Modification	At what stage is this document in the process?
# DCRP/18/03 - Final Modification Report ## Revision of Engineering Recommendation (EREC) P2 - Security of Supply	

The purpose of this document is to assist the Authority in its decision to implement the proposed modifications to EREC P2 and the minor consequential changes to the Distribution Code. The proposed modifications were subject to industry consultation in January and February 2018.

Date of publication: 31st May 2018

Recommendation

The Distribution Code Review Panel (DCRP) and distribution network licensees recommend that the proposed modifications are made to Engineering Recommendation (EREC) P2 and the minor consequential changes to the Distribution Code.

	The Proposer recommends that this modification should be: Submitted to the Authority for approval.
	High Impact:
	Medium Impact: The proposed new EREC P2/7 is expected to have a medium impact on the way in which Distribution Network Operators (DNOs) assess the network demand that needs to be secured and established the optimum means of securing that demand via a combination of network and non-network solutions.
	Low Impact:

Contents

Timetable

Workgroup Report presented to Panel	4th January 2018
Draft Modification Report issued for consultation	12th January 2018
Consultation Closed	12th February 2018
Final Modification Report available for Panel	11th April 2018
Final Modification Report submitted to Authority	31st May 2018

Any questions?

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1. Purpose of the Modification

ENA EREC P2 is a planning standard and an Annex 1 document to the Distribution Code. The proposed modification of this document has been written to recognise the changes to the load and generation connected to distribution networks since EREC P2/6 was published in 2006. In particular it recognises that:

- some demand customers are modifying their electricity consumption in response to market signals; this means that further consideration has to be given to establishing the true demand on the network;
- in addition to providing security of supply from network assets and distributed generation, demand side services can also contribute to security of supplies; and
- the nature and type of distributed generation connected to the network mean that their contribution to security of supplies is different to that in EREC P2/6.

2. EREC P2 Revision Summary

EREC P2 – Security of Supply has been in place since the 1950s and has played a major role in the development of secure and reliable distribution networks. EREC P2 mandates the levels of security of supply DNOs are obliged to provide by specifying required levels of capacity and redundancy and is commonly referred to as a deterministic or minimum standard. DNOs can self-derogate from compliance with some of the requirements or exceed the requirements.

EREC P2 is a Distribution Code annex 1 qualifying standard and is governed by the DCRP. Compliance with EREC P2 is a DNO licence condition.

In 2014 the DCRP set up a working group to undertake a review of the existing standard (Phase 1).

The final phase 1 meeting of the DCRP WG and Consultants was held on 26th August 2016 and the Consortium's reports were subsequently published in September. These can be found here.

In summary, the work concluded that there was a strong economic case for the reform of EREC P2.

Following a period of time to allow the Network Operators to take on board the findings of the Consortium's WS 8 and WS 9 reports, the Network Operators met in October and December 2016 to discuss the reports and propose the next steps. Following discussions it was proposed that the phase 2 work would be arranged into three sub phases.

Phase 2a would focus on modifications and items of clarity that enable smart solutions within the context of the overall RIIO-ED1 regulatory package.

Phase 2b would focus on those items requiring more fundamental changes to other associated licence conditions and obligations.

Phase 2c would review the Engineering Report EREP 130 guidance document.

There were four initial Workshops set up to start proceeding with Phase 2a (Ofgem were invited to these Workshops). These workshops looked at the following subjects:

- Workshop 1, 13/2/17: Defining the purpose of P2/6 and a new/revised P2/7

- Workshop 2, 21/2/17: Defining demand
- Workshop 3, 10/3/17: Automation and Demand/Generation Side Response
- Workshop 4 17/3/17: F-Factor Contribution

On 24th March 2017 Ofgem sent a letter to licensees relating to the progress of revision to EREC P2/6. ENA responded to this letter on 3rd May 2017. This letter provided a summary of the Phase 1 Outputs and detailed the proposed next steps, along with timelines, for the Phase 2 work. The timelines stated in that letter are detailed in Appendix F of this report.

Following on from the four workshops above, the DNO representatives of the DCRP P2 working group developed an initial draft of EREC P2/7. This document was circulated to the DCRP P2 working group for comments and further discussed at a DCRP P2 working group meeting on 11th December 2017. This draft was well received at that meeting and an additional period of time was provided after the meeting to allow further opportunity for feedback.

