

## Distribution Code Consultation DCRP/MP/22/02

### Title: Electricity System Restoration Standard – and Distributed Restart

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**Target Audience:** All current and prospective users of the distribution system, but especially owners and operators of generation and storage of in the range from about 3MW upwards.

**Date Published:** 12 December 2022

**Deadline for responses:** 13 January 2023

#### Summary:

This Distribution Code public consultation relates to changes proposed from the joint Grid Code Review Panel and Distribution Code Review Panel working group to enable the introduction of distributed restart in the distribution systems of Great Britain. This initiative arises from the new licence condition that National Grid Electricity System Operator has to ensure that electricity supplies can be restored in line with government requirements following a shutdown of the national system.

This Distribution Code public consultation is seeking the views from stakeholders on proposed modifications to the Distribution Code, EREC G99 and EREC G59 to enable the introduction of distributed restart in the distribution systems of Great Britain.

#### 1 Introduction

In April 2021, the Department for Business, Energy and Industrial Strategy (BEIS) released a [policy statement](#) setting out the need to introduce a legally binding target for the restoration of electricity supplies in the event of a National Electricity Transmission System failure. This new policy is called the Electricity System Restoration Standard (ESRS). As a consequence of BEIS's policy statement, Ofgem performed an [initial consultation](#) in April 2021 followed by a [statutory consultation](#) in July 2021 on licence amendments to facilitate the introduction of an ESRS, and to align the regulatory framework for procurement of restoration services with that of other balancing services.

These licence modifications include but are not limited to:

- introducing the definition of “restoration services” in National Grid Electricity System Operator's (NGESO) Transmission Licence Standard Condition C1 and amending the definition of balancing services to include “restoration services”,
- replacing all references to “black start” with “Electricity System Restoration” in the Electricity Transmission Licence, including in the ESO's Special Licence Conditions, to align the licence terminology with BEIS's policy,
- introduction of updated Special Condition 2.2 of National Grid's Electricity System Operator's Transmission Licence requiring the introduction of an Electricity System Restoration Standard (ESRS) which requires 60% of electricity demand to be restored within 24 hours in all regions and 100% of electricity demand to be restored within 5 days nationally.

NGESO have raised Grid Code modification GC0156 to address the new obligations on them. GC0156 has been raised as a joint GCRP/DCRP modification.

The modification includes altering, updating and clarifying the responsibilities and requirements of NGESO, DNOs, CUSC parties, Restoration Service Providers, Transmission Licensees, as they all take part in restoration activities. For DNOs and their customers, the key effect is the creating of distribution restoration zones (DRZ) as a new approach to system restoration. The proposal to implement DRZs does require provisions to be included in the Distribution Code and a small number of accommodating changes in EREC G59 and EREC G99.

## **2 The Defect**

The traditional approach to system restoration in GB is top-down, where black start power stations are instructed to energise dead sections of the transmission system to form a power island. Blocks of demand are then connected under the requirements of a local joint restoration plan (LJRP). LJRPs are a current Grid Code requirement and their invocation occurs in parallel across the transmission system to form a skeleton energised network, thereby allowing further power stations and demand to be restored. Traditionally, black start stations have been drawn from the fleet of coal, hydro, pumped storage and gas power stations with some input from HVDC Interconnectors. Going forward it is recognised that, primarily in terms of thermal plant which are generally carbon based, these providers are reducing in numbers as a result of the drive toward renewable technologies.

The [Distributed Restart Project](#) recognises the growth in embedded generation and from this, the pool of capability that could be used to energise sections of the DNOs' networks to form DRZs. In these scenarios, NGESO would instruct the DNO to activate a planned DRZ which would be defined in an accompanying distribution restoration zone plan (DRZP), similar to an LJRP. The aim is intended to run the traditional black start arrangements via LJRPs in parallel with the DRZs thereby restoring the whole system to normal operation as soon as possible. The DRZP revolves around the new rôles of anchor generator and top up service provider. An anchor generator is an embedded generator with grid forming capability. The anchor generator may be supported by one or more top-up service providers who are capable of providing additional generation input, albeit not necessarily grid forming, or a range of ancillary services to assist with running a stable power island, such as reactive power capability, inertia etc, and even flexible demand. Collectively all of these parties are referred to as restoration service providers.

DRZPs would constitute a formal agreement between NGESO, the DNO and the restoration service providers. The agreement would include the DNO undertaking and completing any necessary enabling works – although currently there is no intention or mechanism to make such arrangements mandatory.

## **3 Proposed Solution**

The implementation of Distributed Restart requires both a technical and commercial framework. The Distributed Restart Project address both of these. It is recommended that this consultation paper is read alongside both the Grid Code GC0156 consultation and the project reports from the project's web pages at the link in section 2 above.

The commercial and contractual aspects are not within the scope of the Distribution Code Review Panel, and they are being taken forward primarily by NGESO through the current development of the tender process. It is envisaged that the technical requirements set out in the Grid Code and Distribution Code will be backed up by tripartite contracts between NGESO, the DNO and providers of restoration services in DNOs' networks.

