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Electricity Policy Document 280

Issue 5 November 2022

Distribution System Design – 132kV Network

Amendment Summary

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Issue 5	Template updated. Minor editorial updates.
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Contents

1 Introduction

The general principles contained within this Electricity Policy Document shall be applied to all new work on the 132kV network (Network) of Electricity North West Limited (Electricity North West). The decision as to whether existing Network shall be brought into line with this EPD when reinforcements or material alterations are carried out (including asset replacement work and new connections) will depend on individual circumstances and each case shall be actively considered.

This document is one of the following suite of documents relating to Network Design.

(a) EPD279 - Distribution System Design – General Requirements

(b) EPD280 - Distribution System Design – 132kV Network

(c) EPD281 - Distribution System Design – 33kV Network

(d) EPD282 - Distribution System Design – 11/6.6kV Network

(e) EPD283 - Distribution System Design – Low Voltage Network

This document shall be read in conjunction with EPD279.

2 Scope

This document describes the distribution network design principles at 132kV, which shall be used by the staff of Electricity North West Limited (Electricity North West), acting as service provider, and any third-party connector. It will assist network designers in discharging their responsibilities for compliance with The Electricity Safety, Quality and Continuity Regulations 2002, Electricity Distribution Licence – Condition 5, The Distribution Code and appropriate safety legislation. Additional information and guidance are available, in Code of Practice 280, to staff and contractors employed Electricity North West Limited.

3 Definitions

BSP	Bulk Supply Point – 132kV or 132/11/6.6kV Substation
CEGB	The former Central Electricity Generating Board
CP	Code of Practice
EPD	Electricity Policy Document
ENA ER	Energy Networks Association, Engineering Recommendation
ES	Engineering Specification
GSP	Grid Supply Point – 400 or 275kV to Lower Voltage Substation
Network	The Electricity Distribution Network owned and operated by Electricity North West Limited

NGET	National Grid Electricity Transmission

4 132kV Network and BSPs

4.1 General

Close liaison shall be maintained with NGET on all 132kV development projects in accordance with the Grid Code and the NGET Connection and Use of System Code.

4.2 Network Extension

Extensions to the 132kV Network shall be designed on the feeder-transformer principle with restrictions to be applied in accordance with ENA ER P18 e.g.

(a) No item of equipment shall have isolating facilities on more than four different sites.

(b) Under normal running arrangements the normal operating procedure for making dead any 132kV circuit shall not require the opening of more than seven circuit breakers.

(c) Not more than three transformers on any one site shall be banked together on any one 132kV circuit.

4.3 Bulk Supply Points

4.3.1 Civil designs of BSPs shall be agreed with the Design Manager, Electricity North West Limited in accordance with current practice.

4.3.2 New BSPs shall normally be designed to accommodate 132/33kV transformers up to a maximum capacity of 2 × 90 MVA, but in exceptional circumstances it is permissible to increase the capacity to a maximum of 3 × 90 MVA units.

4.3.3 A new BSP, designed in accordance with subsection 4.3.2, may initially be equipped with a single transformer where adequate interconnection is available. See subsection 4.5.1.

4.3.4 BSPs designed for 132/11kV transformers shall normally have their capacity restricted to 2 × 30 MVA units.

4.3.5 All 132kV transformers shall have local 132kV isolating and earthing facilities.

4.3.6 Due consideration shall be given to transformer duty (viz step-up, step-down, power flows etc), impedance (based on ENA ER P 1/3) and tapping range.

4.4 Voltage Step Change and Voltage Collapse

The Network shall be designed to limit voltage step changes and to avoid voltage collapse. Reference shall be made to EPD279, subsection 4.6.7.

4.5 Interconnection

4.5.1 BSPs shall normally operate independently but consideration shall be given to operating supply points in parallel through the lower voltage Network via transformers located at independent sites. There shall normally be a maximum of three transformers supplying an independent load group, each transformer fed from the same GSP.

4.5.2 The 132kV distribution Network shall not be designed to permit the permanent interconnection of GSP sites.

4.5.3 Lower voltage transfer capacity between BSPs, preferably available within 15 minutes by automatic or supervisory switching, shall be taken into account when determining the need for reinforcement.

4.6 Security of Demand

The demand to be met, after a first circuit outage affecting the capacity of the Network at a BSP busbar, shall be designed to be 100% of the normal maximum demand on that busbar. This demand may be met, either continuously (no break), or using transfer capacity between BSPs (typically at 33kV), restoration being normally achievable within 60s, ie by automatic switching.

Only in a case where the group maximum demand exceeds 100MW, is there a requirement to meet demand after a second circuit outage. In such a case, for a two-transformer BSP, the demand to be restored (within 3 hours) will not be expected to exceed the BSP maximum demand minus 100MW. (See ENA ER P2/7.)

4.7 Protection

Protection of the 132kV Network shall comply with EPD350 Protection for 132kV, 33kV and 11kV Systems, current practice and, as reference material, CEGB plant standards and protection memoranda. Any deviation shall be referred to the Protection Policy Manager.

Design of intertripping facilities shall be in accordance with EPD350.

New 132kV underground cables shall have pilot circuits laid with them or provision (e.g., ducts and pits) made for the future installation of pilot cables. New and refurbished 132kV overhead lines shall have pilot circuits installed with them. The specifications for such pilot circuits shall be agreed, for each individual cable or overhead line, with the Protection Policy Manager.

5 Documents Referenced

DOCUMENTS REFERENCED	
Non-Electricity North West Documents The following documents, legislation, national standards and ENA publications, cannot be supplied by Electricity North West Limited to persons outside those companies:	
Electricity Safety, Quality and Continuity Regulations 2002	
Grid Code	
The NGET Connection and Use of ystem Code	
ENA ER P1/3	275/33kV, 132/33kV and 132/11kV Supply Point Transformers
ENA ER P2/7	Security of Supply
ENA ER P18	Complexity of 132kV Circuits
Electricity North West Limited Published Documents The following documents are available from Electricity North West Limited:	
The Distribution Code	
Electricity Distribution Licence	
EPD279	Distribution System Design – General Requirements
EPD281	Distribution System Design – 33kV Network
EPD282	Distribution System Design – 11/6.6kV Network
EPD283	Distribution System Design – Low Voltage Network
EPD350	Protection for 132kV, 33kV and 11kV Systems
The following document is available to Electricity North West Limited staff:	
CP280	Distribution System Design - 132kV Networks

6 Keywords

132kV; BSP; Design; Network; Planning; Policy; Security; System;