





GC0147:









Mod Title: Last resort disconnection of Embedded Generation – enduring solution

01	Proposal Form
02	Workgroup Consultation
03	Workgroup Report
04	Code Administrator Consultation
05	Draft Grid Code Modification Report
06	Final Grid Code Modification Report

Purpose of Modification: This modification seeks to clarify the enduring arrangements for emergency instructions that the ESO can issue to Distribution Network Operators (DNOs) to disconnect embedded generators, as a last resort in an emergency situation and after having exhausted all other commercially available options.

It is required to replace the temporary solution which was implemented on 7 May 2020 via Grid Code modification GC0143, and which expires on 25 October 2020. That modification was treated as urgent due to the unprecedented societal changes brought about by the COVID-19 pandemic which had led to demands out-turning up to 20% lower than predicted, increasing the need for the ESO to have access to an unambiguous last resort action to use in an emergency.

	<p>The Proposer recommends that this modification should be:</p> <ul style="list-style-type: none"> Assessed by a Workgroup <p>This modification was raised on 14 July 2020 and will be presented by the Proposer to the Panel on 30 July 2020. The Panel will consider the Proposer’s recommendation and determine the appropriate route.</p>
	<p>High Impact:</p> <ul style="list-style-type: none"> ESO in operating the system DNOs in potentially being required to take emergency actions Embedded generators which may be disconnected under emergency conditions Consumers in preventing security of supply issues
	<p>Medium Impact</p> <ul style="list-style-type: none"> Other Grid Code parties not directly impacted by the need to take emergency actions
	<p>Low Impact</p> <ul style="list-style-type: none"> None

Contents		 Any questions?
1	Summary	4
2	Governance	5
3	Why Change?	6
4	Code Specific Matters	8
5	Solution	8
6	Impacts & Other Considerations	9
7	Relevant Objectives	10
8	Implementation	10
9	Legal Text	11
10	Recommendations	11
11	Modification guidance and using this template	Error! Bookmark not defined.
Timetable		
<i>The Code Administrator will update the timetable.</i>		
The Code Administrator recommends the following timetable: <i>(Timetable to be agreed at 1st Workgroup Meeting)</i>		
Initial consideration by Workgroup	dd month year	
Workgroup Consultation issued to the Industry	dd month year	
Modification concluded by Workgroup	dd month year	
Workgroup Report presented to Panel	dd month year	
Code Administration Consultation Report issued to the Industry	dd month year	
Draft Final Modification Report presented to Panel	dd month year	
Modification Panel decision	dd month year	
Final Modification Report issued the Authority	dd month year	
Decision implemented in Grid Code	dd month year	
[NB Implementation is required before May 2021]		
		 Any questions?
		Contact: Code Administrator Nisar Ahmed
		 email address Nisar.Ahmed@nationalgrideso.com
		 telephone 0777 3043068
		Proposer: Rob Wilson
		 email address robert.wilson2@nationalgrideso.com
		 telephone 07799 656402
		National Grid ESO Representative: Rob Wilson
		 email address robert.wilson2@nationalgrideso.com
		 telephone 07799 656402

Proposer Details

<p>Details of Proposer: (Organisation Name)</p>	<p>NGESO</p>
<p>Capacity in which the Grid Code Modification Proposal is being proposed: (e.g. CUSC Party)</p>	<p>Licensee</p>
<p>Details of Proposer's Representative:</p> <p>Name:</p> <p>Organisation:</p> <p>Telephone Number:</p> <p>Email Address:</p>	<p>Rob Wilson</p> <p>NGESO</p> <p>07799 656402</p> <p>robert.wilson2@nationalgrideso.com</p>
<p>Details of Representative's Alternate:</p> <p>Name:</p> <p>Organisation:</p> <p>Telephone Number:</p> <p>Email Address:</p>	<p>Tony Johnson</p> <p>NGESO</p> <p>07966 734856</p> <p>anthony.johnson@nationalgrideso.com</p>
<p>Attachments: Yes</p> <p>The following documents relating to GC0143 are relevant and can be accessed on the ESO page for modification GC0143 here.</p> <ul style="list-style-type: none"> • Ofgem's GC0143 decision letter • National Grid ESO's letter to industry on GC0143 • The ESO's report to Ofgem on the GC0143 Consultation Responses • The ESO's summary of the GC0143 consultation responses • A joint note agreed by the ESO and DNOs on Guidance for Emergency Instruction of Embedded Generation under BC2.9 Emergency Circumstances <p>Draft legal text has also been prepared and is attached in the following documents:</p> <ul style="list-style-type: none"> • New OC6B Embedded Generation Control section (based on OC6 Demand Control section) • Amended OC7 Operational Liaison section (OC7.4.8 System Warnings – amended to provide symmetry between generation and demand disconnection warnings) • Other alignment changes to definitions and to BC2 (which also includes deletion of time-expired GC0143 text) 	

Impact on Core Industry Documentation.

