Grid Code Modification Proposal Form

GC0160: Grid Code Changes for BSC Mod P448 -

"Protecting Generators subject to Firm Load Shedding during a Gas Supply Emergency from excessive Imbalance Charges"

Overview: The BSC Modification proposes to address the risk of Generators in GB being prevented from generating this winter (due to Firm Load Shedding during a Gas Supply Emergency) by allowing such Firm Load Shedding instructions to be settled as Bids. As a result, and in order to ensure consistency between the BSC and the Grid Code, this Modification seeks to ensure that the actions of the affected party in terms of Physical Notifications are aligned.

Modification process & timetable

1. **Proposal Form** — 28 September 2022
2. **Workgroup Consultation** — 06 October 2022 - 10 October 2022
3. **Workgroup Report** — 14 October 2022
4. **Code Administrator Consultation** — 15 October 2022 - 15 November 2022
5. **Draft Final Modification Report** — 17 November 2022
6. **Final Modification Report** — 17 November 2022
7. **Implementation** — 1WD after Authority Decision

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

This modification is expected to have a: High impact on Generators and a medium impact on the ESO.

Modification drivers: Cross Code change and System Security

Proposer's recommendation of governance route	Urgent modification to proceed under a timetable agreed by the Authority (with an Authority decision)

Who can I talk to about the change?	**Proposer:** Garth Graham garth.graham@sse.com 01738 456000	**Code Administrator Contact:** Milly Lewis Milly.Lewis@nationalgrideso.com 07811036380

Contents

What is the issue?

Russia's turning off of the Nord Stream 1 gas[1] supply to Western Europe as a result of the Ukraine War, and the post-covid demand for gas, has recently significantly increased the risk of gas shortages during winter 2022/23. Given the interconnected nature of the gas market, this in turn increases the risk of gas shortages in Great Britain.

There is therefore a credible risk that Great Britain could be subject to one or more gas emergency scenarios during this winter. If this happens then gas supplies to the largest gas consumers with firm rights to gas may be curtailed – i.e. prevented from taking gas - for reasons of safety on the gas system. Gas fired power stations are some of the largest consumers of gas in Great Britain and therefore would expect to be some of the first sites to have their gas curtailed.

If these power stations have sold their power ahead of time through forward trading but are prevented from generating to deliver these volumes by a gas curtailment, then generators could be exposed to large volumes of electricity imbalance charges (plus the associated credit requirements). It is also likely that in these circumstances the ESO would have to instruct other plant or demand side response to make up for the lost gas plant volumes, which could drive very high or indeed extreme levels of imbalance prices. The combination of high volumes of imbalance at extreme imbalance prices could be sufficient to cause generators to become insolvent, which would increase risks to security of supply.

In order to seek to manage this substantial risk, generators can only avoid putting themselves in the position of being exposed to such imbalances. The only way they can do this is to avoid contracting ahead of time either in forward timescales or even in day ahead markets. Indeed, the only way a generator can eliminate this substantial risk is to present their volume in the Balancing Mechanism so that any volumes generated are paid for on delivery and not open to imbalance risk. This inevitably reduces liquidity in traded markets to the disadvantage of all trading parties.

In order to demonstrate the possible size of the issue, and the potential threat to generators and system security, it is worth considering the approach that is likely to be taken when gas is curtailed under a gas emergency. The priority in such an emergency will be to prevent the disconnection of domestic customers' gas. Therefore, demand customers with lower priority will be taken off first. In order to maximise the effectiveness of these actions, customers are likely to be taken off in order of size.

Generators make up a large proportion of the largest gas customers in GB and will therefore likely be the first customers to be curtailed, again in order of size. By way of example, if we look at the 10 largest gas fired power stations[2] represent a total capacity of around 12.8GW of capacity, meaning that their average size is around 1.28GW. The largest of these is 2.2GW and the smallest around 900MW.

The table below shows the status quo situation and the potential sort of imbalance costs which could be incurred if these stations were to be fully contracted and then curtailed for 24 hours. It does so on the basis of three levels of imbalance price: £3,000/MWh,

[1] For the avoidance of doubt, the references in this proposal to 'gas' is to natural gas.
[2] Based on the NETSO's published TEC Register.

