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Workgroup Consultation

GC0139:

Enhanced Planning-Data Exchange to Facilitate Whole System Planning

Overview: *To increase the scope and detail of planning-data exchange between Network Operators and NESO to help facilitate the transition to a smart, flexible energy system.*

Modification process & timetable

1. **Proposal Form**
   12 February 2020
2. **Workgroup Consultation**
   17 December 2024 – 21 January 2025
3. **Workgroup Report**
   27 February 2025
4. **Code Administrator Consultation**
   05 March 2025 – 07 April 2025
5. **Draft Modification Report**
   24 April 2025
6. **Final Modification Report**
   06 May 2025
7. **Implementation**
   TBC

Have 5 minutes? Read our Executive summary
Have 20 minutes? Read the full Workgroup Consultation
Have 30 minutes? Read the full Workgroup Consultation and Annexes.

Status summary: The Workgroup are seeking your views on the work completed to date to form the final solution to the issue raised.

This modification is expected to have a:

High impact: National Energy System Operator, Transmission System Owners, and Network Operators (i.e., Distribution Network Operators and Independent Distribution Network Operators)

Medium impact: Power System Analysis Software Vendors

Low impact: Non-embedded and embedded customers.

Modification drivers: *System Planning, System Security and Transparency*

Governance route	Standard Governance modification with assessment by a Workgroup.	
Who can I talk to about the change?	**Proposer:** Ian Povey, Electricity North West Limited Ian.Povey@enwl.co.uk Phone: 07796 548166	**Code Administrator Chair**: Terri Puddefoot terri.puddefoot@nationalgrideso.com Phone: 07858 368991
How do I respond?	Send your response proforma to grid.code@nationalgrideso.com **by 5pm on 21 January 2025**	

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Executive summary

This modification seeks to increase the scope and detail of the planning-data exchange between Network Operators and NESO to help facilitate the transition to a smart, flexible energy system.

What is the issue?

The existing requirements of the Grid Code (in respect of data exchange between Network Operators and National Energy System Operator (NESO) are insufficient for the coordinated and efficient planning of their networks as the industry transitions into a smart energy system and distribution system for there operation activities.

To facilitate the efficient and coordinated planning of the Transmission System, NESO and Transmission Owners need a greater understanding of the quantity, type and impact of distributed energy resources connected to distribution networks.

To facilitate the efficient and coordinated planning of their distribution networks, Network Operators need a greater understanding of transmission system power flows and fault contributions in a variety of demand/generation scenarios.

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

Proposer's solution: An enhanced level of planning data exchanged between Network Operators and NESO; the data exchanged will largely be in the Common Information Model (CIM) format, supplemented by data in an Excel Workbook format. Data exchanges will take place twice a year for both the NESO and Network Operators.

Implementation date: It is proposed to implement the modification within 10 working days following approval by the Authority, with the new obligations taking effect from 1 January 2026.

What is the impact if this change is made?

This modification will require all Network Operators to have the capability to produce power system models in a CIM format, based on the Common Grid model Exchange Standard (CGMES) v3 standard with required extensions and deviations, to meet the data exchange requirements of the Planning Code. It will require the NESO to extend its current CIM capability to produce a power system model of the National Electricity Transmission System (NETS) or produce a bespoke NETS equivalent model for each Distribution Network Operator (DNO) in CIM format.

Whilst this represents a significant increase in workload the proposal represents the most efficient way to exchange the enhanced level of data exchange required as the industry transitions to a smart energy system and distribution system for there operation activities.

This modification will require the establishment of a CIM interface point agreement system.

This modification will also require the establishment of a CIM governance body for Great Britain.

A secure data exchange platform will be required to facilitate the exchange of data between all relevant parties.

Interactions

Key interactions are listed below. However further consideration was given to other codes and modifications and details of these are outlines in in the main Interactions section.

GC0117 interacts with this modification as it could drive a significant increase in the size and scope of the Network Operators models particularly if Large Generators are identified as 10MW in England & Wales.

CSMP434 – additional forecast data on future generation applications

GSR029 – alignment of definitions

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What is the issue?

The existing obligations set out in the Grid Code Planning Code in respect of data exchange between Network Operators and NESO are insufficient for the coordinated and efficient planning of their networks as the industry transitions to a smart energy system and distribution system for its operation activities.

