Public

CMP432 Improve Locational Onshore Security Factor for TNUoS Wider Tariffs

Workgroup 1 (29 January 2025)

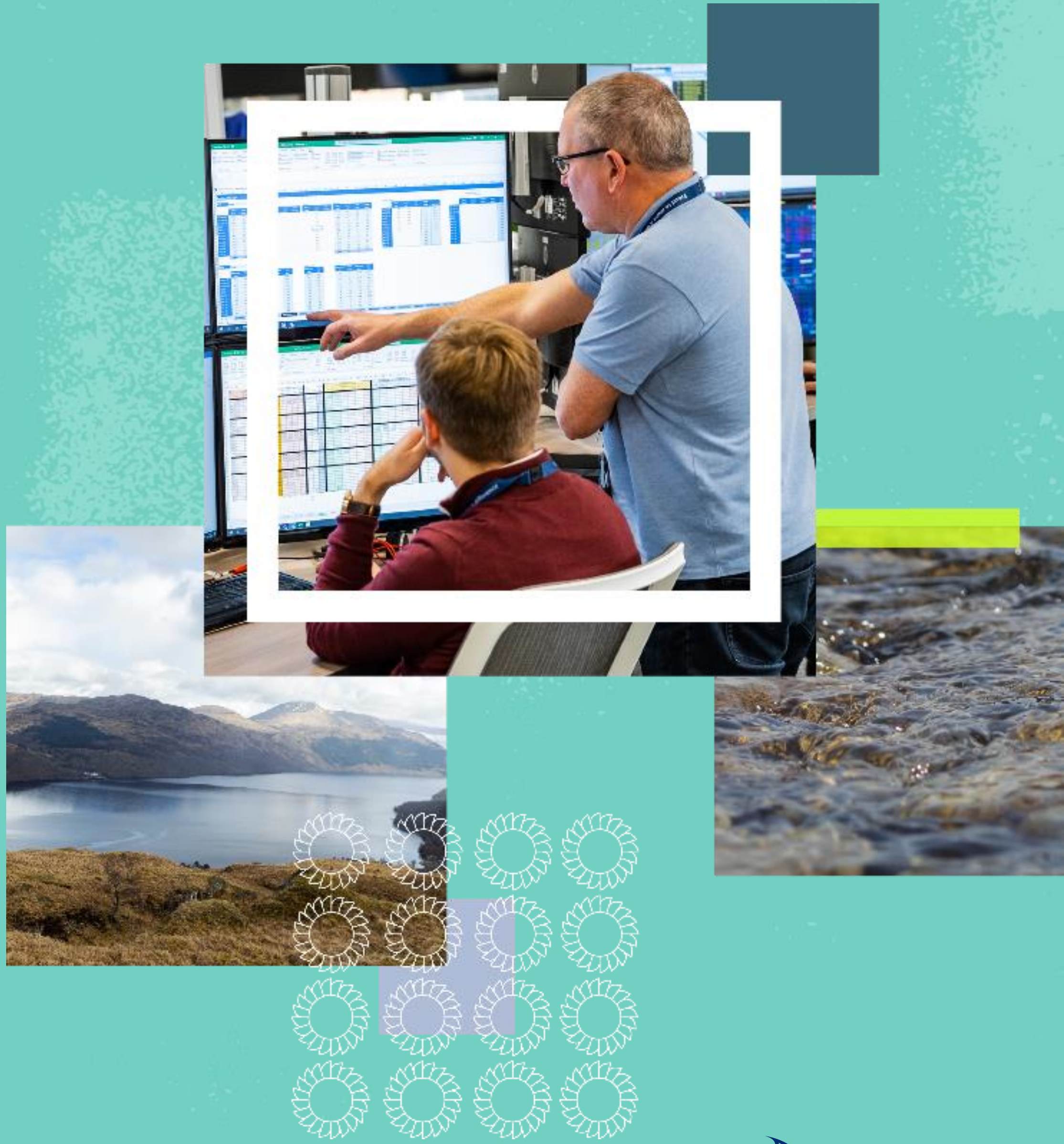
Online Meeting via Teams

NESO National Energy System Operator

CUSC Modification Proposal CMP432

Improve "Locational Onshore Security Factor” for TNUoS Wider Tariffs

January 2025



Rationale for TNUoS Charges

"The underlying rationale behind Transmission Network Use of System charges is that efficient economic signals are provided to Users when services are priced to reflect the ***incremental costs*** *of supplying them."*

