

Workgroup Consultation Response Proforma**GC0156: Facilitating the Implementation of the Electricity System Restoration Standard**

Industry parties are invited to respond to this consultation expressing their views and supplying the rationale for those views, particularly in respect of any specific questions detailed below.

Please send your responses to grid.code@nationalgrideso.com by **5pm on 30 December 2022**. Please note that any responses received after the deadline or sent to a different email address may not receive due consideration.

If you have any queries on the content of this consultation, please contact Banke John-Okwesa banke.john-okwesa@nationalgrideso.com or grid.code@nationalgrideso.com

Respondent details	Please enter your details
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I wish my response to be:

(Please mark the relevant box)

☒ Non-Confidential☐ Confidential

Note: A confidential response will be disclosed to the Authority in full but, unless agreed otherwise, will not be shared with the Panel or the industry and may therefore not influence the debate to the same extent as a non-confidential response.

For reference, the Applicable Grid Code Objectives are:

- a) *To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity*
- 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);*
- 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;*
- 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*
- e) *To promote efficiency in the implementation and administration of the Grid Code arrangements*

Please express your views using the tick boxes and text box spaces provided in the right-hand side of the table below.

Standard Workgroup Consultation questions								
1	Do you believe that the Original Proposal better facilitates the Applicable Objectives?	<p>Mark the Objectives which you believe each solution better facilitates:</p> <table border="1"> <tr> <td>Original</td> <td><input type="checkbox"/>A</td> <td><input type="checkbox"/>B</td> <td><input type="checkbox"/>C</td> <td><input type="checkbox"/>D</td> <td><input type="checkbox"/>E</td> </tr> </table> <p>No. The original proposal does not provide a compelling positive case against any of the relevant objectives. This is due to a lack of evidence and analysis. We would expect the proposer to share their evidence and assessment as to the existing capability, and the improvements to that capability the proposed changes may deliver. Industry and Ofgem can then take an informed view as to the benefit of the options in enabling the ESO to satisfy its obligations to meet the ESRS licence condition. The proposer has stated that modelling of the capability of the system and the impact of the changes has but have not shared that data or quantitative insight from this work.</p> <p>Where there is greater transparency and mutual understanding is in the more procedural elements of the proposal related to planning and liaison between the ESO, RSP DNO and TO's. These measures appear practicable and proportionate and are relatively positive in relation to Applicable Objective (c) in that having a clear and codified process to plan and execute restoration measures should help to efficiently discharge the ESO licence obligations.</p>	Original	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D	<input type="checkbox"/> E
Original	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D	<input type="checkbox"/> E			
2	Do you support the proposed implementation approach?	<p><input type="checkbox"/>Yes <input type="checkbox"/>No</p> <p>We believe it is premature to express an opinion as the implementation approach is not fully documented. The workgroup report notes the ESRS standard and the tools that the ESO hopes to implement by the standards effective date but does not provide a detailed plan or milestones for these to be resolved or for the substantive changes under GC0156 to be adopted.</p>						
3	Do you have any other comments?	<p>This proposal currently lacks sufficient detail. There is no assessment or data provided by the proposer as to the gap between current capability and the required future capability. Also, there is no assessment of what contribution the mandatory additional measures on generators and others is expected to provide towards meeting the standard. This lack of transparent information limits assessment as to the cost effectiveness of the measures or discussion of alternative options that may achieve the same impact for less consumer cost.</p>						

4	Do you wish to raise a Workgroup Consultation Alternative Request for the Workgroup to consider?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No There is not enough clear and transparent information available at this time to raise an alternate, however we may do so at a future date.

Specific Workgroup Consultation questions

5	Do you believe that a cost benefit analysis should be undertaken by the Workgroup and if yes what factors should be considered?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No A CBA should be conducted to ensure the additional resilience requirements for generators and other parties connected to the transmission and distribution networks are the most appropriate and cost effective arrangement for consumers to deliver the necessary additional capability. We note that the intention is that any costs will be recovered through BSUoS charges to consumers CMP398 in accordance with the policy direction from BEIS. With reference to GC0156 BEIS and the ESO undertook an RFI to establish the rough order of magnitude of costs. We note that the range of additional costs presented by the ESO from the RFI they conducted with BEIS was in the range of £500/MW to £22000 / MW. Examining onshore wind the range was up to an estimated £2200/ MW. Although this information does not constitute a CBA it is useful in giving a general indication of the cost impact based on the limited information provided in the RFI. We do not believe the RFI made any distinction between capital and ongoing costs. In our opinion a clear CBA should be undertaken that examines the benefit and costs to consumers of the proposed changes and other options available to the ESO to fulfil its licence obligations.
6	Do you believe that parties obligated by GC0156 should have a cost recovery mechanism in place?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No We think it is right that any additional costs on generators proposed as a consequence of the ESO's licence obligation to meet the ESRS should be socialised. However, this needs to be done in a cost effective manner to ensure that consumers are receiving value for money. For instance it may be cheaper for the