Network Operators are experiencing an increasing volume of distributed energy resource (DER) connection applications. These connections include generation connections of differing technology and fuel type, electricity storage facilities and demand connections where their operators offer a demand side response service. These distributed energy resource connections present a new set of issues in relation to the planning and operation of the distribution network and transmission system than those traditionally experienced.

Similarly, the move away from coal fired generation towards large scale renewable and High Voltage Direct Current (HVDC) interconnector technology is changing the operation of and power flows on the transmission system. This presents a new set of issues to the planning and operation of distribution networks, particularly those distribution networks that connect across different Grid Supply Points.

Why change?

To facilitate the efficient and coordinated planning of the Transmission System, NESO and Transmission Owners (TOs) need a greater understanding of the quantity, type and impact of distributed energy resources connected to distribution networks.

To facilitate the efficient and coordinated planning of their distribution networks Network Operators need a greater understanding of transmission system flows and fault contributions within a variety of demand/generation scenarios.

It is essential that network companies have a detailed knowledge of adjacent connected networks. This modification will significantly improve the scope and detail of the planning data exchanged between Network Operators and NESO.

What is the solution?

Proposer's solution

This modification proposes:

- To introduce a new section to the Planning Code (PC.9) that describes the information to be provided by a Network Operator to NESO. The new PC.9 replaces the existing related PC obligations in respect of annual planning data submissions to the NESO.
- To introduce a new section to the Planning Code (PC.10) that describes the information to be provided by NESO to a Distribution Network Operator. The new PC.10 replaces the existing related PC obligations in respect of annual planning data submissions to Network Operators.
- To introduce a new appendix to the Planning Code (PC.G) that specifies the detail of the power system models in CIM format and associated documentation.
- To introduce new schedules in the Data Registration Code (DRC), describing the information provided by a Network Operator to NESO, that will support the data submissions

with forecasts of demand and generation at cardinal points in time. These new schedules will apply to Network Operators and replace the existing schedules.

- To introduce new defined terms to the Glossary and Definitions.
- That there will be 2 submissions a year by both Network Operators and NESO. These submissions will reflect the peak and minimum demands on the transmission system and connection points.
- That each submission will consist of a Power System Model (PSM) in CIM format, schedules, a PSM Scenario document and a PSM Changes Document.
- That the requirements of each submission as set out in Table 1 below, noting that the timeline differs from the current timeline as demonstrated in Table 2 below:

		Routine	As Needed
	Power System Model (PSM)	Week 2: Solved Subtransmission PSM for historic NETS minimum demand Week 28: Solved Subtransmission PSM for historic NETS peak demand	Evaluation of Transmission Impact assessment: Planned connections and updated network development projects
	Tabular	Week 2: Schedules: 21C, 21D, 21E, 23, 24, 25 & 26Week 28: Schedules: 21A, 21B, 22, 23, 27A, 27B, 27C, 28, 29A, 29B, 29C, 30A & 30B	
	Narrative	Week 2: PSM Scenario Document/PSM Change Document Week 28: PSM Scenario Document/PSM Change Document	
	Power System Model (PSM)	Week 12: Summer Solved NETS PSMs for 4 forecast grid conditions Week 38: Winter Solved NETS PSMs for 3 forecast grid conditions	Transmission Licensee-initiated modification: Planned connections/works and updated network development projects
	Narrative	Week 12: PSM Scenario Document/PSM Change Document Week 38: PSM Scenario Document/PSM Change Document	