(CUSC 14.14.6 – underlying rationale behind TNUoS Charges)

SQSS requires that MITS Transmission network is already sufficiently secure, so:

...if additional MITS network capacity does not require additional redundancy for security

...Then TNUoS Wider locational price signal should not charge for additional redundancy for security

Empirical example: Future incremental network looks a lot like West Coast Bootstrap (Beyond 2030)

West Coast Bootstrap

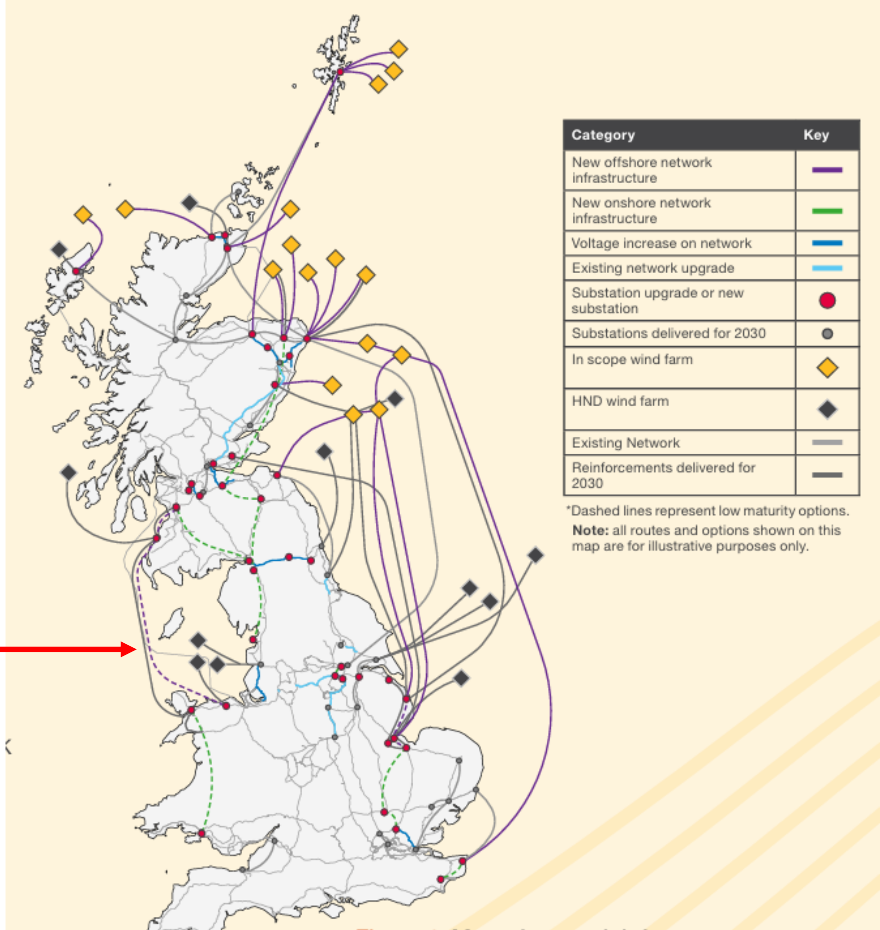
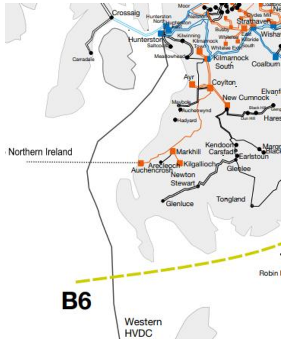


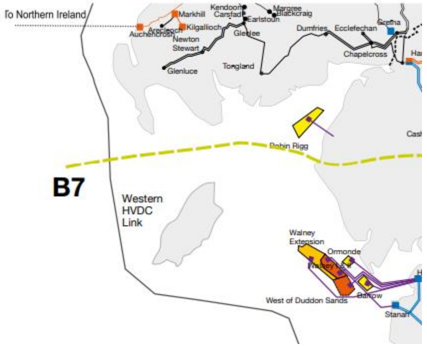
Figure 1. Map of network infrastructure to be delivered beyond 2030

https://www.neso.energy/document/304756/download

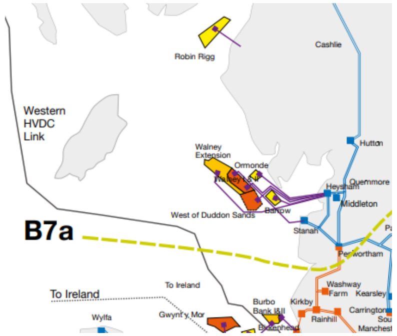
Empirical example: West Coast Bootstrap (ETYS)



- **B6 –** ‘the boundary capability has increased to 5.7GW compared to last year due to the addition of the new Western HVDC circuit and upgrade of cables at Torness.’



