Weston BSP

Network Development Report – South West

May 2024

Electricity Distribution

nationalgrid

Contents

Weston BSP

1. Network Overview

Weston Bulk Supply Point (BSP) supplies the large coastal town of Weston-Super-Mare in North Somerset. The BSP supplies five primary substations which supply various areas of the town as well as the village of East Brent to the South. The BSP is supplied from two 132/33 kV (Grid Transformers) GTs, fed via two 132 kV circuits from Sandford GSP. Weston BSP supplies approximately 47,000 customers.

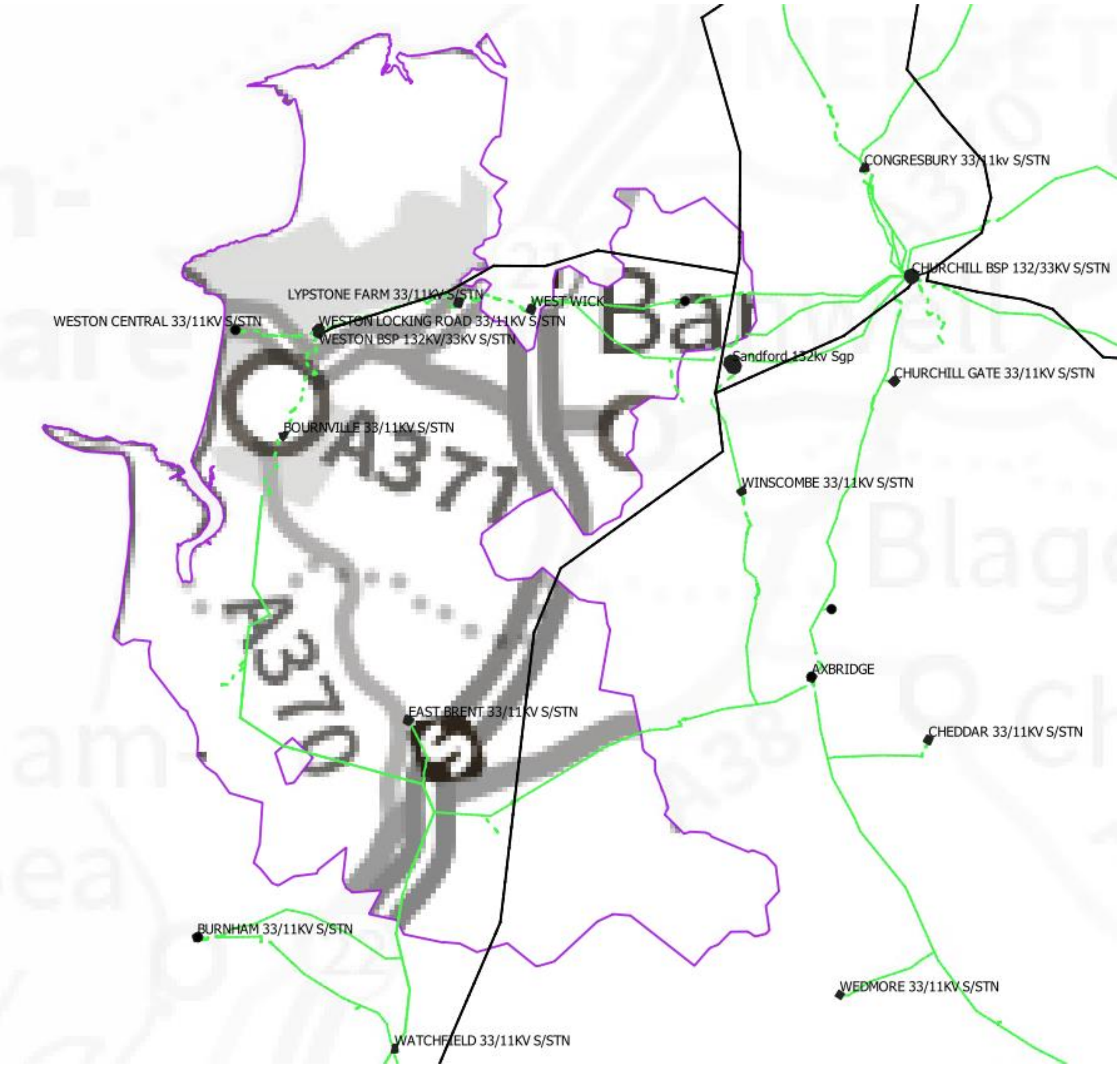

Figure 1.1 Weston BSP geographic network coverage

This report discusses all existing and future network constraints over a 0-10 year horizon associated with the 33/11 kV transformers, 33 kV circuits and 132/33 kV transformers which supply and are supplied by Weston BSP. This uses the methodology outlined in the Network Development Plan Methodology Report with Network Operability Modelling applied as outlined below.

