of Generators, Interconnector Owners and Restoration Contractors in the event of a severe space weather event, in particular to understand if there will be any impact on their availability. In terms of the proposed outcome statements, if a User experienced anything to do with space weather, then it is ensuring that information where appropriate can be more widely disseminated, such as to the Met Office. The questioner agreed this was a useful clarification.

Met Office Scale Specific to GICs

A Workgroup observer noted that this modification appears to be specific to the impact of GICs and does not appear to consider the impact of space weather on communication systems or Global Positioning Satellites (GPS) utilised for timing, both of which may directly or indirectly influence Generator operations. For instance, certain wind farms rely on satellite communications for specific aspects of their communication and control systems. The observer raised the question of whether BMRS notifications to Users would be appropriate in cases involving significant non-GIC space weather events.

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The NESO Subject Matter Expert (SME) confirmed this topic had been discussed as part of the urgent criteria at the [Special Grid Code Review Panel](#) on 17 July 2025. It was concluded GC0183 is about reporting, which contributed to the decision to support urgency.

Another Workgroup member agreed with the observer's view that there are many things affected by space weather but the context here is about known impacts on the electricity system as opposed to impacts on communication systems, which may or may not be used by parties. It is not for BMRS to be broadcasting threats or impacts of space weather. The Met Office is focused on advising NESO on G4/G5² events and these events will be notified to industry parties through the BMRS system or other communication routes as appropriate. There are also a number of space weather situations which happen so quickly that there is not enough time to put information out via BMRS. The approach of GC0183 is not to cover every single space weather phenomena that could happen but focusing on those that could impact on electrical assets as opposed to potentially wider impacts on communications.

Draft Legal Text Discussion

Glossary and Definitions

'Space Weather Advisory'

A Workgroup member requested clarification on who the stakeholders might be in terms of 'Space Weather Advisory' information, as they had noticed statements in the draft Legal Text are being issued directly to Control Centres and Externally Interconnected System Operators (EISOs). This would be Network Operators and Users but not necessarily Generators, as Generators use Control Points rather than Control Centres. It was clarified that the original intention was for stakeholders to obtain information through BMRS. However, following discussion, it was recognised that network control centres (as non market participants) do not regularly monitor the BMRS. Therefore, for effective network control and to ensure Interconnector Owner awareness, alternative communication measures may be necessary. Not all Control Centres (e.g. Network Operator Control Centres) are required to take action; only the Generators, Interconnector Owners and Restoration Contractors are required to respond with respect to the notification, though it is worth noting that under the Grid Code, Generating Plant is controlled from a Control Point rather than a Control Centre.

² [Met Office Space weather scale for geomagnetic storms – G1 to G5](#)

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In respect of the proposed 'Space Weather Advisory' Grid Code definition it was noted that the intention was for NESO to inform stakeholders; such as Generators, Interconnector Owners and Network Operators; of relevant information without it being in the form of a notification (requiring specific action(s) from certain parties).

A Workgroup member pointed out that Control Centre is not the right term, as it refers to a location and is not capable of issuing statements; Network Operator may be more suitable. They also noted that the modification title mentions Generators and Interconnector Owners, but the requirements now affect Control Centres and possibly other Users, broadening the stakeholder group. Another Workgroup member agreed and suggested using the term Network Operator instead of Control Centre. The NESO SME felt the term User may be a simple way of capturing all stakeholders.

After this discussion, the Workgroup member queried whether Transmission Owners (TOs) would be affected. If so, there may be a need to consider an STC modification to also apply to TOs noting obligations cannot be placed on TOs as part of the Grid Code. The Proposer replied that this is still under consideration and there is no definitive answer yet, but a consequential STC modification may be needed if TOs are included. That said, if this is the case, it is suggested any changes to the STC are applied as a consequence of the Grid Code changes and the Grid Code takes the lead in defining the requirements necessary.

It was suggested in the second drafting of the Legal Text that the term EISO should be removed from the definition. The NESO SME agreed with this assessment stating EISOs would be covered by the Control Point definition and hence would directly monitor the BMRS. One Workgroup member pointed out that there is no mention of Control Point in the 'Space Weather Advisory' definition. The NESO SME clarified that the Control Point definition in the Grid Code includes EISOs with a Control Centre and confirmed the wording is correct and agreed to remove EISO from the definition.