- **B7 –** ‘the boundary capability has increased to 6.5GW compared to last year due to the addition of the new Western HVDC circuit.’



- **B7a –** ‘the boundary capability has increased to 8.7GW compared to last year due to the addition of the new Western HVDC circuit.’

Zone	Boundary Transfer Capability 2017 (GW) [1]	Boundary Transfer Capability 2018 (GW) [2]	Change in Boundary Transfer Capability (GW)	Bootstrap Capacity 2018 (GW)	Implied incremental Security Factor 2018
B6	3.5	5.7	2.2	2.2	1.00
B7	4.3	6.5	2.2	2.2	1.00
B7a	6.0	8.7	2.7	2.2	0.81

1 https://www.neso.energy/document/102616/download

2 https://www.neso.energy/document/133836/download

Additional questions from Terms of Reference "b"

Consider the methodology for calculating the security factor (Locational Onshore Security Factor Section 14.15.88 – 14.15.90)

14.15.88 The locational onshore security factor for everything other than Identified Onshore Circuits is derived by running a secure DCLF ICRP transport study of the network excluding local circuits and Identified Onshore Circuits based on the same market background as used for Zoning in the DCLF ICRP transport model. This calculates the nodal marginal costs where peak net demand can be met despite the Security and Quality of Supply Standard contingencies (simulating single and double circuit faults) on the network. Essentially the calculation of secured nodal marginal costs is identical to the process outlined above except that the secure DCLF study additionally calculates a nodal marginal cost taking into account the requirement to be secure against a set of worse case contingencies in terms of maximum flow for each circuit.

- **SECULF measures existing average conditions, not incremental conditions. If incremental conditions are different, then the SECULF model is irrelevant**
- **SECULF currently uses the Year Round background due to largest flow, but YR background is about bulk energy and CBA trade-off between network vs constraints, not demand security, so wrong background for measuring security**

14.15.89 For the purposes of 14.15.88 the secured nodal cost differential is compared to that produced by the DCLF ICRP transport model and the resultant ratio of the two determines the locational security factor using the Least Squares Fit method. Further information may be obtained from the charging website.

- **The measured ratio of secured to unsecured MWkm is different from redundant network capacity built for security, so the answer does not mean what it claims to mean**

14.15.90 For the purposes of 14.15.88 the locational onshore security factor, derived in accordance with paragraphs 14.15.88 and 14.15.89 and expressed to eight decimal places, is based on an average from a number of studies conducted by The Company to account for future network developments. This security factor is reviewed for each price control period and fixed for the duration. The locational onshore security factor which is currently applicable, is detailed in The Company's Statement of Use of System Charges, which is available from the Charging website.

- **Action: Ask NESO to share the SECULF model, so WG can consider it**
- **Action: Ask NESO publish the historical working calculations behind these studies beyond simply the final answer**

14.15.90A An Identified Onshore Circuit shall be defined as a single transmission HVDC subsea circuit or a single transmission AC subsea circuit between two MITS Nodes where there is only one route for the power to flow between the two MITS Nodes. The expansion factors for Identified Onshore Circuits are adjusted by dividing the applicable expansion factor for the Identified Onshore Circuits, calculated as per Sections 14.15.70 to 14.15.77, by the locational onshore security factor calculated in 14.15.90. When the locational onshore security factor is applied as per Section 14.15.94 and 14.15.95, this would result in an effective locational onshore security factor for Identified Onshore Circuits of 1.0.