		ESO to purchase additional specific capability through the tender process (including from BTM and DSR V2G aggregators etc) than to retrofit with new capability the entire portfolio of distributed generation.
7	<p>Do you think that the proposals are sufficient and cost effective to ensure that NGENSO can meet its ESRS licence obligations?</p> <p>Please provide a rationale for your answer</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>No. As highlighted throughout this response there has been no evidence presented as to the sufficiency of the measures or the cost effectiveness in comparison with other measures the ESO may be able to take.</p>
8	<p>Do you agree that all the costs associated with TO/DNO implementation of ESRS should be recovered through their respective price controls? If not, what funding mechanism do you favour?</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>We agree with the principle that all parties should be able to recover efficiently incurred costs. The price control process appears an appropriate mechanism for TO and DNO's as this is subject to industry and Ofgem scrutiny. The cost recovery proposals for other parties under CMP398 could be extended to encompass TO / DNO if this was judged to be the optimum method of recovery.</p>
9	<p>The ESRS restoration target is expressed in terms of transmission demand rather than total demand (see Glossary and Definitions). Do you understand the implications of this, and are you happy with those implications?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>There is not complete clarity amongst industry. We believe there may be a level of collective understanding within the workgroup but do not believe the nuances of this are fully captured. The key element is clarity as to the ESO's obligations to achieve the standards set by BEIS. The publication of the order and related relevant correspondence between BEIS and the ESO may assist with wider understanding. The nuances of the standard and the ESO licence obligations need to be articulated by the ESO and BEIS more clearly to wider industry and consumers.</p> <p>Our understanding is that the standard is an outcome measure based on the prevailing forecast peak transmission demand that would have occurred but for the loss of electricity. The 60% and 100% measures are relative to that forecast peak transmission demand and not based on numbers of customers restored either on the transmission or distribution systems. Theoretically if one customer could consume 60 % of the forecast peak transmission demand, then restoration of that individual</p>

		<p>customer would satisfy the target. The process for calculating the proportion of restoration from each region has not been discussed in depth or the geographic boundaries of regions articulated within the workgroup report.</p> <p>The ESO should make available the direction letter and relevant correspondence that have shaped their obligation for workgroups and the code administrator consultation. The ESO could also hold webinars and use its communication outreach to ensure wider industry and customers understand that the standard is not based on restoration of individual connections but based on a changeable forecast of potential demand.</p> <p>We think there is undoubtedly more work by the ESO needed to clearly articulate the ESRS measures and to provide more analysis as to the range of scenarios the ESRS will and will not cover. It also needs to be clear what exemptions the ESO may rely on to relieve it of its obligations and what this would mean for achieving the restoration standards.</p>
10	Do you think that there is a common understanding between stakeholders of the demand to be restored in GB required by ESRS?	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>All comments relevant to this question are included in Q 9.</p>
11	Do you see any barriers for Network Operators and Users to deliver the changes proposed to implement the ESRS by December 2026?	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Most of the changes related to planning and execution of a restoration strategy between DNO TO and the ESO should be deliverable within the timescales as these are mainly procedural.</p> <p>For the proposed changes to connected assets there is a barrier in information. As there is no analysis that describes the gap in capability it is not yet possible to determine if the measures proposed in GC0156 will satisfy that capability gap, or how much capability each of the measures will deliver</p> <p>The second barrier is funding of the proposed mandatory retrospective changes. This is being addressed and contingent upon a funding mechanism being approved through CMP398.</p>

		Project delivery of mandatory changes may become constrained if there is uncertainty over funding arrangements, or if the technical requirements are altered at short notice.
12	Do you believe there are further changes to the network i.e. NETS and/or Distribution Network required to implement ESRS obligations?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <p>Possibly as it is not clear what foundation the plans have been made. There is a lack of information on the existing and the required capability and the assumptions used by the ESO. As an example, It is not clear that energising transformers, transmission and distribution circuits will not trip anchor generators. The Distributed Restart tests show that without mitigations like reduced voltages or Point on wave switching the islands can collapse as the island grows by the addition of new sections. It is difficult to see how to assess these issues without actually doing tests on the network, but there are issues as to how far this can be taken without affecting customers. There is also an assumption that real customers can actually be used as load in the early stages of an LJRP we are not aware that this has actually ever been tested.</p>
13	The Annex (pages 29 – 32) in the Future Networks subgroup report covers 2 scenarios where site supplies are lost up to 72 hours. Which of these 2 scenarios is the most realistic? (The full details of these scenarios can be found on pages 29 – 34 of the Future Networks subgroup report in Annex 4)	<input checked="" type="checkbox"/> Scenario 1 <input checked="" type="checkbox"/> Scenario 2 <p>The question is incorrect to imply that there is a choice between scenario one and two. Both scenarios are realistic and are illustrative of the implications of the control and return decisions that generators will have to assess before action to return to production. Both scenarios were written to illustrate different operating conditions and there is not a choice between them.</p>
14	What are your views on the scope of the parties being impacted by the mandatory changes proposed as part of GC0156?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <p>In terms of retrospectively applying these requirements to existing parties who do not have these capacities this could be very difficult and expensive, with currently no way of refunding the costs to parties.</p> <p>It is not just funding technical solutions that need to be considered here. Staffing levels and locations have been adjusted and evolved to match current market</p>

		conditions. There are now numerous parties that operate unstaffed sites, and organisations who sub-contract various activities to ensure efficient operation. To ensure that all sites have absolutely everyone needed to restart a de-energised site would be costly for consumers and given resource constraints (including technical) probably impossible nowadays.
15	The GC0156 proposed solution 72 hrs resilience is expected to be applied retrospectively to existing CUSC parties. Do you agree with this retrospective application and if not, what is your rationale / view about this?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No No. In the absence of any assessment of either the additional capability that '72hr resilience' will provide or the difference of the obligation applying to just new build or retrospectively then it is not possible to make a rational evidence-based decision on this.
16	Do you believe that cyber security requirements in accordance with the NIS standard are sufficient and as referenced in the proposed Grid Code drafting (available in Annex 6)?	<input type="checkbox"/> Yes <input type="checkbox"/> No Whilst these appear to be adequate, there has to be more consideration of how all parties can implement these requirements and the timescales required to do so. If implemented without these considerations it is likely that consumer costs will be greater than need be.
17	Do you agree that the draft legal text is appropriate and sufficient to implement GC0156? If not please provide your suggestions?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No There are still areas which are not clear and there needs to be a fuller detailed description of the process. Also there needs to be more instructions aimed at parties who are just Users. Our General legal text amendments and comments are included at the end of the document.
18	Are there any barriers to new entrants to provide restoration services that are not covered in the GC0156 legal drafting?	Yes. One of the problems to a new entrant is there is no easy way to test their current capability to see what they can do. They are asked to commit to a tender process and the investment with the possibility at the end they are not successful and receive no recompense.
19	Do you believe there should be further assurance activities in addition to those described in the proposed legal text	There are other areas of OC5 testing which also need discussed:- 1) It would be helpful if it was clarified which sections of OC.5 apply to System Restoration, we don't think OC5.5 applies but if that is the case then the