'Space Weather Awareness Notification'

A Workgroup member asked why the anticipated levels in the 'Space Weather Awareness Notification' definition were set between G2 and G4, with G5 excluded. It was clarified that the approach is to avoid unnecessary advance awareness of anticipated low level (no/minor significance) events and instead issue an actual notification, to wider stakeholders, to prepare in the event of a G5 (high significance) situation. The Met Office monitors these space weather conditions and will provide information to NESO and other relevant parties. If a G5 event is anticipated, the Met Office will notify NESO to

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move to the 'prepare' or 'possible stage' depending on how much notice has been given.

The NESO SME raised concerns about using G2 to G5 terminology due to possible confusion with existing Grid Code terms, for example Engineering Recommendation G5 which is used in the Grid Code as a defined term in respect of harmonic assessment, which is a very different subject when compared to space weather. A Workgroup member clarified these rankings were not being defined, and that G2 to G4 were bracketed to show no relation to current Grid Code definitions. The NESO SME suggested explicitly defining terms (e.g. Met Office G2, Met Office G3 etc), while the Workgroup member proposed adding a clarifying sentence stating these do not relate to anything currently defined in the Grid Code.

A discussion was held regarding the use of email for awareness notifications, while other notifications are distributed via BMRS. It was clarified that this approach provides NESO with flexibility to alert specific organisations through awareness notifications, whereas the broader community receives notifications only for events that significantly affect them. The Proposer noted that the emergency planning team would send the awareness emails for informational purposes. These notifications do not initiate any required actions, which accounts for the procedural differences.

The NESO SME asked the Workgroup whether definitions should mention the Met Office or just refer to notifications from The Company about space weather. The Proposer clarified that The Company, not being a space weather expert, will follow Met Office advice and rankings, rather than the Grid Code. This reliance on the Met Office is reflected in the definitions.

The NESO SME suggested removing the 'Space Weather Awareness Notification' unless it was referenced elsewhere, but a Workgroup member suggested keeping it as 'Space Weather Awareness Statement' to provide industry-wide awareness, even if no action is required. The Workgroup subsequently agreed to remove the 'Space Weather Awareness Statement' from Operating Code 7 (OC7), as it will be addressed in the Space Weather Industry Protocol, rather than the Grid Code.

'Space Weather Output Usable Declaration'

A Workgroup member questioned the wording of this definition and if there was rationale behind an outage always being classified as a 'planned outage' versus it being a force majeure or an emergency event. The NESO SME explained that an unplanned outage typically refers to a fault occurring without prior warning, however, in this case,

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prior notice was provided. A Workgroup member raised a concern that, as an Interconnector Owner, they could be required to cease operations if connected substations choose to shut down their assets for infrastructure protection, thus the Interconnector outage would not be planned as it is outside of their control. The Proposer clarified that GC0183 focuses on notifying parties of intended plans. If a TO substation providing power to the Interconnector Owner decides to disconnect, this does not alter the intention of the Interconnector Owner. This scenario is not within the scope of GC0183, as it may occur as part of normal business operations such as a planned or unplanned outage.

A Workgroup member raised a question regarding the use of 'Interconnector' instead of 'Interconnector Owner' in the draft Legal Text definitions, highlighting that 'Interconnector' refers to equipment, whereas 'Generator' denotes an individual or entity. The NESO SME agreed that 'Interconnector Owner' would be more appropriate and updated these references throughout the draft Legal Text. Additionally, a Workgroup member emphasised the importance of maintaining consistent terminology across all definitions and in Operating Code 2 (OC2).

It was noted by the Workgroup that where a 'Space Weather Cessation Notification' is issued then this affords relevant stakeholders the opportunity, if they wish, to update/ amend/change (as they see fit) the information they have previously provided to NESO in any previously submitted 'Space Weather Output Usable Declaration' (and do so within 3 hours of the cessation notification being issued).

'Space Weather Prepare Notification'

A Workgroup member asked for a timeline of notifications, specifically questioning if any are issued between 12 hours and 20 minutes in advance. The Proposer clarified that the definition of 'Space Weather Advisory' covers this period but does not require notification or action, it simply allows NESO to share information as needed, as only notifications trigger action. The Proposer provided flow diagrams to help understand the notification timelines. These can be found in **Annex 06**. The NESO SME updated OC2.5.1 to read '...within three hours of The Company issuing a Space Weather Prepare Notification...' and made similar updates to other related clauses.

'Space Weather Experience Notification'

A Workgroup member suggested specifying '...Met Office guidance...' in the definition of Space Weather Experience Notification. The Workgroup agreed and the definition was updated accordingly.

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Operating Code 2 (OC2)

The NESO SME questioned whether TSO (Transmission System Operator) in OC2.5.1 was appropriate terminology, noting it's not defined in the Grid Code. It was clarified that the intention, of the proposed wording, was to allow for the possibility that the Externally Interconnected System Operator (EISO) may notify relevant parties including neighbouring TSOs and market participants at their discretion but is not obliged to do so. The NESO SMEs questioned if this detail was necessary and noted that this arose from discussions about sharing information with European colleagues when Interconnectors are about to become unavailable.