Following some minor amendments to the draft EREC P2/7 document, a formal DCRP proposal for the modification was submitted to DCRP and tabled at the 4th January 2018 meeting. At this meeting the modification received DCRP approval to proceed to a public consultation. The consultation can be found here (DCRP/18/03/PC).

The main changes proposed in this consultation document were:

- Clarifying EREC P2 as being a standard defining the security of supply that is to be achieved, whilst EREP 130, which is in the process of being reviewed, becomes a document describing how that security of supply should be achieved;
- Formally incorporating Distributed Energy Resources (DER) into EREC P2;
- Removal of F-Factors and other tables associated with assessing the security contribution from Distributed Generation (DG) which is already duplicated in EREP 130;
- Refreshing the definition of demand to appropriately include consideration and treatment of flexible resources such as DG and Demand Side Response (DSR); and
- Specifically excluding the security of supply to DG installations from the scope of EREC P2 as justified by the consortiums analysis and findings.

On 12th January 2018 DCRP formally opened up a public consultation on the proposed draft of EREC P2/7. The initial deadline for responses was 2nd February, however due to the limited number of responses received, the deadline was extended to 12th February 2018.

Four responses from the public consultation were received. These responses were supportive of the proposed changes. Appendix A details the consultations responses, however of the four responses, one requested confidentiality and therefore this response is not included in this report but will be sent separately to Ofgem. Further detail of this public consultation can be found here.

3. Main changes to EREC P2/6

As stated above, the DCRP working group agreed that EREC P2 should be a standard defining the security of supply that is to be achieved, whilst EREP 130 should be a document describing how that security of supply should be achieved. Therefore it is proposed that any duplications in the current EREC P2/6 and EREP 130 are removed in the newly revised EREC P2/7. Another aspect of this proposal is to formally incorporate DER into EREC P2. Below is a summary of the main changes proposed in EREC P2/7. Appendix B of this document includes a clean copy of

the proposed EREC P2/7 and Appendix C includes the tracked change document. The main changes are summarised below:

1. The scope of the document has been updated as below:

   The purpose of this Engineering Recommendation is to define the standard to which a Group Demand should be secured. It details the factors that should be taken into consideration to establish the magnitude of the Group Demand that needs to be secured and also the means of securing that demand using a combination of network assets and non-network assets. It does not detail how the DNO should meet the standard, however guidance on the means of achieving the prescribed security of supply is set out in Engineering Report 130 [Ref 1].

   This document does not set out any minimum requirements for the security of supply for connections to a generating facility. This document deals with the security of DNOs distribution networks. It does not apply to the security of the connection between the DNOs distribution network and an individual customer, which should be agreed between the DNO and that customer.

2. The definition of Group Demand has been updated to take into account (but not be limited to):
   - The Latent Demand due to DG
   - The Latent Demand due to DSR
   - The Latent Demand due to storage and any other types of DERs
   - The effects of suppliers time of use tariffs
   - The effects of Network Operator price signals e.g. DNO or Triads
   - The effects of cold load pickup / demand following re-energisation
   - META data e.g. peak demand values vs half hourly average values
3. Cold Load Pickup, Demand Side Response, Latent Demand, Measured Demand, Network Operator, Secured Outage, Supplier and Transmission System Operator have been added to the terms and definitions. Declared Net Capability, Intermittent Generation, Non-intermittent Generation and Persistence (Tm) have been removed from the terms and definitions due to the proposed removal of F-Factors.
4. "Capability of a network to meet demand" – this section has split into the following sub sections to clarify the means by which Group Demand can be secured:
   - Capability of Circuits
   - Capability of non-circuit based capacity
   - Impact of Active Network Management, other control systems or protection systems
   - Security contribution from multiple sources
5. Table 1 remains unchanged in this proposal.
6. F-Factors and other tables associated with assessing the security contribution from Distributed Generation which are already duplicated in EREP 130 have been removed from the proposed version of EREC P2/7.
7. As justified by the consortiums findings in Phase 1 (link to this report above), the security of supply to DG installations has been excluded from the scope of EREC P2.

4. Where is EREC P2 referenced in the Distribution Code?

The Distribution Code refers to EREC P2 in a number of instances. These instances require updating as described below.

