

Grid Code Alternative Form

GC0155 Alternative Request 1:

Grid Code Workgroup – Clarification of FRT requirements

Overview:

This proposed alternative solution is an alternate to the proposed draft legal text presented by National Grid ESO (NGESO) as proposer of GC0155, which does not provide sufficient clarification, regarding:

- 1) Expected upper threshold of transient overvoltage (TOV) at point of connection (POC) that the generator or power park module (PPM) needs to ride through during fault clearance or recovery;
- 2) Reactive power injection/absorption profile required to manage TOV conditions efficiently; and
- 3) Alignment with international standard requirements to enable procurement of generators and power park modules that can meet NGESO's TOV requirements at the cheapest cost for end consumers in GB.

In addition, it will not retrospectively require existing Generators to modify their plant to achieve the proposed GC0155 Original solution.

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What is the proposed alternative solution?

Draft legal text changes for this Proposed Alternative Modification Proposal from Original Modification Proposal are detailed in Appendix 1 based on the current version of the Original legal text. The proposed GC0155 Original solution assumes retrospectivity automatically, which is anticipated to put the financial burden on developers without any suitable cost recovery mechanism. The retrospective implementation may not be possible at many sites in GB. Hence, this alternate proposal which focuses on forward looking (not retrospective) ECC clauses to be applicable to generators connecting after implementation of GC0155 modification.

The attached draft legal text proposes changes to the clauses under ECC6.3.15 to introduce high voltage ride through (HVRT) requirements into the Grid Code.

Additionally, we propose a discussion on ECC.6.3.16 fast fault current injection requirement, to efficiently manage TOV conditions during fault recovery. The updated fast fault current injection could be developed in line with the German Grid Code requirements, which proposes a smooth transition from reactive current injection to absorption during transition between fault low voltage and TOV conditions. The generator shall return to normal voltage control once the voltage is stabilised within normal operating conditions as per CC6.1.4/ECC6.1.4 after fault clearance.

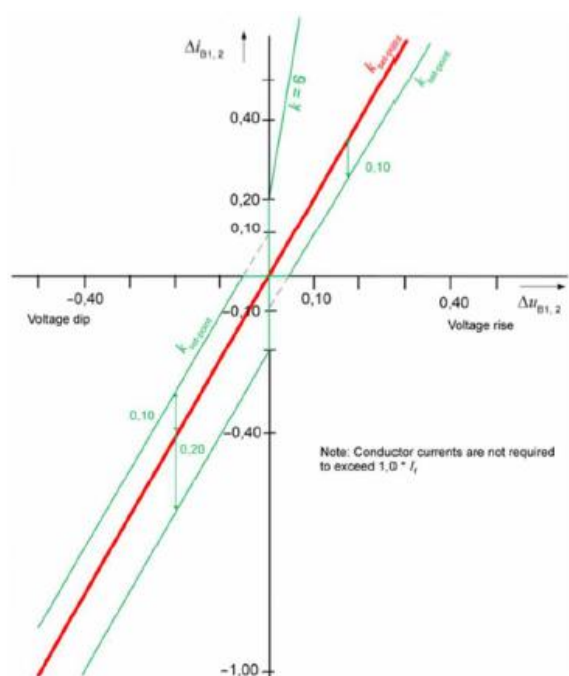


Figure 3 Dynamic Reactive Current Injection during Faults according to VDE-AR-N 4110:2018 [4]

What is the difference between this and the Original Proposal?

In general this Alternative Modification Proposal will have the same effect as the Original Modification Proposal except that it will not be retrospective (whereas the Original would be).

It will not retrospectively require existing Generators to modify their plant to achieve the proposed GC0155 (Original) solution.

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
(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:
(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	Positive:
(e) To promote efficiency in the implementation and administration of the Grid Code arrangements	Neutral:

When will this change take place?

Implementation date:

As per the Original Proposal

Implementation approach:

As per the Original Proposal.

Acronyms, key terms and reference material

Acronym / key term	Meaning
NGESO	National Grid ESO
TOV	transient overvoltage
POC	point of connection
PPM	power park module
GB	Great Britain
FRT	Fault Ride Through
HVRT	high voltage ride through
ECC	European Connection Conditions
CC	Connection Conditions

Reference material:

- 1.

