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| Workgroup Consultation | | | |
| **GC0183:**  **Generator and Interconnector Availability During a Severe Space Weather Event**  **Overview:** This modification will make changes to the Grid Code to obligate Generators and Interconnectors to notify NESO of their intended position in the event of severe space weather. | | **Modification process & timetable**    **Proposal Form**  09 July 2025  **Workgroup Consultation**  19 August 2025 - 29 August 2025  **Workgroup Report**  15 September 2025  **Code Administrator Consultation**  19 September 2025 - 20 October 2025  **Draft Final Modification Report**  27 October 2025  **Final Modification Report**  30 October 2025  **Implementation**  10 Business Days after Authority Decision  **1**  **2**  **3**  **4**  **5**  **6**  **7** | |
| **Have 5 minutes?** Read our [Executive summary](#_Executive_summary_1)  **Have 60 minutes?** Read the full [Workgroup Consultation](#_Why_change?)  **Have 120 minutes?** Read the full Workgroup Consultation and Annexes. | | | |
| **Status summary:** The Workgroup are seeking your views on the work completed to date to form the final solution to the issue raised. | | | |
| **This modification is expected to have a:** High impact on Generators, Interconnectors and the National Energy System Operator. Medium impact on Network Operators and Transmission Owners. | | | |
| **Modification drivers:** System Operability and System Security. | | | |
| **Governance route** | Urgent modification to proceed under a timetable agreed by the Authority (with an Authority Decision). | | |
| **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](mailto:Claire.Goult@neso.energy)  07938 737 807 |
| **How do I respond?** | Send your response proforma to [grid.code@neso.energy](mailto:grid.code@neso.energy) by **5pm** on **29 August 2025** | | |

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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 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 and Interconnectors 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 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 and Interconnectors 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 STC change) may need to inform NESO via a ‘Space Weather Outcome Statement’ if their assets have experienced impacts as a result of Space Weather.

**Interactions**

Changes to the Balancing Mechanism Reporting Service (BMRS) or interactions with Grid Code modification GC0164 may be needed. Consideration is also being given to whether the System Operator Transmission Owner Code (STC) should be amended due to the Space Weather Industry Protocol, rather than as a direct result of this (GC0183) Grid Code modification.

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 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 and Interconnectors may potentially alter the operational status of some assets, depending on their understanding of the risk of a severe space weather event to those assets. For example, some assets may 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?

To enable NESO and market participants to understand the intended positions of Generators and Interconnectors 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**.

Workgroup considerations

The Workgroup convened 03 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.