The Distribution Code modifications are intended to provide the high level requirements to enable distributed restart, including the development of a detailed distribution zone restoration plan, for each instance where distributed restart is viable based on a joint NGESO/DNO review of total system requirements, network topology and the availability of potential restoration service providers identified through a shared contractual tender process.

The GC0156 joint working group has met eight times since its inception in April 2022. The working group has taken the output from the Distributed Restart Project and from earlier work in GC0148. The working group has produced harmonized Grid Code and Distribution Code text. It is expected that the Grid Code text could be directly applicable to any embedded service providers who are CUSC parties, and the text also directs DNO activities. The Distribution Code text reflects the requirements on the embedded parties who are not CUSC signatories and is likely to be the most accessible and appropriate requirements for them, and has the minimum of reliance on technical requirements being included in the tripartite contracts.

It is worth noting that the GC0156 Grid Code modification proposal includes a provision that all CUSC parties shall have 72 hour resilient electricity supplies to their plant so that they can assist in system restoration, whether or not that party is a restoration service provider. There is no equivalent retrospective requirement proposed for distribution connected parties (who are not CUSC parties) unless they elect to enter into a restoration services contract.

The key additions to the Distribution Code are in DPC6, DPC8, DOC2, DOC5 and DOC9.

### **3.1 DPC6 amendments**

The requirements on restoration service providers to have 72 hours electricity resilience for their communication, telemetry and essential management have been added into DPC6. These include the requirement to have cyber security to a level consistent with other critical national infrastructure providers.

### **3.2 DPC8 amendments**

New requirements for restoration service providers to provide relevant static data about their capabilities associated with the creation of individual DRZ plans.

### **3.3 DOC2 amendments**

A requirement has been added for restoration service providers to notify the DNO of changes to the availability of their plant and their ability to operate to their DRZP.

### **3.4 DOC5 amendments**

The new testing requirements broadly mirror those in use for DRZPs, but are tailored to the distributed restoration provider context. Again the proposals for DOC5 follow the corresponding OC5 text in the Grid Code as closely as possible, recognizing the necessary drafting differences between the Grid and Distribution Codes.

### **3.5 DOC9 amendments**

DOC9 already has the high level requirements for LJRPs, but as these generally do not involve embedded parties, the detail is high level and defers to the content of the LJRPs. The DRZP proposal mirrors this approach in terms of the formal establishment of plans, their maintenance and testing. However given the learning emerging from the Distributed Restoration Project the drafting does provide more high level structure to the operation of DRZPs than for LJRPs. The DRZPs would need to follow this structure, but the details for each DRZP would need to be developed on an individual basis between NGESO, the other relevant transmission licensees, the DNO and the restoration service provider(s). The high level structure of operation runs from inception and energization of the dead network through to synchronization to other power islands and/or the restored system and draws heavily on the parallel detail for LJRPs in the Grid Code. The proposals for DOC9 follow the corresponding OC9 text in the Grid Code as closely as possible, recognizing the necessary drafting differences between the Grid and Distribution Codes.

### 3.6 Contractual arrangements

The Distributed Restart Project considered the balance between requirements embodied in the industry codes and contractual requirements, the various models for both the structure of any necessary contracts, who the contracts should be between, and who the lead procurement party should be. These considerations are covered in sections 10.1 and 3.3 of the Project's report "*Distribution Restoration future commercial structure and industry codes recommendations*" (December 2021) at the link given above. The Project's preferred approach is for tripartite agreements between the DNO, NGESO and the restoration service providers (be they either as an anchor generator or as a top-up service provider), with NGESO taking the procurement lead. This would require that restoration service providers enter into a tripartite contract with NGESO and the relevant DNO. The contract would be procured by NGESO through a tendering process. Figure 3-1 shows the proposed relationships,