Table 1

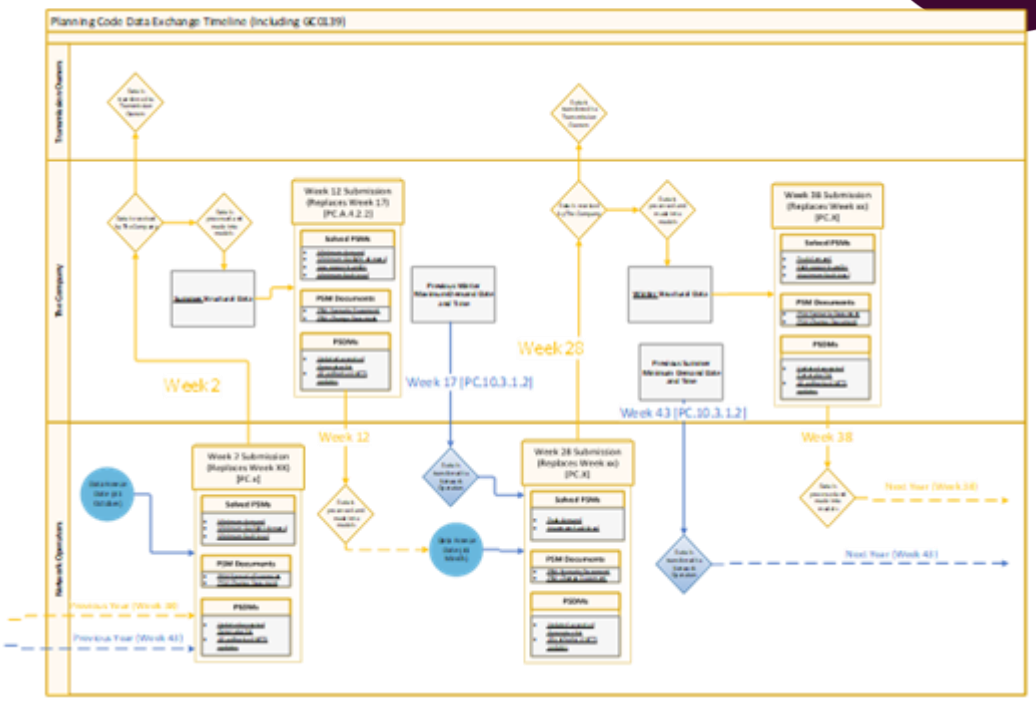

Table 2

- To support the Evaluation of Transmission Impact (ETI) assessment process with the provision of updates of accepted-to-connect connections and their associated changes to the PSM. The submitted power system models will be suitable for use in the ETI analysis.
- An enhanced level of planning data exchanged between Network Operators and NESO; the data exchanged to largely be in the CIM format.
- Network Operators, at weeks 2 and 28, to provide NESO with a switch level PSM in CIM format detailing the sub-transmission network and equivalents representing networks at the boundary between the sub-transmission network and networks operating at a lower voltage.
- That the lower voltage distribution network equivalents shall detail total demand at the boundary and the generation at the boundary. The generation at the boundary shall be aggregated by Energy source with existing generation detailed separately from generation that is accepted to connect but not yet connected.
- PSM in CIM format of the distribution network shall be provided for the following demand/generation scenarios:
    - NETS minimum Demand; and
    - NETS Peak Demand
- NESO, at weeks 12 and 38, to provide Network Operators with PSMs in CIM format of a switch level, single boundary representation of the transmission system.
- The physical extent of the representation of the transmission system shall be bounded by boundary nodes agreed between NESO and Network Operators.

- PSMs of the transmission system shall be provided for a number of demand/generation scenarios, as follows:
    - Maximum fault level;
    - Peak demand;
    - Summer minimum demand;
    - Solar-peak/daytime-minimum demand;
    - National high-power transfer dispatch scenario, and;
    - National low power transfer dispatch scenario.
- To align the data exchange requirements of the Weeks 2 and 28 data submissions with the those of an ETI.

Workgroup considerations

The Workgroup convened 22 times to discuss the perceived issue, detail the scope of the proposed defect, devise potential solutions and assess the proposal in terms of the Applicable Code Objectives.

Due to the complexity of the legal text a subgroup was created to develop the changes to the Planning Code and Glossary and Definitions. Subgroups were run in addition to Workgroups.

A detailed summary of work considered in the Subgroups and presented back to the Workgroup can be found in Annex 4.

Consideration of the proposer's solution

Data Exchange Options

The Workgroup considered 4 options (See annex 6) relating to Data Exchange:

Option 1 – Minimum number of CIM files, augmented with BSP Schedules to reflect all the forecast scenarios

Option 2 – All Cardinal Point Scenarios in CIM files

Option 3 – the use of Steady State Hypothesis (SSH) files which may be used reduce the need to either i) present different demand scenario data in excel spreadsheets (Option 1) or ii) reduce the number of CIM files that need to be exchanged (Option 2)

Option 4 – Minimum number of CIM files Augmented with GSP Schedules to reflect all forecast scenarios

Both the Proposer and Workgroup members showed preference to Option 4.

Work with the ENA's Data & Digitalisation Steering Group (DDSG)

The proposer worked with the DDSG's CIM subgroup to seek CIM technical expertise to help identify gaps in the CIM CGMES v3 standard compared to the new requirements of the PC. Following this, a tender was issued seeking companies that could undertake a gap analysis between the CGMES v3 CIM format (with extensions specified by Ofgem for the Long Term

Development Statement (LTDS)) and the requirements of the PC. Open Grid Systems (OGS) were the successful tender, which having supported Ofgem with their CIM work on the LTDS has provided useful background experience.