A Workgroup member raised concerns about possible conflicts with safety requirements and output declarations under OC2.5.1 b) and OC2.5.2 b), asking whether leniency would apply if compliance posed risks. The Workgroup discussed clarifying the wording to allow exceptions for safety risks, with immediate notification required. It was agreed that the purpose is to keep NESO informed for planning and provisions should be considered to accommodate such scenarios. The NESO SME shared a revised draft of OC2.5.1 b) and OC2.5.2 b) which sought to address concerns with the proposed wording, raised in an Alternative Request. A Workgroup member suggested that the revised wording of OC2.5.1(b) and OC2.5.2(b) which includes '...unless an Event makes it impossible to do so.' would unfairly penalise Users for unforeseen events that affect compliance. The Chair confirmed that the wording had been changed to '...unless an Event prevents them from doing so.'

A Workgroup member asked whether, if a Generator declares they will stay on during a space weather event but later observes abnormal conditions (e.g. rising transformer temperatures) and decides to disconnect to protect plant or people, this would be treated as a breach of the Grid Code or as a fault. The NESO SME and Proposer confirmed that this would be considered a fault, not a breach, as it aligns with standard operational practice to protect equipment and would not be treated as non-compliance. The Workgroup discussed the definition of Event in the Grid Code and its relevance to faults/breaches, noting that the definition covers unscheduled or unplanned occurrences, including faults, incidents, breakdowns, and adverse weather, but not generic space weather unless it directly impacts the plant. The Workgroup

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agreed that justified deviations for safety reasons would not be considered breaches, but Generators would need to provide evidence if questioned later.

Considering OC2.5.2, a Workgroup member raised a concern that when a possible notification has been issued it may only be 20 to 60 minutes before a space weather event occurs and questioned if it was feasible for a Generator to respond in this timeframe. The Proposer explained the intention of the wording in the draft Legal Text is 'without undue delay' and it is recognised that there will not always be time for everyone to respond. The Proposer confirmed that if a User has acted expeditiously then they will have done so 'without undue delay', even though that may be 65 to 70 minutes.

Referring to OC2.5.4, a Workgroup member questioned using 'User' and 'neighbouring assets,' noting that TOs aren't Users and that this issue was raised before in the Glossary and Definitions section. The Workgroup member believes the intent is unclear and requires clarification. The Workgroup discussed whether to use '...Assets...' or '...Plant and Apparatus...' in OC2.5.4 and related clauses. The Proposer confirmed that OC2.5.4 has been updated to use '...Plant and Apparatus...' but some references remain as '...Assets...' for flexibility.

The Workgroup discussed the obligations for this modification, noting that the modification appears to oblige Users to respond to a NESO Space Weather notification, which is a new obligation, but Users may decide not to do anything operationally as a result of that Notification. Workgroup members asked whether they can choose not to respond to NESO following a notification, should they decide not to change their operational status. The Proposer confirmed that they can choose not to respond, and NESO will assume this means that they're operating as usual, but NESO would prefer that everyone responds even if it's with a nil response e.g. a response that confirms they will not change their operational status.

A Workgroup member raised concerns about whether the modification obligates Generators to perform space weather risk assessments or just to declare their intended operational status. The Proposer clarified that the modification only requires Generators to declare their position (e.g. staying online or coming offline) in response to NESO's notification, not to perform a formal assessment. If a Generator does not respond, NESO will assume business-as-usual operation based on previous values. Workgroup members discussed that for Generators without prior space weather procedures,

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compliance would mainly involve setting up a simple process for their control room to respond to notifications. They noted that, in practice, many may choose to continue as usual without additional assessment, since the modification does not obligate further action.

Workgroup members noted that the technical assessment of GIC risk is complex and depends on factors like equipment type, location, and site characteristics. The Proposer confirmed that this modification does not require such detailed assessment, Generators are only expected to declare their intended action based on current knowledge. The Chair noted that accounting for Users' knowledge / preparedness for space weather events and their ability to assess GIC risk is outside the scope of the modification.

A Workgroup member suggested a two-tier approach where Users could submit a one-off declaration (e.g. always stay on or always come off) within 10 days of the modification being implemented, which would then be updated annually as part of the standard Week 24 data submission. However, if a User does not submit this, they would be obligated to respond in real time within three hours of a NESO notification.

