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Workgroup Consultation

GC0103:

The introduction of harmonised Applicable Electrical Standards in GB to ensure compliance with the EU Connection Codes

Overview: This modification seeks to set out within the Grid Code the compliance obligations in the EU Connection Codes as they relate to Electrical Standards.

Modification process & timetable

1	Proposal Form 31 August 2017
2	Workgroup Consultation 21 May 2025 – 12 June 2025
3	Workgroup Report 16 July 2025
4	Code Administrator Consultation 04 August 2025– 04 September 2025
5	Draft Final Modification Report 17 September 2025
6	Final Modification Report 03 October 2025
7	Implementation TBC

Have 5 minutes? Read our [Executive summary](#)

Have 45 minutes? Read the full [Workgroup Consultation](#)

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: Medium impact on Transmission Owners (including Offshore Transmission Owners and Interconnectors), Distribution Network Operators, (including Transmission connected iDNOs), potential CATO parties, Transmission System Users, System Operator, Non-Embedded Customers and Generators

Modification drivers: Efficiency and standardising connection arrangements (within Transmission busbar protection zones) between Users and Transmission Owners across the Transmission Owner areas.

Governance route	Standard Governance modification assessed by a Workgroup	
Who can I talk to about the change?	Proposer: Garth Graham, SSE Garth.graham@sse.com Phone: 01738 456000	Code Administrator Chair: Claire Goult Claire.goult@neso.energy Phone: 07938 737807
How do I respond?	Send your response proforma to grid.code@nationalenergygyso.com by 5pm on 12 June 2025	

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Contents

Contents.....	2
Executive Summary.....	3
What is the issue?.....	4
Why change?.....	4
What is the solution?	4
Proposer's solution.....	4
Workgroup considerations	5
What is the impact of this change?	19
Proposer's assessment against Code Objectives	19
When will this change take place?	22
Interactions	23
How to respond.....	23
Acronyms, key terms and reference material.....	24
Annexes.....	25

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Executive Summary

What is the issue?

Currently, there are three versions of Electrical Standards within Great Britain (GB) and this is set to grow in the future with the introduction of Competitively Appointed Transmission Owners (CATOs). These differences and inconsistencies cause difficulty for Users as it takes time and effort to check connection designs against each (different) set which leads to higher costs to consumers.

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

Proposer's solution: This modification seeks to set out within the Grid Code the compliance obligations in the European Union (EU) Connection Codes¹ as they relate to Electrical Standards. The aim is to work with Industry to set out compliance obligations within the Grid Code, as they relate to harmonised Electrical Standards. It would be applied to new connections within the busbar protection zone.

Implementation date: Within 10 Business Days of an Authority decision.

Interactions

None indicated.

¹ These codes, as amended for Brexit, remain retained GB law – see, for example, the requirements for Generator connections: "[Commission Regulation \(EU\) 2016/631 of 14 April 2016 establishing a network code on requirements for grid connection of Generators \(Text with EEA relevance\)](#)".

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What is the issue?

Why change?

Electrical Standards contain the technical specifications, policies and procedures that must be complied with by Users connected to or seeking to connect to the National Electricity Transmission System (NETS). Currently, there are three versions of Electrical Standards (one for each of the onshore Transmission Owners (TOs)²) within GB that apply, depending on where, geographically, a User's project is connecting to the NETS and this number (of versions) is set to grow in the future with the introduction of CATOs³.

Differences and inconsistencies in the three current versions of the Electrical Standards within GB cause issues for Users, in turn leading to additional costs and inefficiency that may impact investment confidence and gives rise to higher cost to consumers. Users also feel that there is a lack of transparency in the justification for the regional variations and the governance of the change process is inefficient.

The Requirements for Generators (RfG), Demand Connection Code (DCC) and High Voltage Direct Current (HVDC) Network Codes were drafted to facilitate greater connection of renewable generation; improve security of supply; and enhance competition to reduce costs for end consumers, across EU Member States. These three codes set harmonised technical standards for the connection of new equipment for Generators, demand and HVDC systems (including Direct Current-Connected Power Park Modules respectively).

The differences in the three current versions of the Electrical Standards, combined with the implementation of the three EU Network Codes means there is now a need for a single harmonised GB Electrical Standard to ensure the obligations within those EU Network Codes are met.

What is the solution?

Proposer's solution

This modification was raised in 2017 to seek to set out within the Grid Code the compliance obligations in the EU Connection Codes as they relate to Electrical

² NGET in England & Wales, SPT in Southern Scotland and SSEN-T in Northern Scotland.