	<p>within OC5? If yes, please state the activity and explain why?</p>	<p>title of that section needs expanded to something like PROCEDURE FOR TESTING ROUTINE OPERATING CAPABILITIES</p> <ol style="list-style-type: none"> 2) Similarly does OC5.6 apply and if not does a dispute resolution procedure need added to OC.5.7 3) Again, do not believe OC.5.4 applies. 4) Within OC.5.5.2 there is a section dealing with User requests for tests, but this does not appear anywhere in OC.5.7. So currently there is no method for a User to request to test their plant. 5) Within OC.5.5.3 it states "The User is responsible for carrying out the test on their Plant and retains the responsibility for the safety of personnel and their Plant during the test" there is not an equivalent section in OC.5.7. We believe that during System Restoration tests similar to Distributed Restart tests this is potential covered in a test contract which similarly seems to suggest the Generator is responsible for safety. Whilst saying that testing is the responsibly of the Generator is fine in terms of maintaining frequency and local voltage mostly limited to the Generators plant. However, during larger area tests, which may be required, once the generator is running and has done the initial local network energisation the generator then has no control over what equipment is being connected by the Network Operator and do not know or control remote voltages. We believe this needs to be fully discussed and added to the code. <p>If cold start times become mandatory on restoration of electrical supplies to a site are there any plans to test to confirm compliance with this requirement?</p>
20	<p>Do you think the right requirements have been identified for Network Operators in terms of Network design and operational capability as summarised in the consultation document and annex and as detailed in the proposed legal text in CC/ECC.6.4.6.3b and OC9?</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Some issues remain unclear. For instance, its not clear how the network operator will assess the energisation and over-voltages caused by transformer energisations. Also, on a growing network with more than one generator there is a risk of potential steady state over-voltages being caused by a single generator tripping and the remaining generator not being able to hold the extremes of the network voltage down. Again, it is not clear how the Network Operator is considering or</p>

		planning these issues, or what measures or actions it would take to resolve these.
21	Due to comments received from some Workgroup members on Appendix 9 (technical requirements associated with restoration services) of the ECC draft legal text, the ESO has proposed that a separate subgroup should be established under the umbrella of GC0156 to develop a set of technical requirements associated with restoration services for inclusion in the Relevant Electrical Standards which would include appropriate experts from across the industry. Do you believe this is an appropriate way forward if not why?	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>It is not clear why this has been proposed apart from moving from a transparent open governance model to a more closed one. Our view is that any changes should use appropriate codes that are governed through all parties' licences collectively.</p>
22	Are you aware that Anchor Plants may be expected to carry out a deadline line charge test and remote synchronisation test as described in OC5.7.2.2(h) / OC5.7.2.3(d)? If so, do you have a view on this test?	<p>The only way that anyone can confirm that anchor generator can energise the network is by testing, so this needs to be done. The problem is how is this going to be arranged and what is the extent of the network to be energised?. If you look at the distributed restart test reports it is quite clear the generator can energise the immediate local network, but the problems then occurred whilst the Network Operator then subsequently energised further lines and transformers (particularly transformers). Now a generator could pass very localised tests then during a real event suddenly find themselves energising conditions they have not been tested against, but it is difficult to see how large area test can be done, needs further consideration.</p> <p>In terms of remote synchronisation tests again these needs done, however there is a risk to the generator if Network Operator's equipment is faulty and there is a mal-synchronisation. The prime need for this test is for check the Network Operator has the facilities to know the frequency and voltage at the remote synchronisation location and can issue instructions to the generator to</p>

		adjust frequency and voltage as they will only know the local frequency and voltage.
23	The distributed restart legal text has been drafted on the basis that ESO will lead on the procurement of restoration services. Do you think this should move to DNO led in future? If yes, please explain why	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No No.
24	The distributed restart legal text has been drafted on the basis that: i) there will be a connection agreement with the DNO that binds an embedded restoration service provider to the Distribution Code and ii) a tripartite agreement that binds the embedded restoration service provider to the relevant parts of the Grid and Distribution Codes. Do you see any difficulties with this proposed contractual arrangement?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Yes, there is the potential for confusion between parties and inconsistency. Also, the way it is being drafted it is not entirely clear what parts of the Grid Code apply to embedded Restoration Service Providers - does it all or is it only specific sections. There is also the EU Generator part again its not clear if they are an EU generator in some of the OC5 test sections. It would be neater if the technical requirements for an embedded generator providing Restoration Services were in the Distribution code and only the OC 9 and BCs applied. It would be helpful if there was a more detailed description of how the distributed restart process will actually work.
25	Do you believe it is appropriate to have a mains independence minimum resilience period of 24 hours as required by the NCER or 72 hours as a general GB standard for existing black start purposes as proposed with the GC0156 solution for Grid Code parties, BM parties, VLPs and restoration service providers? Do you agree with a retrospective application of this and if not, what is your suggestion / views about this?	72 hours seems reasonable for all sites communications equipment. It also seems reasonable for all parties who wish to enter into contracts to provide Restoration Services. However, it does seem excessive to apply this to parties who are not going to get any recompense for providing this capability. In terms of retrospectively applying these requirements to existing parties who do not have these capacities we believe this could be very difficult and expensive with currently no way of refunding the costs. Staffing levels and locations have been adjusted and evolved to match current market conditions. There are now numerous unstaffed sites, organisations who sub-contract various activities to ensure efficient operation. To ensure that all sites have absolutely everyone needed to restart a de-energised site would be costly for consumers and given resource constraints probably impossible nowadays.

