Public

Workgroup Report

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**
   19 November 2025
4. **Code Administrator Consultation**
   05 December 2025 – 12 January 2026
5. **Draft Final Modification Report**
   21 January 2026
6. **Final Modification Report**
   10 February 2026
7. **Implementation**
   10 Business Days after Authority Decision

Have 5 minutes? Read our Executive summary
Have 90 minutes? Read the full Workgroup Report
Have 180 minutes? Read the full Workgroup Report and Annexes.

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

This modification is expected to have a: Medium impact on Transmission Licensees, Interconnector Owners, Distribution Network Operators, (including Transmission connected iDNOs), potential CATOs, NESO, Non-Embedded Customers and Generators

Modification drivers: Efficiency and standardising connection arrangements at the connection point/interface point as applicable 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

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Executive Summary

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

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 harmonisation requirement in the European Union (EU) Grid Connection Codes[1] 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[2].

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

What is the impact if this change is made?

The proposed solution aims to create harmonised electrical standards for grid connections in GB, which would enhance efficiency for the System Operator (NESO) and Users during the connection process. It highlights the benefits of a unified approach, including reduced administrative burdens, improved competition, and compliance with EU legislation, ultimately aiming to facilitate the integration of renewable energy sources and ensure system security for consumer benefit.

Workgroup conclusions: The Workgroup concluded by majority, 7 out of 8 voters, that the Original better facilitated the Applicable Objectives than the Baseline.

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[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)".

[2] The Grid Code refers to the busbar protection zone but the relevant protection zone at the connection point may not be busbar protection

Interactions

None indicated.

What is the issue?

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

Electrical Standards contain some of 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)[3]) 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 CATOs[4].

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.

Why change?

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 requirements for the connection of new equipment for Generators, Users with Demand Units and HVDC System Owners (including Direct Current-Connected Power Park Modules).

The differences in the three current versions of the Electrical Standards, combined with the implementation of the three EU Network Codes means there will be efficiencies from a single harmonised GB Electrical Standard to ensure the intent of those EU Network Codes are met.

[3] NGET in England & Wales, SPT in Southern Scotland and SSEN-T in Northern Scotland.

[4] Onshore electricity transmission early competition: first project | Ofgem

What is the solution?

Proposer's Original 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 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.

The '*Applicable Electrical Standards'* would, as now, be incorporated into the Grid Code and follow the existing governance process as laid out in the 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 9 times from 2023 onwards 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

Consideration of the Proposer's solution

GC0103 was raised in 2017 but paused due to higher priority work. Work on 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. These included the difficulty in presenting the benefit case for the Modification, and that a compelling argument needed to be articulated for why the AES is required.

The Proposer explained 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 the materiality of 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 email[5] 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 level[6]) shows that the cost, to GB consumers, of having three separate applicable Electrical Standards for the three onshore TOs (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 generation[7] 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.

[5] Dated 02 September 2020 (16:53).
[6] The Proposer also noted the difficultly of sourcing the relevant costing information etc., from global equipment manufacturers, which would make it impractical to complete a detailed CBA in this case.
[7] Note: the principle, in the illustrative example, would be similar for other Users.

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.

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

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);

i) 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

ii) The manufacturer also has to have a bespoke commissioning regime, operation and maintenance 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).

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 CfD[8] 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 choose 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 2021[9], 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 Proposer suggested, reinforced the arguments set out in the illustrative ('ABC') example above.

Subsequently, in June 2023[10], the Proposer shared with the Workgroup an article, from Farmers Weekly[11], (and, a month or so later[12], from The Grocer[13]) 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.

[8] Contracts for Difference (CfD) | National Energy System Operator
[9] Email dated 03 May 2021 (10:17).
[10] Email dated 12 June 2023 (08:50).
[11] EU food producers 'not ready' for UK import checks - Farmers Weekly
[12] Email dated 08 August 2023 (15:20).
[13] Christmas food under threat due to new Brexit rules | News | The Grocer

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 2023[14], in respect of the recommendations of the Winser Review[15] (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 infrastructure build to introduce new, harmonised equipment standards.* [emphasis added]

[14] Email dated 08 August 2023 (08:54).