OGS assisted with further changes to Section 9 and 10 to ensure the language used was not only appropriate for engineering consumption but was also capable for translation into CIM syntax. This element of the work has necessitated several new definitions which are proposed in the Glossary and Definitions.

GB SQSS Review – GSR029

The workgroup was cognisant of the proposals of the GSR029 workgroup, to align SQSS with EREC P2. This modification, GC0139, has adopted definitions that aims to facilitate alignment of SQSS with EREC P2 and incorporated them into the Glossary and Definitions. PC.9 therefore requires reporting against these definitions, which are: Group Demand, Latent Demand, Measured Demand, Embedded Generation Export, Embedded Generation Import and Gross Demand. These updates were introduced to the Workgroup who were supportive of the changes made.

Implementation and Costs

The NESO estimated costs are outlined in Annex 5.

Network Operators are already working to implement the requirements of CIM and the Long-Term Development Statement (Distribution SLC25). It is estimated that implementation costs of GC0139 will partly be covered by the ongoing work on the Long-Term Development Statement. Annual preparation and reporting costs may increase compared to the current PC preparation, submission and reporting costs.

Governance Arrangements

To implement the proposals of this modification will require extensions to the scope of the current format of CGMES v.3. These extensions will need to be agreed by the Company and all Network Operators and implemented by the relevant software vendors. It is anticipated that future modifications to the PC requirements will need further extensions to CGMES. Hence there is a requirement for Governance arrangements for CIM within GB.

This requirement has already been identified by the working group that is implementing the requirements of the new Long Term Development Statement (Distribution SLC25). The Long-Term Development Statement working group has assumed the role of Governance body for an interim period however, arrangements are to be implemented to establish an enduring Governance body that will oversee CIM development in GB and seek international adoption with the International Electrotechnical Commission (IEC).

Consideration of other options

The early work considered an expansion of the current data exchange methodology using expanded spreadsheets. This option was rejected as requiring too much individual business development to both populate and consume the data on an initial basis. Funds would need to be regularly allocated to deal with changes. It was decided that the most efficient way to exchange the enhanced data reporting requirements would be through the exchange of PSMs in CIM format. NESO and Network Operators have other reporting requirements in CIM format so development of the CIM format represents efficient IT expenditure and provides the opportunity to better integrate with other relevant corporate IT systems to solve multiple requirements.

Consideration of alternatives

During the initial stages of the proposed change a possible alternative solution discussed by the workgroup was to:

- expand the Grid Code Planning Code (PC) obligations placed on Network Operators to include an enhanced level of planning data exchange and to retain the existing Excel Workbook format; and
- expand the PC obligations placed on the ESO to include an enhanced level of planning data exchange in an Excel Workbook format.

This solution could be implemented immediately, without the need to develop a CIM data exchange process, but was seen as highly inefficient and overly burdensome, particularly for NESO. Therefore, this was not formally raised as an alternative.

No formal alternatives have since been raised.

Draft legal text

The draft legal text for this change can be found in Annex 3.

What is the impact of this change?

Who will it impact? How will it impact them and when? What are the positive and negative impacts?

Proposer's assessment against Code Objectives

Proposer's assessment against Grid Code Objectives	
Relevant Objective	**Identified impact**
(a) To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity	**Positive** Reduces the time necessary to interpret data exchanges into working models and allows more detailed models than current methods allow.
(b) 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** Accurate network models and alignment with Evaluation of Transmission Impact (ETI) will enable efficient offers for generation and demand connections.

(c) 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** Enables more detailed models than current methods allow which should enable the system operator to reduce uncertainty.
(d) 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** Enables a more efficient exchange of information between licensees.
(e) To promote efficiency in the implementation and administration of the Grid Code arrangements	**Neutral** Implementation and administration of the Grid Code arrangements will remain unchanged by these proposals.

Standard Workgroup consultation question: Do you believe that GC0139 Original proposal better facilitates the Applicable Objectives?

When will this change take place?

Implementation date

It is proposed to implement the modification within 10 working days following approval by the Authority, with the new obligations taking effect from 1 January 2026.

Implementation approach

This modification proposal specifies that the enhanced data provision is triggered for the whole Distribution Licence area when an Appendix G to the BCA is established for one GSP within that Distribution Licence area.

