

Update – May 2015

Foreword

This statement is an update to the Long Term Development Statement (LTDS) published in November 2014 and is intended to be in addition to and used in conjunction with the November 2014 publication of which an electronic copy is available to download at our website: www.northernpowergrid.com/ltlds.

Although every effort has been made to ensure the accuracy of the data provided in this statement, Northern Powergrid does not accept any liability for the accuracy of the information contained herein, and in particular neither Northern Powergrid nor its directors or its employees shall be under any liability for any misstatement or opinion on which the recipient of this statement relies or seeks to rely.

Users of the detailed version of the Long Term Development Statement are encouraged to download their own personal copy of the LTDS via registration on the Northern Powergrid LTDS webpage. This will enable Northern Powergrid to advise users when any updates to the LTDS are issued.

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Introduction

1 Purpose of statement

The Long Term Development Statement (LTDS), published annually in November is compiled in accordance with distribution licence standard condition 25. The aim of the long-term development statement is to:

- Improve the availability of information about Northern Powergrid's distribution system
- Furnish developers with sufficient information to carry out initial assessments of system capability
- Inform users of our distribution system development proposals
- Inform relevant people of the correct points of contact within Northern Powergrid for specific enquiries

This statement is an update to the Long Term Development Statement published in November 2014 and is intended to be in addition to and used in conjunction with the November 2014 publication. Any comments on the usability, quality or content of the statement would be welcomed, along with any suggestions for future improvements. Such comments should be addressed to the LTDS Co-ordinator, whose contact details are presented in the next section.

2 Contact details for further information

Requests for assistance in interpretation and clarification of the information contained in the statement should be made to:

LTDS Co-ordinator
Asset Management (System Planning)
Northern Powergrid
98 Aketon Road
Castleford
West Yorkshire
WF10 5DS

☎: 01977 605951

✉: LTDS@northernpowergrid.com

Enquiries concerning new or modified connections should be addressed to:

Northern Powergrid Connections
Cargo Fleet Lane
Middlesbrough
Cleveland
TS3 8DG

☎: 0845 070 2703

✉: network.connections@northernpowergrid.com

Detailed information

3 Third-party interest for a connection

The number of connection enquiries received for a particular area may be of assistance when making an initial assessment of the feasibility of a new or additional connection. Appendix 8 contains a summary of enquiries for new or modified demand and generation connections received between 1 October 2014 and 31 March 2015 for connections to the 132, 66 and 33kV system and 11kV busbars. The information is summated to supply point level, or grid supply point where the size of the proposed connection means it cannot be provided at a lower voltage.

Data within Appendix 8 is contained in the link below:

[Appendix 8: Third-party Interest for Connection](#)

4 Authorised system development proposals

This section provides a brief description of the system development projects that are currently under construction and those projects where construction has not yet started, but the relevant finance for the projects has been secured. In addition to projects that are fully funded by Northern Powergrid, information is also provided for projects that have an element of customer contribution and those that are totally funded by a customer, where details of that project are considered to be in the public domain. Projects that are contained within the current Northern Powergrid 10-year investment plan that had been financially sanctioned before the end of March 2015 are included.

Details on any other non-financially authorised schemes contained within the current 10-year investment plan relating to a particular geographic location will be provided on request, although this information may be limited in scope and description.

The following authorised system development proposals that appeared in November 2014 LTDS have been removed from this (May-update) statement as they are now completed as planned.

- (Elland GSP, Sowerby Bridge SP) – Todmorden and Reaps windfarm generation connection
- (Ferrybridge B GSP, Ferrybridge Multi-Fuel SP) – Ferrybridge multi-fuel generation connection
- (Keadby GSP, Santon SP) – Pasture Road South 33/11kV substation transformer replacement

The following authorised system development proposal that appeared in November

2014 LTDS has not been included in this (May-update) statement as the project has been cancelled by the customer.

- (Keadby GSP, Santon SP) – Saxby windfarm generation connection

For each authorised system development proposal included in this year's statement, the following information is provided:

- Project name
- Outline of the planned works
- Indicative timescales¹
- Reason for carrying out the works
- Expected impact on distribution system capability

Where the expected delivery date has changed, the previously forecast date is included. Changes in delivery dates can occur for various reasons. Typical reasons for changes in project plans are:

- Difficulties in securing appropriate wayleaves
- Changes to system outage dates
- Changes to customer requirements
- Re-engineering of projects
- Changes to supplier lead times

All the development proposals are grouped by grid supply point (GSP) and then supply point (SP), as indicated in each of the development proposal titles. Those projects with an asterisk (*) in their title in this section were also included in the November 2015 statement.

4.1 (Bradford West GSP, Holmfield SP) – Ovenden Moor windfarm generation connection*

Outline of planned work

This project connected 22.5MW of new wind generation at Ovenden Moor, Halifax. The connection of Ovenden Moor Windfarm will require the cabled connection via a new 33kV Switchboard at Holmfield 33kV substation on the existing Furness Avenue T2 circuit.

