The South West

Network Development Report – South West

May 2024

Electricity Distribution

nationalgrid

Contents

South West

1. Network Overview

The South West is one of the four licence areas within National Grid Electricity Distribution (NGED) network, serving approximately 1.4 million customers. The area covers approximately 14,400 square kilometres and extends from Bristol and Bath in the North East, along the peninsula to Land's End, some 300 km to the South West, and also includes the Isles of Scilly. The area is largely rural but includes the cities and towns of Bath, Bristol, Exeter, Plymouth, Taunton, Torquay and Weston-Super-Mare.

There is a wide spread of industrial and commercial activities within the area. Tourism and farming are also important to local communities. Business activity is generally concentrated on the population centres, in particular the north east of the area around Bristol and Bath. In contract to the major cities we are also responsible for some of the most sparsely populated areas in the UK including Dartmoor and Exmoor National Parks.

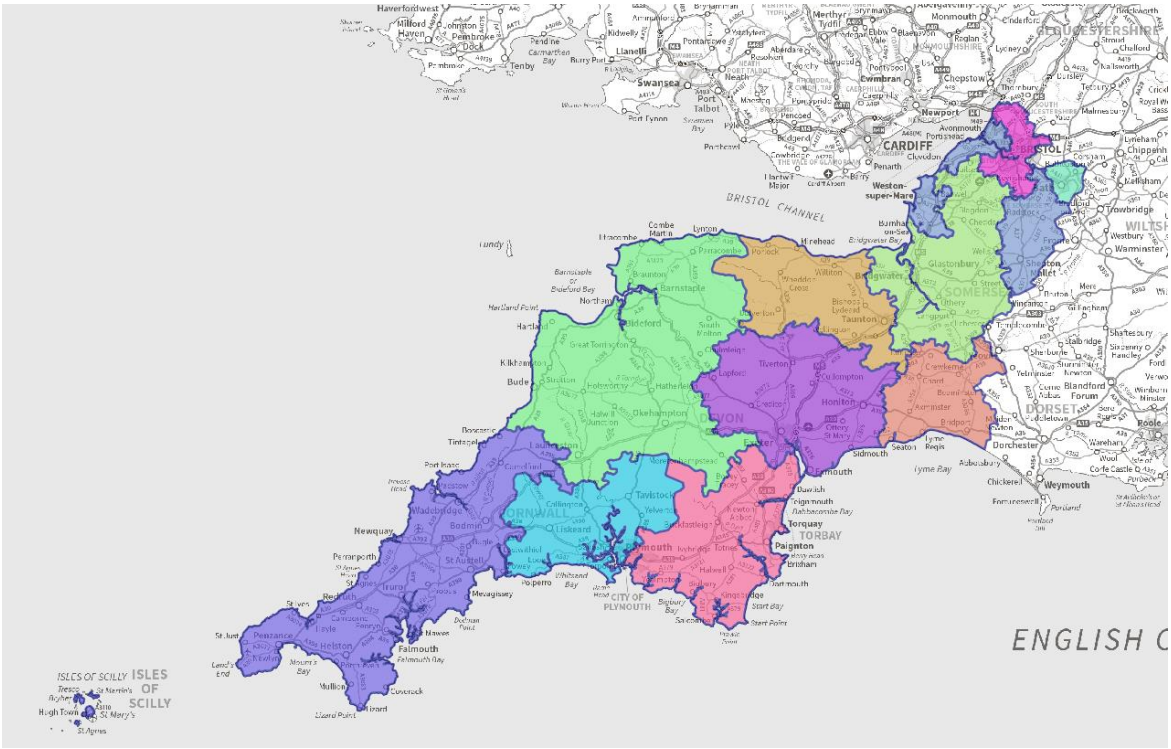

Figure 1.1 South West geographic area

The South West network covers 12 Grid Supply Points (GSPs), each feeding a number of Bulk Supply Points (BSPs) to cover its geographic area. Analysis has been carried out across the primary distribution network and reports discussing existing and future network constraints over a 0-10 year horizon have been provided.