26	As a stakeholder, are there any implications of the proposed future requirements which are not clear?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <p>What are the penalties if as a general User with no Restoration Service Provider services if the start-up time submission in DRC Schedule 16 is not met in the event of a system shutdown.</p> <p>As highlighted in previous questions the need case has not been clearly demonstrated, there is no assessment of current and future capability requirements, no assessment of the capability improvement from the proposed changes and no CBA has been produced.</p>
27	Do you have any views on how the requirements should be implemented into the Grid Code bearing in mind the requirements of the ESRS are not enforceable until 31 December 2026?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <p>If the changes only apply to commercially agreed requirements, then the requirements can be codeified and then only applied as parties get contracts. It's a lot more difficult to retrospectively apply them to all parties, one suggestion is to add all the parts into the code listing them in the general condition as only apply from 31 December 2026 but highlighting that text in say yellow or green as opposed to lots of foot notes, but that's difficult with the deletions</p>
28	Do you agree with Ofgem's proposed approach to the DNO ESR re-opener?	<input type="checkbox"/> Yes <input type="checkbox"/> No <p>We have no opinion on this subject.</p>

Comments on GC0156 Draft Legal Text in Workgroup Consultation**Connection Conditions**

CC.3.1 (e) extends the requirements of BM Participants to CC.7.9, CC.7.10 and CC.7.11. We assume the addition of CC.7.9 is a correction of as this should already apply to BM participants but is not included in the introductory text. In terms of the reference to CC.7.10 within section CC.7.10 there are no specific references to BM Participants but there are references to GB Code User, Network Operator and Restoration Service Provider identifying which paragraphs apply to each of them, so which parts apply to BM Participants? Similarly with CC.7.11 there are no references to BM Participants, but references to others, so which parts apply to BM Participants?

CC.3.1 (f) adds the requirements to Restoration Service Providers who are not already covered in (a) to (e) to meet CC.6.3.5 and CC.8.1. First question who exactly are these parties who are not covered somewhere else? Do they not have to meet any of the other references to Restoration Service Provider in the other paragraphs in the CCs?

CC.6.1.3 Do we need to add this, I find it difficult to see how any party connected to the system offering this service isn't caught by this as they must be a User somewhere?

CC.6.1.4 Similarly do we need to add this, this is just a statement of how the voltage will be managed at their connection point and they must have a connection point so this must be covered already as a User? Other point of note is I see there is a +/-6% tolerance with voltages less than 132kV does this mean that any potential distributed restart providers need to have a tighter voltage control system?

Suggested changes to **CC.6.2.2.2.1.2** “**Restoration Service Providers** shall **also if required** have the ability to switch to alternative **Protection** settings on their **Plant** and **Apparatus** if they are required to do so to be able to satisfy their obligations of a **Restoration Plan**. **Similarly, the Restoration Service Providers shall have the ability to switch back to the original protection settings bump-lessly whilst their plant remains in service, when required.** Changes to any protection settings shall be agreed between **The Company** and/or **Relevant Transmission Licensee** and/or **Network Operator** as part of developing a Restoration Plan. In the case of directly connected **Restoration Service Providers** at a **Connection Point** these requirements shall be in accordance with the requirements of the **Bilateral Agreement**.”

Suggest deleting to CC.6.2.2.6, CC.6.2.2.6.1 and CC.6.2.2.6.2 and adding the following new sections CC.6.3.7(g), CC.6.3.7(h), CC.6.3.7(i)(i) and CC.6.3.7(i)(ii) below:-

CC.6.3.7(g) Restoration Service Providers shall be capable of operating their **Generating Units** such that, the **Frequency** control device (or turbine speed governor) and unit load controller or equivalent control device, can be switched to **Frequency** control only with no load influence, during the early stages of a **System Restoration** whilst in island operation. **CC.6.3.7(h) Generating Unit, DC Converter or Power Park Module** owners shall advise the Company of the capability of operating their **Generating Units** such that, the **Frequency** control device (or turbine speed governor) and unit load controller or equivalent control device, can be switched to **Frequency** control only with no load influence, during the early stages of a **System Restoration** whilst in island operation. If there is a suitable capability **The Company** and the **User** shall agree on how it shall be used and kept available **[needs a bit of discussion]**.

CC.6.3.7(i) (i)

Changes to any control schemes and settings identified from CC.6.3.7(g) and CC.6.3.7(h) shall be agreed between **The Company** and/or **Relevant Transmission Licensee** and/or **Network Operator** as part of developing a **Local Joint Restoration Plan** or **Distribution Restoration Zone Plan**.

CC.6.3.7(i) (ii)

During a **System Restoration** any changes to the schemes and settings, defined in CC.6.3.7(g) and CC.6.3.7(h), of the different control devices of the **Generating Unit or Power Park Module** or **Restoration Service Provider** or **DC Converter** shall be coordinated and agreed between, the **Relevant Transmission Licensee**, the **GB Generator**, **Restoration Service Provider** and **DC Converter** owner.