The NESO SME acknowledged the value of the suggested approach (combining real-time and Week 24 data submissions) but raised concerns about the practical implications for operational staff, specifically how Electricity National Control Centre's (ENCC) or similar teams would process and cross-check different sets of data. They suggested this is more of an operational implementation issue rather than a codes consideration. The Workgroup subsequently agreed that declarations as part of Week 24 data submissions should not be included in OC2.

A series of further updates were made to OC2, including:

- Updates made to notification terms for clarity and consistency, including the use of '...imminent...' instead of '...possible...' and '...experienced...' instead of '...expected...'.
- If no Space Weather Output Usable Declaration is submitted, the company will assume no impact to availability due to space weather.

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- Wording regarding timeliness was changed for consistency with other sections, from '...undue delay...' to '...as soon as practicable...' or '...as soon as reasonably practicable...' depending on the clause.
- The Workgroup agreed to update the text in OC2.5.1 to read '...within three hours of The Company issuing a Space Weather Prepare Notification...' and to making related updates to other clauses.
- The Workgroup discussed whether to use '...Assets...' or '...Plant and Apparatus...' in OC2.5.4 and related clauses. The Chair confirmed that the Proposer is content to use '...Plant and Apparatus...' in OC2.5.4 but leave some references as '...Assets...' for flexibility.

Operating Code 7 (OC7)

The NESO SME questioned whether it would be more appropriate to include the space weather notifications in OC2 or Balancing Code 1 (BC1), commenting that there are a lot of similarities between the approach in BC1.5.4 (Reserve and System Margin) and the proposals for GC0183, especially the references back to OC7. They noted that OC2 covers outages in planning timescales, whereas BC1 covers issues in the pre-gate closure period. The NESO SME noted that the space weather notification work covers the period towards the end of OC2 timescales but also transitions over into BC1 timescales so the issue is not clear cut.

The NESO SME confirmed that changes to OC7 were minor and mostly typographical. The substantive discussion points were:

- OC7.3.1 has been updated to confirm which Users the draft Legal Text refers to and now includes Interconnector Owners and Restoration Owners.
- The Workgroup agreed to remove the 'Space Weather Awareness Statement' from OC7, as it will be addressed in the Space Weather Industry Protocol, rather than the Grid Code.
- References throughout OC7 of '...without undue delay...' were changed to '...as soon as practicable...' or '...as soon as reasonably practicable...' to align with related references elsewhere in the draft Legal Text.

Balancing Code 1 (BC1)

The NESO SME confirmed that a reference in BC1 (Special Actions) has been included to signpost the process related to space weather notifications, while keeping the main process in OC2. The Chair confirmed that updating the Legal Text in BC1 creates a

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definite EBR impact, which will require a one-month Code Administrator Consultation, which is already built into the timeline.

Interactions

The Workgroup also discussed interactions with the Balancing and Settlement Code (BSC). A Workgroup member explained that while the BSC governance process includes modifications and a change proposal process, the current understanding is that neither appears necessary for the BMRS reporting (of the proposed space weather Notifications to be introduced by GC0183). This is because the required space weather related notification actions could be handled through the existing ENCC BMRS update process. During the conclusion of the GC0183 final Workgroup meeting there was a confirmed BSC interaction with the opening of the [CP1614](#) (Reporting Space Weather Events on Insights) consultation on 09 September 2025. CP1614 proposes a minor update to the Insights Platform to categorise space weather events under System Warnings, aligning with BSC and Grid Code requirements. The CP1614 proposal will not impact GC0183, but the outcome of this modification will impact CP1614 in terms of the language used.

The GC0183 Workgroup recognised that there is likely to be an interaction between Grid Code modification GC0183 and Grid Code modification [GC0164](#) (Simplification of Operating Code No.2). It was recognised that as GC0183 had been granted urgency, it was likely to precede Grid Code Modification GC0164 in terms of timelines. In view of this, it was felt that GC0164 would need to take the GC0183 changes into account whilst also recognising that GC0164 changes the format and structure of OC2 quite substantially (compared to the draft Legal Text that GC0183 is modelled around). It was therefore felt that the GC0164 Workgroup would be in a better place to reflect the space weather changes (that would arise if GC0183 is approved) noting their experience in restructuring OC2.

Workgroup Consultation Summary

The Workgroup held their Workgroup Consultation between 19 August 2025 – 29 August 2025 and received 6 non-confidential and 0 confidential responses. The full responses and a summary of the responses can be found in **Annex 07**.