³ [Onshore electricity transmission early competition: first project | Ofgem](#)

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Standards. It would be applied to new connections to the NETS. When raised the intention was to develop across a common standard, irrespective of the location in GB.

Given that the obligations in the EU Network Codes apply to 'new' projects only (and not to 'existing' projects) it is proposed that the single harmonised Electrical Standards introduced by this proposal would be known as the '*Applicable Electrical Standards*' (this will also avoid confusion with the '*Relevant Electrical Standards*', as defined in the Grid Code, which will continue to apply to 'Existing' projects) and would not be more stringent than the requirements in the EU Network Codes/Guidelines. It would be applied to all 'New' connections to the GB electrical system depending on whether they are generation, Demand or HVDC.

It is proposed that a GCRP Workgroup be set up to review the current Electrical Standards and the potential solutions.

The '*Applicable Electrical Standards*' would, as now, be incorporated into the Grid Code and follow the existing governance process as laid out in Grid Code General Conditions (GC11). The Applicable Electrical Standards would sit alongside the Relevant Electrical Standards as there is no retrospectivity proposed under this modification.

Workgroup considerations

The Workgroup convened 4 times to discuss the identified issue within the scope of the defect, develop potential solutions, and evaluate the proposal in relation to the Applicable Code Objectives. Several meetings occurred between 2017 and 2019 before the GC0103 Workgroup resumed on 27 June 2023.

Consideration of the Proposer's solution

GC0103 was raised in 2017 but paused due to higher priority work. It was reconvened in June 2023 where the Proposer invited members to support the development of single harmonised set of standards called the '*Applicable Electrical Standards*' (AES).

Technical Progress made by the original 2017 Workgroup

A member of the original Workgroup discussed some of the barriers that faced the Workgroup in finding a solution. It was raised that there was difficulty in presenting the benefit case for the Workgroup, and that a compelling argument is needed for why the AES is required.

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The Proposer raised that procurement of equipment would be cheaper if manufacturers only had to work to a single standard, however a Workgroup member argued that there would need to be evidence for this.

The Needs Case for GC0103

This request, from Workgroup members, for supporting evidence of the need for GC0103, was addressed, by the Proposer, in an email⁴ to the Workgroup.

The Proposer suggested that the need for a detailed Cost Benefit Analysis (CBA) was unnecessary in the case of GC0103 as a simple examination of the facts (at a principles level⁵) shows that the cost, to GB consumers, of having three separate applicable Electrical Standards for the three onshore TO (let alone CATOs in the future) is greater than the cost of having a single standard, especially in the context of GC0103.

In simple (illustrative) terms, the Proposer provided an example whereby the international standard is for a piece of generation⁶ equipment to do 'ABC'.

The two options for the GB based TO, who does not adopt that international standard, is that a bespoke standard (for that TO area only) is developed and maintained – at cost – by the TO (and also by the Generators who have to operate to it) which, when compared with the international standard, is to either:

- 1) do more – 'ABCD'; or
- 2) do less – 'AB'.

Buying a piece of equipment (such as Plant or Apparatus) that does ABC means that the market, for it, is at its most competitive as there are the largest number of parties building to that international standard and they are selling the greatest number of units across the largest possible marketplace.

This means, everything else being equal, that the Generators buying the ABC product gets the best possible price (i.e. the lowest cost) for that piece of equipment.

⁴ Dated 2nd September 2020 (16:53).

⁵ The Proposer also noted the difficulty of sourcing the relevant costing information etc., from global equipment manufacturers, which would make it impractical to complete a detailed CBA in this case.

⁶ Note: the principle, in the illustrative example, would be similar for other Users.

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However, this is not the case with products that are based on a bespoke TO standard for a number of reasons, including:

- i) In terms of an ABCD (or AB) product this means that the manufacturer has to design, build and test that piece of equipment to meet that revised greater (or lesser) standard. That is an additional cost that can only be charged to those Generators who are looking to build in that TO's area, who are required (by the TO) to have the equipment to do ABCD (or AB);
- ii) When it comes to actually placing an order, by the Generator, for that product then that manufacturer has to modify their production run / staff training / supply chain etc., to manufacture the bespoke ABCD (or AB) piece of equipment for a limited production run (and then return the production line back to the ABC production). That is an additional cost that can only be charged to those Generators who are looking to build in that TO's area, who are required (by the TO) to have the equipment to do ABCD (or AB); and
- iii) The manufacturer also has to have a bespoke commissioning regime, O&M regime and spares for the ABCD (and AB) equipment which costs extra when compared with the equivalent regime/spares for the ABC product. That is an additional cost that can only be charged to those Generators who are looking to build in that TO's area, who are required (by the TO) to have the equipment to do ABCD (or AB).