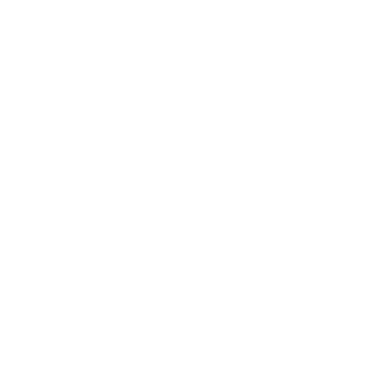
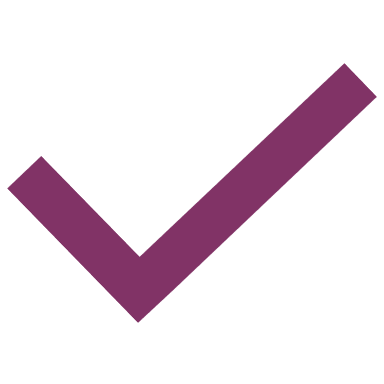
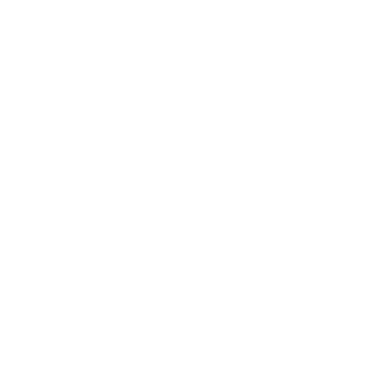
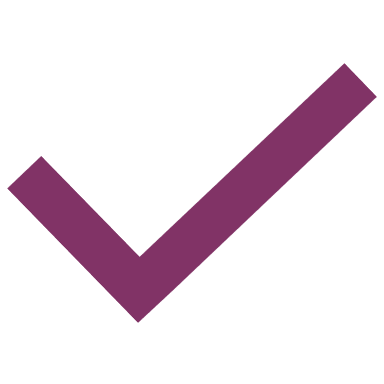
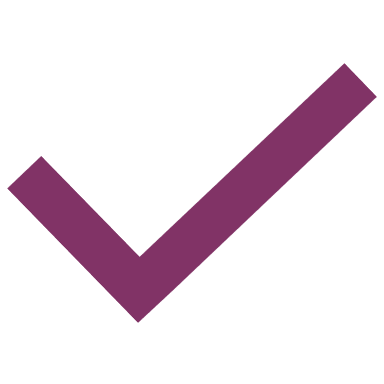
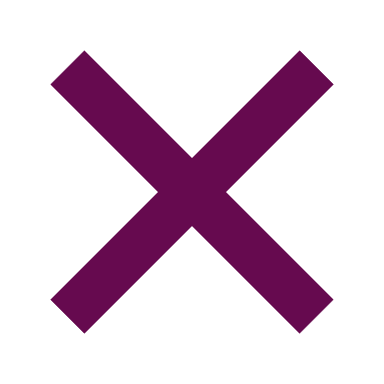
**Workgroup Discussion ahead of the Workgroup Consultation**

**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 the Workgroup members:

* 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[[1]](#footnote-2) 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 and Interconnectors 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 Interconnectors and Generators 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 and interconnectors 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 Interconnectors will issue an Outage Declaration to NESO setting out their anticipated availability during and after a severe space weather event.​

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, and the final proposal is based solely on this option.

NESO has visibility of the operational status of key assets in the event of severe space weather, allowing for effective operation of the electricity system

NESO issues **a Space Weather Prepare Notification** to control centres and EISOs and posts the Notification on BMRS

Generators and Interconnectors issue a **Space Weather Output Useable Declaration** to NESO within 3 hours of a receiving the Space Weather Prepare Notification

**Output Useable Declaration**

Make an amendment to the Grid Code to obligate Generators and Interconnectors to issue a ‘Space Weather Outage 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 some insights with members 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.

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**

A member of the Workgroup 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 ‘Space Weather Industry Protocol,’ which led to the submission of GC0183. Another 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 members of the drafting group for review before a possible industry-wide release by September 2025. There will be two versions: one for parties with Critical National Infrastructure (CNI) and another, partially redacted for other industry stakeholders.

A member questioned whether development timescales, for the SWIP, would impact this modification or if the SWIP is entirely independent. Another 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 and Interconnectors 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.