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Applicable Grid Code Objectives

Reasons given by one respondent as to why it is believed the Original Proposal better facilitates the Grid Code objectives were as follows:

- Enable the timely provision of critical operational information related to Generator and Interconnector owner intentions during a space weather event;
- Enable NESO and market participants to be informed of the potential market situation during a space weather event; and
- Provide NESO with vital information regarding the availability of generation plant and Interconnectors during a space weather event.

One respondent stated that the Original Proposal did not better facilitate any of the Grid Code Objectives, due to:

- Lack of a standardised method to assess the impact of GICs on electricity assets;
- Potential high prices for consumers during a space weather event; and
- Introduction of new, expensive requirements.

Workgroup feedback: The Workgroup made no further comments.

Implementation approach

3 out of 6 respondents supported the proposed implementation approach. Of those that did not support the approach:

- A Generator respondent referred to the lack of clear assessment guidance from NESO;
- An Interconnector respondent requested further clarity on the process, IT systems, and format for submitting Space Weather Output Usable Declarations.
- Another Interconnector respondent raised concerns about the short 10-business-day implementation timeframe, which may not allow sufficient time for industry to make necessary IT and procedural changes.

Workgroup feedback: The Proposer acknowledged that the 10 Business Day implementation timescales are unlikely to work operationally, however a Workgroup member suggested that due to the additional steps required to implement this

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modification, industry will have around 8 weeks to prepare for any IT updates that may be required. They suggested that other than updates to IT systems required by NESO to implement this modification, they did not see any reason for Users to need any IT updates, as all the required IT systems should already be in place.

Workgroup members noted that the 10 Business Day implementation period will be difficult to meet, as they will need time to document and proceduralise their response and to establish alternative processes and procedures for BMRS notifications. The Proposer confirmed that all notifications will be shared through the control room distribution lists, so Users won't need to rely on BMRS. They also confirmed that the Space Weather Industry Protocol will be shared with industry shortly, which should clarify the steps required and start putting processes in place. The Proposer confirmed that NESO will use appropriate communications channels to inform industry of the implementation of this modification and their obligations.

Draft Legal Text

3 out of 6 respondents believed the draft Legal Text satisfied the intent of the modification. Of those that did not agree:

- A Generator respondent stated that it puts the onus on the Generator to carry out GIC assessments, without a standard way to undertake the assessment.
- An Interconnector respondent stated use of the term 'Possible' Notification implies a tentative state and suggested using 'Imminent' to better reflect the urgency. They also requested more clarity around the meaning of "undue delay".
- Another Interconnector respondent believes the 'best estimate' nature of the 'Space Weather Output Usable Declaration' and the requirement to maintain that position may lead to non-compliance in evolving situations.

Workgroup feedback: The Proposer clarified that the modification requires Generators to declare their operational status in response to NESO's notification, not to perform formal assessments. If no response is received, NESO will assume business-as-usual operations. Workgroup members discussed that compliance for Generators without prior space weather procedures would involve setting up a simple process for their control room to respond to notifications. They noted that many may continue as usual

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without additional assessments. The Workgroup agreed that technical assessment of GIC risk is complex and depends on factors like equipment type and location, but the modification only requires Generators to declare their intended action based on current knowledge. A two-tier approach was suggested where Users could submit a one-off declaration within 10 days of the modification being implemented, updated annually as part of the Week 24 data submission, or respond in real-time within three hours of a NESO notification. The NESO SME acknowledged the value the suggested approach but raised concerns about the practical implications for operational staff.

Assessment of impact on EBR Article 18

3 out of 6 respondents agreed with the assessment of the impact on EBR Article 18, 1 did not agree, and 2 did not provide a response. The respondent that did not agree with the assessment suggested Generators redeclaring their availability during an imminent space weather event could affect the price stack.

Workgroup feedback: The Workgroup were content with this feedback and made no further comments. However, the Workgroup agreed that later revisions to the Legal Text in BC1 creates a definite EBR Article 18 impact, requiring a change in assessment of this modification's impact on EBR Article 18.

Inclusion of draft Legal Text in OC2 or BC1

3 out of 6 respondents agreed with including the draft Legal Text in OC2, 1 did not agree, and 2 did not provide a response. The respondent that did not agree stated this was due to the timescales involved of a few hours and stated OC2 is not the ideal method of implementation.

Workgroup feedback: The Workgroup discussed the location of the new requirements. The NESO SME presented options for placing the Legal Text in OC2, BC1, or referencing OC2 from BC1. Workgroup members noted that if the Week 24 (annual/pre-populated) data submission is included, OC2 is preferable since it already handles such data. No strong objections were raised to any option, but the Workgroup agreed the final decision depends on the inclusion of the Week 24 concept. The Workgroup subsequently agreed that declarations as part of Week 24 data submissions should not be included in OC2.