In addition, the manufacturer is unlikely to offer the Generator the same level of warranties etc., for the ABCD (or AB) product when compared with the ABC product (as there is less certainty around it). The Generator therefore has to factor in (within their risk profile) an additional risk premia for the lesser manufacturer's warranty – which is a further cost for the Generator.

Furthermore, some manufacturers faced with these (i)–(iii) issues; and perhaps coupled with the smaller size of the (single TO area) marketplace for that TO's bespoke needs; may self-select and choose not to respond to the Generator's tender to provide an ABCD (or AB) product which means that the Generator is forced to seek valid tender responses from fewer manufacturers (leading to less choice / competition).

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As has been widely accepted by Ofgem (and others) the less competition there is in a market the higher the costs are to those that buy in that marketplace (in this case the Generator).

This (along with the (i)-(iii) issues) will lead to higher costs for the Generator (and thus end consumers via, for example, higher CfD⁷ auction and National Energy System Operator (NESO) Pathfinder prices and / or wholesale prices) of adopting either a product based on a bespoke ABCD or AB standard when compared to the ABC standard.

As a consequence of the above it is also possible that the Generator may chose not to locate their Plant in that TO's area in order to avoid the additional costs and risks for them (meaning less competition in the generation market).

Later, in May 2021⁸, the Proposer shared with the Workgroup a report from The Times, in respect of manufacturers, the most relevant element being the following:

"The pressure systems industry is particularly worried because it has to meet additional safety standards. Its concern is that overseas metal mills and foundries will decide not to register for the UK system as the cost will be too great compared with the size of the market."

Andrew Varga, managing director of Seetru Engineering in Bristol agreed. "People will end up seeing rising prices as manufacturers pass on the costs," he said. "There will also be reduced choice in the market."

This, the Propopser suggested, reinforced the arguments set out in the illustrative ('ABC') example above.

Subsequently, in June 2023⁹, the Proposer shared with the Workgroup an article, from Farmers Weekly¹⁰, (and, a month or so later¹¹, from The Grocer¹²) around higher costs of operating to different requirements leading to those costs being reflected onto the parties giving rise to those costs, as well as leading to some providers withdrawing from supplying into that particular market.

⁷ [Contracts for Difference \(CfD\) | National Energy System Operator](#)

⁸ Email dated 3rd May 2021 (10:17).

⁹ Email dated 12th June 2023 (08:50).

¹⁰ [EU food producers 'not ready' for UK import checks - Farmers Weekly](#)

¹¹ Email dated 8th August 2023 (15:20).

¹² [Christmas food under threat due to new Brexit rules | News | The Grocer](#)

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Taken together, the Proposer believed the above addressed the Workgroup members points about the *“benefit case for the Workgroup, and that a compelling argument is needed for why the AES is required”* and *“that there would need to be evidence”*.

Winser Review

Over and above the case as set out (primarily in September 2020 but also in May 2021 and June 2023) the Proposer wrote to the Workgroup, in August 2023¹³, in respect of the recommendations of the Winser Review¹⁴ (that had been commissioned by the Department for Energy Security and Net Zero (DESNZ)) and, in particular, the statements and recommendations on pages 24–26 of the *“Companion Report Findings and Recommendations”*.

The Proposer underlined, for the Workgroup, some elements (see below) from the Winser Review that they believed to be particularly relevant, in respect of GC0103, not just for the GB TOs but also for GB Generators in terms of evidencing the benefits of standard harmonisation.

“5.3 Standardisation of Equipment Challenge:

The equipment required to build new or reinforce existing infrastructure must meet a strict set of standards. The standards used within GB are often different to those used across Europe and the rest of the world. This can lead to equipment manufacturers needing to meet GB specific requirements (e.g., the tower design used within GB compared to other European countries). The adoption of innovative solutions can be limited by the standards applied within GB (e.g., a tower design using less steel could be used across Europe but does not meet GB standards). [emphasis added]

The equipment standards across the three Transmission Owners (TOs) in GB are not always the same. This can make the GB market even more challenging for equipment manufacturers, as bespoke solutions can be required for different TOs, for the same type of equipment. There is an opportunity with new

¹³ Email dated 8th August 2023 (08:54).

¹⁴ [Electricity Networks Commissioner: companion report findings and recommendations \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1184441/electricity-networks-commissioner-companion-report-findings-and-recommendations.pdf)

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infrastructure build to introduce new, harmonised equipment standards.

[emphasis added]

The specification for an asset (e.g., a cable) is often not defined until the detailed planning stage. With the current lead times for the supply chain this can lead to delay in having equipment ready to start construction.

