

Distribution Code Consultation DCRP/MP/22/01

Title: Emergency and Restoration Code Implementation – and Distributed Restart.

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: 26 April 2022

Deadline for responses: 17:00 27 May 2022

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 i) implement the remainder of the obligations arising from the EU Network Code Emergency and Restoration, and ii) to enable the introduction of Distributed Restart in the distribution systems of Great Britain. There are no Distribution Code implications arising from the EU Emergency and Restoration Code and hence 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

This defect relates to the implementation of the EU Emergency and Restoration Code and has been considered by a joint Grid Code Review Panel and Distribution Code Review Panel working group, designated GC0148. The Distribution Code Review Panel agreed to consider the issues as a joint working group at the 06 August 2020 Panel meeting.

The EU Emergency and Restoration Code is one of a suite of European Codes which was developed as a result of the European Energy Third Package. The Emergency and Restoration Code covers the process by which Member States ensure appropriate measures are put in place to:

- i. prevent a black out from occurring (defensive measures) and
- ii. restore the system (restoration measures) as quickly as possible in the event of a total or partial system shutdown.

Until the introduction of the Trade and Cooperation Agreement and the UK's withdrawal from the EU in 2020, the UK was an EU Member and therefore bound by the requirements of the Energy Third Package which included compliance with the EU Emergency and Restoration Code.

As part of the UK's withdrawal from the EU, the requirements of the Emergency and Restoration Code have been incorporated into GB law through Statutory Instrument SI 533 2019.

In GB, implementation of the Phase I of the EU Emergency and Restoration Code was achieved through Grid Code modifications GC0125 (EU Emergency & Restoration: Black Start testing requirements for Interconnectors), GC0127 (EU Emergency & Restoration: Requirements resulting from System Defence Plan) and GC0128 (EU Code Emergency & Restoration: Requirements

resulting from System Restoration Plan). These modifications were approved by the Authority on 05 February 2020. There were no implications from this work for the Distribution Code.

Modification GC0148 comprises three parts, these being:

- i.) the requirement to implement Article 15(5) – 15(8) which relates to low frequency demand disconnection, Article 41 which relates to communications systems and Article 42(1), (2) and (5) which relates to critical tools and facilities. All of these requirements have a compliance date of 18 December 2022.
- ii.) the requirement to address some outstanding issues from the implementation of Grid Code modifications GC0125, GC0127 and GC0128 which relate to:-
 - (a) How Non-CUSC parties would fall under the framework of the EU Emergency and Restoration Code noting that the solution provided under Grid Code modifications GC0125, GC0127 and GC0128 applies only to CUSC Parties.
 - (b) Clarity relating to the treatment of Electricity Storage Modules during low system frequencies as provided for under Article 15(3).
- iii.) to consider the requirements in implementing Distributed Restart. Distributed Restart is a Network Innovation Competition project which aims to explore the practicality of system restoration using embedded generation and embedded restoration service providers to restore supplies to parts of DNOs' systems, which to date is an approach that has not been used for overall system restoration purposes in GB. As such this project falls under the provisions of the EU Emergency and Restoration Code. It is likely that the Electricity System Restoration Standard, which has just started to be considered under Grid Code Modification GC0156, will make formal use of Distributed Restart, hence it is likely that legal text agreed as part of the GC0148 modification will need to be updated to incorporate the Electricity System Restoration Standard requirements.

From the considerations of the joint GC0148 WG there are no implications for the Distribution Code from (i) and (ii) above.

The proposal to implement Distributed Restart, however, 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 distribution restoration zones. In these scenarios, NGESO would instruct the DNO to activate a planned distribution restoration zone 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 DRZPs thereby restoring the whole system to normal operation as soon as possible. The DRZP revolves around the new rôle of anchor generator, which 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 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 which would include the DNO undertaking and completing any necessary enabling works on their systems – 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 <https://www.nationalgrideso.com/future-energy/projects/distributed-restart> address both of these. It is recommended that this consultation paper is read alongside both the Grid Code GC0148 consultation and the project reports from the above link.

The commercial and contractual aspects are not within the scope of the Distribution Code Review Panel, and they are being taken forward primarily by National Grid Electricity System Operator in conjunction with the relevant DNOs 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 agreed to be viable based on joint NGESO and DNO review of total system requirements, network topology and the availability of potential restoration service providers identified through a shared contractual tender process.

The GC0148 working group has met eight times since its inception in June 2021. The working group has taken the output from the Distributed Restart Project and used this to produced matching Grid Code and Distribution Code text. It is expected that the Grid Code text would be directly applicable to any embedded service providers who are CUSC parties, and also directs DNO activities. The Distribution Code text reflects the requirements on the embedded parties and is likely to be the most accessible and appropriate requirements for them, and does not rely on any technical requirements being documented in the tripartite contracts themselves.

The key additions to the Distribution Code are in DOC5 and DOC9.

3.1 DOC9 amendments

DOC 9 already has the high level requirements for LJ RPs, but as these generally do not involve embedded parties, the detail is high level and defers to the content of the LJ RPs. 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 LJ RPs. 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, NGET, SHET and SPT, 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 LJ RPs in the Grid Code and the new proposals developed for DRZPs in the Grid Code. The intention is that the DRZP requirements in the Grid Code mirror those in the Distribution Code.

3.2 DOC5 amendments

The new testing requirements broadly mirror those in use for LJ RPs, but are tailored to the distributed restoration provider context. Again, the intention is that the DRZP requirements in the Grid Code mirror those in the Distribution Code.

3.3 Other amendments

3.3.1 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 is required when the DRZP is being developed, annually to the DNO and on request when a DRZP is implemented.

3.3.2 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.

3.4 Documentation

Appendix A - the proposed Distribution Code amendments

Appendix B - the proposed EREC G99 amendments

Appendix C - the proposed EREC G59 amendments.

3.5 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 such as those in their Connection Agreement with the DNO and tripartite contract with the DNO and NGESO. 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. Do you think it is appropriate to include the Distributed Restart amendments now bearing in mind such proposals would fall under the EU Emergency and Restoration Code, or do you think that the Distributed Restart legal text should be transferred to GC0156, so that it can be

finalised in the context of the ERSR requirements? Please provide a rationale for your response.

4. 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 by 17:00 on 27 May 2022 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 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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