**Draft Legal Text Discussion**

Glossary and Definitions

|  |  |
| --- | --- |
| **Space Weather Advisory** | A statement issued by **The Company** via the **BMRS** (and directly to **Control Centres** and **ESIOs**) that is sent to advise stakeholders of a space weather related matter that warrants **The** **Company** informing relevant stakeholders of, for their information and further consideration. |
| **Space Weather Awareness Notification** | A ‘For Awareness’ notification issued by **The Company** via email to relevant stakeholders following **The Company** being informed by the Met Office of space weather related activity that is of a nature and anticipated level (of [G2 to G4] using the Met Office ranking) that warrants **The Company** informing relevant stakeholders for their awareness purposes. |
| **Space Weather Cancellation Notification** | A notification issued by **The Company** via the **BMRS** (and directly to **Control Centres** and **ESIOs**); following **The Company** being informed by the Met Office that the reason(s) for the issuing of any previous Space Weather related notifications (issued by the Met Office) have now passed, timed out or otherwise ceased to be relevant; that is sent to inform stakeholders that a space weather situation has concluded. |
| **Space Weather Cessation Notification** | A notification issued by **The Company** via the **BMRS** (and directly to **Control Centres** and **ESIOs**); following **The Company** being informed by the Met Office that the reason(s) for the issuing of any previous Space Weather related notifications (issued by the Met Office) have now receded (but the space weather situation has not concluded) such that the situation has reverted to a *‘Space Weather Prepare’* level; that is sent to inform stakeholders that a space weather situation has changed (from the ‘*Space Weather Prepare’* or *‘Space Weather Expected’* level). |
| **Space Weather Expected Notification** | A notification issued by **The Company** via the **BMRS** (and directly to **Control Centres** and **ESIOs**) following them being informed by the Met Office or other relevant stakeholders that impacts, consistent with a space weather event, have been seen or experienced in GB so that stakeholders can inform **The Company** (by way of a **Space Weather Outcome Statement**) if such impacts are seen or experienced by the stakeholder’s assets. |
| **Space Weather Possible Notification** | A notification issued by **The Company** via the **BMRS** (and directly to **Control Centres** and **ESIOs**) following them being informed by the Met Office of an imminent space weather related activity that is of a nature and anticipated level (of [G4 or above] [G5] using the Met Office ranking) that warrants **The** **Company** informing relevant stakeholders for their possible [impactful] [actioning] purposes.  A **Space Weather Possible Notification** is likely to be issued (by **The Company**) some twenty to sixty minutes ahead of a space weather event being forecast to impact the **NETS**. |
| **Space Weather Prepare Notification** | A notification issued by **The Company** via the **BMRS** (and directly to **Control Centres** and **ESIOs**) following them being informed by the Met Office of space weather related activity that is of a nature and anticipated level (of [G4 or above] [G5] using the Met Office ranking) that warrants **The** **Company** informing relevant stakeholders for their preparation purposes.  A **Space Weather Prepare Notification** is likely to be issued (by **The Company**) some twelve to thirty-six hours ahead of a space weather event being forecast to impact the **NETS**. |
| **Space Weather Outcome Statement** | A statement (prepared in good faith) that is issued, without undue delay, by the **User** or **Control Centre** or **ESIO** to **The Company** where; following the issuing of a **Space Weather Expected Notification**; their asset(s) have seen or experienced impacts that they believe, at the time, are or maybe of a nature consistent with a space weather event. |
| **Space Weather Output Useable Declaration** | A **User’s** best estimate of the expected (un)availability of their specified asset(s); in the event of a **Space Weather Possible Notification** being issued; that the **User** must submit to **The Company** within three hours of **The Company** issuing a **Space Weather Prepare Notification**.  This shall cover the period of time from a **Space Weather Possible Notification** being issued (in the future) by **The Company** until [X] hour(s) after a **Space Weather Cessation Notification** being issued by **The Company** (where the ‘X’ shall be specified, for each relevant asset(s), by the **User** at the time of the declaration submission, and where zero hours is a valid response where the asset(s) will continue to be available throughout the period in question).  For the avoidance of doubt, this declaration shall; if acted upon by a **Large Power Station** or of part of the **National Electricity Transmission System**, or of part of a **User System** (following **The Company** issuing a **Space Weather Prepare Notification)**;be deemed a **Planned Outage**. |

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 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. 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 not regularly monitor the BMRS. Therefore, for effective network control and to ensure Interconnector awareness, alternative communication measures may be necessary. Not all Control Centres (eg Network Operator (DNO) Control Centres) are required to take action; only the Generators and Interconnectors are required to respond with respect to the notification, though it is worth noting that under the Grid Code, Generatoring Plant is controlled from a “Control Point” rather than a Control Centre.