- **This solution still has a defect: There may be zero redundancy for security purposes, even if there is more than "one route". So there is a risk that when a second route is added, that the circuit will cease to be "identified" and its Security Factor will inappropriately (non cost reflective) revert to the standard locational onshore security factor**

Link to: Guidance on TNUoS Locational Onshore Security Factor Calculation December 2020 - download

Additional questions from Terms of Reference

Further objectives of the Charging Methodology set out in Section 14. 14.11

"14.14.11 In setting and reviewing these charges The Company has a number of further objectives. These are to:

• offer clarity of principles and transparency of the methodology;

• inform existing Users and potential new entrants with accurate and stable cost messages;

• charge on the basis of services provided and ***on the basis of incremental rather than average costs****, and so promote the optimal use of and investment in the transmission system; and*

• be implementable within practical cost parameters and time-scales." [emphasis added]

- ***SECULF model measures average, not incremental***

Industry Feedback for consideration – in TOR

Following discussions with TNUoS Task Force, TCMF, ESO

1) What if reinforcement was a larger capacity circuit, compared with the previous, increasing the fault condition ? (TOR "c")

- If the fault condition increased, much of the new circuit will be held in reserve, so limited benefit from the increased capacity. This naturally limits the capacities of new circuits included in network design, so this is not an issue for long-run price signal.
- There will be occasions when an additional circuit may release **more** transfer capacity than just the specific circuit itself.
- Changing fault conditions should **not** be part of a long-run marginal cost signal.

2) What if reinforcement was achieved by upgrading an existing circuit to a larger capacity, therefore increasing the fault condition? (TOR "d")

- The decision to upgrade instead of building new (e.g. reconductoring) is primarily driven by ongoing maintenance considerations.
- Also see answer to Question1 above

3) Do some types of technology require additional MITS redundancy, e.g. large inflexible conventional such as nuclear? (TOR "e")

- Flexible generation, e.g. wind, require relatively low redundancy, as network outages can be managed through constraints and intertrip contracts
- Security Factor could be charged differently between the Peak-Security versus Year-Round backgrounds
- Consider if security should be applied to charges differently for different technologies and/or backgrounds

4) What evidence is there that the current Security Factor is reflective of how TOs make network reinforcement decisions (TOR "f")

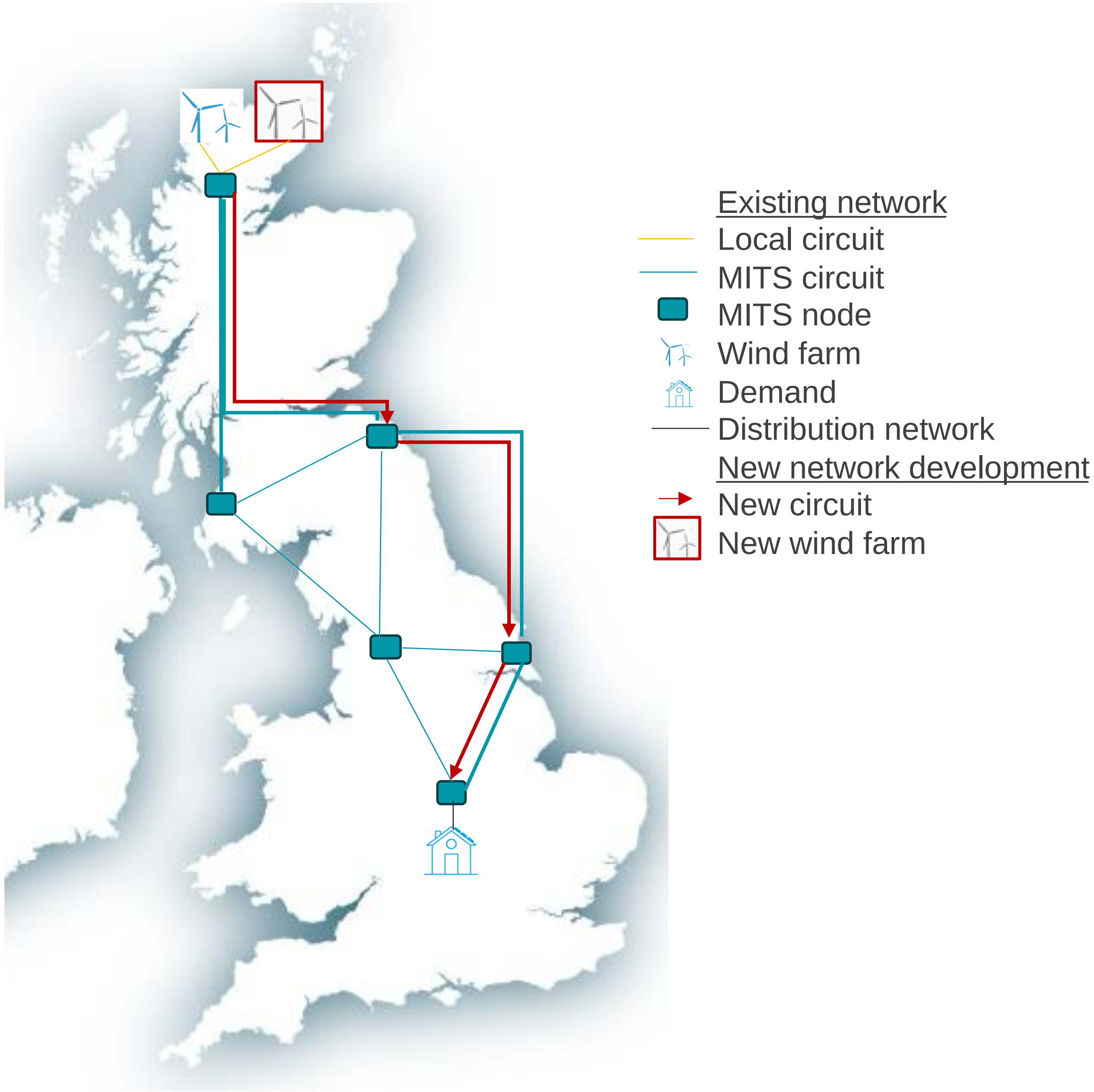
- To be considered by the workgroup
- Action: request WG support from NESO NOA team (or other relevant experts) and Tos

