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## Grid Code Modification Proposal Form

# GC0182: Standardisation of Power Flow Metering Polarity

**Overview:** This modification aims to provide a unified standard for Power Flow Metering Polarity when data is sent to NESO. The standard will be in the format of a diagram and explanatory description.

### Modification process & timetable



**Status summary:** The Proposer has raised a modification and is seeking a decision from the Panel on the governance route to be taken.

**This modification is expected to have a:** High impact on Transmission System Owners, Interconnectors, Network Operators. Low impact on Generators, Transmission Owners and Aggregators

**Modification drivers:** Cross-code change, Efficiency, GB Compliance, Harmonisation, System Operability, System Planning, System Security

<b>Proposer's recommendation of governance route</b>	Standard Governance modification with assessment by a Workgroup
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<b>Who can I talk to about the change?</b>	<p><b>Proposer:</b> Jay Chandarana  <a href="mailto:jay.chandarana3@neso.energy">jay.chandarana3@neso.energy</a>          07701230211</p> <p><b>Code Administrator Contact:</b> Robert Hughes  <a href="mailto:robert.hughes3@neso.energy">robert.hughes3@neso.energy</a></p>
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## What is the defect you are trying to resolve?

NESO needs to operate the GB electricity network securely and safely in real-time using the Supervisory Control and Data Acquisition (SCADA) tool. The NESO SCADA system

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constantly receives power flow measurement data from external parties including Generators, Transmission Owners (TOs) and Distribution Network Operators (DNOs) to show NESO Control Room engineers the most up-to-date network status and assist them to take operational actions if necessary. However, there are occasions where power flow metering data with inconsistent polarity against the NESO convention are fed into the NESO SCADA system, for example negative instead of positive flow. Over 800 meters have been identified as having incorrect polarity. The NESO SCADA system feeds data to multiple downstream systems used internally to operate the system. Therefore, errors in operational metering systems means that operation of the transmission system becomes suboptimal, which will push up operating costs and hence the costs to the end consumer.

## Why change?

For NESO, receiving power flow metering data with inconsistent polarity compared to the NESO convention can impact situational awareness for the NESO Control Room engineers, reduce sub-optimal performance and reduce system security leading to potential SQSS breaches, as well as and additional balancing costs. For other industry stakeholders, there can be delays in setting up operational metering for new connections and increased workload, due to the need to update and correct the polarity. In addition, NESO might need to spend more time making decisions on the outage and commissioning plan, as the power flow data could be misleading. Furthermore, inconsistent polarity may introduce billing errors for settlements between NESO and energy providers. NESO has been liaising with the corresponding parties and trying to follow the guidance and policy in industry codes to correct the inconsistent polarity of the received power flow meter data. However, there are a number of issues, including:

- No clear and unified power flow polarity standard for the power flow data sent to NESO;
- No clause in industry codes or licence obligations requesting parties to follow a power flow polarity standard. Therefore, certain parties may choose their own convention which is inconsistent with other parts of the network; and
- No clause in industry codes requesting parties sending power flow metering with inconsistent polarity to fix the issue.

## **What is the Proposer's solution?**

We propose to introduce and publish a diagram indicating the standard of Power Flow Metering Polarity when sending data to NESO as an Electrical Standard, which will be

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referred to in the Grid Code. The Electrical Standard will also be referenced in the GC.A.A Annex to the General Conditions. Explanatory notes to assist industry stakeholders understand the proposed standard will also be introduced. This will only focus on new connections at this stage. This modification has been raised at the Grid Code Development Forum (GCDF) on two occasions. The first, in October 2024 to introduce the change. Stakeholders were generally in favour of making the change, although they did have some questions and feedback. Whilst some of these were clarified during the session last October, it was suggested that further work would be needed to figure the criticality of the issue and make sure the proposed standard align with any existing convention. Subject Matter Experts (SMEs) within NESO have engaged with stakeholders more extensively after this and presented the modified proposal once again to GCDF in July 2025, where NESO SMEs provided further evidence to justify the criticality of the issue, presented the key principles of the proposed standard and clarified that the standard is consistent with the polarity conventions of all 3 TOs and Elexon and that the standard will only be applied to new connections in the current stage. In addition to the above, SME's have also engaged with generators, Transmission Owners (TOs) and Elexon to address any feedback and concerns they may have had.

## What is in and out of scope?

At this stage current stage, the standard is only applicable to new connections and new meters on existing connection and it will not be applied retrospectively.

### Draft legal text

Draft legal text for this change can be found in **Annex 01**.