£6,000/MWh and £9,000/MWh. The first has been chosen as it is similar in size to the offer prices which were experienced on occasion last winter (2021/22), the second as it is the current level of the Value of Lost Load (VoLL) and the third as it is around the level of the price at which some actions were taken by the ESO on 20 July 2022, albeit in these circumstances for (electricity) system purposes. It would not be unrealistic to assume that, in a period when there is a significant shortage in the supply of gas leading to gas curtailment of CCGTs etc., that there could also be significant scarcity in the electricity market too, and that actions around these sorts of levels may be accepted and go on to set imbalance prices. This could particularly be the case if customers are curtailed at prices factoring in their particular values of lost load, or if system to system trades are taken over interconnectors.

		Imbalance Price		
	MW	£3,000/MWh	£6,000/MWh	£9,000/MWh
Max	2200	£158.40m	£316.80m	£475.20m
Average	1280	£92.16m	£184.32m	£276.48m
Min	900	£64.80m	£129.60m	£194.40m

Table 1: Illustrative Imbalance exposure for each 24 hours' curtailment at full output.

Although the above table may show the worst case scenario for a single power station by assuming that all of its capacity is contracted for the whole day, in reality generators might have multiple stations curtailed and / or the gas emergency could run for several days, or indeed weeks, during which significant imbalance exposures could accrue. Therefore, it is clear that gas fired generators in GB face a potentially significant risk associated with gas (safety) emergency actions.

In the event that an imbalance situation did arise for the generator, and noting the illustrative quantum(s) set out in the table above, this would also be expected to quickly result in a substantial credit call arising (absent the BSC Modification) which could place the affected generator into default and thence to exit the market with the resulting market liquidity impacts noted above as, for example, has been seen with the Calon Energy market exit[3]. Furthermore, in the event that the affected generator went into payment default, then the resulting shortfall would rest with other (BSC) parties, which would also be detrimental to those (BSC) parties.

The Gas System Operator (GSO) is National Grid Gas. In the event of an expected shortfall in available gas (such as for the reasons noted above in terms of the Ukraine situation), that has a potentially detrimental effect on gas pressures within the pipelines in GB, then this will lead to the GSO, in close cooperation with the Network Emergency Coordinator (NEC), taking action in accordance with the Gas Safety Management Regulations[4] to address a significant (gas) safety concern which, at a high level, includes both a Stage 1 and a Stage 2 situation. It is only at Stage 2 that the (gas) load shedding would be applied to the largest gas users which, in respect of this Modification, concerns gas fuelled generators in GB.

[3] Calon Energy's UK gas plants put in 'dormant state' by administrators - Energy Live News
[4] A guide to the Gas Safety (Management) Regulations 1996. Guidance on Regulations - L80 (hse.gov.uk)

Why change?

For the reasons set out above, there are likely to be imminent changes needed to be made to the Grid Code as a consequence of the likely solutions primary BSC Modification. These changes are required to ensure that the substantial risks for gas fuelled generators in the event of gas curtailment are addressed.

What is the proposer's solution?

The solution, which is limited to a gas curtailment situation, is that the Physical Notification(s) (PN) submitted by a gas fired generator,(subject to interrupted gas supplies to the site by firm load shedding during a gas deficit emergency interruption) shall, throughout the gas interruption, in the reasonable view of the User, reflect the expected output of the unit as at the time just prior to the start of the gas interruption. That is, the PN would reflect what the affected generator would have notified had the gas not been interrupted.

This shall take into account the amount of power already sold for delivery during the period of (gas) interruption by the User at the time of the start of the (gas) interruption and, if relevant, the relative efficiency of any (gas) interrupted unit compared with other non-interrupted (gas) units that would also be expected to deliver the power sold.

The PNs of any interrupted unit shall, for the duration of the (gas) interruption, not be increased as a result of any power sold after the start of the (gas) interruption but may be reduced as a result of any mitigating actions taken by the relevant User.

Changes to the Grid Code will be dependent on the solution of the BSC modification P448.

Draft legal text

This is expected to follow in due course but, based on the solution noted above, it is expected to be limited in nature.

What is the impact of this change?