The challenge is to agree a level of standardisation that allows solutions to be built that accommodate genuine differences in requirements, but wherever possible provides access to the benefits of consistency within GB and with other markets. These potential benefits include speed of supply, diversity of supply, lower cost through economies of scale, and introduction of innovation, amongst others." [emphasis added]

"Recommendations:

SE1: A forum should be created between the Future System Operator (FSO), Transmission Owners (TOs), equipment manufacturers and Ofgem to review and update equipment standards used within GB. Its main aims would be to

- Standardise where possible equipment specification across TOs.
- Standardise equipment ratings to be used within project design (e.g., circuit breaker rating) to support moving away from bespoke ratings.
- Engage with and apply international standards where appropriate and beneficial. [emphasis added]
- Seek and facilitate innovation that would be enabled by standardisation.

SE2: A process should be created to support and enable the work of this forum. This process should include a mechanism for Grid Code modifications to enable the update of equipment standards if required. [emphasis added]

Implementation: SE1 & SE2: Setting up a forum will require resources from the TOs, Ofgem and the FSO. This forum could be led by the FSO. Open engagement with the supply chain will be required, so as not to favour particular manufacturers, or larger manufacturers – Ofgem should oversee this to ensure competition is not adversely impacted. Ofgem's endorsement of the standards will be required to

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support regulatory approval and should form part of Recommendation RA1: Regulatory Approval. The TOs own their equipment standards and they must adhere to codes and standards when creating them. It is possible to make changes to equipment standards but when considering innovative solutions, they may not meet Grid Code requirements. This means updating equipment standards may require modifications to the Grid Code. Designing a process to update the Grid Code as required will be an essential enabler to updating equipment standards, utilising international standards and deploying innovative solutions within GB. [emphasis added]

The use of standard equipment should be endorsed through planning policies as there may be an impact on the amount of land required, access conditions or the environment. For example, a different tower design may have a slightly larger footprint.

The forum should look for early opportunities to standardise; however, this recommendation may take several years to implement. A forum will need to be created and standards updated before being applied to a project. Due to the lead times involved in the supply chain implementing these new standards, it is unlikely to support projects required for 2030 but could start to support projects delivering shortly after. Implementing a process for updating equipment standards and Grid Code should happen as matter of urgency as it will support increasing the number of manufacturers that could be used within the supply chain. [emphasis added]

This recommendation combined with Recommendation RD1: Route Design Standardisation and Recommendation AR2: Automation of Route Design will help reducing the pre-application stage of the process. This recommendation will support the supply chain and development of long-term relationships, as discussed in Recommendation SC1: Supply Chain.

Developing, agreeing and maintaining these standards will require resources across all parties. This may be an increase of those already deployed in these organisations. There are likely to be testing and validation needs that will be in addition to those already used. Some of testing facilities may need to be built; others may be accessed through contract or other arrangements.

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The cost of this effort will be offset by the benefits arising from improvement in the end-to-end process. This is due to having access to a more diverse supply chain (if there is alignment with other countries/markets) and moving projects from bespoke designs to standard ones. Using standards that are established in other markets will provide access to a wider pool of expertise, knowledge and experience that can be deployed in GB. This will support increasing the number of contractors who are able to work in GB. Further benefits will arise in operations and ongoing evolution of networks assuming that standardisation will lead (over time) to more consistent operating and design practices. [emphasis added]

Some months later, in November 2023¹⁵, the Proposer brought to the Workgroup's attention the UK Government's formal response¹⁶ (as part of the Autumn Statement) to the Winner Review.

In particular, the Proposer noted the statement¹⁷ that:

"The government agrees that greater coordination between the ESO and later the FSO (once established), Ofgem, TOs and equipment manufacturers on equipment standards would be beneficial."

Accordingly, the UK Government proposed that a forum be established, via the ENA, to examine this further and the UK Government went on to note¹⁸, under 'Next Steps', that:

"Key stakeholders will convene in 2023 to discuss manufacturing efficiency and international compatibility benefits associated with standardisation proposals that fall within the scope of its function. The TOs, and ESO (and then FSO, when established) will design a process to implement equipment standardisation recommendations, agreed at the forum, by the end of 2024."

Subsequently, the three GB TOs agreed with the Proposer's assessment of the benefits and discharged (in early 2025¹⁹) on GC0103 instruction when they produced a "Transmission Owners Relevant Electrical Standards" which can be found at **Annex 03**.

¹⁵ Email dated 22nd November 2023 (15:52).