Please mark the relevant boxes with an "x" and provide any supporting information

BSC

CUSC

STC

EBGL Article 18 T&C

Other

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

If compensation arrangements were to be considered this could not be achieved in the Grid Code and in this case changes to the BSC, CUSC or DCUSA could also be required.

For the purposes of the Grid Code modification processes associated with the European Electricity Balancing Guideline (EBGL) article 18, this modification will amend areas of the code mapped to the balancing terms and conditions. It is also possible that changes to the System Defence and System Restoration Plans, prepared in accordance with the Emergency and Restoration European Network Code, may need to be considered.

An awareness is also required of two ongoing/recent DCUSA modifications – [DCP350](#) which requires DNOs to maintain a register of embedded generators >1MW and has just been approved by Ofgem, and [DCP371](#) which was raised in July 2020 and intends to provide the governance arrangements regarding Distributors ability to manage consumer devices (such as EV chargers) connected to Smart Meter infrastructure to prevent network overloads in emergency scenarios as a last resort measure.

1 Summary

Glossary of terms used in this document

Acronym	Description
The Panel	Grid Code Review Panel
ESO	Electricity System Operator
NGESO	National Grid Electricity System Operator
DSO	Distribution System Operators
DNO	Distribution Network Operator
BM	Balancing Mechanism
NETS	National Electricity Transmission System
ODFM	Optional Downward Flexibility Management

Defect

Prior to the implementation of modification GC0143 while there was a process for the ESO to instruct DNOs to take demand control actions to reduce import from the NETS, it was felt that there was not the same detailed implementation clarity, structure and legally unambiguous ability for the ESO to instruct Distribution Network Operators (DNOs) to disconnect embedded generation as a last resort and in an emergency situation.

A temporary solution to address this defect was put in place on 7 May 2020 via the implementation of Grid Code modification GC0143. However, that modification included a sunset clause that will time out after 25 October 2020 and therefore an enduring solution to address the same defect is required.

What

Enduring amendments will be made to the Grid Code to clarify the ability of the ESO to instruct Distribution Network Operators (DNOs) to reduce export to the NETS by the disconnection of embedded generation as a last resort in an emergency situation.

Why

GC143 clarified an ambiguous situation within the code on an interim basis. This expires on 25 October 2020, and as such there is a requirement for an enduring solution that continues to provide the necessary clarity around the last resort disconnection of embedded generation and will need to be in place to cover periods of very low demand such as those that may be anticipated from Spring 2021. Developing an enduring solution was also a commitment that the ESO made as part of GC0143 and was a requirement of Ofgem's decision on this.

How

The proposed change will set out the enduring arrangements by which the ESO are able to instruct DNOs to disconnect embedded generation, as required in an emergency situation and as a last resort.

The commitment made by the ESO and required to be fulfilled by Ofgem in their decision on GC0143 was to follow normal industry processes for establishing and agreeing these enduring arrangements, since GC0143 was progressed as an urgent modification and with limited opportunity for consultation, engagement, or to ensure that the solution was fully detailed.

2 Governance

Justification for Normal Procedures

This modification should follow standard governance procedures due to its material impact on a number of parties, including:

- The ESO in operating the NETS
- DNOs in potentially being required to take emergency actions
- Embedded generators in being disconnected under emergency conditions
- Consumers in helping to mitigate the risk of security of supply issues

Requested Next Steps

This modification should:

- be assessed by a Workgroup

Due to the potential for material impacts on many parties, a Workgroup is needed. All concerned parties should work together to develop an enduring solution; part of this process should be to address the concerns that consultees expressed during the development of GC0143, including the many consultation responses.

The modification needs to be implemented by Spring 2021 – specifically before the Bank Holidays in May 2021 which are anticipated to be the first low demand periods following expiry of the GC0143 solution on October 2020.

3 Why Change?

Background: very low demand periods due to COVID-19 measures

During the COVID-19 pandemic in the first half of 2020, the societal changes required by the need to achieve social distancing led to demand for electricity falling by up to 20% compared to predicted values. During low demand periods it was predicted that this could lead to generation on the system comprising only non-flexible larger plant, such as nuclear generators, and embedded generation, and that this would therefore limit the ESO's ability to balance the system and maintain security of supply.