In respect of ‘Space Weather Advisory’ it was noted that the intention was that this would enable NESO to inform stakeholders; such as Generators, Interconnectors and Network Operators; of relevant information without it being in the form of a ‘Notification’ (requiring specific action(s) from certain parties).

A 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 Interconnectors, but the requirements now affect Control Centres and possibly other Users, broadening the stakeholder group. Another member agreed and suggested using '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 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. The Proposer replied that this is still under consideration and there is no definitive answer yet, but an STC modification may be needed if TOs are included. That said, if this is the case, it is suggested any changes to STC are applied as a consequence of the Grid Code changes and the Grid Code takes the lead in defining the requirements necessary.

A member asked why the anticipated levels in the ‘Space Weather Awareness Notification’ definition were set between G2 and G4, with G5 [[2]](#footnote-3)excluded. It was clarified that the approach is to avoid unecessary 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 signficance) 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 move to the ‘prepare’ or ‘possible stage’ depending on how much notice has been given.

A NESO Grid Code Subject Matter Expert (SME) raised concerns about using G2 to G5 terminology due to possible confusion with existing Grid Code terms, for example, Engineering Recommendation G5 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 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 SME suggested explicitly defining terms (e.g. Met Office G2, Met Office G3 etc), while the 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.

A member observed that in the proposed defintion of ‘Space Weather Output Usable Declaration’ reference is only made to the ‘Space Weather Cessation Notification’ and not a “Space Weather Cancellation Notification”. Clarification was sought on whether both ‘cessation’ and ‘cancellation’ should be included, as both may be relevant.

Operating Code 2 (OC2)

OC2.4.1.2.1 d) where **The Company** has issued a **Space Weather Prepare Notification** or **Space Weather Possible Notification**, the **Generator**, **EISO**, and **Restoration Contractor** shall follow the **Space Weather Output Useable** process as defined in OC2.5.

OC2.5 Space Weather Events

OC2.5.1 In addition to the requirements of OC2.4, where **The Company** issues a **Space Weather Prepare Notification** in accordance with OC7.4.9, **Generators**, **EISO** and **Restoration Contractors** shall conform with the following requirements;

1. within 3 hours of the issuing of the **Space Weather Prepare Notification** submit their **Space Weather Output Useable Declaration** to **The Company and the EISO will take what steps they consider appropriate to inform any relevant parties (such as, but limited to, any other TSO and market participants) as they consider to be appropriate** (for the avoidance of doubt where such notification is not provided to **The Company**, then the **Space Weather Output Useable Declaration** shall be deemed to be unchanged from previously declared values);
2. where a **Space Weather Possible Notification** is issued by **The Company** in accordance with OC7.4.9, comply with their submitted **Space Weather Output Useable Declaration**;
3. where **The Company** issues a **Space Weather Cessation Notification** in accordance with OC7.4.9 following the issuing of a **Space Weather Possible Notification** or a **Space Weather Expected Notification** this will revert to a **Space Weather Prepare Notification** stage;
4. accordingly, within 3 hours of the issuing of the **Space Weather Cessation Notification** submit any revision to their **Space Weather Output Useable Declaration** to **The Company** (for the avoidance of doubt where such notification is not provided to **The Company**, then the **Space Weather Output Useable Declaration** as submitted under 2.5.1(a) will prevail);
5. where **The Company** issues a **Space Weather Cancellation Notification** in accordance with OC7.4.9 following the issuing of a **Space Weather Prepare Notification, Space Weather Possible Notification**  or a **Space Weather Expected Notification**, then the **Space Weather Output Useable Declarations** as submitted under this OC2.5.1 shall cease to have effect and **Output Usable** information shall revert to that submitted under OC2.4 following the return to service in the timescales set out in the **Space Weather Output Useable Declaration** previously submitted;

OC2.5.2 Where **The Company** issues a **Space Weather Possible Notification** without first issuing a **Space Weather Prepare Notification**, **Generators**, **EISO** and **Restoration Contractors** shall;