Suggested changes to **CC.6.2.3.7 “Network Operators** shall **also if required** have the ability to switch to alternative **Protection** settings and control settings on their **Plant** and **Apparatus** if they are required to do so to be able to satisfy their obligations of a **Restoration Plan**. Similarly, the **Network Operators** shall have the ability to switch back to the original protection settings bump-lessly whilst their plant remains in service, when **required**. Any alternative **Protection** settings or control settings shall be included in the **Restoration Plan**.”

CC.6.3.2(e)(i) Not sure what the purpose of the new extra text, as this paragraph is a capability to maintain zero transfer not a requirement to provide zero transfer and it also applies to synchronous generators.

CC.6.3.2(e)(iii) Is the GB generator not by default in this case the Restoration Service Provider? If the offshore generator is AC and the connection is AC then life is simple but if there is a DC convertor who owns it (OFTO) then what is the anchor the generator or convertor or both? Initially suggested change to “(iii) the **Reactive Power** capability (within an associated steady state tolerance) specified in the **Bilateral Agreement** if any alternative has been agreed with the **GB Generator** and/or **Restoration Service Provider**, and the, **Offshore Transmission Licensee** and **The Company**. In the case of that the **GB Generators** and/or **DC Converter** owners are **Restoration Service Providers** who own and operate **Anchor Plant** and/or **Top Up Restoration Plant**, the **Reactive Power** capability requirements at the **Offshore Grid Entry Point** shall be agreed between the **Restoration Service Provider**, **Offshore Transmission Licensee** and **The Company** in order to facilitate the operation of an **Offshore Local Joint Restoration Plan**”.

CC.6.3.3(g) Not sure why this is included as anything with a future completion date must be an EU HVDC don't think this can apply to anyone so suggest deleting.

CC.6.3.5.1 Can we just clarify what the contracts are as this section mentions Anchor Restorations Contracts, Top-up Restoration Contracts and Distribution Restoration Contracts are these all the correct terms? They are different in CC.6.4.5.1. The text in ECC.6.3.5.2 is correct.

CC.6.3.5.2 If my new suggestion above of changes CC.6.3.7 were to be added is still required or should it just refer to those sections.

CC.6.3.5.4 Not sure why this is included as anything with a future completion date must be an EU HVDC don't think this can apply to anyone so suggest deleting.

CC.6.4.5.2(c) User System Entry Point more thought needed

CC.7.9 Can this still exist

CC.A.5.5.2 Just looking at this and allowing LFDD relays to be switched off is there any need to also consider G57 & G99 frequency relays?

European Connection Condition

ECC.3.1(e) same comments as per CC3.1(e)

ECC.3.1(f) same comments as per CC3.1(f)

ECC.6.2.2.7 as this already exists cannot just delete as suggested for CC.6.2.2.6 but would think the suggested new text for CC.6.3.7 is added to ECC.6.3.7 as follows

ECC.6.3.7.3.8 Restoration Service Providers shall be capable of operating their **Generating Units** such that, the **Frequency** control device (or turbine speed governor) and unit load controller or equivalent control device, can be switched to **Frequency** control only with no load influence, during the early stages of a **System Restoration** whilst in island operation.

ECC.6.3.7.3.9 Generating Unit, HVDC System or Power Park Module owners shall advise the Company of the capability of operating their **Generating Units** such that, the **Frequency** control device (or turbine speed governor) and unit load controller or equivalent control device, can be switched to **Frequency** control only with no load influence, during the early stages of a **System Restoration** whilst in island operation. If there is a suitable capability **The Company** and the **User** shall agree on how it shall be used and kept available **[needs a bit of discussion]**.

Suggested changes to **ECC.6.2.3.7.2** as per CC.6.2.3.7 “**Network Operators** shall **also if required** have the ability to switch to alternative **Protection** settings and control settings on their **Plant** and **Apparatus** if they are required to do so to be able to satisfy their obligations of a **Restoration Plan**. **Similarly, the Network Operators shall have the ability to switch back to the original protection settings bump-lessly whilst their plant remains in service, when required.** Any alternative **Protection** settings or control settings shall be included in the **Restoration Plan**.”

ECC.6.3.2.5.1 is the new text not actually covered in ECC.6.3.2.5.2

ECC.6.3.3.1.1(g) &(h) is the signal these are providing not the same signal which is already being provided under ECC.6.3.3.1.1(f)?

Suggested change for **ECC.6.3.5.3(i)** “The Power-Generating Module or DC Connected Power Park Module shall be capable of starting from a Total Shutdown or Partial Shutdown without any external electrical energy supply within **either** 2 hours of receiving an instruction from The Company in the case of Local Joint Restoration Plan **and or alternatively** 8 hours of receiving an instruction from a Network Operator in the case of a Distribution Restoration Zone Plan”

Suggested change for **ECC.6.3.5.4** “Each HVDC System or Remote End HVDC Converter Station which has Anchor Plant Black Start Capability and **which have** an Anchor Restoration Contract shall be capable of energising the busbar of an AC substation to..”
General comment do we need to EU Restoration service Provider & GB Restoration service Provider or are we only applying to distribution connected Restoration Services Providers when the term is used?

Glossary & Definitions

Do we really need all the definitions can terms like Anchor Restoration Service Provider and Top Up Restoration Service Provider be deleted and the definition for Restoration Service Provider be changed to “ **A User who has either Aan Anchor Restoration Contract Service Provider** or a Top Up Restoration **Contract Service Provider**.”