Interactions

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

Impacted parties are NGESO, Transmission Owners and all Network Operators

STC

There is a possibility that there may need to be consequential changes made to the STC following this modification. It is therefore proposed that any change arising from this Grid Code modification to STCP 22-1 Production of Models for GB System Planning.

With TOs not being bound by the GC a change to ensure that the annual site compliance process, known as BO7, a requirement in the STC is required.

Notification to the STC Panel so that the necessary consequential changes can be made.

CUSC

There are two current CUSC modification proposals:

- CMP328 – Connections Triggering Distribution Impact Assessment
- CMP434 - Implementing Connections Reform

Consideration was given to the following modification which has now concluded

- CMP298: Updating the Statement of Works process to facilitate aggregated assessment of relevant and collectively relevant embedded generation (Now concluded)

It is not expected that these modifications will explicitly detail any data exchange requirements, however they may wish to reference, or repeat (in a form of statement) the data exchange requirement contained within the Grid Code.

Grid Code

- GC0117: Improving transparency and consistency of access arrangements across GB by the creation of a pan-GB commonality of Power Station requirements

SQSS

- GSR029: Review of Demand Connection Criteria to Align with EREC P2/7 - Group demand definition

Other

Distribution Standard Licence Condition 25 (SLC25) requires Network Operators to publish a Long Term Development Statement inclusive of PSM in CIM format.

How to respond

Standard Workgroup consultation questions

1. Do you believe that the Original Proposal and/or any potential alternatives better facilitate the Applicable Objectives?
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 GC0139 does not impact the Electricity Balancing Regulation (EBR) Article 18 terms and conditions held within the Code?

Specific Workgroup consultation questions

7. Do you agree that Option 4 represents to the best solution to providing an enhanced data exchange without a significant increase in the number of forecasting schedules exchanged?
8. Do you think that the proposed definitions will supply NESO and the TOs with sufficient data to discharge their license requirements confirming with respect to SQSS compliance?
9. This modification proposal relates to annual planning data exchanges only. The provision of data to support a new connection (PC.4) will remain unchanged and not directly supported with CIM models. This is because the data requirements within PC.4 are not covered by CGMES v3 and would require significant extensions not justified by the benefits. Do you agree with this position of the Workgroup?
10. Is the delivery timescale of January 2026 to transition to a CIM data exchange methodology reasonable and practically achievable?
11. Do you envisage that any costs would be incurred to implement these proposals over and above any changes associated with implementing other CIM data exchanges and those associated with the existing data exchanges?

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@nationalgrideso.com using the response pro-forma which can be found on the GC0139 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 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.

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Acronyms, key terms, and reference material

Acronym / key term	Meaning
BSC	Balancing and Settlement Code
BSP	Balancing Service Provider
BCA	Bilateral Connection Agreement
CGEMS	Common Grid Model Exchange Standards
CIM	Common Information Model
CUSC	Connection and Use of System Code
CMP	CUSC Modification Proposal
DDSG	Data and Digital Steering Group
DRC	Data Registration Code
DER	distributed energy resource
DNO	Distribution Network Operator
EBR	Electricity Balancing Guideline
EREC	Engineering Recommendation
ETI	Evaluation of Transmission Impact
GB	Great Britain
GC	Grid Code
GSP	Grid Supply Point
HVDC	High Voltage Direct Current
IEC	International Electrotechnical Commission.
LTDS	Long Term Development Statements
NETS	National Electricity Transmission System
NESO	National Energy System Operator
OGS	Open Grid Systems
PC	Planning Code
PSM	Power System Model
SQSS	Security and Quality of Supply Standards
SSH	Steady State Hypothesis

STC	System Operator Transmission Owner Code
T&Cs	Terms and Conditions
TO	Transmission Owner

Reference material

- Open Networks Workstream 1B Product 4 report: Data Exchange in Planning Timescales; Data Scope – Final Report (22 pages)
- Enhanced Schedule 11 (Excel workbook with 5 spreadsheets)
- Schedule 5 – Enhanced Node Data V2 (Excel workbook with 4 spreadsheets)
- Ofgem Open Letter - The Common Information Model (CIM) regulatory approach and the Long Term Development Statement (10 January 2022)

Annexes

Annex	Information
Annex 1	Proposal form
Annex 2	Terms of reference
Annex 3	Draft Legal Text
Annex 4	GC0139 Consultation Presentation Slides
Annex 5	GC0139 NESO Costs and Implementation
Annex 6	GC0139 Data Exchange Option
Annex 7	DRC Schedules