

Guidance Paper

Emergency Instruction of Embedded Generation under BC2.9 Emergency Circumstances

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Summary

This document has been produced to supplement Grid Code modification, GC0143, regarding the use of emergency instruction to DNOs for the disconnection of embedded generation under BC2.9 Emergency Circumstances.

It seeks to define the high-level principles that NGENSO and DNOs will adhere to if it is identified that the emergency instruction of embedded generation is the only option to resolve downward regulation concerns.

Commentary

The Grid Code modification outlined in GC0143 references registered capacity in relation to emergency instructions for the disconnection of embedded generation and this is what an emergency instruction will call for.

NGESO frequency management processes assumes that the disconnection of embedded generation will result in the reduction of export from embedded generators within normal tolerances within our processes assume a delivery volume of between 80 and 100%.

In an emergency situation DNOs will not have time to establish and add up the real-time output of generators and it is recognised that the Emergency Instruction is likely to be implemented via pre-prepared switching scripts that do not necessarily take account of time of day or actual output levels.

The ESO hope however that DNOs will be able to use their knowledge of their networks and prevailing conditions (e.g. whether it is windy and/or dark) to disconnect registered capacity that is likely to deliver an export reduction in line with NGENSOs tolerances but we recognise that the Grid Code relates to registered capacity rather than export, and the challenges in achieving this in real time particularly where disconnection is achieved by a pre-prepared switching schedule.

High Level Principles

The following high-level principles will be adhered to where possible and practical. However, it is also recognised that in a developing situation there may be circumstances that prevent either NGENSO and/or DNOs from doing this. As experience of this and NGENSO's requirements develop, the means of implementing an EI will evolve.

NGESO will observe the following conditions:

An NRAPM will be issued at the earliest opportunity and prior to requesting EI

The NRAPM will detail total volume shortfall of downward regulation, applicable time period(s) and time of next review

Total volume of emergency instruction requested across GB will typically be in blocks of 500-700MW over a 30min period

Emergency instruction of embedded generation will be:

Equal across all DNO license areas

The aggregate registered capacity of the embedded generation associated with an EI will be the same for all DNO license areas

Likely to cover a whole DNO license area

The aggregate registered capacity of the embedded generation associated with an EI will be requested at a DNO GSP or GSP group level

Requested in 50MW blocks

The aggregate registered capacity of the embedded generation will be in 50MW blocks per GSP, GSP group or DNO license area

Unlikely to exceed 50% of the combined forecast of embedded wind and PV

The volume of EI requested per DNO license area is unlikely to exceed 50% of the combined forecast of embedded wind and PV within that area

Implemented by DNOs in pre-prepared blocks within 5 to 30 min

Emergency instructions should be implemented 'without delay' and using reasonable endeavours. Where a pre-prepared switching schedule is used this should take between 5 and 30 min. Implementation of a more specific emergency instructions via a bespoke switching routine could take longer but will still be on a best endeavours basis

Implemented by DNOs in such a way as to deliver a reduction in export, as a consequence of disconnection, as close to 50MW per block as is practicable (ideally between 80 and 100%)

Where practicable and recognising the real-time challenges of this since EIs are for disconnection of registered capacity and need to be implemented 'without delay', the reduction in export as a consequence of disconnection should be as close to 50MW per block as is practicable (ideally between 80 and 100%), preferably with reference to actual output where this can be established in reasonable timescales

Priorities for maintaining connection of embedded generation

The priority for maintaining connection to the network must consider whole system impact. These specific priorities will be kept under review in line with, for example, expectations for the season ahead. Priorities should reflect the general and specific information available to DNOs at the time with the aim of meeting the following objectives:

- 1) Maximising value to the total system and local networks by reducing the requirement for other balancing actions; and
- 2) Minimising plant, environmental or system impact on the local network and/or provider

The following guidance has been developed between NGENSO and DNOs, taking into account system conditions this summer:

The order that embedded generation is disconnected will be at the discretion of the DNO

Under Grid Code BC2.9.3.3 (f) (i) NGENSO may requested disconnection of a specific embedded generator

This will take into account, where practicable, the effectiveness of the disconnection to address the issues trying to be resolved, wider system issues and the potential consequences for the embedded generators

It will be broadly in line with the following:

ORDER	CATEGORY OF GENERATION	COMMENT
1	Non-synchronous generation	In order to maintain system inertia. The export from these technology types could be weather dependent. Although the instruction would be to disconnect 'registered capacity', it is still expected that this will deliver actual MW output change of between 80% and 100% of requested volume
2	Synchronous generators without any associated demand	Lower down the list due to the need to maintain system inertia wherever possible
3	Synchronous generators with associated demand	For example, CHP installation waste management facilities, other industrial facilities with substantial on-site demand
4	Critical DG support of COVID and CNI sites	

The reconnection of embedded generation will be:

Not completed until notified by NGENSO

Delivered by a 'consent to reconnect' by NGENSO, to be completed as soon as reasonably practicable

Recognising that the process to reconnect embedded generation may not be straightforward, NGENSO will issue a consent to reconnect, and expect this to happen as soon as practicable