The ESO sought to mitigate this operational risk by establishing a new commercial service aimed at generators that do not participate in the Balancing Mechanism, Optional Downwards Flexibility Management (ODFM). However, as a last resort and if all commercially available options through either this service or any other future arrangements plus actions in the Balancing Mechanism (BM) had been taken, there could still be a requirement to balance the system which would need to be done by controlling embedded generators. Where embedded generators are not participants in the BM and therefore do not hold connection agreements (or have other commercial arrangements) with the ESO, the ESO has no mechanism to achieve this other than by instructing the DNOs to do this through the existing Grid Code mechanism for Emergency Instructions that can be given by the ESO to DNOs.

In a situation at the other end of the scale, so when demand on the system is greater than the export from the generation connected to it, similar provisions are in place to allow demand control actions to be taken in which DNOs are instructed to reduce the demand imported from the NETS, by for example disconnecting parts of their networks supplying customers from the NETS. Such a scenario is similarly extremely rare but the theory is more familiar and established.

GC0143 temporary solution in place, but enduring solution needed

A temporary solution to address this defect was put in place on 7 May 2020 via the implementation of Grid Code modification GC0143. That modification was progressed with urgency, being raised on 30 April 2020 and implemented on 7 May as it needed to be in place before the Bank Holiday on 8 May which was expected to see a very low demand.

GC0143 included a sunset clause that will time out after 25 October 2020. It was the ESO's intention that a more considered solution to the defect identified would be developed once GC0143 had been implemented.

If an enduring solution is not put in place, then once the GC0143 solution times out the original defect will remain. It is important to note that while the COVID-19 pandemic hastened a much lower level of demand, this situation has been developing over a number of years as overall demand on the transmission system has reduced due to changes in industry and greater energy efficiency, but in particular due to the connection of increasing volumes of embedded generation, predominantly using solar and wind generation technologies.

The proposed changes seek to review the existing arrangements including those made as part of the temporary solution under GC0143 and to provide an enduring solution to address the defect.

GC0143 consultation responses

67 non-confidential consultation responses and two confidential responses were submitted to the GC0143 consultation which ran from 1 May 2020 to 5 May 2020.

Most respondents stated that they understood the reasoning behind the modification being raised, the nature of the societal changes caused by the COVID-19 pandemic leading to unprecedented low demand levels, and the risk this poses for security of supply.

A large number of concerns were however also raised. As part of the final modification report for GC0143 the ESO summarised the key themes and outlined how they were being addressed. As a condition of Ofgem's approval of GC0143, the ESO was required to compile a full report on the consultation responses with the particular goal of again highlighting the actions that had been taken to address them where applicable, but also in facilitating their use to help to form an enduring solution.

The following list of key themes should be considered in the development of the enduring solution and should also be reflected in the Terms of Reference for the workgroup:

Key theme	Considerations
Process for carrying out emergency instructions	<ul style="list-style-type: none"> • Compensation arrangements • Priority of instructions • DNO actions and visibility of generators • Last resort nature • Notice of disconnection • Reporting on use of process
Impacts / risks of emergency disconnection	<ul style="list-style-type: none"> • Risks to network stability • Risks to assets • Risks to environment / public health • Restarting generators
Communications and reporting	<ul style="list-style-type: none"> • Clarity over the process to be followed and how this can be communicated • Use of system warnings • Post-event reporting

Further guidance on GC0143

After GC0143 was implemented, the ESO responded to stakeholder feedback by publishing the document jointly developed by the ESO and DNOs 'Guidance for Emergency Instruction of Embedded Generation under BC2.9 Emergency Circumstances', which defines the high-level principles that NGESO and DNOs will adhere to if it is identified that the emergency instruction of embedded generation is the only option to resolve downwards regulation concerns.

4 Code Specific Matters

Technical Skillsets

Understanding of the Wholesale Electricity Market

Understanding of the Grid Code

Understanding of the GB Electricity System

Understanding of the GB Industry Codes

Reference Documents

Grid Code Modification [GC0143 - Last resort disconnection of Embedded Generation](#)

5 Solution

The changes proposed will give the ESO the clear ability to instruct DNOs to disconnect embedded generation in an emergency situation. This would only be pursued as a last resort if no further actions were available to the ESO either commercially or in the BM. It should be noted that during the Bank Holiday weekends in May 2020 up to 2GW of ODFM was instructed but this avoided the need for any further actions.