¹⁶ Transmission Acceleration Action Plan: Government response to the Electricity Networks Commissioner's report on accelerating electricity transmission network build (publishing.service.gov.uk)

¹⁷ On page 36.

¹⁸ On page 36.

¹⁹ And shared this output with stakeholders in March 2025.

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In light of the case made; in respect of the clear benefits of harmonised Electrical Standards, in the conclusions and recommendations of Winsor Review and the UK Government's endorsement of that; the Proposer believed this also addressed the Workgroup members points about the *"benefit case for the Workgroup, and that a compelling argument is needed for why the AES is required"* and *"that there would need to be evidence"*.

Authority and Harmonisation

One Workgroup member raised that there is no clear incentive from the Authority to do harmonisation work.

The Proposer noted that the European Connection Codes do set out a legal requirement, in respect of harmonisation, including on the National Regulatory Authority (NRA) (in GB terms, the Authority). For example, the Proposer noted the wording in Recital (3):

"Harmonised rules for grid connection for power-generating modules should be set out in order to provide a clear legal framework for grid connections, facilitate Unionwide trade in electricity, ensure system security, facilitate the integration of renewable electricity sources, increase competition and allow more efficient use of the network and resources, for the benefit of consumers".

On 28th February 2025, the Authority published²⁰ its 'minded-to' consultation document for GC0117. The Proposer identified a number of passages, from that (GC0117) document, to the Workgroup which have relevance to GC0103, in the context of addressing the question posed, by the Workgroup member, that *"there is no clear incentive from the Authority to do harmonisation work"*.

As the Authority noted, in the 'Introduction' to that document²¹:

"The current GC does not apply uniform access and connection arrangements across GB. This leads to disparities and inefficiencies that hinder the creation of a pan-GB market for Power Stations and Power Generating Module (PGM) technology. This inconsistency results in different requirements for Power Stations

²⁰ [Grid Code 0117 Final Modification Report Minded-to Decision Consultation | Ofgem](#)

²¹ [GC0117: Improving Transparency and Consistency of Access Arrangements Across GB by the Creation of a pan-GB commonality of Power Station Requirements](#)

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depending on their location, which can lead to higher costs and operational challenges.²²

Examining the 'Our Assessment and Minded-To Decision' section²³ of that document, which sets out the Authority's view, it identified, for example, the following:

"We [the Authority] consider the Proposer's^[24] statement that "the current GC does not apply consistency of access or connection arrangements across GB and as such, does not assist in the creation of a pan-GB market for Power Stations and PGM technology's," to be a valid observation²⁵."

"...by introducing a common, clear set of requirements which every new connection to the electricity network will need to meet across GB, should help make it easier and more efficient to operate the electricity system.²⁶"

[In the context of Applicable Objective (ii)] "By standardising the technical requirements across GB, competition within the supply chain for Power Station equipment will increase. This will potentially reduce the cost for Generators, resulting in lower electricity costs for consumers.²⁷"

[In the context of Applicable Objective (v)] "The application of a single, harmonised, common minimum requirement across the whole GB system will produce efficiency in the implementation and administration of the GC arrangements as it avoids the costs, risks and inefficiencies associated with operating to three separate arrangements today.²⁸"

[In the context of Applicable Objective (v)] "...produce efficiencies by creating a harmonised and standardised GB wide connection requirement, promoting clearer rules and governance for industry.²⁹"

"...arrangements differ by region, which can create additional layers of complexity and inefficiency. By standardising the connection requirements nationally, the OP simplifies the application process for Power Stations. ...ensure no Generator is disadvantaged due to regional differencesBy standardising GC requirements, the OP will reduce connection complexity for future stakeholders. It will also

²² Paragraph 1.2

²³ Pages 14-22

²⁴ [Note: the Proposer of GC0117 is also the Proposer of GC0103]

²⁵ Paragraph 4.3

²⁶ Paragraph 4.4

²⁷ Paragraph 4.22

²⁸ Paragraph 4.30

²⁹ Paragraph 4.31

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increase competition among equipment manufacturers, leading to reduced development costs. This will lower costs for consumers³⁰".

Accordingly, in the Proposer's view, these statements (from the Authority) in terms of GC0117 are helpful for the Workgroup, when considering GC0103.

One Workgroup member raised that even when working to international standards, there are usually options to choose from. The Proposer suggested that where options are given, GB should harmonise on one of the options.

One Workgroup member suggested that harmonisation across GB would not be possible given that in Scotland, 132kV assets are considered transmission assets, whereas this is not the case in England and Wales. The Proposer noted this and suggested that a single, harmonised approach, based on the Electricity Network Association (ENA) requirements could be followed for all 132kV assets transmission in Scotland (and where relevant England & Wales), and that the AES could cover 275kV and above.