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Consequential modification in the STC

4 out of 6 respondents agreed it was appropriate to have a consequential modification in the STC, with 2 not providing a response. Of those that agreed, two stated that it would ensure TOs declare their asset capability in a similar manner to Network Operators. One respondent noted that a consequential STC modification should be communicated to affected parties as soon as possible.

Workgroup feedback: The Proposer confirmed that the STC modification will be raised once the Space Weather Industry Protocol is delivered and GC0183 is implemented. Further details, including who will raise the STC modification and timescales, will be made available to industry as the modification is progressed. The Workgroup were content with this feedback and made no further comments.

Proposed changes in OC2's impact on EBR Article 18

1 out of 6 respondents agreed that the changes in OC2 would impact EBR Article 18, 2 did not agree, and 3 did not provide a response. The respondent that agreed suggested that the proposed text in OC2 could be moved to BC1, to avoid ambiguity and clarify that there is an EBR implication.

Workgroup feedback: The Workgroup were content with this feedback and made no further comments.

Consideration of other options

A suggested Alternative solution was proposed by an Interconnector Workgroup member which sought to amend BC1.9.1(b) and BC1.9.2(b) by allowing Users to deviate from the best estimate position they declared in their Space Weather Output Usable Declaration, in the event the User is prevented from so doing as a result of an unavoidable event i.e. plant breakdown, safety grounds.

The NESO SME suggested amendments to the Legal Text designed to address the concerns raised in the Alternative proposal, specifically the addition of clauses OC2.5.1(b) and OC2.5.2(b). The Alternative Proposer questioned whether Interconnectors are covered by the definition of 'Event' in the amendments suggested by the NESO SME. The NESO SME suggested that the definition of 'Event' covers Interconnectors under the '...or relating to, a System' and OC3.4.1 refers to a loss of interconnection in its list of

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Events deemed to be Significant Events. For clarity, the definitions of 'Event', 'System', and 'User System' are outlined below:

Event

An unscheduled or unplanned (although it may be anticipated) occurrence on, or relating to, a **System** (including **Embedded Power Stations**) including, without limiting that general description, faults, incidents and breakdowns and adverse weather conditions being experienced.

System

Any **User System** and/or the **National Electricity Transmission System**, as the case may be.

User System

Any system owned or operated by a **User** comprising:-

- (a) **Power Generating Modules** or **Generating Units**; and/or
- (b) Systems consisting (wholly or mainly) of electric lines used for the distribution of electricity from **Grid Supply Points** or **Generating Units** or **Power Generating Modules** or other entry points to the point of delivery to **Customers**, or other **Users**;

and **Plant** and/or **Apparatus** (including prior to the **OTSUA Transfer Time**, any **OTSUA**) connecting:-

- (c) The system as described above; or
- (d) **Non-Embedded Customers** equipment;

to the **National Electricity Transmission System** or to the relevant other **User System**, as the case may be.

The **User System** includes any **Remote Transmission Assets** operated by such **User** or other person and any **Plant** and/or **Apparatus** and meters owned or operated by the **User** or other person in connection with the distribution of electricity but does not include any part of the **National Electricity Transmission System**.

The Workgroup member suggesting the Alternative solution confirmed that they were content with the suggested Legal Text amendments and withdrew their proposal. The Chair sought and received confirmation from the Workgroup that the revised Legal Text adequately addresses the concerns of the Alternative.

Terms of Reference Overview

a) Implementation and costs

A Workgroup member observed that, despite the urgency of this modification and expectations that such changes would typically be implemented within days, a 10 Business Day implementation period is necessary. This timeframe will enable obligated parties to adequately adjust their internal processes to comply with the requirements outlined in the proposal. Additionally, the NESO SME indicated that ongoing internal investigations into IT systems may prompt further changes as a result of this modification.

The Workgroup concluded that implementation and costs will be minimal for NESO and Users as they will be using existing processes and systems, updated for the space weather aspects introduced by this modification.

b) Review draft legal text should it have been provided. If legal text is not submitted within the Grid Code Modification Proposal the Workgroup should be instructed to assist in the developing of the legal text;

The Legal Text has been discussed and reviewed extensively throughout the process. See pages 10–17 of this document for the full discussion.

c) Consider whether any further Industry experts or stakeholders should be invited to participate within the Workgroup to ensure that all potentially affected stakeholders have the opportunity to be represented in the Workgroup. Demonstrate what has been done to cover this clearly in the report;

A Workgroup member asked whether the Workgroup consisted of any Interconnector representatives; another Workgroup member confirmed they represented an Interconnector Owner.