Illustrative Reinforcement for Additional Generation

New wind farm:
+1GW transfer capacity

Economic reinforcement:
+1GW across the network

Transport model assumes:
+1.76GW across the network



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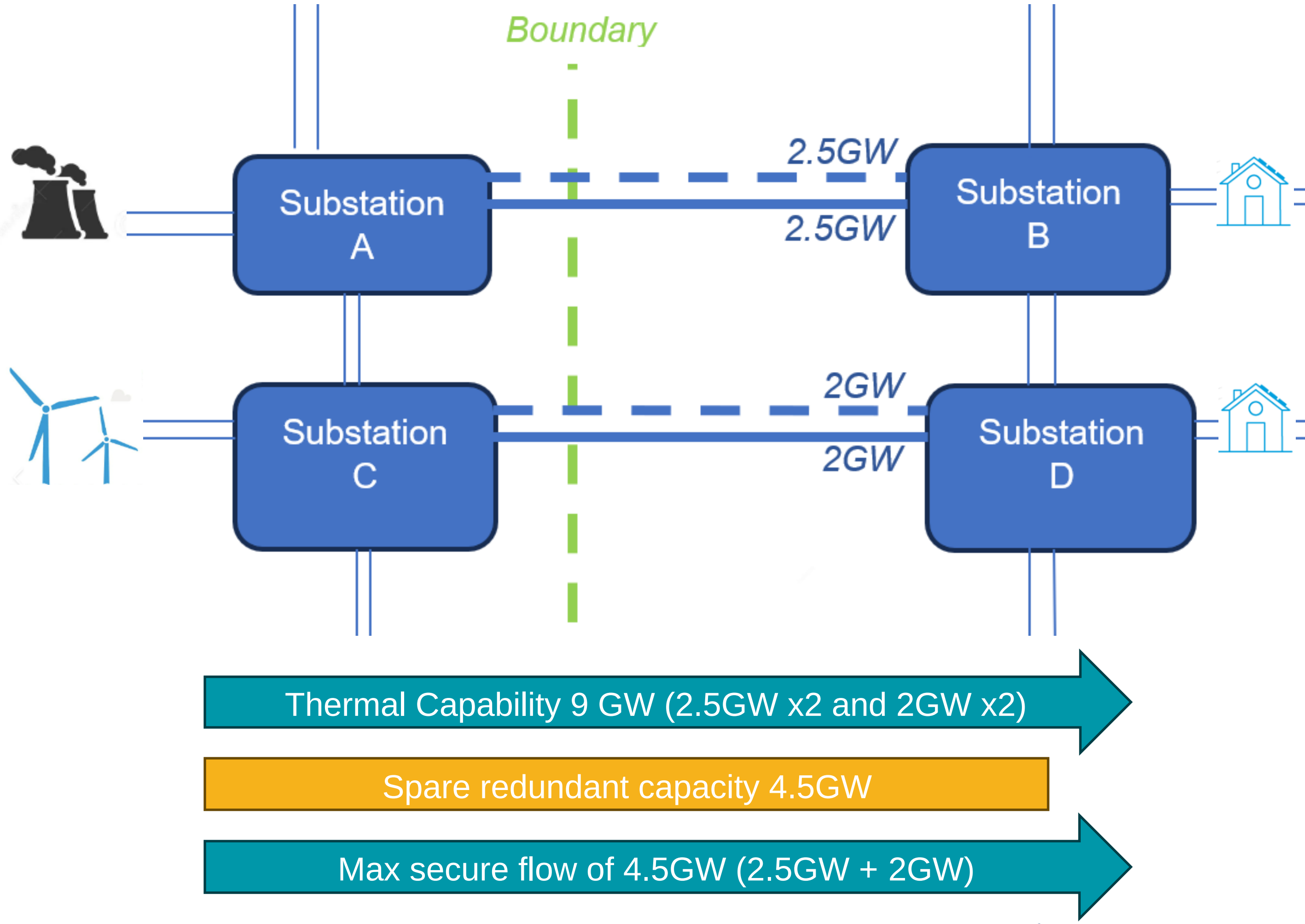
What is the issue?