Reconvened Workgroup Progression

On 27 June 2023, the Workgroup reconvened. The Proposer delivered a presentation to the Workgroup outlining the current situation with three sets of Relevant Electrical Standards (RES) for the three different Transmission Owners (TOs). The Proposer raised that there is the potential for the introduction of Competitively Appointed Transmission Owners (CATOs) to increase the number of RES documents in future, and proposed that there should be one 'Applicable Electrical Standard' (AES) for all new parties connecting to the grid.

The Proposer was asked by the Workgroup to provide clarity on the scope and details of the solution. It was explained that the scope of the proposal is to standardise the existing three separate sets of RES that are applicable in GB into a single set (to be known as the AES, to avoid confusion with the legacy RES that will remain applicable for existing sites). The Proposer described how it is expected that further Workgroup discussions or in a possible subgroup as to which set of standards should be adopted; such as one of the existing three RES sets or a hybrid or 'something else'.

The Proposer stated that the expectation of this modification would be a single set of standards that going forward, GB connecting Users need to comply with.

The Proposer stressed that this modification should be prospective rather than retrospective, noting that if existing assets made significant changes, they would then

³⁰ Paragraph 4.38

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need to comply with the latest RES which, if GC0103 was approved, would become the AES. The Proposer then noted that the Scottish Power RES is based on the international standard, and given the advantages this has (for the reasons noted in the 'ABC' illustrative example) that this RES would be the one the Proposer is minded to have implemented as the AES.

A Workgroup member expressed concerns that there was no guidance on what constitutes a material change to an asset. The Proposer clarified that a Material Effect to an asset is already defined in the Grid Code and CUSC, and this is not subject to change as part of this modification. The Proposer confirmed that this GC0103 modification is not proposing to change that: the codes today determine if a change, at a User site, necessitates that site needing to comply with the more up to date RES (if there has been a change to the RES since the site was initially commissioned). All that GC0103 would do is, at that point, replace the need to meet the updated RES with needing to meet (instead) the AES (as introduced by this modification).

A Workgroup member noted it would be important to map similarities and differences within the existing RES documents, and other Workgroup members later expressed that the modification timeline may need to be extended to allow technical discussions to take place, with some members raising a concern about how a new standard would work, especially with legacy equipment on the NETS.

Some Workgroup members queried the benefit of the modification, and the Proposer clarified that the purpose of the modification was to ensure consistency throughout GB, and explained that this would result in lowered costs for Users and consumers (see 'The Needs Case' and the 'Winser Review' above for supporting evidence for this). Another Workgroup member suggested limiting the scope of the modification to only cover electrical capability, however the Proposer stated that this would not solve the issue of having multiple different standards dependent on location.

Some Workgroup members raised a question around governance changes to the new standards, and it was clarified that the AES would sit as part of the Grid Code, and be governed with the existing Grid Code Electrical Standards governance structure.

After several queries regarding the standard to be adopted, the Proposer clarified that they were working towards having one AES with the suggestion of using the Scottish Power RES, however they would be open to having Workgroup Alternatives raised by the Workgroup to propose a different AES. It was also discussed that a technical sub-group may be required in future to ensure all technical changes can be considered.

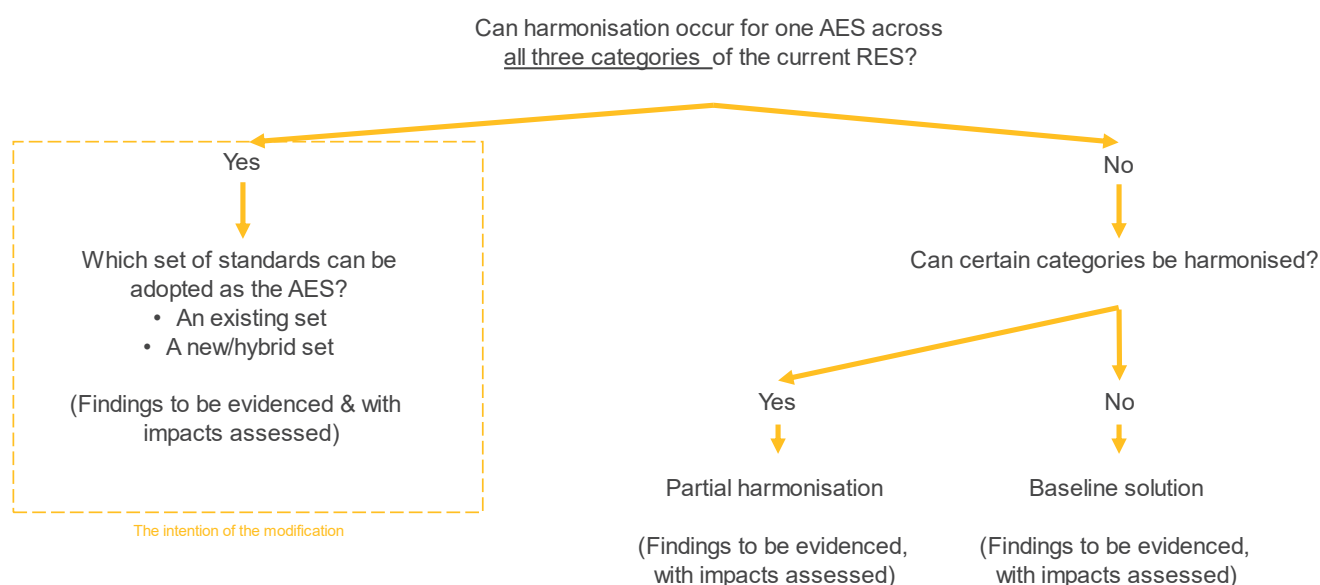
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The Scope of the RES/AES