GUIDANCE NOTE 1

(Dated 01.04.1993 England and Wales Distribution Code

Adopted for the Distribution Code of Great Britain)

ENGINEERING RECOMMENDATION P2/6

The **Distribution Code Review Panel** has reviewed Engineering Recommendation P2/6 and for **Customers** falling within the remit of the **Distribution Code** has agreed that:-

The main section of this document deals with the establishment of recommendations for the security of electricity transmission and distribution systems of network operators. It does not apply to the supply connection of a **Customer**.

Each **Customer** supply connection needs to be considered on its own merits by discussion between the **Customer** and the network operator. The costs of providing a **Customer** supply connection by the network operator will be partly dependent upon the nature of the network operator's electrical system and the location of the **Customer's** premises. It will be for the **Customer** to decide, in negotiations with the network operator, the level of security required for the electricity supply to be provided to the **Customer's** premises. In general, the greater the level of security of supply required by the **Customer**, the greater the capital investment required by the network operator, as a consequence this will require the **Customer** to meet a higher level of supply connection charge.

The intent of this guidance is now incorporated into the proposed EREC P2/7 and therefore it is proposed that Guidance Note 1 is deleted from the Distribution Code.

DCODE Annex 1 list of Qualifying Standards includes the following:

4 (a) **Engineering Recommendation P2/6**

Security of Supply.

It is proposed that the above is replaced with

4 (a) **Engineering Recommendation P2/7**

Security of Supply.

DPC4.2.1 **Security**

In accordance with the Condition 5 of the **Distribution Licence, DNOs** shall plan and develop their **DNO's Distribution Systems** to a standard not less than that set out in DGD Annex 1 Item 4, Engineering Recommendation P2/6 – "Security of Supply" or such other standard of planning as **DNOs may, with the approval of the Authority**, adopt from time to time

In accordance with the **Distribution Licence** Scottish Hydro Electric Power Distribution Ltd shall plan and develop its **DNO's Distribution System** in Scotland to a standard set out in EM7907. Engineering Recommendation P2/6 – "Security of Supply" has been modified by

Scottish Hydro Electric Power Distribution Ltd as EM7907 and this is accepted by the **Authority**.

It is proposed that the above is replaced by:

DPC4.2.1 **Security**

In accordance with the Condition 5 of the **Distribution Licence, DNOs** shall plan and develop their **DNO's Distribution Systems** to a standard not less than that set out in DGD Annex 1 Item 4, Engineering Recommendation P2/7 – "Security of Supply" or such other standard of planning as **DNOs may, with the approval of the Authority**, adopt from time to time

In accordance with the **Distribution Licence** Scottish Hydro Electric Power Distribution Ltd shall plan and develop its **DNO's Distribution System** in Scotland to a standard set out in PO-PS-037 (formally EM7907). Engineering Recommendation P2/6 – "Security of Supply" has been modified by Scottish Hydro Electric Power Distribution Ltd as PO-PS-037 and this is accepted by the **Authority**.

Note to Authority

Scottish Hydro Electric Power Distribution Ltd is currently reviewing PO-PS-037 to align with the newly proposed EREC P2/7 and they will be in contact once a formal decision has been made regarding this proposed modification.

DPC7.4.5.2 With the **System** in its normal operating state, it is desirable that all **Generation Set**s remain connected and stable for any of the following credible fault outages,

(a) any one single circuit overhead line, transformer feeder or cable circuit, independent of length,

(b) any one transformer or reactor,

(c) any single section of busbar at or nearest the point of connection where busbar protection with a total clearance time of less than 200ms is installed,

(d) if demand is to be secured under a second circuit outage as required by ER P2/6, fault outages (a) or (b), overlapping with any pre-existing first circuit outage, usually for maintenance purposes. In this case the combination of circuit outages considered should be that causing the most onerous conditions for **System Stability**, taking account of the slowest combination of main protection, circuit breaker operating times and strength of the connections to the system remaining after the faulty circuit or circuits have been disconnected

It is proposed that the above is replaced by:

DPC7.4.5.2 With the System in its normal operating state, it is desirable that all **Power Generating Modules** remain connected and stable for any of the following credible fault outages,

(a) any one single circuit overhead line, transformer feeder or cable circuit, independent of length,

(b) any one transformer or reactor,

(c) any single section of busbar at or nearest the point of connection where busbar protection with a total clearance time of less than 200ms is installed,