Suggested changes to definition of **Top Up Restoration Contract** “~~In the case of a Local Joint Restoration Plan is Aan~~ agreement to provide an Top Up Restoration Capability and other associated services between a ~~Top Up~~ Restoration Service Provider and either The Company in the case of a Local Joint Restoration Plan, or The Company and relevant Network Operator in the case of a Distribution Restoration Zone Plan under which the ~~Top Up Restoration Service Provider provides an Top Up Restoration Capability and other associated services~~. In the case of a Distribution Restoration Zone Plan, is an agreement between The Company and relevant Network Operator under which the ~~Top Up Restoration Service Provider provides an Top Up Restoration Capability and other associated services~~;

Suggested changes to definition of Top Up Restoration Capability “~~In the case of a Top Up Restoration Service Provider forming part of a Local Joint Restoration Plan, is t~~The ability for one or more ~~any of a its~~ Restoration Service Provider’s ~~relevant~~ Plant(s) to Start-Up from Shutdown and to be Synchronised to the System upon instruction from ~~either~~ The Company, or a Relevant Network Operator, as appropriate, such that it can deliver the service it has agreed to provide in accordance with the requirements of the Top Up Restoration Contract. ~~In the case of a Top Up Restoration Service Provider forming part of a Distribution Restoration Zone Plan, is the ability for one or more its Plants to Start-Up from Shutdown and to be Synchronised to the System upon instruction from a relevant Network Operator, such that it can deliver the service it has agreed to provide in accordance with the requirements of the Top Up Restoration Contract.”~~

Suggested changes to definition of **Anchor Restoration Contract** “~~In the case of a Local Joint Restoration Plan is a~~An agreement to provide Anchor Plant Capability and other associated services between a ~~Anchor~~ Restoration Service Provider and either The Company in the case of a Local Joint Restoration Plan, or The Company and relevant Network Operator in the case of a Distribution Restoration Zone Plan under which the ~~Anchor Restoration Service Provider provides an Anchor Plant Capability and other associated services~~. In the case of a Distribution Restoration Zone Plan is an agreement between The Company and relevant Network Operator under which the ~~Anchor Restoration Service Provider provides an Anchor Plant Capability and other associated services~~”

Not sure about Anchor Generator/Anchor Plant Owner and others what is the difference

Operating Code 1

OC1.7.1 when the term daily is used when does this mean? Is it immediately after that day’s peak has occurred also will this value be changed during the day as the forecast is revised? Suggested change to OC.1.7.2 “~~the pre-shutdown~~ forecasts of 60% and 100% of daily National Demand, necessary for the System Restoration Region’s targets.”

Operating Code 2

OC.2.1.1(a) does Restoration Service Providers Plant need to be added to the list must they not by default covered by the previous list?

OC.2.1.2(a) does the Electricity System Restoration Standard need to be specifically mentioned, is it not already set out in the Transmission Licence like the other standards of security which are not specifically mentioned?

OC.2.1.2(b) does Restoration Service Providers Plant need to be added to the list must they not by default covered by the previous list? Also suggest changes “~~Under normal operating conditions~~, The envelope is defined by

1. the difference between the total generation output expected from Large Power Stations, Medium Power Stations and Demand, the operational planning margin and taking into account External Interconnections and outages on the Total System, ~~whilst planning for the system operating in a normal condition~~
2. ~~This OC2 also needs to make provision for~~ the availability and location of Plant and Apparatus ~~required to discharge the requirements of the Electricity System Restoration Standard following a Total System Shutdown or Partial System Shutdown in order to ensure the requirements of the Electricity System Restoration Standard can be discharged.~~”

OC.2.1.8 is this actually needed as surely Restoration Service Providers need to be using Plant and Apparatus which is covered by Generators or Interconnector Owners also is this not covered by OC.2.3.1(f)

OC.2.4.1.2.2 although Restoration service Providers has been added its not clear what happens to their data and how they are supposed to interpreted their envelope of opportunity.

OC.2.4.1.3.2(b) given this is about assets at a Grid Entry Point can there be any Restoration Service Provider not already covered

Suggested change to **OC.2.4.1.3.2(e)** “(other than those aspects which may operationally affect Embedded Small Power Stations or Embedded Medium Power Stations unless they are ~~owned and/or operated by providing~~ Restoration Services ~~s-Providers~~),

OC.2.4.1.3.3(a) given this is about assets at a Grid Entry Point can there be any Restoration Service Provider not already covered

Suggested changes to **OC.2.4.1.3.3(e) & (h) & OC.2.4.1.3.5(a)(ii) & (b)(iv) & (d)(ii)** “(other than those aspects which may operationally affect Embedded Small Power Stations or Embedded Medium Power Stations unless they are ~~owned and/or operated by providing~~ Restoration Services ~~s-Providers~~),

OC.2.4.1.3.5(n) not sure what this is trying to do it seems to say that the parties who are already providing the data also need to do it again.

Operating Code 5

The following changes are to try and reduce the number of new definitions potentially removing the need for Anchor Generator, Anchor HVDC System Owner, Anchor DC Converter Station Owner, Anchor Plant Test, Anchor Plant Owner

Suggested change to **OC.5.7.1(a)(i)** “In the case of an Anchor Generating ~~Unit~~, The Company and/or relevant Network Operator shall require ~~the Restoration Service Provider an Anchor Generator~~ to carry out a test (either a “Anchor Generating Unit Test” or an Anchor

Power Station Test”) in order to demonstrate that an Anchor Plant has an Anchor Plant Capability.”

Suggested change to **OC.5.7.1(a)(ii)** “In the case of either an Anchor HVDC System Owner or Anchor DC Converter Station Owner, The Company or relevant Network Operator shall require the Restoration Service Provider an Anchor HVDC System Owner or Anchor DC Converter Station Owner with a Anchor HVDC System to carry out a test (an “Anchor System HVDC Test”) on a HVDC System or DC Converter, in order to demonstrate that a Anchor HVDC System has an Anchor Plant Capability.

