

The Distribution Code Review Panel of Great
Britain

Meeting 2 June 2016

EU Network Codes Update

Paper by Secretary

This paper provides the Panel with an update on the development, progress and implementation of the European ENTSO-e Network Codes.

Headlines

- **ENC Requirements for Generators (RfG)** was published in the Official Journal of the European Union (OJEU) on the 27 April 2016. The Code will therefore enter into Force on 17 May 2016. Generators that will need to comply with the code will be those under construction and which have not let contracts for main plant items by 17 May 2018. You can find it [here](#).
- **RfG Generator banding** proposals seeks to modify the Grid Code and Distribution Code by setting generator 'banding thresholds' as required in the RfG. The industry consultation can be found [here](#) and closes 16 May. RfG still has a significant number of parameters to resolve in GB in next 8 months or so.
- **ENC Demand Connection: DCC** – implementation thinking underway.
- **ENC Guideline on System Operation (GL SO):** The GL SO was voted and adopted at Cross-Border Committee on 4 May 2016. The document will now be translated into all official languages before going into scrutiny procedure.
Underlying approach consistent with GB approach. It seems to have flexibility of implementation in relation to data requirements, but could force strict compliance with existing D Code outage planning rubric for some DNO assets and generators, with resource implications.
- **ENC Emergency and Restoration (E&R)** – Latest version of the NC discussed at the last cross Border Committee meeting on 4 May 2016.
- **Market Codes** – do not seem relevant to DNOs, but need to watch out for DSO-hostile drafting in Balancing Code early next year.
- **Balancing Guideline:** expected to enter into comitology in autumn 2016 and adopted before the end of the year. The Commission is deciding which issues should be included in legislation – the Market Design Initiative – and which ones should remain in the Guideline.
- **A workshop on the CBA on the Imbalance Settlement Period** took place on 15th April. Finland, GB and Spain have concerns about the way the consultant Frontiers is treating the information provided that was discussed at the meeting.

GB Update**Connection Codes**

Requirements for Generators - Main issue for DNOs in relation to RfG are:

Banding

- Lower limit of Type B is 1MW, so all generators above 1MW have to have fault ride through capability.
- Type C (looking to be set at 50MW – but value to be set by consultation) need to have frequency control and more sophisticated voltage control.
- Formal GCRP/DCRP consultation on thresholds (by GC0048) will close 17 May 2016.

Formal compliance regime needed for Type B and above

- Type B limited to frequency and reactive capability – might be possible in most cases to rely on a certificate from machine manufacturer for frequency response and fault ride through.
- Type C (and D) more onerous – more akin to LEEMPS.
- WG currently sorting out detail for GB by end of 2016 – as it progresses need to ensure all DNOs brought up to speed.
- Implications of mass market compliance still being considered by DECC.

Overfrequency

- WG to set frequency response parameters in 2016 (all bands) – proposed 50.4Hz, 10% droop.
- need to remove G59 stage 2 setting for new connexions.
- Fault Ride Through
- Parameters now set – to be consulted upon. Need to change U/V stage 2 settings and assess risk of doing so.

Voltage Control

- Parameters and requirements to be fine tuned by WG in 2016.

Other Issues

- Real time and/or other data – probably set by the System Operation Guideline – requirements not currently completely clear, but seems that it will be left to GB governance to decide extent of real time data.
- Reconnection after disturbances - to be discussed in WG in 2016.
- RoCoF withstand for new plant to be determined in 2016; RoCoF system operating limits to be developed later in 2016 – both via one or two WGs.

Demand Connection Code (DCC) Main issue for DNOs in relation to DCC are:

- Thinking on GB application only just started in earnest (GC0091).
- Doesn't (formally) apply to existing distribution systems.
- Not clear when a new or modified GSP will count as new for compliance purposes, nor how extensive the compliance challenge will be.
- New GSPs will have need capability to run at 0.9pf in all four quadrants, and not export VAR when running at less than 25% of maximum import MW.
- Applies compliance requirements to DSR that is supplied to network operators. Does not apply to other DSR.
- Still uncertainty about the exact requirements for data transfer at GSPs – expect to be resolved as part of the Systems Operation Guidelines development.
- New LFDD facilities will need to have directional blocking.