(d) if demand is to be secured under a second circuit outage as required by EREC P2/7, fault outages (a) or (b), overlapping with any pre-existing first circuit outage, usually for maintenance purposes. In this case the combination of circuit outages considered should be that causing the

most onerous conditions for **System Stability**, taking account of the slowest combination of main protection, circuit breaker operating times and strength of the connections to the system remaining after the faulty circuit or circuits have been disconnected

Intermittent and Non-intermittent Generation is defined in ER P2/6 as follows:

- Intermittent Generation: Generation plant where the energy source for the prime mover cannot be made available on demand
- Non-intermittent Generation: Generation plant where the energy source for the prime mover can be made available on demand

It is proposed that the above is replaced by:

Intermittent and Non-intermittent Generation is defined in ENA EREP 130 as follows:

- Intermittent Generation: Generation plant where the energy source for the prime mover cannot be made available on demand
- Non-intermittent Generation: Generation plant where the energy source for the prime mover can be made available on demand

Notes:

1. Intermittent and Non-intermittent Generation is defined in ER P2/6 as follows

- Intermittent Generation: Generation plant where the energy source for the prime mover cannot be made available on demand
- Non-intermittent Generation: Generation plant where the energy source for the prime mover can be made available on demand

It is proposed that the above is replaced by:

Notes:

1. Intermittent and Non-intermittent Generation is defined in ENA EREP 130 as follows

- Intermittent Generation: Generation plant where the energy source for the prime mover cannot be made available on demand
- Non-intermittent Generation: Generation plant where the energy source for the prime mover can be made available on demand

5. Impacts on Total System and the DNOs System

The purpose of this revision is to maintain the security of supply at the level currently required by EREC P2/6 and to provide clarity on establishing Group Demand or the means by which demand can be appropriately secured. It is not expected to have material impact on the Total System or the DNOs Systems.

6. Impacts on DNOs Systems' Users

No impact.

7. Assessment against Distribution Code Objectives

The proposed amendments better facilitate the Distribution Code objective (i):

(i) to permit the development, maintenance and operation of an efficient, coordinated and economical system for the distribution of electricity;

Positive - This proposed document formally incorporates DER in to EREC P2 and clarifies the definition of Group Demand to appropriately include consideration and treatment of flexible resources such as DG and DSR. Considering the above will ensure that DNOs are cost effective when establishing the magnitude of the Group Demand that needs to be secured.

(ii) to facilitate competition in the generation and supply of electricity

The proposal has a neutral impact on this objective.

(iii) to 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

The proposal has a neutral impact on this objective.

(iv) to promote efficiency in the implementation and administration of the Distribution Code.

The proposal has a neutral impact on this objective.

8. Impact on other Industry documents

The Security and Quality of Supply Standards (SQSS) Review Panel are aware of these proposed changes and are currently considering whether there are any impacts on the SQSS. Any consequential changes will be progressed in accordance with the SQSS governance arrangements.

9. Environmental Impact Assessment

There are no environmental impacts associated with this proposed modification.

10. Workgroup Recommendations

The DCRP P2 workgroup recommends that the changes proposed in the new EREC P2/7 and the changes to the Distribution Code as outlined in section 3 of this report should be implemented.

11. Distribution Code Review Panel Recommendation

At the meeting of the Distribution Code Review Panel (the Panel) held on 05th April 2018, the proposed Report to Authority was discussed. Subsequently the report was circulated to DCRP for approval via email on 11th April 2018. The Panel unanimously agreed to the submission of

the Report to Authority as the Panel agreed that the Modification proposal better facilitated the objectives of the Distribution Code.

12. Recommendation

The Distribution Code Review Panel and Licenced Distribution Network Operators recommend that this modification report should:

- be submitted to the Authority for approval; and
- subject to the agreement of the Authority the modification should be implemented from the date the revised Distribution Code is published. This recommended date is 16th July 2018.

13. Appendices

A – Consultation Responses (other than confidential responses)

B – ENA Engineering Recommendation P2/7 – Clean

C - ENA Engineering Recommendation P2/7 – Tracked

D – Proposed Distribution Code based on current published version

E – Proposed Distribution Code based on P28 proposals currently with Ofgem (as of 31st May)

F - Phase 2 timelines