For the purposes of this analysis the NGED Best View Distribution Future Energy Scenario (DFES) has been used to study the years 2022 (baseline), 2028 and 2034, with consideration given to how proposals could change under the other scenarios. Five representative days have been studied across the four seasons: Winter Peak Demand, Intermediate Warm Peak Demand, Intermediate Cool Peak Demand, Summer Peak Demand and Summer Peak Generation.

1.1 Network Topology

The Weston BSP network is arranged as follows:

- Weston GT1 and GT2 run in parallel supplying an outdoor 33 kV busbar located at Weston Locking Road. The 132 kV sides of these GTs are supplied by 132 kV from Sandford GSP.
- Weston Locking Road Primary is located on the other side of the railway to Weston BSP, it is supplied by three 33/11 kV transformers fed via an outdoor 33 kV busbar.
- Weston Central has two primary transformers supplied by two 33 kV circuits from Weston BSP.
- Bournville has two primary transformers fed via two 33 kV circuits from Weston BSP. One circuit at Bournville continues to East Brent Primary which is a single transformer primary. This circuit also continues to Burnham primary which is normally fed from Bridgwater BSP but is fed via Weston BSP in the event of a fault/outage.
- Lypstone Farm has two primary transformers supplied by two 33 kV circuits from Weston BSP. Both circuit continue from Lypstone Farm to West Wick with a normal open point on both circuits at West Wick.

1.2 Network Operability Modelling

The following network automation and manual switching schemes have been modelled in the analysis of this area, aligning to how the network is currently operated, as well as proposed actions, to manage some constraints identified operationally.

- Burnham Primary substation is transferred to Weston BSP for a fault on any part of the circuit between Bridgwater and Burnham

2. Summary of Network Constraints

The following constraints were identified for the Best View Scenario, for which mitigation options will be discussed:

- Weston Grid Transformer overloads
- East Brent T2 overload
- Lypstone Farm T1 and T2 overloads
- Weston BSP to Lypstone Farm 33 kV circuit overloads (2L5 and 3L5 circuits)
- Weston BSP to Bournville 33 kV circuit overload (1L5 circuit)
- Weston BSP to Weston Locking Road T3 33 kV circuit overload
- Lost load at Bournville and East Brent for a 33 kV busbar fault at Weston BSP

3. Network Constraint Details and Solution Options

3.1 Weston Grid Transformer overloads

Constraint Overview

Generation | **Demand**

The table below outlines the nature of the network constraints identified in the network analysis, with the worst overloads seen at winter peak demand.

Table 3.1.1 constraint(s) and condition under which constraint occurs

Constraint	N-1 Condition	Subsequent N-2 Condition	First studied year constraint is observed in each season under Best View			
			Winter	Int Cool	Int Warm	Summer
Weston BSP GT1	Fault/outage of Weston GT2 or associated busbar	None	Baseline	2028	2028	2034
Weston BSP GT2	Fault/outage of Weston GT1 or associated busbar	None	Baseline	2028	2028	2034

Uncertainty under other Distribution Future Energy Scenarios: As this constraint occurs under baseline, there is no uncertainty about future forecasts. There is a risk that demand reduces, however this is not forecast under any scenario so mitigation against this constraint is definitely required.

Solution Options

A list of each of the options considered for this constraint is given in the table below.

Table 3.1.2 solution options to solve constraint(s)

Solution Options	Description	Solves Constraint	Wider Benefit	Potential to be cost effective	Viable or Discounted
0	No Intervention	×	×	×	Discounted
Reinforcement					
1	Replace existing transformers	✓	✓	✓	Viable
2	Install additional transformer	✓	×	×	Discounted
3	Replace tap changer and uprate the existing transformers via use of cyclic ratings (GT1 only)	✓	×	✓	Viable
Operational Mitigation					
4	Transfer demand to other BSPs	×	×	×	Discounted
Load Management Schemes					
-	*None Identified*	-	-	-	-
Flexibility services					
5	Procure flexibility	✓	✓	✓	Viable

Solution Development

These options have been assessed on their technical viability and their likely cost-effectiveness pending a full cost benefit analysis (CBA). This CBA will be subsequently carried out by the Distribution Network Operator (DNO) to determine the optimal reinforcement solution, which will then be tested against market provided flexibility by the Distribution System Operator (DSO) as part of the Distribution Network Options Assessment (DNOA) process.