[15] Electricity Networks Commissioner: companion report findings and recommendations (publishing.service.gov.uk)

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 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.

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 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 2023[16], the Proposer brought to the Workgroup's attention the UK Government's formal response[17] (as part of the Autumn Statement) to the Winser Review.

In particular, the Proposer noted the statement[18] 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 note[19], 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 discharged (in early 2025[20]) on GC0103 instruction when they produced a draft "*Transmission Owners Relevant Electrical Standards*". An updated version of the Applicable Electrical Standards was completed in November 2025 which can be found at **Annex 03**.

In light of the case made; in respect of the clear benefits of harmonised Electrical Standards, in the conclusions and recommendations of Winser 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*".

[16] Email dated 22 November 2023 (15:52).

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

[18] On page 36.

[19] On page 36.

[20] And shared this output with stakeholders in March 2025.

Industrial Strategy - Clean Energy Industry Plan:

The Proposer informed members that after the June 2025 Workgroup consultation, the UK Government released several Industrial Strategy documents, including the Industrial Strategy: Clean Energy Industries Sector Plan. Key points highlighted by the Proposer included breaking down investment barriers and collaborating with network operators and the supply chain to standardise equipment requirements, thereby simplifying procurement and streamlining processes.

Nuclear Regulatory Taskforce Interim Report, 2025

The Proposer noted that the UK Government commissioned review by the "Nuclear Regulatory Taskforce 2025" recently published its interim Report which, from the summary (on page 6), included the following (that has relevance in terms of GC0103):

"*International harmonisation Nuclear technology is ideally placed to benefit from international collaboration through the harmonisation and standardisation of industry and regulatory approaches. This potential has not been achieved. Each regulatory system has its own approach, interpretation of international standards, and legal framework, which adds substantial complexity, costs, and delays when seeking approvals*." [emphasis added]

'Governance body for network data standards is unveiled' – Utility Week

The proposer highlighted a report from the Utility Week around the sector moving to single GB applicable standards which notes that:

"*The* [new governance] *body will oversee the Common Information Model (CIM), a set of international standards that enables transparent and secure data exchange in a move that is anticipated to play a key role in modernising the energy sector and integrating new low-carbon technologies into the grid.*

The CIM standards define how assets such as substations and inverters on wind turbines are operated and how information is exchanged between industry stakeholders."

The Proposer argued that these measures, supported by government strategy and the Winser Review's recommendations, further address the Workgroup's concerns regarding the benefit case for harmonised Electrical Standards and the need for supporting 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*".

Another member stated that he did not believe that this was factually correct: it is the intent of the law as recorded in the Recitals, but it is not made an obligation in the articles, because if it was an obligation, it would have needed to have been done by April 2019.

On 28 February 2025, the Authority published[21] it's 'minded-to' consultation document for GC0117 subsequently sent back by the Authority on 18 July 2025, however the Workgroup noted this would not change the intent with respect to GC0103 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 document[22]:

> "*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 depending on their location, which can lead to higher costs and operational challenges.*[23]"

[21] Grid Code GC0117 Final Modification Report Minded-to Decision Consultation | Ofgem

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

[23] Paragraph 1.2

Examining the '*Our Assessment and Minded-To Decision*' section[24] of that document, which sets out the Authority's view, it identified, for example, the following:

> "*We* [the Authority] *consider the Proposer's[25] 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 observation*[26]."
>
> "*….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.*[27]"

[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.*[28]"

[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.*[29]"

[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.*[30]"

> "*…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 differences ….By standardising GC requirements, the OP will reduce connection complexity for future stakeholders. It will also*

[24] Pages 14-22
[25] [Note: the Proposer of GC0117 is also the Proposer of GC0103]
[26] Paragraph 4.3
[27] Paragraph 4.4
[28] Paragraph 4.22
[29] Paragraph 4.30
[30] Paragraph 4.31

> *increase competition among equipment manufacturers, leading to reduced development costs. This will lower costs for consumers*[31]".

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 requirement could be followed for all Transmission assets irrespective of voltage.

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 noted 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 discussions in a possible subgroup, should determine 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 Users would need to comply with.