SQSS says: MITS network is already sufficiently secure

SQSS

TOs plan network additions using SQSS criteria
Surplus capacity is required in case of faults or outages including:

- *"N-2" : Outage on two largest separate circuits*
- *Boundary is initially secure*



TO = Transmission Operator
SQSS = Security and Quality of Supply Standard

What is the issue?

A difference between how networks are planned & how the TNUoS model forecasts this

Required redundant surplus capacity is an <u>absolute number in MW</u>

If current MITS boundary is already secure, new circuits don't cause need for additional redundancy for security

Although if new circuit is larger than previous worst case fault, then some additional security measures may be needed

TNUoS charging model applies the Security Factor as <u>a multiplier</u> to <u>all new circuits</u>

For every new circuit, an additional 1.76 times that is assumed to be required and built

Note: Some circuits only have a factor of 1 applied, for example some remote island links and some local circuits

- **Issue**: TNUoS Security Factor for Wider charges is **<u>not cost reflective</u>** of network planning
- **Solution:** TNUoS Transport model treatment of incremental redundancy should be more cost reflective

CMP432 Workgroup Consultation Responses Review

Question	Number of Respondents			
	Objectives	Yes	No	N/A or No response
Do you believe that the Original Proposal better facilitates the Applicable Objectives?	A	12	1	8
	B	11	2	8
	C	7	6	8
	D	1	11	9
	E	10	2	9
Do you support the proposed implementation approach?		11	7	3
No respondents raised Workgroup Alternative Requests during the Workgroup Consultation.				
No respondents indicated that they disagreed 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 CUSC.				

CMP432 Workgroup Consultation Responses Review

Key Points

- There were mixed views from respondents as to whether the Original Proposal better facilitates the CUSC charging objectives and whether they support the implementation approach.
- Some respondents noted they did not support the modification.
- Some respondents indicated concern that the work required for this modification may not be possible within the current urgent timeline.
- There are concerns about the time needed to properly assess the role of the SECULF model.
- Some respondents believe that removing the Security Factor would enhance competition, improve cost reflectivity, support climate goals, and streamline the charging methodology.
- Some respondents provided arguments for increasing the security factor above 1.76.
- Some respondents believe that the Proposal addresses the steep gradient of charges between the North and South of GB, promoting fairer competition and better CfD strike prices for consumers.
- There are concerns about the complexity and volatility in TNUoS charging, and some believe the proposal will remove this complexity and reduce the volatility and uncertainty in TNUoS charging.
- Some respondents believe that the proposal will better align with how transmission capacity is planned and added in the near and medium term.
- A Respondent suggested a workbook of impacts should be provided for all code modification consultations to enable proper assessment
- A concern was raised about the significant increase in tariffs for northern generators in the 10-year TNUoS projections by NESO, which threatens existing generators and hinders investment
- A Respondent noted they do not support the current charging methodology, as they believe it disincentivises locational signals and is both inefficient and inappropriate

NESO
National Energy System Operator