Option 0 – No Intervention

Capacity Released for constraint(s) considered: 0 MVA **Discounted**

Detailed description: Doing nothing to mitigate the constraint would result in overloads for the conditions described above. Therefore, not intervening would cause problems with system integrity (overloads) and would not be a technically viable solution.

New limiting factor for constraint(s) considered: N/A

Option 1 – Replace existing transformers

Capacity Released for constraint(s) considered: 30 MVA **Viable**

Detailed description: This would involve replacing the existing transformers with 90 MVA units. GT2 is limited by ancillary ratings due to the age of the transformer (installed 1965) meaning there is no possibility to uprate using cyclic ratings. Given the age of GT2 replacing the transformer would have a dual benefit in terms of releasing capacity and replacing aging assets.

GT1 is a newer unit meaning but is limited by a 60MVA tap changer rating meaning it may be possible to replace the tap changer and uprate via cyclic ratings as per Option 3 to defer replacement to 2028. However, it is recommended to assess the cost benefit of this given the predicted need to replace GT1 by 2028 in any case.

Option 4 is more viable in the near term.

New limiting factor for constraint(s) considered: 40 MVA transformer ratings

Option 2 – Install additional transformer

Capacity Released for constraint(s) considered: 60 MVA **Discounted**

Detailed description: Installing a third transformer alongside switchgear and civil works would allow two transformers to remain in service for a fault of either of the existing circuits, preventing an overload. However, this would require an additional 132 kV circuit as well as a compound extension meaning there would be significant costs associated with installing an additional transformer, therefore is not a cost-effective option.

New limiting factor for constraint(s) considered: Existing transformers.

Option 3 – Replace tap changer and uprate the existing transformers via use of cyclic ratings (GT1 only)

Capacity Released for constraint(s) considered: 18 MVA **Viable**

Uprate the existing transformers via use of cyclic ratings in accordance with British Standard 171/IEC60076 and NGED Standard Technique SD8C. This requires a capability assessment of all ancillaries, such as busbars, isolators, Current Transformers (CTs), cables (including cabling within the substation), switchgear, tap changer, transformer bushings, conservator and earthing transformer. In addition, an assessment of the cyclic profile of the load is required to determine if transformer temperature and ageing is within acceptable limits.

GT1 is a newer unit meaning but is limited by a 60MVA tap changer rating meaning it may be possible to replace the tap changer and uprate via cyclic ratings to defer replacement to 2028.

Due to the age of Weston GT2 the ancillary limitations of the GT mean it is not possible to increase the ratings through cyclic ratings. Therefore, it is recommended to replace GT2.

New limiting factor for constraint(s) considered: GT1 cyclic rating or limiting ancillaries

Option 4 – Transfer demand to other BSPs

Capacity Released for constraint(s) considered: 0 MVA **Discounted**

Detailed description: There only nearby BSP is Churchill BSP which is also limited in GT capacity meaning this is not a viable option.

New limiting factor for constraint(s) considered: N/A

Option 5 – Procure flexibility

Estimated Flexibility Required (MVA): 2 MVA+

Viable

Detailed description: Flexibility services could be procured to alleviate projected overloads. The amount required will continue to grow as demand grows meaning this would likely only defer the reinforcement.

Solution Recommendation

It is recommended to assess the cost benefit of Options 1 and 3 for GT1. Given with uprating to 78MVA (Option 3) an overload is still predicted in 2028, it may be more cost-effective to replace the GT1 compared to doing the reinforcement works to replace the tap changers and any other limiting ancillaries.

Due to age and baseline overloads it is recommended to replace GT2 with a 90 MVA unit as it cannot be uprated through cyclic ratings.

3.2 East Brent T2 overload

Constraint Overview

Generation Demand

The table below outlines the nature of the network constraints identified in the network analysis, with the worst overloads seen at winter peak demand.