[31] Paragraph 4.38

The Proposer stressed that this modification should be prospective rather than retrospective, noting that if existing assets made significant changes, they would then need to comply with the AES assuming GC0103 is approved. The Proposer expressed a preference that the Scottish Power RES would be the model for the AES at the time of proposing the modification.

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 alongside the Grid Code, and be governed by the existing Grid Code Electrical Standards governance structure.

After several queries regarding the standard to be adopted, the Proposer clarified the intent of having a single AES with the suggestion of using the Scottish Power RES, however the Proposer would be open to having Workgroup Alternatives raised to propose a different AES. It was also discussed that a technical subgroup may be required in future to ensure all technical aspects are considered.

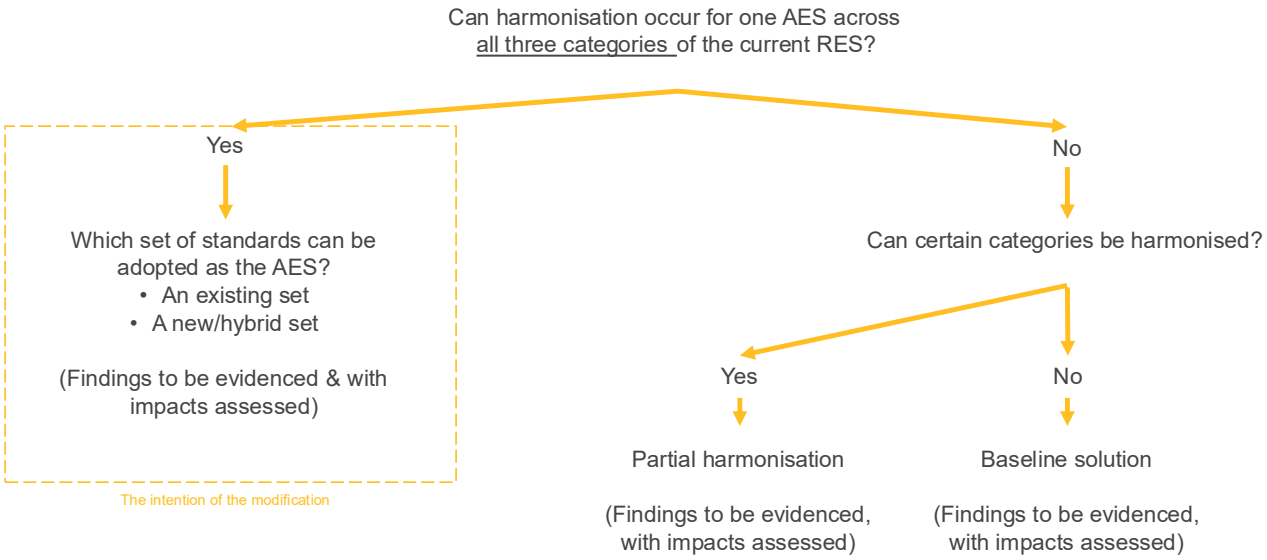
The Scope of the RES/AES

The Proposer outlined the intention of a subgroup would be to look at the technicalities of harmonisation and explore the feasibility of harmonisations of all categories of the current RES, taking into account good industry practice:

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

NESO shared the following graphic with members for clarity:

Figure 1 – Harmonisation Feasibility



The Proposer suggested that the subgroup should look first at the technical feasibility of harmonisation of all categories of the current RES. If this is shown to not be feasible, the Proposer raised the option for partial harmonisation, but confirming it was not the original intent of this modification.

Subgroup Formation

The Workgroup had a discussion regarding the purpose and outputs of a subgroup. This issue was initially raised towards the end of implementing the European Connection Network Codes (RFG, DCC and HVDC Codes) in circa 2017, where it was clarified that 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 subgroup would be to cover points 1) and 2) below, with the outputs of the subgroup 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 subgroup, and it was agreed that the GC0103 Workgroup would be put on hold for the duration of the subgroup work.

Subgroup Conclusion

A subgroup meeting was held on 10 August 2023 to assess the possibility of drafting a harmonised Electrical Standard. As a result, the TOs completed an unsigned draft of the Applicable Electrical Standards in November 2025 which can be found in **Annex 03**. It was noted by the TOs that this was evidence that harmonisation could be possible, and the Workgroup concurred with this.

