Grid Code Alternative Form

GC0154 Alternative Request:
Codify 100MW/min ramp rate into the Grid Code as per SOGL Article 119

Overview: The ESO proposed solution of the GC0154 is restricted to limiting the Interconnectors' power ramp rates from the currently established standard of 100MW/Min to 50 MW/min. The initial difference is the codified ramp rate value. This will not be 50MW/min as the original proposal states, but the current 100MW/min.

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Guidance for Alternative Proposers

Who can raise an Alternative? Any CUSC or BSC Party, or Citizens Advice can raise an Alternative Request in response to the Workgroup Consultation.

How do Alternative Requests become formal Workgroup Alternative Modifications? The Workgroup will carry out a Vote on Alternatives Requests. If the majority of the Workgroup members or the Workgroup Chair believe the Alternative Request will better facilitate the Applicable Objectives than the current version of the Code, the Workgroup will develop it as a Workgroup Alternative Modification.

Who develops the legal text for Alternatives? ESO will develop the Legal text for all Workgroup Alternative Modifications and will liaise with the Alternative Proposer to do so.

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Introduction to the Proposed Alternative Solution

High-voltage direct current (HVDC) is an increasingly important technology for transferring electrical power in the Pan-European transmission grid. New HVDC links play a key role in future development plans for the European transmission grid and internal market, including integration with the GB-grid. The use of the advanced functionalities of these HVDC links in system operations is essential to secure an efficient operation of the grid.

The electricity industry recognizes the importance of the functionalities and ancillary services that can be provided by HVDC links. Several of these functionalities are inherent within the HVDC technology; therefore, the power system can benefit from its readily available efficiency. The use of the functionalities of the HVDC links in system operations contributes to meeting current and future challenges, such as decarbonization and large-scale integration of Renewable Energy Sources, which are largely connected via Power Electronics. In addition, the HVDC technology may support realizing an integrated European energy market and potentially sharing reserves and ancillary services between countries and synchronous areas [1].

The current scope of the GC0154 Original Proposal is restricted to limiting the interconnectors' power ramp rates from the currently established standard of 100MW/min to 50 MW/min and as such would restrict the benefits that HVDC interconnectors can bring.

As noted in the recent Future of Interconnectors (FIC) webinar on the 12th of January 2023 Phase #2, Future Role of Interconnectors by AFRY and NGESO, and reflected in the wider energy policy landscape, it is an enabler for the future grid to develop a framework that optimises ramping restrictions while respecting operational requirements for ramping limits. Indeed, the Original Proposal takes a narrow view of the operational challenge to be addressed, which does not reflect the system-wide approach needed at this key stage of the decarbonisation transition. This alternative proposal seeks to address these concerns.

What is the proposed alternative solution?

The proposed alternative is to codify 100MW/min in the grid code to ensure compliance as per SO GL article 119 as soon as possible.

We remain open to continued discussions on the operational challenges raised by NGESO, either in this workgroup or in a new, dedicated discussion forum outside the Grid Code modification process. The materiality and complexity of this matter requires a whole-system approach and the potential development of new market-based solutions to support NGESO's management of the GB system, based on a robust evidence base and without unnecessarily imposing an onerous technical restriction on all current and future interconnectors at such a pivotal stage of our transition to net zero.

What is the difference between this and the Original Proposal?

The key difference is the codified ramp rate value. This will not be 50MW/min as the original proposal states, but the current rate of 100MW/min. In this way, the alternative proposal ensures timely compliance with the SO GL while preserving space for continued engagement with NGESO, EU TSOs and other key stakeholders, as needed.

While the GB Interconnectors recognise the challenges faced by NGESO in managing an increasingly complex electricity system, our strong view is that any steps to further restrict interconnector ramping must only be taken following a robust, comprehensive assessment of the impacts of any such proposals, undertaken in close cooperation with affected EU partners. This is essential in fully understanding the cross-border impacts of any further ramping restrictions, as well as the wider implications for interconnectors' ability to deliver the flexibility benefits that will be critical in enabling the EU and GB's shared decarbonisation goals. In this context, we are concerned that NGESO's preferred solution appears to rely on an incomplete analysis of the impacts of any departure from the current position, omitting a number of significant factors, and moreover runs directly contrary to wider policy objectives in GB and the EU, which primarily seek to enhance the flexibility benefits that interconnectors can offer.

As such, our view is that there remains insufficient basis for NGESO to introduce any change to GB Interconnectors' maximum ramping rate and that significant further analysis is required before an amendment to the current position can be introduced with confidence. In the interests of finding a suitable compromise, we have previously suggested the introduction of a ramp management service and remain open to developing this solution further with NGESO and our EU partners, along with any other potential solutions that would take advantage of the flexibility benefits offered by interconnectors to support the effective management of the GB and EU systems, to the benefit of GB and EU consumers.