Suggested change to **OC.5.7.1(a)(iii)** “In the case of Restoration Service Provider using an EU Generator’s with Anchor Plant, The Company and/or relevant Network Operator may also require the Restoration Service Provider Generator to carry out a test (a Quick Resynchronisation Unit Test) in order to demonstrate that a its Anchor Power Station has a Quick Re-Synchronisation Capability.

Suggested change to **OC.5.7.1(a)(iv)** “In the case of a Top up Restoration Service Plant Provider, The Company or relevant Network Operator shall require the Top Up Restoration Service Provider to demonstrate that the requirements of the Top Up Restoration Service Contract can be fulfilled.”

Suggested change to **OC.5.7.1(b)(i)** “~~The Company or relevant Network Operator shall require an Anchor Generator which has an Anchor Restoration Contract to carry out an Anchor Generating Unit Test, on e~~Each Anchor Generating Units, which has an Anchor Plant Capability, within such an Anchor Power Station, ~~the Anchor Generator shall be subjected to execute such~~ an Anchor Generating Unit test at least once every three years. The Company or relevant Network Operator shall not require the Anchor Generating Unit Test to be carried out on more than one Generating Unit at that Anchor Power Station at the same time, and would not, in the absence of exceptional circumstances, expect any of the other Generating Units at the Anchor Power Station to be directly affected by the Anchor Generating Unit Test.”

Suggested change to **OC.5.7.1(b)(ii)** “~~The Company and/or relevant Network Operator may Occasionally there is a requirement the Anchor Generator~~ to carry out an Anchor Power Station Test ~~at any time~~ (but will not require an Anchor Power Station Test to be carried out more than once in every three calendar years in respect of any particular Generating Unit unless it can justify on reasonable grounds the necessity for further tests or unless the further test is a re-test). If successful, this Anchor Power Station Test shall count as a successful Anchor Generating Unit Test for the Generating Unit used in the test.”

Suggested change to **OC.5.7.1(b)(iii)** “~~The Company and/or relevant Network Operator shall require the Each~~ Anchor HVDC System Owner or Anchor DC Converter Station Owner ~~to carry out shall be subjected to~~ an Anchor HVDC System Test at least once every three years which could be at any time (but such a test will not be required to be carried out more than once in every three calendar years unless it can justify on reasonable grounds the necessity for further tests or unless the further test is a re-test).”

Suggested **OC.5.7.1(c)** can be deleted as it is already covered in OC.5.7.1(a) & (b)

Suggested change to **OC.5.7.1(d)** “When The Company and/or relevant Network Operator wishes an Anchor Restoration Service Provider to carry out either a Anchor Plant Test Anchor Generating Unit Test, an Anchor Power Station Test, an Anchor System HVDC Test, a Quick Re-Synchronisation Test or Top Up Restoration Test it shall notify the relevant

~~Anchor~~ Restoration Service Provider at least 7 days prior to the time of the test with details of the proposed ~~Anchor Plant Test~~.

Paragraph **OC.5.7.1(e)** not sure about it point if mentions testing frequency but does not give any, I think it should be deleted and a new paragraph added to OC.5.7.1.(b)(v) giving details of frequency along the lines of OC.5.7.1(b)(v) “~~Top Up Restoration Plant shall be subjected to Testing at least once every three years which could be at any time (but such a test will not be required to be carried out more than once in every three calendar years unless it can justify on reasonable grounds the necessity for further tests or unless the further test is a re-test).~~”

Paragraph **OC.5.7.1(f or second e)** not sure this is needed as testing is on Restoration Service Provided by default does that not just means contracted plant is being tested as per the contract.

Paragraphs **OC.5.7.2.1 & OC.5.7.2.2** should the new text for dead-line energisation steps being added to OC.5.7.2.2 (h) not be inserted in OC.5.7.2.1 as (h) and deleted from OC.5.7.2.2 and OC.5.7.2.2(f) changed to read “The provisions of OC5.7.2.1 (e) and (f) shall thereafter be followed”

OC.5.7.2.4 (e) & (f) seems to imply the Top up Service provider is self-starting then synchronising, not sure that’s what everyone think I thought they were using the power coming from the System to run-up their unit, this needs further discussion.

OC.5.7.2.7 Does this section need to deal with situations where the Restoration Service Provider wishes to do their own tests to check their plant?

Suggested changes to **OC.5.3.1** “An Anchor Power Station or Anchor HVDC System or Anchor DC Converter shall fail an Anchor Plant Test if the Anchor Plant Test shows that it does not have a Anchor Plant Capability (ie. if the relevant Generating Unit or HVDC System or DC Converter fails to be Synchronised to the System within the time specified in the Anchor Restoration Contract unless otherwise agreed by The Company and/or Network Operator For ~~Restoration Service Providers Anchor Plant Owners~~ party to a Local Joint Restoration Plan, their Anchor Plant would be expected to be synchronised to the System within two hours from receiving an instruction from The Company unless otherwise ~~otherwise~~ agreed otherwise agreed by The Company and/or Network Operator, For ~~Restoration Service Providers Anchor Plant Owners~~ party to a Distribution Restoration Zone Plan, their Anchor Plant would be expected to be synchronised to the System within eight hours from receiving an instruction from the relevant Network Operator unless otherwise ~~otherwise~~ agreed by The Company and/or Network Operator,

Operating Code 9

OC.9.4.7.4(b) this currently as drafted limits emergency instructions to Restoration Service Providers on the island surely it should cover all users in the island suggest “System Restoration following a Partial Shutdown where the Balancing Mechanism has not been suspended

~~During a Partial Shutdown where the Balancing Mechanism has not been suspended all instructions to Users connected to the De-Synchronised Power Island will be deemed to be Emergency Instructions under BC2.9.2.2 (iii). All such Emergency Instructions will recognise any differing operational capabilities (however termed) set out in the relevant Ancillary Services Agreement in preference to the declared operational capability as registered pursuant to BC1 (or as amended from time to time in accordance with the BC).~~