Table 3.2.1 constraint(s) and condition under which constraint occurs

Constraint	N-1 Condition	Subsequent N-2 Condition	First studied year constraint is observed in each season under Best View			
			Winter	Int Cool	Int Warm	Summer
East Brent T2 overload	None (intact)	None	2030	2032	2034	>2034

Uncertainty under other Distribution Future Energy Scenarios: Under Leading the Way Scenario, this constraint is predicted to arise in 2029 and under Falling Short it is predicted to arise in 2034.

Solution Options

A list of each of the options considered for this constraint is given in the table below.

Table 3.2.2 solution options to solve constraint(s)

Solution Options	Description	Solves Constraint	Wider Benefit	Potential to be cost effective	Viable or Discounted
0	No Intervention	×	×	×	Discounted
Reinforcement					
1	Replace existing transformer	✓	✓	✓	Viable
2	Install additional transformer and 33 kV circuit	×	×	×	Discounted
Operational Mitigation					
3	Transfer demand to other Primaries	×	×	×	Discounted
Load Management Schemes					
4	Uprate the existing transformers via use of cyclic ratings	×	×	×	Discounted
Flexibility services					
5	Procure flexibility	✓	✓	✓	Viable

Solution Development

These options have been assessed on their technical viability and their likely cost-effectiveness pending a full CBA. This CBA will be subsequently carried out by the DNO to determine the optimal reinforcement solution, which will then be tested against market provided flexibility by the DSO as part of the DNOA process.

Option 0 – No Intervention

Capacity Released for constraint(s) considered: 0 MVA Discounted

Detailed description: Doing nothing to mitigate the constraint would result in overloads for the conditions described above. Therefore, not intervening would cause problems with system integrity (overloads) and would not be a technically viable solution.

New limiting factor for constraint(s) considered: N/A

Option 1 – Replace existing transformer

Capacity Released for constraint(s) considered: 9 MVA — Viable

Detailed description: This would involve replacing the existing transformer with a 7.5/15 MVA unit. Given the age of the transformer (installed 1962) this would have a dual benefit in terms of releasing capacity and replacing aging assets.

New limiting factor for constraint(s) considered: New transformer rating

Option 2 – Install additional transformer and 33 kV circuit

Capacity Released for constraint(s) considered: 0 MVA — Discounted

Detailed description: Installing an additional transformer would mitigate the intact overloads but this would then become an N-1 (first circuit outage) constraint which would still need to be mitigated. In addition a very long 33 kV circuit would be required at significant cost. Therefore, this option is not technically viable or cost-effective.

New limiting factor for constraint(s) considered: Existing transformers.

Option 3 – Transfer demand to other Primaries

Capacity Released for constraint(s) considered: 0 MVA — Discounted

Detailed description: East Brent is very remote with the nearest primary substations of Burnham and Bournville being upwards of 6 km away. Therefore, demand transfer options are very limited and there is unlikely to be any significant transfer capacity available. Therefore, this is not a viable solution.

New limiting factor for constraint(s) considered: N/A

Option 4 – Uprate the existing transformers via use of cyclic ratings

Capacity Released for constraint(s) considered: 0 MVA — Discounted

As East Brent is a single transformer primary the transformer does not run in parallel with a second transformer. Therefore, it is already subject to an increased aging rate as it experiences the full load during normal running (compared to 50% for parallel operation) and cannot be uprated.

New limiting factor for constraint(s) considered: N/A.

Option 5 – Procure flexibility

Estimated Flexibility Required (MVA): 0.5 MVA+ — Viable

Detailed description: Flexibility services could be procured to alleviate projected overloads. The amount required will continue to grow as demand grows meaning this would likely only defer the reinforcement.

Solution Recommendation

It is recommended to firstly consider flexibility as an option to defer reinforcement, subject to a cost benefit analysis confirmation through the DNOA process. Following this, it is recommended to replace the existing transformer to allow for long term growth in the area.

3.3 Weston BSP to Lypstone Farm 33 kV circuit overloads (2L5 and 3L5 circuits) and Lypstone Farm T1 and T2 overloads

Constraint Overview

Generation | **Demand**

The table below outlines the nature of the network constraints identified in the network analysis, with the worst overloads seen at winter peak demand.