The Proposer outlined the intention of a subgroup would be to look at the technicalities of harmonisation and explore the technical feasibility for why harmonisations of all categories of the current RES wouldn't be possible, taking into account good industry practice:

- (i) Electrical capabilities
- (ii) Condition Monitoring & Maintenance & Access
- (iii) Environmental Monitoring

The NESO shared the following graphic with members for clarity:



The Proposer suggested that the sub-group should look first at technical feasibility for harmonisation of all categories of the current RES. If this is shown to not be technically feasible, the Proposer raised the option for partial harmonization, but confirming it was not the intended solution for this modification.

One Workgroup member raised that their RES was currently being written, and that some elements of it had been adapted based on the remote nature of some of their operational sites. They queried whether it was possible for a harmonised RES to be written, given different operational conditions in different parts of GB.

A Workgroup member stated that they only recognised electrical capabilities to be part of the RES, since the RES only mandates things that have an impact on the NETS (National Electricity Transmission System).

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It was explained that condition monitoring of non-NETS assets would not be likely to have an impact on the NETS, since faults should trip the assets resulting in the network being protected. The Proposer shared that they were happy for the scope of the modification to only include electrical capabilities; if that was all a User needed to comply with (according to the Grid Code / CUSC) in order to connect to (and use) the NETS; and thus manufacturing of assets was not required for the other aspects, namely condition monitoring, maintenance and access, and environmental monitoring.

Sub-Group Formation

The Workgroup had a discussion regarding the purpose and outputs of a sub-group. A member of the initial (2017) GC0103 Workgroup clarified that in their view the scope was limited to anything having a direct impact on the NETS; this was limited to assets within the busbar protection zone (as this was all that the Grid Code, via the existing RES, could oblige a User to comply with). Other members of the Workgroup agreed that this was the correct approach to follow, since User circuit breakers should trip to protect the NETS for anything outside the busbar protection zone.

One Workgroup member shared a view that the language of current RES documents is different between TOs, and that this may be a difficulty in checking existing harmonisation.

It was suggested that the purpose of the sub-group would be to cover points 1) and 2) below, with the outputs of the sub-group needing to be assessed as to whether point 3) will be possible in the scope of this modification.

- 1) Develop the framework for how a set of harmonised standards can be developed (i.e. mapping existing standards to see where harmonisation is feasible);
- 2) Impact assessment & benefits case of the overarching principle behind the GC0103 proposal (requiring input from Ofgem as to information they will require for their decision); and
- 3) Construct a harmonised set of standards.

Members from the different TOs agreed to be part of the sub-group, and it was agreed that the GC0103 Workgroup would be put on hold for the duration of the sub-group work.

Sub-group Conclusion

A sub-group meeting was held on 10 August 2023 to assess the possibility of drafting a harmonised Electrical Standard. As a result, the TOs completed a draft version of the 'Transmission Owners Relevant Electrical Standards' (this can be found in **Annex 03**). It

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was noted by the TOs that this was evidence that harmonisation could be possible, and the Workgroup concurred with this.

A Workgroup specific question has been asked on 'Transmission Owners Relevant Electrical Standards' (See question 6). Please note any comments to this question will be provided to the TOs and will not be addressed by this Workgroup.

Draft legal text

There are proposed amendments to the following sections of the Grid Code:

- Glossary and definitions
- General Conditions

The draft legal text for this change can be found in Annex 04.