Local Joint Restoration Plans

~~Instructions in relation to Anchor Power Stations and/or Anchor HVDC Systems and/or Anchor DC Converter Stations Owners and to Network Operators and Top-Up Restoration Service Providers which are part of an activated Local Joint Restoration Plan will be deemed to be Emergency Instructions under BC2.9.2.2 (iv) and will recognise any differing operational capabilities (however termed) set out in the relevant Ancillary Services Agreement in preference to the declared operational capability as registered pursuant to BC1 (or as amended from time to time in accordance with the BC). For the purposes of these instructions the System Restoration will be an emergency circumstance under BC2.9."~~

OC..9.4.7.5 Not sure about changing from Genset to Generating Unit as Genset is the highest level therefore catches all types of generator whereas generating Unit is around 3 to 4 levels down the hierarchy and I am not sure it actually appears in every strand.

Suggested change to **OC.9.4.7.1.7** "Where The Company issues an Emergency Instruction (or in Scotland where a Relevant Scottish Transmission Licensee issues an instruction) to a Network Operator to activate a Distribution Restoration Zone Plan, the Network Operator will first issue instructions to the ~~Restoration Service Provider Anchor Plant Owner~~ informing them ~~m Anchor Plant Owner~~ of the requirement to prepare their Anchor Plant to re-energise a Distribution Restoration Zone (or part thereof) in accordance with the Distribution Restoration Zone Plan. The Network Operator in liaison with the ~~Restoration Service Provider Anchor Plant Owner~~ will discuss when their Anchor Plant is expected to be available and ready to start re-energising the Distribution Restoration Zone. For the avoidance of doubt, the ~~Restoration Service Provider Anchor Plant Owner~~ shall not start to re-energise the Distribution Restoration Zone until given a formal instruction by the Network Operator in accordance with OC9.4.7.7.12 and this instruction shall only be given once the Network Operator has configured its System and taken the necessary additional actions to prepare the Distribution Restoration Zone to be re-energised. This will include any automatic switching that takes place through the action of a Distribution Restoration Zone Control System."

OC.9.4.7.11.8 is this text actually performing any function "Such instructions would only be issued to relevant Restoration Service Providers other than Anchor Restoration Service Providers once the Network Operator has re-energised the Distribution Restoration Zone (or part thereof) by issuing instructions to the Anchor Restoration Service Provider and the Distribution Restoration Zone is in a position to expand and supply more Demand in accordance with the Distribution Restoration Zone Plan." Can this not just be deleted.

Suggested change to **OC.9.4.7.11.9** "The Network Operator shall inform The Company (and the Relevant Scottish Transmission Licensee in the case of a Scottish Distribution Restoration Zone) advising that it has contacted the appropriate ~~Anchor Restoration Service Provider and Top-Up~~ Restoration Service Providers in accordance with the Distribution Restoration Zone Plan and provide an indicative time of when the Distribution Restoration Zone and associated Plant and Apparatus is ready to be re-energised and the expected time of when the Anchor ~~Plant~~ will be ~~Restoration Service Provider~~ in a position to re-energise the Distribution Restoration Zone (or part thereof).

OC.9.4.7.11.11 Suggested changes to clarify operation and energisation times "Once the Network Operator has reconfigured its System and associated Plant and Apparatus (including but not limited to Protection and control system settings) it will contact the Anchor Plant Restoration Service Provider (which could also be achieved by the Distribution Restoration Zone Control System) to confirm the foregoing and agree a time for the Anchor Plant Restoration Service Provider to operate their Plant so as to **be ready to** re-energise the

Distribution Restoration Zone (or part thereof). Where the Anchor Restoration Service Provider or Network Operator needs to change the agreed **proposed** re-energisation time as a result of an unforeseen event such as, but not limited to, a faulty item of Plant or Apparatus, safety issue or unavailability of personnel, the Anchor Restoration Service Provider and/or Network Operator will agree a revised re-energisation time.

OC.9.4.7.11.12 Suggested changes to clarify operation and energisation times “The Network Operator will inform The Company (or relevant Scottish Transmission Licensee in the case of a Scottish Distribution Restoration Zone) of the time when the Anchor Restoration Service Provider is estimated **scheduled** to re-energise a section of the Network Operator’s System. Should this **estimated scheduled** time vary, the Network Operator will inform The Company (or relevant Scottish Transmission Licensee in the case of a Scottish Distribution Restoration Zone) as necessary and provide an indication of any revised **estimate** re-energisation time and the reason for the change.”

OC.9.4.7.11.13 Suggested changes to clarify operation and energisation times “**The Restoration Service Provider shall contact the Network Operator once their Anchor Plant is ready to re-energise the network. The Network Operator shall then assess their network status the estimated** ~~At the agreed~~ re-energisation time as detailed in OC.9.4.7.8.11, **and if conditions are suitable** the Network Operator will ~~contact the Anchor Restoration Service Provider and~~ issue an instruction to the Anchor Restoration Service Provider to re-energise the Distribution Restoration Zone (or part thereof) unless this is achieved via fully automatic means which could include a Distribution Restoration Zone Control System.”
Suggested changes to OC.9.4.7.11.14 “Once the Distribution Restoration Zone (or part thereof) has been re-energised and feeding some local Demand or controllable Demand provided by a relevant Restoration Service Provider, ~~the Anchor Restoration Service Provider~~ will be required to follow instructions from the Network Operator...”

General Conditions

Should the Distribution Restoration Zone Control System High Level Functional Requirements be in the England and Wales only list?

Governance Rules

Cannot see any changes

Planning Code

Nothing

DRC