1. without undue delay submit their **Space Weather Output Useable Declaration** to **The Company**;
2. comply with their **Space Weather Output Useable Declaration** as submitted in accordance with OC2.5.2(a);
3. where **The Company** issues a **Space Weather Cessation Notification** in accordance with OC7.4.9 following the issuing of a **Space Weather Possible Notification** or a **Space Weather Expected Notification** this will revert to a **Space Weather Prepare Notification** stage;
4. accordingly, within 3 hours of the issuing of the **Space Weather Cessation Notification** submit any revision to their **Space Weather Output Useable Declaration** to **The Company** (for the avoidance of doubt where such notification is not provided to **The Company**, then the **Space Weather Output Useable Declaration** as submitted under (a) will prevail);
5. where **The Company** issues a **Space Weather Cancellation Notification** in accordance with OC7.4.9 following the issuing of a **Space Weather Prepare Notification, Space Weather Possible Notification**  or a **Space Weather Expected Notification**, then the **Space Weather Output Useable Declarations** as submitted under this OC2.5.2 shall cease to have effect and **Output Usable** information shall revert to that submitted under OC2.4 following the return to service in the timescales set out in the **Space Weather Output Useable Declaration** previously submitted;

OC2.5.3 Where a **Space Weather Expected Notification** is issued by **The Company** then the **User where relevant** shall submit a **Space Weather Outcome Statement** without undue delay.

OC2.5.4 Where a **Space Weather Outcome Statement** has been submitted to **The Company**, this may be shared by **The Company** with the **Met Office**, the **Authority** and The Secretary of State (or such other person or team nominated by them to act on their behalf with respect to receiving **Space Weather Output Usage Declarations**).  Where any other **User(s)** has neighbouring asset(s) (being in close electrical proximity to the asset(s) to which the **Space Weather Outcome Statement** relates) which might also be affected, **The Company** will seek the agreement of the **User** to share that information with the neighbouring asset **User(s)**, such agreement not to be unreasonably withheld.

The NESO Grid Code 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. One SME wondered if this detail was necessary. Another SME noted that this arose from discussions about sharing information with European colleagues when interconnectors are about to become unavailable.

Referring to OC2.5.4, a 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 member believes the intent is unclear and requires clarification.

Operating Code 7 (OC7)

OC7.4.9 Notification of Space Weather Events

1. All space weather notifications issued by **The Company** (whether activating or deactivating an action) as per Appendix 3 of OC7 will be published on the **BMRS**. Should the **BMRS** be unavailable, for example due to communications or systems failures, other appropriate channels including email will be utilised until the **BMRS** can be restored.
2. Any **Space Weather Prepare Notifications**, **Space Weather Possible Notifications**, **Space Weather Expected Notifications**, **Space Weather Cessation Notifications**, **Space Weather Cancellation Notifications**, or **Space Weather Advisory** shall be issued by **The Company** to **Control Centres**, and **EISO(s)**.
3. **The Company** will employ reasonable endeavours to publish such information arising under (a) and (b) above without undue delay in accordance with OC2.5.

**APPENDIX 3 – Space Weather Notifications per OC7.4.9**

|  |  |  |
| --- | --- | --- |
| Notifications | Reference | Warning of/or Consequence |
| **Space Weather Awareness Notification** | Grid Code OC7.4.9 | Stakeholder informed for their awareness |
| **Space Weather Prepare Notification** | Grid Code OC7.4.9 | Submission of **Space Weather Output Useable Declaration** |
| **Space Weather Possible Notification** | Grid Code OC7.4.9 | Compliance with **Space Weather Output Useable Declaration** |
| **Space Weather Expected Notification** | Grid Code OC7.4.9 | Submission of **Space Weather Outcome Statement** |
| **Space Weather Cessation Notifications** | Grid Code OC7.4.9 | Resubmission of **Space Weather Output Useable Declaration** |
| **Space Weather Cancellation Notifications** | Grid Code OC7.4.9 | Revert to pre-**Space Weather Output Useable Declaration** as per Grid Code OC2.4 |
| **Space Weather Advisory** | Grid Code OC7.4.9 | Stakeholder informed for their further consideration |