## What is the impact of this change?

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;	<b>Positive</b> Improved situational awareness, system security, better forecast and reduced balancing cost Reduce and/or mitigate iterations and delay for setting up new

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	connections and approval for outage and commissioning Improved coordination, efficiency and transparency between NESO and other parties following unified polarity standard and standardised process.
(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);	<b>Neutral</b>
(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;	<b>Positive</b> Improved situational awareness, system security, better forecast and reduced balancing cost Reduce and/or mitigate iterations and delay for setting up new connections and approval for outage and commissioning Improved coordination, efficiency and transparency between NESO and other parties following unified polarity standard and standardised process.
(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	<b>Positive</b> Improved situational awareness, system security, better forecast and reduced balancing

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	cost Reduce and/or mitigate iterations and delay for setting up new connections and approval for outage and commissioning Improved coordination, efficiency and transparency between NESO and other parties following unified polarity standard and standardised process.
(v) To promote efficiency in the implementation and administration of the Grid Code arrangements	<b>Neutral</b>

\* 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	<b>Positive</b> Improved situational awareness, system security, better forecast and reduced balancing cost Reduce and/or mitigate iterations and delay for setting up new connections and approval for outage and commissioning Improved coordination, efficiency and transparency between NESO and other parties following unified polarity standard and standardised process.
Lower bills than would otherwise be the case	<b>Positive</b> NESO do not need to over-procure reserve to maintain system security when accurate metering data is provided.
Benefits for society as a whole	<b>Neutral</b>

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Reduced environmental damage	<b>Neutral</b>
Improved quality of service	<b>Positive</b> Improved situational awareness, system security, better forecast and reduced balancing cost Reduce and/or mitigate iterations and delay for setting up new connections and approval for outage and commissioning Improved coordination, efficiency and transparency between NESO and other parties following unified polarity standard and standardised process.

## When will this change take place?

### Implementation date:

10 Business Days after Authority Decision

### Proposer's justification of Implementation date:

Implementation date as soon as possible after Ofgem decision

### Date decision required by

Requested by 01 September 2026, or as soon as possible.

### Implementation approach

During the planning and design stage of new connection or replacement of existing metering points, a specific team within NESO will be the contact point and they will inform the third party of the polarity standard. Prior to issue of Operation Notification by NESO (i.e. EON, ION, LON), the metering points will be checked by NESO SCADA, Op Metering and Compliance and agreed with the third party. During ongoing operation, the third party will need to provide evidence to NESO Compliance team the standard is followed.

### Proposer's justification for governance route

Governance route: Standard Governance modification with assessment by a Workgroup Due to the potential impact on relevant parties, the workgroup will provide further refinement for the draft meter polarity standard. Because of the materiality, we propose that the regulator (OFGEM) will make the decision on the proposed change.

## Interactions

☐ CUSC      ☐ BSC      ☒ STC      ☐ SQSS  
☐ European Network Codes    ☐ EBR Article 18 T&Cs<sup>1</sup>    ☐ Other modifications    ☐ Other

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The Electrical Standard will be incorporated into the Grid Code which is only applicable to Generators. The Standard should also be applicable to all other industry stakeholders that send data to NESO, therefore the STC needs to be updated to reference this Standard so that Transmission Owners (TOs) and Offshore Transmission Owners (OFTOs) also follow the same Standard. For most transmission connected Generators the metering will be sent to NESO through TOs' assets and referring the Electrical Standard in STC can make TOs aware and follow the standard in such circumstances.

## Industry engagement and feedback

This modification has been raised at the Grid Code Development Forum (GCDF) on two occasions. The first, in October 2024 to introduce the change. Stakeholders were generally in favour of making the change, although they did have some questions and feedback. Whilst some of these were clarified during the session last October, it was suggested that further work would be needed to figure the criticality of the issue and make sure the proposed standard align with any existing convention. Subject Matter Experts (SMEs) within NESO have engaged with stakeholders more extensively after this and presented the modified proposal once again to GCDF in July 2025, where NESO SMEs provided further evidence to justify the criticality of the issue, presented the key principles of the proposed standard and clarified that the standard is consistent with the polarity conventions of all 3 TOs and Elexon and that the standard will only be applied to new connections in the current stage. In addition to the above, SME's have also engaged with generators, Transmission Owners (TOs) and Elexon to address any feedback and concerns they may have had.

## Acronyms, key terms and reference material

Acronym / key term	Meaning
BSC	Balancing and Settlement Code
CC	Connection Conditions
CUSC	Connection and Use of System Code
DNO	Distribution Network Owner
EBR	Electricity Balancing Regulation
ECC	European Connection Conditions



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EON	Energisation Operational Notification
GC	Grid Code
GCDF	Grid Code Development Forum
ION	Interim Operational Notification
LON	Limited Operational Notification
NESO	National Energy System Operator
OFGEM	Office of Gas and Electricity Markets
OFTO	Off-Shore Transmission Owner
SCADA	Supervisory Control and Data Acquisition
SME	Subject Matter Expert
STC	System Operator Transmission Owner Code
SQSS	Security and Quality of Supply Standards
T&Cs	Terms and Conditions
TO	Transmission Owner

## Annexes

Annex	Information
Annex 01	Draft Legal Text
Annex 02	Metering Polarity Electrical Standard