Please note: The General Conditions draft legal text provided as part of this Workgroup consultation is not on the latest Baseline Grid Code. The NESO SME concluded that, at this stage, it was beneficial to use the proposed GC0169 text (based on the proposal under GC0169 of the intention to update GC11) as this current modification proposes to change the same section of the Grid Code. Notwithstanding the proposed wording from GC0169, the draft legal text for GC0103 will be updated (to the Baseline) for the Code Administrator Consultation. In addition, GC0103 Workgroup members may wish to consider amending other sections of the Grid Code relevant to this modification while updating the draft legal text.

What is the impact of this change?

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 proposed solution will allow the System Operator and Transmission Licensees to apply a consistent set of standards within the

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	busbar protection zone across GB.
(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 The proposed solution will assist the Users of the National Electricity Transmission System and during the connection process. A single harmonised set of Electrical Standards will also help enable competition in the construction of connection assets as, at the moment, it is not clear what standard CATOs should use. A common set of standards will also provide a level playing field between Generators in different parts of GB compared to the current situation in which a Generator in, say, Carlisle has different connection requirements and standards to one in, say, Glasgow and yet another set for one located in, say, Inverness.
(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 creation of a harmonised set of standards would ensure that changes to standards are managed in a controlled, open and

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	transparent manner and ensure that where a clear action to improve a standard is discovered, it can be applied across the country at the same time.
(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	Positive The EU Connection Codes derive from the Third Energy Package legislation which is focused on delivering security of supply; supporting the connection of new renewable Plant; and increasing competition to lower end customer costs. This proposal ensures harmonised rules for grid connection for power-generating modules, demand and HVDC assets are set out in order to provide a clear legal framework for grid connections, facilitate Union-wide trade in electricity, ensure system security, facilitate the integration of renewable electricity sources, increase competition and allow more efficient use of the network and resources, for the benefit of consumers.

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	Furthermore, this modification ensures GB compliance with EU legislation in a timely manner and does so in a way that is not more stringent than EU law permits.
(v) To promote efficiency in the implementation and administration of the Grid Code arrangements	Positive Applying harmonised rules for grid connection for Power Generating Modules, demand and HVDC assets reduces the administrative costs and burden for Users (in being able to seek connection on the basis of a uniform approach) and the system operator (when assessing compliance) in the administration of the Grid Code arrangements.

* See Electricity System Operator Licence

When will this change take place?

Implementation date

Within 10 Business Days of an Authority decision.

Date decision required by

TBC

Implementation approach

No system changes are required in order to implement this proposal.

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Interactions

None identified.

How to respond

Standard Workgroup Consultation questions

1. Do you believe that the Original Proposal better facilitate 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 not impact the European Electricity Balancing Regulation (EBR) Article 18 terms and conditions held within the Code?

Specific Workgroup Consultation questions

7. As set out at the bottom of page 12 the three GB TOs have prepared a draft "Transmission Owners Relevant Electrical Standards" which can be found at **Annex 03**. Do you have any views on that document that you'd like to share?
[Please note any comments to this question will be provided to the TOs and will not be addressed by this Workgroup].

The Workgroup is seeking the views of 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 using the response pro-forma which can be found on the [GC0103 modification page](#).

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

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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
AES	Applicable Electrical Standards
BSC	Balancing and Settlement Code
CATO	Competitively Appointed Transmission Owner
CBA	Cost Benefit Analysis
CfD	Contract(s) for Differences
CMP	CUSC Modification Proposal
CUSC	Connection and Use of System Code
DCC	Demand Connection Code
DESNZ	Department of Energy Security and Net Zero (UK Government department)
EBR	Electricity Balancing Regulation
ESO	Electricity System Operator
ENA	Electricity Network Association
EU	European Union
FSO	Future System Operator
GB	Great Britain
GC	Grid Code
GCRP	Grid Code Review Panel
HVDC	High Voltage Direct Current
iDNO	Independent Distribution Network Operator

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kV	kilo Volts
NETS	National Electricity Transmission System
NESO	National Energy System Operator
NGET	National Grid Electricity Transmission (the TO for England & Wales)
NRA	National Regulatory Authority (In GB terms this is Ofgem)
PGM	Power Generating Modules
RES	Relevant Electrical Standards
RfG	Requirements for Generators
SPT	Scottish Power Transmission (the TO for Southern Scotland)
SSEN-T	SSE Networks Transmission (the TO for Northern Scotland)
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	GC0103 Proposal Form
Annex 02	GC0103 Terms of Reference
Annex 03	GC0103 Draft Transmission Owners Relevant Electrical Standards
Annex 04	GC0103 Draft Legal Text