While the simplest solution would be to remove or extend the sunset clause from the text added to the code through GC0143, the ESO has committed to a full consideration of the areas that could not be addressed previously which was also a requirement of the Ofgem decision on GC0143.

Areas to address

In forming an enduring solution the following areas will be considered in addition to those set out in the table above:

- Symmetry (where applicable) with demand control instructions and protocols in section OC6 of the Grid Code;
- System warnings as covered under section OC7.4 of the Grid Code which would include any necessary arrangements to ensure that at an earlier stage of a developing situation more warning could be given to potentially impacted parties;
- Compensation arrangements – while any compensation mechanism could not be covered under the Grid Code this needs to be considered as it was a key area of stakeholder feedback from the GC0143 consultation;
- Whether Article 13 paragraph 7 of the Clean Energy Package applies. This states that *“where non-market based redispatching is used, it shall be subject to financial*

compensation by the system operator requesting the redispatching....except in the case of producers that have accepted a connection agreement under which there is no guarantee of firm delivery of energy”.

- Definition of last resort and when an emergency instruction could be issued; there is a balance to be struck here in that during an emergency the ESO and DNOs need to maintain some operational flexibility and to be able to act quickly;
- How an emergency instruction will be implemented, including:
 - Establishing the order of priority
 - Considerations around damage to equipment/environmental impact/loss of critical processes
- Parallels and principles with the Negative Reserve Active Power Margin (NRAPM) used in the Grid Code (BC1.5.5);
- The restoration process; and
- The reporting post-event.
- Interactions between other services (for example ODFM or DNO Active Network Management schemes) and the effectiveness of Emergency Instructions.
- Depending on the preferred solution developed by the workgroup, whether a phased or staged implementation may be appropriate.

6 Impacts & Other Considerations

As a means of last resort, this enduring Grid Code Modification will mitigate the risk of a security of supply issue and impact on all consumers and industry participants. In terms of other considerations, it is worth noting that while generators participating in the BM are compensated for any emergency actions instructed by the ESO, there is no such route currently available to embedded generators that are not BM participants.

While non-BM embedded generators also do not have connection agreements with the ESO, are not subject to the Grid Code, CUSC or BSC and do not pay Transmission Network Use of System (TNUoS) charges which are paid by BM participants and which confer on them firm access rights to the transmission system, this remains a key stakeholder concern and needs to be considered by the workgroup.

Does this modification impact a Significant Code Review (SCR) or other significant industry change projects, if so, how?

No

Consumer Impacts

Implementing this modification will maintain security of supply during periods of very low demand.

7 Relevant Objectives

Impact of the modification on the Applicable 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	None
(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);	None
(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
(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	None
(e) To promote efficiency in the implementation and administration of the Grid Code arrangements	None

By ensuring detailed implementation clarity, structure and legally unambiguous ability for the ESO to instruct Distribution Network Operators (DNOs) to disconnect embedded generation as a last resort and in an emergency situation, this modification lessens the risk of any impact on security of supply during very low demand periods and has a clear positive impact therefore on objective (c).

As this is required as a means of last resort to be used only on the exhaustion of all commercial alternatives (and it is hoped that it will never be used), so the impact on objectives (a) and (b) in particular regarding the development of the system and facilitating effective competition in generation will be negligible.

8 Implementation

Emergency instructions as set out in this proposal can be made at present under the solution implemented through GC0143 and were also possible historically although subject to the need for clarification as set out. Development and implementation of this modification is intended to improve the clarity and structure of any instruction and remove any ambiguity and legal risk on DNOs in acting on such an instruction on an enduring basis. The 'defect' in the code is required to be addressed by April 2021 in time for the

first predicted low demand periods of 2021 and following the expiry of the time-limited GC0143 solution.

9 Legal Text

The following first drafts of legal text have been prepared and should sit alongside this proposal:

- New 'Embedded Generation Control' section of the code (provisionally numbered OC6B) which is broadly symmetrical to the OC6 'Demand Control' section
- Amended OC7 Operational Liaison section of the code in which the OC7.4.8 'National Electricity Transmission System Warnings' section has been revised to again align between 'Demand Control' and 'Embedded Generation Control' actions and warnings.
- Other amendments made to the Glossary & Definitions section and to section BC2 (particularly BC2.9 dealing with 'Emergency Instructions'); note that among these changes is the removal of most of the text associated with modification GC0143 which will have timed out before modification GC0147 is completed.

10 Recommendations

Proposer's Recommendation to Panel

- Refer this proposal to a Workgroup for assessment.