In addition to issuing a Workgroup invitation to Grid Code parties (as per normal procedure) NESO also engaged via the Operational Transparency Forum (OTF) with wider stakeholders on the importance and relevance of space weather. In addition, NESO has also been engaging with stakeholders via a number of groups on the topic of space weather and these groups were advised, by NESO, of this modification.

d) Consider implications to sections linked to the Regulated Sections of the Grid Code;

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Covered as part of the Legal Text review.	
<p>e) Consider the scope of work identified and whether this is achievable within the timeframe outlined in the Ofgem Urgency decision letter</p> <p>The Workgroup agree the 10 Business Days implementation is achievable, noting the additional time for industry to prepare during the one-month Code Administrator Consultation period due to EBR impact.</p>	
<p>f) Consider interactions with other Industry related processes dealing with the issue of space weather and consider ways in which information should be incorporated. Where relevant suggest ways in which these might be taken forward;</p> <p>NESO provided feedback to the Workgroup on the interactions it is undertaking with other stakeholder groups dealing with the issue of space weather to assist in the taking forward of this modification proposal.</p>	
<p>g) Consider interaction with other obligations on stakeholders e.g. obligations relating to reporting of events under OC7.</p> <p>A Workgroup member noted that reporting obligations by Network Operators to NESO are considered Business as Usual (BAU). The intention, for reporting events, is to distinguish these from non-BAU events using the proposed 'Space Weather Outcome Statement', which serves to alert NESO to incidents outside typical operations (and to share these space weather reports with the Met Office, Ofgem and DESNZ). If an event is later found to be unrelated to space weather or initially thought to be BAU, this mechanism still allows stakeholders to flag exceptions. The aim is to ensure specific space weather related events aren't overlooked in routine BAU notifications (from Network Operators to NESO) and are properly brought to DESNZ, Ofgem the Met Office, or NESO's attention.</p> <p>This was undertaken as part of the Legal Text review which specifically included OC7.</p>	

The Terms of Reference can be found in **Annex 02**.

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What is the impact of this change?

The proposal will obligate Generators, Interconnector Owners and Restoration Contractors³ to issue a ‘Space Weather Output Usable Declaration’ to NESO (and advise the market via their REMIT / information submissions), setting out their anticipated availability during and after a severe space weather event, following a space weather notification being issued by NESO. It is aimed at providing greater visibility for NESO of the operational status of key assets in the event of a severe space weather event. This will support NESO in managing scenarios that have the potential to lead to a shortfall in electricity supply or instability of the GB electricity system.

Network Operators⁴ may need to inform NESO via a ‘Space Weather Outcome Statement’ if their assets have experienced impacts as a result of space weather.

Proposer’s assessment against Grid Code Objectives

Proposer’s assessment against Grid Code Objectives	
Relevant Applicable Objective	Identified impact
(i) To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity;	Positive The timely provision of critical operational information related to a space weather event will enable NESO to operate the system if this situation arises.
(ii) Facilitating effective competition in the generation and supply of electricity (and without limiting the foregoing, to facilitate the national electricity transmission system being made available to persons authorised to supply or generate electricity on terms which neither prevent nor	Positive Both NESO and market participants will be informed, in a timely manner, of the potential market situation if a space weather possible notification is issued.

³ TOs are not included because there are already established procedures for this process.

⁴ This may also extend to Transmission Owners if an STC change is raised in due course.

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restrict competition in the supply or generation of electricity);	
(iii) Subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national electricity transmission system operator area taken as a whole;	Positive The modification aims to ensure that NESO, for potentially critical operational reasons, has timely visibility of the intended positions of Generators, Interconnector Owners and Restoration Contractors during a severe space weather event.
(iv) To efficiently discharge the obligations imposed upon the licensee by this license* and to comply with the Electricity Regulation and any relevant legally binding decisions of the European Commission and/or the Agency; and	Neutral
(v) To promote efficiency in the implementation and administration of the Grid Code arrangements.	Neutral
* See <i>Electricity System Operator Licence</i>	

Stakeholder / consumer benefit categories	Proposer's view
Improved safety and reliability of the system	Positive It is aimed at providing greater visibility for NESO of the operational status of key assets in the event of a severe space weather event. This will support NESO in managing scenarios that have the potential to

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	lead to a shortfall in electricity supply or instability of the GB electricity system.
Lower bills than would otherwise be the case	Neutral
Benefits for society as a whole	Neutral
Reduced environmental damage	Neutral
Improved quality of service	Neutral

Workgroup Vote

The Workgroup met on 10 September 2025 to carry out their Workgroup Vote. The full Workgroup Vote can be found in **Annex 08**. The table below provides a summary of the Workgroup Members view on the best option to implement this change.