Table 3.3.1 constraint(s) and condition under which constraint occurs

Constraint	N-1 Condition	Subsequent N-2 Condition	First studied year constraint is observed in each season under Best View			
			Winter	Int Cool	Int Warm	Summer
Lypstone Farm T1 overload	Lypstone Farm T2 or associated circuit fault/outage	None	2028	2028	2028	2034
Lypstone Farm T2 overload	Lypstone Farm T1 or associated circuit fault/outage	None	2028	2028	2028	2034
Weston BSP 2L5 circuit to Lypstone Farm 4L3 33kV circuit overloads	Weston BSP 3L5 circuit fault/outage	None	2028	2028	2034	>2034
Weston BSP 3L5 circuit to Lypstone Farm 5L3 33kV circuit overloads	Weston BSP 2L5 circuit fault/outage	None	2028	2028	2034	>2034

Uncertainty under other Distribution Future Energy Scenarios: Under Leading the Way Scenario, this constraint is predicted to arise in 2026 and under Falling Short it is predicted to arise in 2030.

Solution Options

A list of each of the options considered for this constraint is given in the table below.

Table 3.3.2 solution options to solve constraint(s)

Solution Options	Description	Solves Constraint	Wider Benefit	Potential to be cost effective	Viable or Discounted
0	No Intervention	×	×	×	Discounted
Reinforcement					
1	Replace existing transformers and reinforce 33 kV circuits	✓	×	×	Discounted
2	Install additional transformer and 33 kV circuit	✓	✓	✓	Viable
3	Install new primary substation	✓	✓	✓	Viable
Operational Mitigation					
4	Transfer demand to other Primaries (with 11 kV reinforcement if required)	✓	✓	✓	Viable
Load Management Schemes					
5	Uprate the existing transformers via use of cyclic ratings	×	×	×	Discounted
Flexibility services					
6	Procure flexibility	✓	✓	✓	Viable

Solution Development

These options have been assessed on their technical viability and their likely cost-effectiveness pending a full CBA. This CBA will be subsequently carried out by the DNO to determine the optimal reinforcement solution, which will then be tested against market provided flexibility by the DSO as part of the DNOA process.

Option 0 – No Intervention

Capacity Released for constraint(s) considered: 0 MVA **Discounted**

Detailed description: Doing nothing to mitigate the constraint would result in overloads for the conditions described above. Therefore, not intervening would cause problems with system integrity (overloads) and would not be a technically viable solution.

New limiting factor for constraint(s) considered: N/A

Option 1 – Replace existing transformers

Capacity Released for constraint(s) considered: 17 MVA **Discounted**

Detailed description: This would involve replacing the existing transformers with 20/40 MVA units as well as uprating the 33 kV circuits. As the transformers were installed in 2017 this would not be cost-effective particularly when compared to installing a third transformer or transferring demand. Therefore, this option has been discounted.

New limiting factor for constraint(s) considered: 40 MVA transformer ratings

Option 2 – Install additional transformer and 33kV circuit

Capacity Released for constraint(s) considered: 22.9 MVA **Viable**

Detailed description: Installing a third transformer alongside a third 33 kV circuit, switchgear and civil works would allow two transformers to remain in service for a fault of either of the existing circuits, preventing an overload. It would however cause overloads for N-2 unless the network was split up following an arranged outage.

New limiting factor for constraint(s) considered: Existing transformers.

Option 3 – Install new primary substation

Capacity Released for constraint(s) considered: 46 MVA **Viable**

Detailed description: This would involve identifying a viable site to locate a new primary substation, studying the connection options into Weston BSP and transferring sufficient demand away from Lypstone Farm to prevent overloads. The benefit of a new primary is there would be no N-2 overload as there would be at a three transformer primary if not splitting the network during arranged outage. Therefore, this option is more secure but at a higher cost.

New limiting factor for constraint(s) considered: Transfers off Lypstone farm available

Option 4 – Transfer demand to other Primaries (with 11 kV reinforcement if required)

Capacity Released for constraint(s) considered: **Viable**

Up to 9MVA dependent on 11kV circuit capacity.

Detailed description: West Wick Primary substation is the nearest primary substation and has significant spare capacity with 14MVA transformers a predicted demand of 5 MVA in 2028 under Best View. Therefore, utilising this capacity is likely the most cost-effective option provided the 11 kV circuits are capable of picking up additional demand. Reinforcement of the 11 kV circuits to release this capacity should also be considered as it is likely to be lower cost than an additional transformer and 33 kV circuit to Lypstone Farm.