Legacy Standards

The Grid Code currently cites outdated standards from 1999 or earlier (CC.6.2.1.2 (a)). The Workgroup proposed removing old timelines, linking electrical standards to General Conditions, and distinguishing between pre- and post-1999 standards while considering bilateral agreements. Legacy plants, some nearly a century old would continue to operate according to the standard applicable at the time they connected (subject to the asset not being substantially modified).

Technical Specifications and Definitions

The Workgroup discussed the use and definition of "technical specifications" versus "electrical standards." Concerns were raised about clarity. The Workgroup considered whether to reinstate or redefine the term "technical specification" or replace it with "technical standards" or "electrical standards" to avoid confusion and ensure consistent terminology across the relevant documents. The Workgroup agreed that the definition of “Technical Standards” and “Technical Specifications” was complex, with routes to Standards Committees such as the International Electrotechnical Commission (IEC) which is a science in itself. As part of the proposal, the NESO took an action to simplify the text and check with its Legal team that the NESO under its licence did not have an ongoing obligation to maintain an up to date list of Technical Specifications.

The Workgroup came to the conclusion that the intent of the Grid Code, was for NESO and Transmission Licensees only to be able to maintain the Relevant Electrical Standards and Applicable Electrical Standards.

Quality Assurance Requirements

The Workgroup discussed quality assurance requirements for Plant and Apparatus, debating whether to maintain current references to ISO 9000 and EN 45001 standards (CC.6.2.1.2 (d)). It was decided to keep the existing wording, emphasising NESO's role (in coordination with Transmission Licensees) confirming compliance rather than enforcing specific standards.

The Workgroup discussed whether NESO still needs to maintain and publish lists of technical specifications or electrical standards, given that there may be a requirement on NESO to maintain and these might be covered by current General Conditions. The legal text has been updated to clarify the requirements.

Workgroup Consultation Summary

The Workgroup held its Workgroup Consultation between 21 May 2025 – 12 June 2025 and received six non-confidential responses and zero confidential responses. The full responses and a summary of the responses can be found in **Annex 05**.

The respondents included representatives from five industry parties: Distribution Network Operator, System Operator, Transmission Owner, Generator and Storage User.

Implementation Approach: Four respondents supported harmonised standards, with one noting that since modifications began in 2017, further delays would negatively impact GB consumers. Another respondent opposed the current approach and suggested changes to clarify the use of 'Technical Standard'. One respondent was mixed; they backed harmonised standards but raised concerns about the lack of compliance requirements for Users and inconsistent legacy documents.

Draft Legal Text: Three respondents felt the legal text met its purpose. One noted, however, that the full list of Technical Specifications (CC6.2.1.2.b) is not maintained by the Company and highlighted multiple mentions of "Technical Specification" in the Grid Code. While generally appropriate, some uses may require review—such as NESO's requirement for all plant at a User's site to meet Technical Specifications and, within the busbar protection zone, to follow Electrical Standards. The respondent questioned whether this approach is suitable. Two other respondents said the legal text did not meet its intent and offered suggestions for improvement.

Post Workgroup Consultation Discussion

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

- Connection Conditions
- European Connection Conditions
- Glossary and definitions
- General Conditions
- Planning Condition

The Workgroup reviewed proposed updates to the legal text, aiming to clarify language for consistent application. The Workgroup agreed to simplify the legal text where possible and ensure that it was clear which standards applied and how changes could be proposed. The NESO representative responded that the amendment of 'User' in the legal text does not provide a restriction and is universal.

There was also a discussion about the transitional period between the Relevant Electrical Standard (RES) and Applicable Electrical Standards (AES) and how to handle legacy arrangements. With a suggestion to define the date of when RES will end.

Several edits were made to the legal text to enhance clarity and consistency regarding numbering and unnecessary text. The word "Only" was added to specific sections to clarify who could activate the Electrical Standard Procedure. They also discussed the need to ensure that the AES and RES governance arrangements were clear and not overly complicated.