The NESO Grid Code SME noted whether it would be more appropriate to include the Space Weather declararions in OC2 or BC1, commenting that there are a lot of similarites between the approach in BC1..5.4 (Reserve and System Margin) and the propsals for the Space Weather modification, especially the references back to OC7. He 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 priod towards the end of OC2 timescales but also transitions over into BC1 timescales so the issue is not clear cut. The SME also stated that changes to BC1 would have EBR implications and would require at least a one-month consultation period. The Proposer suggested it would be appropriate to raise this as a specific Consultation question.

Workgroup Consultation question X: Do you believe that the proposed legal drafting currently developed for OC2 is best included in OC2 or BC1 bearing in mind the Space Weather timescales involved. ?

**Terms of Reference (ToR)**

ToR 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; and*

Regarding ToR c), a member asked whether the Workgroup consisted of any Interconnector representatives; another member confirmed they represented an interconnector owner.

ToR f) *Identify interactions with other Industry related processes dealing with the issue and consider ways in which information should be incorporated. Where relevant suggest ways in which these might be taken forward.*

Members requested the Grid Code Review Panel clarify what is meant by the term ‘issue’ and would like to add further wording to indicate the issue is referring to Space Weather. This was taken to the August Panel.

ToR g) *Consider interaction with other obligations on stakeholders e.g. obligations relating to reporting of events under OC7.*

A Workgroup member noted that reporting obligations by Distribution Network Operators (DNOs) 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 DNOs to NESO) and are properly brought to DESNZ, Ofgem the Met Office, or NESO's attention.

**Interactions**

Interactions with the STC were previously noted on page 3 in the draft Legal Text discussion.

The Workgroup also discussed interactions with the Balancing and Settlement Code (BSC). A 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 Electricity National Control Centre's (ENCC) BMRS update process. The Proposer noted ongoing discussions with Elexon, who currently agree with this assessment.

**Implementation**

A 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, a NESO SME indicated that ongoing internal investigations into IT systems may prompt further changes as a result of this modification.

**Consideration of other options**

*This area should provide an overview of options that the Workgroup have discussed in their initial meetings ahead of the Consultation being issued but has not been formally raised as an Alterative Request/ considered out of scope.*

Workgroup consultation question X: Xxxxx?

What is the solution?

## Proposer’s Original solution

Make an amendment to the Grid Code to obligate Generators and Interconnectors 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 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 Sub-group and more recently via the Space Weather Industry Protocol Workgroup on examining issues associated with space weather.

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 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 25th June 2025 ([PowerPoint Presentation](https://www.neso.energy/document/363471/download) slides 13-25.)

Workgroup Consultation question X: Xxxxx?

**Draft legal text**

Amendments have currently been proposed to the following sections of the Grid Code:

* Glossary and Definitions
* Operating Code 2 (OC2)
* Operating Code 7 (OC7)

The draft legal text for this change can be found in **Annex xx**.

The following considerations were taken into account when creating the draft legal text:

* [Discussion topic]: [Outcome]
* [Discussion topic]: [Outcome]

Workgroup Consultation question X: Xxxxx?

What is the impact of this change?

The proposal will obligate Generators and Interconnectors 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 Operators and Transmission Owners may need to inform NESO via a ‘Space Weather Outcome Statement’ if their assets have experienced impacts as a result of Space Weather.

## Original Proposer’s assessment against Code Objectives

|  |  |
| --- | --- |
| Proposer’s assessment against Grid Code Objectives | |
| Relevant 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 restrict competition in the supply or generation of electricity); | **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. |
| (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 and interconnectors 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 Electricity System Operator Licence* | |

|  |  |
| --- | --- |
| Proposer’s assessment of the impact of the modification on the stakeholder / consumer benefit categories | |
| Stakeholder / consumer benefit categories | **Identified impact** |
| 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 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** |

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 and Interconnectors and for NESO to then provide DESNZ with updates.