For the purposes of this analysis the NGED Best View Distribution Future Energy Scenario (DFES) has been used to study each year up to and including 2034. Representative days for each of the four seasons (Winter, Intermediate Cool, Intermediate Warm, and Summer) have been studied to cover the edge case scenarios for the network.

1.1 Network Topology

The GSPs form the boundaries between transmission and distribution networks, typically supplied via 400/132 kV or 275/132 kV Super Grid Transformers (SGTs). The South West GSPs are listed below:

- **Iron Acton**: supplied via 6x 275/132 kV SGTs – shared with NGED West Midlands and National Grid Electricity Transmission
- **Seabank**: at time of writing supplied via 3x 400/132 kV SGTs
- **Sandford**: supplied via 2x 400/132 kV SGTs
- **Melksham**: supplied via 4x 400/132 kV SGTs – shared with Scottish and Southern Electricity Networks' Central Southern England licence area
- **Bridgwater**: supplied via 1x 400/132 kV and 1x 275/132 kV SGTs
- **Taunton**: supplied via 2x 400/132 kV SGTs
- **Axminster**: supplied via 2x 400/132 kV SGTs – shared with Scottish and Southern Electricity Networks' Central Southern England licence area
- **Exeter**: supplies via 3x 400/132 kV SGTs
- **Abham**: supplied via 2x 400/132 kV SGT
- **Landulph**: supplied via 3x 400/132 kV SGTs (one on hot-standby)
- **Alverdiscott**: supplied via 2x 400/132 kV SGTs
- **Indian Queens**: supplied via 4x 400/132 kV SGTs

Ryeford and Chipping Sodbury Bulk Supply Points (BSPs) both form part of the West Midlands licence area but are supplied from Iron Acton GSP in the South West.

Studies of Melksham and Axminster GSPs were limited to the NGED-owned sections of network; however, SSEN also publishes an NDP, so analysis and results for the SSEN-owned sections of network can be found on their website.

The GSPs typically supply multiple BSPs including 132/66 kV, 132/33 kV and 132/11 kV sites. The 132/11 kV BSPs are only found in central Bristol within the South West licence area as they are most suitable for high density demand locations; whereas 132/33 kV BSPs typically supply more rural areas, where the demand is more widely distributed.