New limiting factor for constraint(s) considered: N/A

Option 5 – Uprate the existing transformers via use of cyclic ratings

Capacity Released for constraint(s) considered: 0MVA

Discounted

Detailed description: The transformers are not capable of cyclic rating as they are continuous emergency rated transformers already designed to operate at high temperature under N-1. Therefore, any increase to the operating temperature would result in potential damage to the transformers or incorrect operation of protection. In addition, capacity is limited by the 33 kV circuits meaning no capacity would be released.

New limiting factor for constraint(s) considered: N/A.

Option 6 – Procure flexibility

Estimated Flexibility Required (MVA): 1 MVA+

Viable

Detailed description: Flexibility services could be procured to alleviate projected overloads. The amount required will continue to grow as demand grows meaning this would likely only defer the reinforcement.

Solution Recommendation

It is recommended to firstly consider flexibility as an option to defer reinforcement, subject to a cost benefit analysis confirmation through the DNOA process. Following this, transferring demand to West Wick Primary substation is likely to be the lowest cost option, with potential 11 kV reinforcement to give additional transfer capacity.

Finally, a cost benefit analysis of a new primary substation in the vicinity, compared to a third 33 kV circuit and transformer at Lypstone farm, should be carried out to determine which option is best to release significant capacity once 11 kV transfer capacity is exhausted.

3.4 Weston BSP to Bournville 33 kV circuit overload (1L5 circuit)

Constraint Overview

Generation | Demand

The table below outlines the nature of the network constraints identified in the network analysis, with the worst overloads seen at winter peak demand.

Table 3.4.1 constraint(s) and condition under which constraint occurs

Constraint	N-1 Condition	Subsequent N-2 Condition	First year constraint is observed in each season under Best View			
			Winter	Int Cool	Int Warm	Summer
Weston BSP to Bournville 33 kV circuit overload (1L5 circuit)	Fault/outage at Bridgwater resulting in Burnham being picked up from Weston BSP	None	2028	2028	>2034	>2034

Uncertainty under other Distribution Future Energy Scenarios: Under Leading the Way Scenario, this constraint is predicted to arise in 2026 and under Falling Short it is predicted to arise in 2033.

Solution Recommendation

It is recommended to close the 33kV section breaker at Bournville to parallel the 33kV circuits between Weston BSP and Bournville under normal running (which are currently split). This prevents an overload when picking up Burnham and improves voltage performance. This will require a protection review and a new protection configuration and settings. This will prevent the N-1 overloads, however, it will become an N-2 issue for an arranged outage of one circuit between Weston and Bournville followed by a fault on the Burnham side. As there is no overload in intermediate warm or summer the arranged outage window could be limited to these seasons to solve the N-2 issue.

Longer term, reinforcement between Bridgwater and Burnham is likely to be required as suggested in the Bridgwater BSP report to further secure demand and release further capacity.

3.5 Weston Locking Road Transformer overload

Constraint Overview

Generation | Demand

The table below outlines the nature of the network constraints identified in the network analysis, with the worst overloads seen at winter peak demand.

Table 3.5.1 constraint(s) and condition under which constraint occurs

Constraint	N-1 Condition	Subsequent N-2 Condition	First year constraint is observed in each season under Best View			
			Winter	Int Cool	Int Warm	Summer
Weston Locking Road T3 overload	Weston BSP Main 2 or Main 3 busbar fault	None	2030	2030	2030	2030
Weston Locking Road T1/T2/T3 overload	Weston Locking Road T1/T2/T3 arranged outage	Weston Locking Road T1/T2/T3 arranged fault	2030	2030	2030	2030

Uncertainty under other Distribution Future Energy Scenarios: Under Leading the Way Scenario, this constraint is predicted to arise in 2030 and under Falling Short it is predicted to arise in 2034.

Solution Options

A list of each of the options considered for this constraint is given in the table below.

Table 3.5.2 solution options to solve constraint(s)

Solution Options	Description	Solves Constraint	Wider Area Benefit	Potential to be cost effective	Viable or Discounted
0	No Intervention	×	×	×	Discounted
Reinforcement					
1	Install 33 kV section breaker between Main 2 and Main 3 busbar (via a new indoor 33 kV switchboard)	✓	✓	✓	Viable
Operational Mitigation					
2	Transfer demand to other Primaries	✓	✓	✓	Viable
Load Management Schemes					
-	*None Identified*	-	-	-	-
Flexibility services					
3	Procure flexibility	✓	✓	✓	Viable

Solution Development

These options have been assessed on their technical viability and their likely cost-effectiveness pending a full CBA. This CBA will be subsequently carried out by the DNO to determine the optimal reinforcement solution, which will then be tested against market provided flexibility by the DSO as part of the DNOA process.