Processes will also need to be developed to define how Generators and Interconnectors will submit the required data to NESO.

Interactions

|  |  |  |  |
| --- | --- | --- | --- |
| ​​CUSC | ​​​BSC | ​​STC | ​​​SQSS |
| ​​​European Network Codes | ​​ EBR Article 18 T&Cs1 | ​​​Other modifications | ​​​Other |

There may need to be changes to the BMRS processes due to space weather Notifications being published on the BMRS and additionally, there may be an interaction with Grid Code modification GC0164.

We are also considering whether an amendment to STC will be required. However, 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.

How to respond

**Standard Workgroup Consultation questions**

1. Do you believe that the Original Proposal better facilitates the Applicable Objectives versus the current baseline?
2. Do you support the proposed implementation approach?
3. Do you have any other comments?
4. Do you wish to raise a Workgroup Consultation Alternative request for the Workgroup to consider?
5. Does the draft legal text satisfy the intent of the modification?
6. Do you agree with the Workgroup’s assessment that the modification does/does not impact the European Electricity Balancing Regulation (EBR) Article 18 terms and conditions held within the Code?
7. Do you have any comments on the impact of the modification on the EBR Objectives?

**Specific Workgroup Consultation questions**

1. Do you believe that the proposed legal drafting currently developed for OC2 is best included in OC2 or BC1 bearing in mind the Space Weather timescales involved

The Workgroup is seeking the views Grid Code Users and other interested parties in relation to the issues noted in this document and specifically in response to the questions above.

Please send your response to [grid.code@neso.energy](mailto:grid.code@neso.energy) using the response pro-forma which can be found on the [GC0183 modification page](https://www.neso.energy/industry-information/codes/gc/modifications/gc0183-generator-and-interconnector-availability-during-severe-space-weather-event).

In accordance with Governance Rules if you wish to raise a Workgroup Consultation Alternative Request please fill in the form which you can find at the above link.

*If you wish to submit a confidential response, mark the relevant box on your consultation proforma. Confidential responses will be disclosed to the Authority in full but, unless agreed otherwise, will not be shared with the Panel, Workgroup or the industry and may therefore not influence the debate to the same extent as a non-confidential response.*

Acronyms, key terms and reference material

|  |  |
| --- | --- |
| **Acronym / key term** | **Meaning** |
| BAU | Business As Usual |
| 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 |
| EBR | Electricity Balancing Regulation |
| EISO | Externally Interconnected System Operator |
| GB | Great Britain |
| GC | Grid Code |
| GICs | Geomagnetically Induced Currents |
| NESO | National Energy System Operator |
| NETS | National Electricity Transmission System |
| OC2 | Operating Code 2 |
| OC7 | Operating Code 7 |
| REMIT | Regulation for Energy Markets Integrity and Transparency |
| SME | Subject Matter Expert |
| STC | System Operator Transmission Owner Code |
| SQSS | Security and Quality of Supply Standards |
| SWIP | Space Weather Industry Protocol |
| ToR | Terms of Reference |
| TOs | Transmission Owners |
| T&Cs | Terms and Conditions |

Annexes

|  |  |
| --- | --- |
| **Annex** | **Information** |
| Annex 01 | GC0183 Proposal Form |
| Annex 02 | GC0183 Terms of Reference |
| Annex 03 | GC0183 Urgency Letter |
| Annex 04 | GC0183 Space Weather Generator and Interconnector Briefing |
| Annex 05 | GC0183 Draft Legal Text |

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. [↑](#footnote-ref-2)
2. [Met Office Space weather scale for geomagnetic storms – G1 to G5](https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/business/public-sector/space-weather/geomagnetic-storms-impacts.pdf) [↑](#footnote-ref-3)