Operational Codes

Transmission System Operation Guidelines (TSOG)

- Combination of three codes Operational Security, Operational Planning and Scheduling and Load Frequency Control and Reserves but legal status is unchanged (as a guideline).

Main issue for DNOs in relation to TSOG are:

- Agreed by Cross Border Committee 5 May 2016.
- Basic approach fairly close to existing GB G Code rubric.
- Although approach is close to GB drafting, it could require activity and compliance at a level not exercised in GB – resource etc implications for some DNO assets and generators. 12 month TSO development of this from coming into force.
- Still possible disconnect between requirements and pre-RfG plant capabilities – but flexibility of implementation might avoid this being an issue.
- Unclear requirements on data provision and communications – potentially requiring redundant data comms down to all 1MW generators. However this has 12 month implementation period with detailed specification to be proposed by TSO.

Emergency & Restoration Code

Main issue for DNOs in relation to E&R Code are:

- New draft released by the Commission in April 2016
- Seems to be clearer on the need for redundant communication channels, but will only apply to those who elect to provide defence or restoration services, as opposed to all customers.
- Reconnection of generation (and demand) post faults or widespread outages likely to be resolved as part of RfG implementation.

Market Codes

Capacity Allocation and Congestion Management

- Now law.
- Primarily concerned with identifying cross border and inter system capacity.

Forward Capacity Allocation

- Pending comitology.
- Primarily concerned with identifying cross border and inter system capacity.

Balancing Code

- On hold until next year.
- Seems to be high level rules within which national balancing rules must be framed.

GC 0048 Joint panel WG – Coordination Meeting 12 May

TSOG was approved at the cross border meeting on 5 May and could be in force by November this year. Unlike the connection codes, it comes into legal force immediately. Some aspects of it, particularly data transfer requirements and outage planning, have a development and implementation period. NG will consider the challenges of this and make some proposals for some new blocks of work to take this forward.

GB documentation to match this will be challenging to achieve, although the principles are close to existing GB principles. Issue for DNOs is that although the principles are consistent with the existing D Code, the TSOG will probably require DNOs (and generators) to exercise them - which could be a significant process challenge. NG will need to specify which generation and which assets are to be caught by the TSOG requirements, and it is these assets where outage planning will need to be comprehensive.

RfG grinds on. Nothing new to note. Useful confirmation from DECC, in the face of a strong challenge from generators, that we should be starting from the current GB documentation and seeking minimum change, rather than a more fundamental change taking the EU drafting as the starting position.

The overall work plan was reviewed, and NG have an action to turn all the various work strands into a consolidated set of consultation proposals. Potentially there could be upward of 15 separate consultations on the work strands underway, which is probably too many.

Similarly we don't want to make individual consultations and associated legal text too large, not least in case Ofgem reject one of them. Proposals are to be discussed at the next GC0048 meeting.

GC 0048 Joint panel WG – Technical Aspects Meeting 11May

This technical meeting concentrated on the voltage and reactive requirements for generators. The bulk of the meeting was taken up with explaining how the RfG requirements in general are very similar to the GB requirements, although their presentation in many aspects is quite different. It will be important in due course to decide whether to carry on the presentation of GB requirements in the traditional way, or to adopt the RfG approach – or even to adopt both to help overall transparency and familiarity.

For Type B generators (ie expected to be in the 1MW to 50MW range), there are few requirements, really limited to saying that the network operator can specify the reactive range to be required. In addition for synchronous machines, the network operator can specify the voltage control behaviour too, although interestingly, not for power park modules. This is a contrast to the current GB arrangements where network operators do not appear to have the rights to insist on a particular reactive power range, but can always insist on voltage control mode (at least as far as the reactive range allows).

For type C and D, the requirements are similar to existing Grid Code requirements, which generally apply to both embedded and directly connected. So although the formulation is different, the application should be fairly similar in practice. The next meeting in a month's time will take all these forward, apply appropriate parameters to reflect the GB requirements, and discuss the implications in more detail.