Interconnectors continually support EU and GB wide energy transition targets, renewable development goals and help to ensure security of supply in all connected markets whilst remaining pivotal in energy cooperation. We recognise the growing operational challenges that NGESO will be required to manage as the GB system comes to rely on an increasingly intermittent, embedded generation mix and are keen to support finding a solution which would support the ESO, EU counterparts, and the market flexibility needs for net zero. It must, however, be recognised that a solution is required that allows for flexibility in order to reach net zero targets instead of an approach that is solely based on restrictions and will only hinder reaching the set goals.

We therefore propose that the 100MW/min is codified, and the approach is further developed with a focus on:

- Clarifying the end-to-end consumer benefits on the UK and EU side by considering all significant costs and benefits of a range of market-based tools including the ramp management option, via a new CBA realised with a market consultant. This should consider the potential benefits that an increased interconnector ramp rate could bring, particularly in light of the growing need for enhanced system flexibility as the UK transitions to net zero;
- Engaging deeply with the connected EU TSOs to get them onboard on an aligned view on how the future cross border ramping would be managed while ensuring that the model will work with future cross border capacity calculation and allocation mechanisms without the need for restrictions to these mechanisms;
- Ensuring the flexibility benefits are maintained to support further renewable intermittent wind connection.

What is the impact of this change and when will the change take place?

The impact of this alternative proposal will be minimal as it would make the Grid Code consistent with the maximum ramp rates for normal operation that have always in place on most interconnectors between GB and continental Europe. This can be implemented in limited time and with limited resources.

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** Transparent and single coordinated parameter for all interconnectors Allow interconnectors to deliver required volumes as associated with commercial schedules more effectively by means of an efficient ramp rate.
(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** Allows for market-based solutions for where additional services may be instructed for network management/ operation.
(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** Allow interconnectors to rapidly respond to changing conditions to meet security of supply as when required, in conjunction with other services as/when required in the utilisation hierarchy
(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** Achieve compliance with SOGL article 119
(e) To promote efficiency in the implementation and administration of the Grid Code arrangements	**Positive** One single arrangement for all ICs instead of multiple arrangements

When will this change take place?

Implementation date: N/A, already implemented.
Implementation approach: minimal operational or contractual changes required.

Acronyms, key terms and reference material

Acronym / key term	Meaning
HVDC	High Voltage Direct Current
NGESO	National Grid Electricity System Operator
RFI	Redirection of Flows Over Interconnectors
SO GL	System Operator Guideline
TSO	Transmission System Operator

References

[1] ENTSOe Technical Report 2019 HVDC Links in System Operations

[2] Biden-Harris Administration Launches $10.5 Billion Investment to Strengthen America's Electric Grid - https://www.energy.gov/articles/biden-harris-administration-launches-105-billion-investment-strengthen-americas-electric

Annex 1

Binomial principle of Safety and Reliability to ensure Security of supply.

The increasing use of HVDC links in the transmission grids makes it necessary to operate HVDC links in the best possible manner, which is established based on grid analytical studies considering the planned expansion/evolution of the electrical power grid and the past operating experience to meet energy demand. Electricity as the main form of energy becomes a reality in the next decades expanding further its use in all sectors of economy including increased local manufacturing where products are sold when manufacturing becomes a less polluting activity than it was in the past.

The use of the most appropriate control strategies will become increasingly important since the transmission grids will be operated closer to their limits in the future due to the increasing use of distributed renewable power generation. Operating HVDC links and using the services they can offer requires a certain level of coordination with other HVDC schemes and other sources and controllable devices. The HVDC links operation will become interwound in several system operation aspects.

It is important to stress that because of the novelty of the situation, detailed and specific studies are required to define every aspect of the use of the flexibility of control.

The following aspects are important to be considered:
- HVDC technologies and the state of the art, as well as what are possible by the available ones;
- Advanced operational functionalities and services;
- Need for coordination;
- Impact on operational staff;
- Essential commercial and regulatory provisions.

All synchronous areas in Europe have HVDC links in operation and are connected to other synchronous areas using HVDC links. Several HVDC links are under construction, while several HVDC links are under consideration.

In addition, a large offshore wind capacity will be connected via HVDC to the AC grid with possible Multiple-Terminals in different TSOs and across different synchronous areas.

Developments in advanced power electronic devices and fully controlled semiconductors have immensely impacted the development of HVDC technology. As a result, HVDC is now one of the best transmission solutions for the transfer of bulk power over long distances and submarine cables. The application of HVDC has been increasingly used in many parts of the world, which tap into their renewable sources of energy and use the controllable and flexible HVDC links to optimize the use of abundant renewable energy when they are available.