Option 0 – No Intervention

Capacity Released for constraint(s) considered: 0 MVA

Discounted

Detailed description: Doing nothing to mitigate the constraint would result in overloads for the conditions described above. Therefore, not intervening would cause problems with system integrity (overloads) and would not be a technically viable solution.

New limiting factor for constraint(s) considered: N/A

Option 1 – Install 33kV section breaker between Main 2 and Main 3 busbar

Capacity Released for constraint(s) considered: 23 MVA **Viable**

Detailed description: This options involves installing a 33 kV section breaker between Main 2 and Main 3 to prevent both busbars going off for a busbar fault. This will require an assessment of whether a section breaker can be installed in the existing outdoor compound or whether converting the outdoor 33 kV busbar and switchgear into an indoor 33 kV switchboard may be required. Fault level exceedance of existing isolators is also predicted which may provide a further driver for installing an indoor 33 kV switchboard.

New limiting factor for constraint(s) considered: Existing 33 kV cable sections.

Option 2 – Transfer demand to other Primaries

Capacity Released for constraint(s) considered: **Viable**

Up to 8 MVA (dependent on 11 kV circuit Capacity)

Detailed description: There is available capacity at Weston Central which may allow demand to be transferred on the 11 kV network. This may allow reinforcement to be deferred. A review of the 11 kV capacity by the Secondary System Planning Team will be carried out to determine the full viability of this option.

New limiting factor for constraint(s) considered: N/A

Option 3 – Procure flexibility at Weston Locking Road at 11 kV or below

Estimated Flexibility Required (MVA): 1 MVA+ **Viable**

Detailed description: Flexibility services could be procured at Weston Locking road to alleviate overloads. The amount required will continue to grow as demand grows meaning this would likely only defer the reinforcement. In addition, installing a 33 kV section breaker has additional benefits to network configuration options.

Solution Recommendation

It is recommended to install a 33 kV section breaker between Main 2 and Main 3 busbar to prevent the loss of both busbars for a fault. This would prevent N-1 overloads for a busbar fault but would not solve the N-2 issues for the loss of two transformers. This will require an assessment of whether a section breaker can be installed in the existing outdoor compound or whether converting the outdoor 33 kV busbar and switchgear into an indoor 33 kV switchboard may be required. Fault level exceedance of existing isolators is also predicted which may provide a further driver for installing an indoor 33 kV switchboard.

This will require an assessment of whether a section breaker can be installed in the existing outdoor compounder or whether converting the outdoor 33 kV busbar and switchgear into an indoor 33 kV switchboard may be required. Fault level exceedance of existing isolators is also predicted which may provide a further driver for installing an indoor 33 kV switchboard, subject to a cost benefit analysis.

In order to defer reinforcement and mitigate N-2 overloads demand transfer to Weston Central can be considered along with flexibility services.

3.6 Lost load at Bournville and East Brent for a 33 kV busbar fault at Weston BSP

Constraint Overview

Generation | Demand

The table below outlines the nature of the network constraints identified in the network analysis, with the worst overloads seen at winter peak demand.

Table 3.6.1 constraint(s) and condition under which constraint occurs

Constraint	N-1 Condition	Subsequent N-2 Condition	First year constraint is observed in each season under Best View			
			Winter	Int Cool	Int Warm	Summer
Lost load at Bournville and East Brent	Weston BSP Main 2 or Main 3 busbar fault	None	Baseline	Baseline	Baseline	Baseline

Uncertainty under other Distribution Future Energy Scenarios: As this occurs under baseline there is no uncertainty on the constraint occurring.

Solution Recommendation

It is recommended to install a 33 kV section breaker between Main 2 and Main 3 busbar to prevent the loss of both busbars for a fault resulting in the disconnection of both 33 kV circuits to Bournville. This will require an assessment of whether a section breaker can be installed in the existing outdoor compound or whether converting the outdoor 33 kV busbar and switchgear into an indoor 33 kV switchboard may be required. This would include an assessment of fault level to determine if there is dual driver due to fault level exceedances.

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