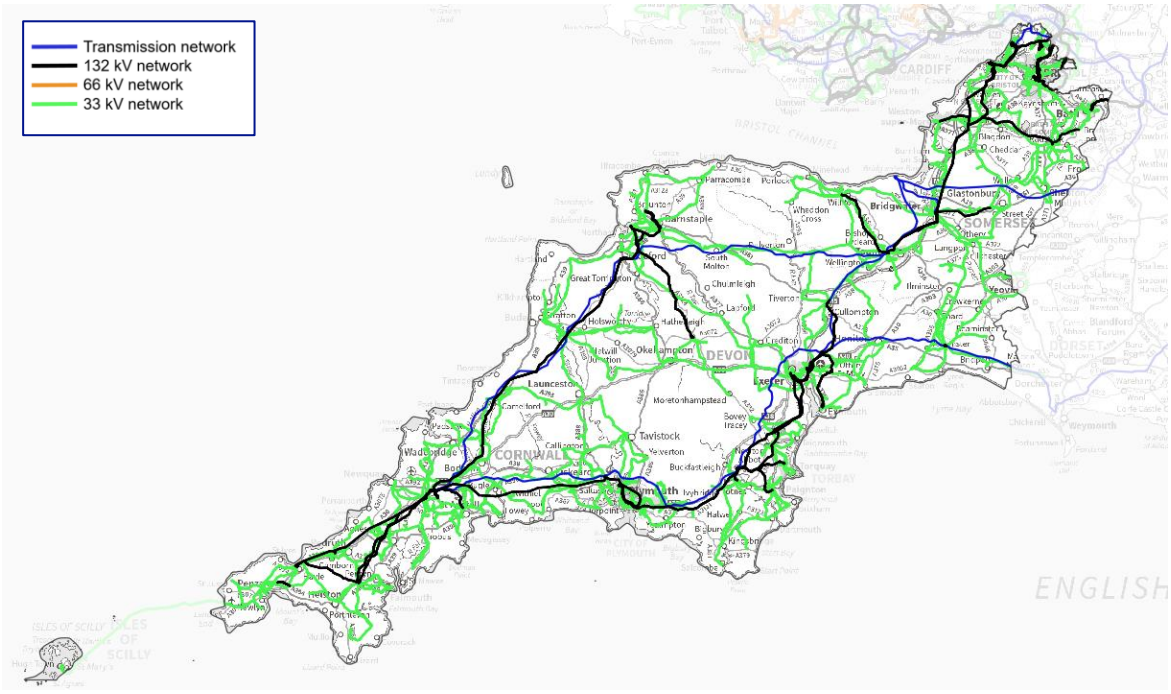

Figure 1.1.1 South West primary network geographic

2. GSP Network Constraint Summary

The tables below highlight the BSPs within each GSP, and the number of constraints identified in each area up to and including 2034. Details of the individual constraints are covered within the GSP reports.

Iron Acton GSP:

BSP / 132 kV	Constraints
132 kV Network	4
Feeder Road	4
Lockleaze BSP & Bradley Stoke BSP	4
St Pauls	1

Seabank GSP:

BSP / 132 kV	Number of constraints
132 kV network	2
Seabank GSP	1
Seabank BSP	0
Portishead	3
Radstock	7

Sandford GSP:

BSP / 132 kV	Number of constraints
132 kV network	1
Weston BSP	6
Churchill	5

Melksham GSP:

BSP / 132 kV	Number of constraints
132 kV network	1
Bath	5

Axminster GSP:

BSP / 132 kV	Number of constraints
132 kV network	1
Woodcote	6
Yeovil	6

Bridgwater GSP:

BSP / 132 kV	Number of constraints
132 kV network	2
Bridgwater	2
Street	6

Taunton GSP:

BSP / 132 kV	Number of constraints
132 kV network	0
Taunton	7
Bowhays Cross	7

Exeter GSP:

BSP / 132 kV	Number of constraints
132 kV network	8
Tiverton	11
Exeter Main	9
Sowton	9
Exeter City	5
Exmouth	2

Abham GSP:

BSP / 132 kV	Number of constraints
132 kV network	4
Plymouth	3
Plympton	7
Paignton	6
Torquay	3
Totnes	8
Newton Abbot	6

Landulph GSP:

BSP / 132 kV	Number of constraints
132 kV network	3
Milehouse	4
Ernesettle	7
Landulph - St Germans	14

Alverdiscott & Indian Queens GSPs:

BSP / 132 kV	Number of constraints
132 kV network	6
East Yelland	3
Barnstaple	5
Pyworthy & North Tawton	7
Hayle	6
Rame	8
Fraddon	7
St Tudy	5
St Austell	6
Camborne	4
Truro	8

3. Transmission-Distribution Interface

As discussed earlier, these GSPs typically form the boundary between the transmission and distribution networks. Across the South West and in most of its GSPs, high levels of New Connection activity (mainly dominated by Battery Storage connections and Photovoltaic generation schemes) have triggered constraints at the transmission network including SGT capacity, 275 kV and 400 kV circuit ratings, and 132 kV switchgear fault level limits.

Discussions are ongoing with the transmission network owner with regards to the best viable solution to mitigate these constraints, with options varying from uprating the existing assets to establishing additional GSPs in locations that best suit the network and its serving customers.

Some of the GSPs where new sites are being considered include:

- Axminster GSP
- Indian Queens GSP
- Alverdiscott GSP
- Abham GSP
- Iron Acton GSP

In addition to thermal and fault level constraints, there are spaces limitations at several of the GSPs with regards to installing additional bays for new connection and network reinforcement purposes; establishing new sites could therefore help mitigate this and make provisions for accommodating the increasing number of bays required.

4. Grid Transformer Cyclic Ratings

Across the South West, BSPs include Grid Transformers (GTs) that do not always have their cyclic ratings utilised. This generally applies to 132/33 kV and 132/11 kV grid transformers. Utilising these cyclic ratings would include carrying out further assessments and site checks to determine the appropriate level to uprate them to.

This has been discussed in the individual NDP reports where relevant.

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Registered Office: Avonbank, Feeder Road, Bristol BS2 0TB
nationalgrid.co.uk