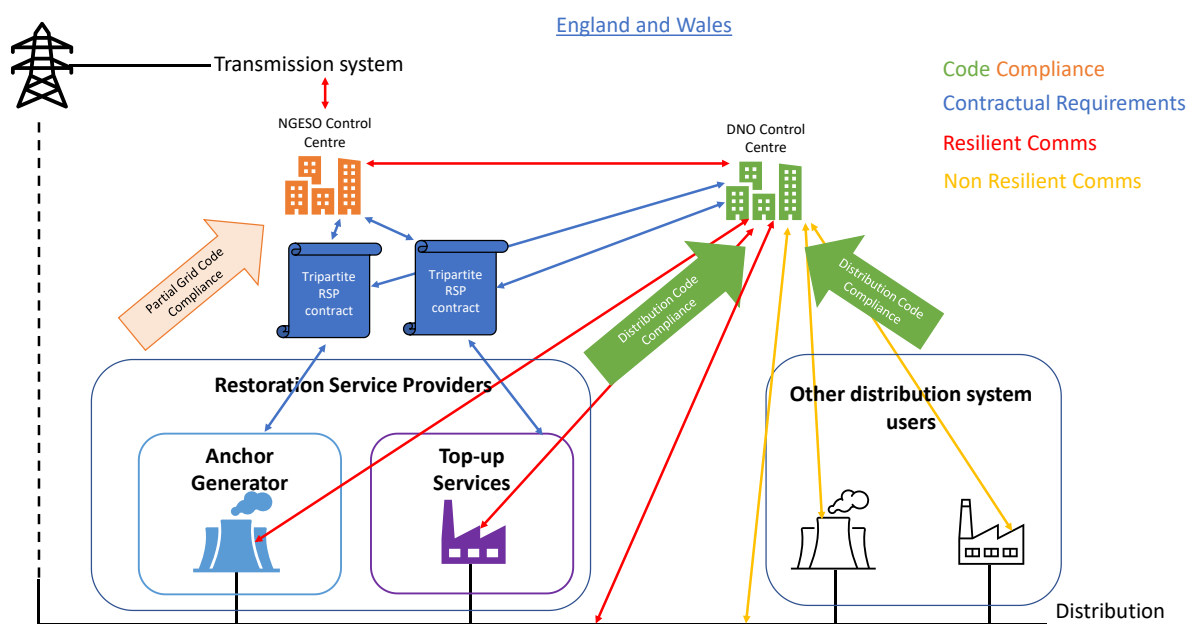


Figure 3-1

This contracting model is one of the three implementation methods developed in the Distributed Restart Project as described in the Project's report referred to above. Comments are also welcome on the Project's choice of this model.

NGESO has the licence obligation and the income stream to remunerate the services and therefore the technical requirements need to be placed in the Grid Code. The Grid Code text encapsulates the whole distribution restoration process through a DRZ, and specifically covers the requirements on DNOs and restoration service providers. As the restoration service provider is connected to the distribution system, and is bound by the Distribution Code, the working group believes it is appropriate to put the key requirements into the Distribution Code for the restoration service provider to conform to. Although contractually the restoration service providers can and should be bound to the Grid Code, it is not straightforward to apply Grid Code drafting to embedded parties, not least because the context of the drafting is subtly different and, for example, some of the key definitions are necessarily different. Hence it might be appropriate to assign a contractual hierarchy such that the requirements of the Distribution Code have primacy for restoration service providers, followed by the tripartite contract and then the Grid Code. Stakeholders' views on the design of the contractual arrangements and the relationship with the codes will be welcome.

### **3.7 Other amendments**

#### **3.7.1 DPC8**

A short section of text has been appended to DPC8 detailing the information that is required from restoration service providers active in a DRZP. Information will be required initially when the DRZP is being established, and then either when any relevant information changes, or on demand by the DNO.

#### **3.7.2 EREC G99 & EREC G59**

A general statement has been added in section 2 (scope) noting that some of the more standard requirements of EREC G99 such as loss of mains protection may need to be re-engineered to accommodate restoration service providers whilst operating in an active DRZ and similarly scope for amending the default requirements for earthing are also included.

### **3.8 Documentation**

Appendix A – the proposed Distribution Code amendments

Appendix B – the proposed EREC G99 amendments

Appendix C – the proposed EREC G59 amendments

### **3.9 Implementation**

The proposed text for inclusion in the above documents does not require any specific action from any party, unless parties willingly agree to enter into a contract for the provision of distribution restart services, in which case they would be bound by the requirements of the Distribution Code, as well as the detailed contractual requirements. As such there is no need for an implementation period and the drafted requirements would be applicable from the date that the Authority approves the changes, should the Authority do so.

## **4 Applicable Code Objectives**

The applicable Distribution Code Objectives are to:

- (a) permit the development, maintenance, and operation of an efficient, co-ordinated, and economical system for the distribution of electricity; and
- (b) facilitate competition in the generation and supply of electricity; and
- (c) efficiently discharge the obligations imposed upon distribution licensees by the distribution licences and comply with the Regulation and any relevant legally binding decision of the European Commission and/or the Agency for the Co-operation of Energy Regulators; and
- (d) promote efficiency in the implementation and administration of the Distribution Code.

## **5 Consultation Questions**

1. Do you agree with the general intent of the proposed modification? If not, it would be helpful if you could explain your views.
2. Do you agree that the draft legal text is adequate for the adoption of distributed restart? Please do provide comments on the drafting either as mark up, the response proforma, or any other convenient method.
3. 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, with a proposed hierarchy of Distribution Code, tripartite contract, Grid Code.

Do you see any difficulties with this proposed contractual arrangement?

4. The distributed restart legal text has been drafted on the basis that NGESO will lead on the procurement of restoration services. Do you think this should move to DNO led in future? If yes, please explain why.
5. Please state how you think this modification addresses the relevant Distribution Code Objectives.

## 6 Next Steps

Responses to this consultation should be sent to the Distribution Code Review Panel Secretary at [dcode@energynetworks.org](mailto:dcode@energynetworks.org) by 17:00 on 13 January 2023 on the pro-forma provided expressly for the purpose, or via any other convenient means. Responses after this date may not be considered.

The progress of this modification will depend on responses to this, and the parallel Grid Code Review Panel, consultations, and the possible interaction with GC0156 as described in section 1 above. The Grid Code Review Panel and the Distribution Code Review Panel will then decide on the next steps towards implementing this modification.

**For more information, please contact:**

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