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

Applicability to Offshore Areas: Concerns were raised about applying electrical standards to offshore connections, with suggestions to clarify that these standards apply to all parties connected at the Offshore Interface Point. Clear wording is needed to specify the standards' applicability to offshore connections interfacing with onshore transmission systems.

Bilateral Agreements and Standards: The Workgroup noted that while the Grid Code sets requirements, the specific electrical standards for users are defined in bilateral agreements rather than in the Grid Code itself.

AES Update and Alignment: A Workgroup member provided an update, stating that the TOs had addressed technical comments and were working on non-technical comments. The aim is to ensure that the AES document was ready for Panel review to align it with Ofgem's decision on GC0103.

Terms of Reference Overview

a) Implementation and costs; There are no real implementation costs other than the sunk costs of creating the new AES. Implementation will be straightforward for all new connections, with no implications on existing connections (page 8).
b) Review draft legal text should it have been provided. If legal text is not submitted within the Grid Code Modification Proposal the Workgroup should be instructed to assist in the developing of the legal text; The Workgroup has prepared and reviewed the legal text for this proposal – Page 21 and **Annex 04**.

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; The Code Administrator reached out to the stakeholder community prior to the start of the Workgroup along with the publication of the Workgroup consultation. As subgroup of TOs was established. The TO subgroup included appropriate TO experts and an industry consultant to be able to create a harmonised AES.
d) Consider EBR implications; Workgroup members concurred that there was no impact on the Electricity Balancing Regulation (EBR). Furthermore, all six respondents to the Workgroup consultation confirmed that this modification does not affect the EBR.
e) Consider any unintended consequences of the modification, including evidence of an impact assessment; The Workgroup acknowledged that obtaining detailed impact data from manufacturers is impractical due to confidentiality. The evidence provided, included examples and UK Government reviews like the Winser report, was considered sufficient to discharge the impact assessment requirement. (Page 10)
f) Consider the interaction between GC0103 and ongoing RES work; If this proposal is approved, then the RES will be frozen and should not require any future technical updates. The AES will be updated as required under the standard Grid Code governance for Electrical Standards.
g) Consider any cross code impacts, including any relating to CATOs and GC0159 in particular The Workgroup noted that the CATO Grid Code modification (GC0159: Introducing Competitively Appointed Transmission Owners) has been approved and will be included in the latest Baseline legal text.

What is the impact of this change?

Proposer's assessment against Code Objectives

Original Proposer's assessment against Grid Code Objectives	
Relevant Applicable Objective	**Identified impact**
(i) To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity;	**Positive** The proposed solution will allow the System Operator and Transmission Licensees to apply a consistent set of standards within the 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 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. 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*

Workgroup Vote

The Workgroup met on 08 September 2025 to carry out their Workgroup Vote. The full Workgroup Vote can be found in **Annex 06**. The table below provides a summary of the Workgroup Members view on the best option to implement this change.

For reference the Applicable Grid Code Objectives are:

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

** See Electricity System Operator Licence*

The Workgroup concluded by majority (7 out of 8 votes) that the Original better facilitated the Applicable Objectives than the Baseline.

Option	Number of voters that voted this option as better than the Baseline
Original	7

When will this change take place?

Implementation date

Within 10 Business Days of an Authority decision.

Date decision required by

TBC - The aim is to ensure that the AES document was ready for Panel review to align it with Ofgem's decision on GC0103.

Implementation approach

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

Interactions

☐CUSC	☐BSC	☐STC	☐SQSS
☐European Network Codes	☐ EBR Article 18 T&Cs[1]	☐Other modifications	☐Other

None identified.

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
CIM	Common Information Model
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

HVDC	High Voltage Direct Current
iDNO	Independent Distribution Network Operator
IEC	International Electrotechnical Commission
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 Central and Southern Scotland)
SSEN-T	SSE Networks Transmission (the TO for Northern Scotland)
SQSS	Security and Quality of Supply Standards
STC	System Operator Transmission Owner Code
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 Applicable Electrical Standards V1.0 (unsigned)

Annex 04	GC0103 Legal Text
Annex 05	GC0103 Workgroup Consultation Responses and Summary
Annex 06	GC0103 Workgroup Vote
Annex 07	GC0103 Workgroup Attendance Record
Annex 08	GC0103 Workgroup Action Log