For reference the Applicable Grid Code Objectives are:

- i. *To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity*
- ii. *Facilitating effective competition in the generation and supply of electricity (and without limiting the foregoing, to facilitate the national electricity transmission system being made available to persons authorised to supply or generate electricity on terms which neither prevent nor restrict competition in the supply or generation of electricity);*
- iii. *Subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national electricity transmission system operator area taken as a whole;*
- iv. *To efficiently discharge the obligations imposed upon the licensee by this license* and to comply with the Electricity Regulation and any relevant legally binding decisions of the European Commission and/or the Agency; and*
- v. *To promote efficiency in the implementation and administration of the Grid Code arrangements*

* See Electricity System Operator Licence

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

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Option	Number of voters that voted this option as better than the Baseline (Out of 8)
Original	8

When will this change take place?

Implementation date

10 Business Days following an Authority Decision. This period allows for internal process preparation and gives Users time to prepare and meet their obligations.

We are currently entering the most active period of solar activity in the 11-year cycle. This could last for 2–3 years, therefore, implementing this modification as soon as possible will reduce the risk to the GB energy system.

In addition, the intention is that the SWIP will be issued to relevant stakeholders in mid-late September. The Grid Code modification will sit alongside this protocol. By aligning the implementation of the Grid Code modification with the protocol ‘go live’ date this will provide greater clarity and certainty for relevant stakeholders and NESO.

Date decision required by

As soon as possible to mitigate the risk to security of supply.

Implementation approach

Processes will need to be developed by NESO to assess the data submitted by Generators, Interconnector Owners and Restoration Contractors and for NESO to then provide the industry with updates. NESO will also need to make sure software systems are updated to reflect the proposed change.

Processes will also need to be developed to define how Generators, Interconnector Owners and Restoration Contractors will submit the required data to NESO.

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Interactions

☐ CUSC ☒ BSC ☐ STC ☐ SQSS
☐ European Network ☒ EBR Article 18 ☒ Other ☐ Other
Codes T&Cs¹ modifications

Changes to the BMRS processes due to space weather notifications being published on the BMRS.

There is an interaction with Grid Code modification [GC0164](#) due to the amendments to OC2 and the BSC change proposal CP1614 which proposes a minor update to the Insights Platform to categorise space weather events under System Warnings.

Revisions to the Legal Text in BC1 has created a definite EBR Article 18 impact. This required a change in assessment (from the one presented during the Workgroup Consultation) of this modification's impact on EBR Article 18.

If an amendment to the STC is required, this would be as a result of the Space Weather Industry Protocol being issued, rather than a consequence of this modification to the Grid Code.

Acronyms, key terms and reference material

Acronym / key term	Meaning
BAU	Business As Usual
BC1	Balancing Code 1
BSC	Balancing and Settlement Code
BMRS	Balancing Mechanism Reporting Service
CNI	Critical National Infrastructure
CUSC	Connection and Use of System Code
CMEs	Coronal Mass Ejections
DESNZ	Department for Energy Security and Net Zero
DNOs	Distribution Network Operators

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EBR	Electricity Balancing Regulation
EISO	Externally Interconnected System Operator
ENCC	Electricity National Control Centre
GB	Great Britain
GC	Grid Code
GICs	Geomagnetically Induced Currents
GPS	Global Positioning Satellite
NESO	National Energy System Operator
NETS	National Electricity Transmission System
OC2	Operating Code 2
OC7	Operating Code 7
OTSUA	Offshore Transmission System User Agreement
OTF	Operational Transparency Forum
PN	Physical Notification
REMIT	Regulation for Energy Markets Integrity and Transparency
SME	Subject Matter Expert
SQSS	Security and Quality of Supply Standards
STC	System Operator Transmission Owner Code
SWIP	Space Weather Industry Protocol
ToR	Terms of Reference
TOs	Transmission Owners
T&Cs	Terms and Conditions

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Annexes

Annex	Information
Annex 01	GC0183 Proposal Form
Annex 02	GC0183 Terms of Reference
Annex 03	GC0183 Urgency Letters
Annex 04	GC0183 Space Weather Generator and Interconnector Briefing
Annex 05	GC0183 Legal Text
Annex 06	GC0183 Notification Process Flows
Annex 07	GC0183 Workgroup Consultation Responses and Summary
Annex 08	GC0183 Workgroup Vote
Annex 09	GC0183 Workgroup Attendance Record
Annex 10	GC0183 Workgroup Action Log