TSOG Mapping workshop 9 May 2016

The group met to continue the mapping of pages 64 to 97 of the TSOG. Interesting to note how different and confused the views of this small group of industry experts became from time to time on the scope of the TSOG requirements, and how the cross-border issues are

turned into specific requirements on some users, but not others. A confusion made deeper by the separate Generation and Load Data Provision Methodology consultation made under the auspices of CACM.

The groups feeling is that interpretation of TSOG, or at least efficient implementation of it, will need to be attendant on the GLDPM being final - which should be this June. Worth noting that ENTSO-E have just issued a summary of (and response to) consultation responses on GLDPM, and where it is clear that its scope will be less than some of us had interpreted. Another day arranged in late May to press on with the remaining 100 articles. GB might need to move fairly quickly on TSOG. It has been accepted by the Cross Border committee, so it is on the conveyor belt to becoming law. Much of it applies immediately – so that implies that we need to get on with new drafting for GB pretty quickly.

HVDC and RfG Fault Ride Through Meeting 5 May 2016

This was a meeting of HVDC and RfG experts to discuss the implications in the two codes for fast fault current injection for fault ride through. This is an existing technique, although not particularly mature in understanding or approach. It exists in a simple form in the GB Grid Code applying to large wind farms etc.

There are two reasons to want fault current injection from non-synchronous generators. The first is to have reactive current as early as possible to prop the volts up so that protection on the transmission system can still discriminate; ie the worry is that if during a fault the voltage collapse is so complete that transmission protection will not be able to discriminate. The worry seems to be that this will extend tripping times, rather than making protection trip-happy, so extending the required main protection times beyond 140ms. Clearly this has risks for stability.

The second reason is to help active power recovery around and after fault clearance. This seems to have been less of a driver hitherto in GB. The EU Codes cover both of these, and allow the injected current to change its nature over the period of the fault from reactive to active to help achieve the twin objectives above.

One member of the group representing manufacturers made several complimentary references to the GB Grid Code compared with European ones, particularly the German code. His point was that the Germans, for example, had specified fault current injection in great and possibly spurious detail. For example the injection has to start, and is specified, within the first cycle following fault inception. Practically this is (a) hard to measure and establish compliance and (b) constrains how the overall ends (which need to be achieved over three or four cycles) is implemented. NG colleagues were very supportive of this, as the GB Code is more functionally based, requiring full rated current injected during the period of the fault, with active power being restored within 0.5s of the connexion point voltage being back within normal operating limits (ie 0.9pu).

The group discussed what seems to be an important point – NG do not currently see any need for additional response from what the Grid Code currently requires, although they might need something different in the future. This enabled the meeting to agree that the key thing for implementation was to confirm that the GB code was in line with the RfG/HVDC drafting. This is not obvious because it has been written expecting detailed specifications from TSOs along the more detailed German lines, but it did seem, from the study of the drafting yesterday, that this should not be an impediment. But more work to do, particularly by NG, to examine this.

On the day this seemed a good outcome to me. DNOs have to be able to apply this easily and efficiently down to 1MW generators (Type B) – so compliance against a requirement

specified in the Grid Code currently will be key. However if it can be done for Large currently we should be able to find ways to do it appropriately for 1MW machines and above on Distribution networks. But a key point for DNOs to watch for as this develops.

Next steps are for NG to consider the above in more detail and try to get to some draft legal text.

DECC workshop on Emergency and Restoration EU Code 27 April 2016

The Emergency and Restoration EU Code was released by the Commission 24 April. This is the first time that it has been released as a Commission draft. The previous version is over a year old and was an ENTSO-e draft. Many of the points on ENTSO-e's poor drafting have been eliminated by the Commission's drafting and there are only a small number of significant points.

Firstly it seems to be that the application of stringent communication requirements will only be with small parties who have specifically agreed to provide services to the TSO which means cost of compliance can be factored in before agreeing to provide the service. The drafting is unclear about how all this will work with aggregators.

The drafting seems to mandate that GB will have LVDD and an automatic overfrequency defence scheme. It is not quite clear what is intended, or what will entail compliance with this so DECC has agreed to work on this with the Commission.

A number of points were made by the attendees. As this is the first Commission draft, there is a good chance that some or many of GB's points will be taken on board.