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** In the view of the Proposer this Modification will better facilitate Applicable Grid Code Objective (a), as it will allow the ESO to operate the NETS more efficiently, economically and in a more coordinated manner by continuing to have the affected plant available after a GDE situation.
(b) Facilitating effective competition in the generation and supply of electricity (and without limiting the foregoing, to	**Positive**

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);	In the view of the Proposer this Modification will better facilitate Applicable Grid Code Objective (b), by promoting liquidity in traded markets in timescales running up to real time.
(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** In the view of the Proposer this Modification will better facilitate Applicable Grid Code Objective (c) as this change will facilitate the affected generators continuing to participate in the market and operate for system stability purposes in light of a GDE.
(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	**Neutral**
(e) To promote efficiency in the implementation and administration of the Grid Code arrangements	**Neutral**

Proposer's assessment of the impact of the modification on the stakeholder / consumer benefit categories	
Stakeholder / consumer benefit categories	**Identified impact**
Improved safety and reliability of the system	**Positive** Due to the mitigation of the risk to the security of supply in the electricity market through generators becoming insolvent due to extremely high imbalance charges and credit requirements.
Lower bills than would otherwise be the case	**Positive** Due to the mitigation of the risk that the reduced liquidity of the market would significantly increase wholesale electricity prices, which would be passed on to consumers.
Benefits for society as a whole	**Positive** The 'Benefits for society as a whole' consumer benefit is due to a combination of the 'Improved reliability and safety' and 'Lower bills than would otherwise be the case' consumer benefits described above.
Reduced environmental damage	**Neutral**
Improved quality of service	**Neutral**

When will this change take place?

Implementation date
To follow the timetable proposed in the BSC Modification, 1 Working Day after an Authority Decision.

Date decision required by

The Proposer recommends the following the BSC modification timetable**:**	
Modification presented to Panel	29 September 2022
Submitted to Authority for decision on urgency	29 September 2022
Modification Work Group #1	4 October 2022
Industry Consultation	5 – 11 October 2022
Modification Work Group #2	12 October 2022
Urgent Modification & EBR Consultation (calendar month)	13 October - 12 November 2022
Modification Work Group #3	14 November 2022
Draft Urgent Modification Report presented to Panel	15 November 2022
Final Urgent Modification Report submitted to Authority	16 November 2022
Authority Decision received	18 November 2022
Implementation	21 November 2022

Implementation approach
Changes to internal systems / procedure of the affected generator(s).

Proposer's justification for governance route
Governance route: Urgent modification to proceed under a timetable agreed by the Authority (with an Authority decision)

Considering Ofgem's Urgency Criteria, we believe that this Modification should be treated as urgent because the solution needs to be in place at the earliest opportunity before winter 2022-23.

Ofgem's Urgency Criteria (a) **A significant commercial impact on parties, consumers, or other stakeholder(s)**

This is evidenced, in respect of the significant commercial impact, by the quantum(s) shown in the table in Section 1 above.

Ofgem's Urgency Criteria (b) **A significant impact on the safety and security of the electricity and/or gas systems**

In terms of the significant impact on the security of the electricity system this is evidenced by what can be expected, should the proposed solution not be taken forward, if a GDE situation arises and the affected generators are (due to the resulting imbalance cost /

associated credit cover) placed into Administration/ Liquidation / Receivership as these types of appointed organisation(s) are highly unlikely to be able to maintain the plant within the marketplace in the short to medium term (see, for example, Calon Energy administration[5] situation – which, to be clear, did not arise from a GDE) when gas supplies are restored with the associated detrimental impact on security of the electricity system (as well as detrimental effect on the marketplace).

Interactions

☐CUSC	☒BSC	☐STC	☐SQSS
☐European Network Codes	☒ EBR Article 18 T&Cs[6]	☐Other modifications	☐Other

There is an interaction with the BSC Modification being raised which is titled "Protecting Generators subject to Firm Load Shedding during a Gas Supply Emergency from excessive Imbalance Charges"

Acronyms, key terms and reference material

Acronym / key term	Meaning
BSC	Balancing and Settlement Code
CUSC	Connection and Use of System Code
EBR	Electricity Balancing Regulation
GC	Grid Code
GSO	Gas System Operator
GDE	Gas Deficit Emergency
NEC	Network Emergency Coordinator
PN	Physical Notification(s)
STC	System Operator Transmission Owner Code
SQSS	Security and Quality of Supply Standards
T&Cs	Terms and Conditions
VoLL	Value of Lost Load

Reference material

- Add links to reference material

[5] Calon Energy's UK gas plants put in 'dormant state' by administrators - Energy Live News

[6] If your modification amends any of the clauses mapped out in Annex GR.B of the Governance Rules section of the Grid Code, it will change the Terms & Conditions relating to Balancing Service Providers. The modification will need to follow the process set out in Article 18 of the Electricity Balancing Regulation (EBR – EU Regulation 2017/2195). All Grid Code modifications must be consulted on for 1 month in the Code Administrator Consultation phase, unless they are Urgent modifications which have no impact on EBR Article 18 T&Cs. N.B. This will also satisfy the requirements of the NCER process.