Table 1: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Holmfield 33kV Substation – Feeder CB	33	1,250	31.5	1

¹ Project timescales are included as a guide only and may be subject to change. For confirmation of project timescales please contact the LTDS Co-ordinator.

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Holmfield 33kV Substation – Non Automatic Feeder CB	33	1,250	31.5	1
Ovenden Moor WF – Metered CB	33	1,250	31.5	1

Table 2: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating (A)	Estimated length (km)
Holmfield – Ovenden Moor WF	33	300mm ² Cu XLPE	570	8.5

Expected delivery date

Quarter 1, 2016 (reforecast from Quarter 4, 2016).

Reasons for carrying out the work

A request was received for the connection of a windfarm.

Impact on distribution system

The connection of this wind farm has no impact on existing equipment due to fault level increase.

4.2 (Camblesforth GSP, Camblesforth SP) – Twin Rivers windfarm generation connection*

Outline of planned work

This project will connect 32MW of new wind generation at Whitgift Common, Humberside. The connection is to be made via a new 66kV mixed overhead line / underground cable circuit from Guardian Glass 66/11kV primary substation.

Table 3: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Guardian Glass - Feeder CB	66	1,250	31.5	1
Twin Rivers - Metering CB	66	1,250	31.5	1

Table 4: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating (A)	Estimated length (km)
Guardian Glass S/S – White house farm (Cabled Section)	66	500mm ² Cu XLPE	621	2.5
White House Farm – Twin Rivers WF (Cabled Sections)	66	300mm ² Cu XPLE	298	1.7
Guardian Glass S/S – Twin Rivers WF (OHL Sections)	66	200mm ² AAAC	568 (Summer)	4.2

Expected delivery date

Quarter 2, 2016.

Reasons for carrying out this work

A request was received for the connection of a windfarm.

Impact on distribution system

The connection of this windfarm has no impact on existing equipment due to fault level increase.

4.3 (Camblesforth GSP, Guardian Glass SP) – Goole Fields 2 windfarm generation connection*

Outline of planned work

This project connected 35MW of new wind generation adjacent to Goole Fields WF, Humberside. The connection of Goole Fields 2 Windfarm will require an underground cable loop into the Gaurdian Glass – Twin Rivers WF circuit (circuit approved but not yet constructed).

Table 5: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Goole Fields 2 Substation – Bus Section CB	66	1,250	31.5	1
Goole Fields 2 Substation – Metered CB	66	1,250	31.5	1

Table 6: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating (A)	Estimated length (km)
POC – Goole Fields 2 Substation	66	500mm ² Cu XLPE	621	0.03 (2 x 15 metres)

Expected delivery date

Quarter 4, 2016.

Reasons for carrying out the work

A request was received for the connection of a windfarm.

Impact on distribution system

The connection of this windfarm has no impact on existing equipment due to fault level increase.

4.4 (Creyke Beck GSP, Cornwall Street SP) – Cleveland Street switched firm generation connection*

Outline of planned work

This project is to connect 25MW of new generation at Cornwall Street, Hull. The connection will be made via two underground cables connected into the 132kV circuits from Creyke Beck to Cornwall Street T1 and T2 to a metering circuit breaker situated in Cornwall Street.

Table 7: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Cornwall Street	132	2,000	40	1

Expected delivery date

Quarter 3, 2016 .

Reasons for carrying out the work

A request was received for the connection of this generation.

Impact on distribution system

The table below illustrates the change in fault levels at the nominated busbars as a result of this connection:

Table 8: Change in fault levels

Busbar	Voltage (kV)	Break fault level (kA RMS)		Make fault level (kA Peak)	
		Before connection	After connection	Before connection	After connection
Creyke Beck M1&R1	132	10.5	10.8	26.3	27.0
Creyke Beck M2&R2	132	10.7	10.6	26.7	26.6
Cornwall Street	11	9.45	9.91	23.6	24.8

4.5 (Creyke Beck GSP, Driffield SP) – Fraisthorpe windfarm generation connection*

Outline of planned work

This project is to connect 30.6MW of new wind generation at Fraisthorpe, East Riding of Yorkshire.

This scheme is an expansion of a previously quoted Barmston North 20.7MW windfarm. The customer has accepted the previous quote (scheme no 30062) however wishes to increase the capacity of the development to 30.6MW. This scheme therefore assumes that if accepted it will be implemented in place of the original connection.

The connection will be made via underground cable from a teed connection on the Driffield 132/66kV to Brett Street 132/66kV circuit to a 66kV metering circuit breaker at Fraisthorpe.

Table 9: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Fraisthorpe – metering circuit breaker	66	1,250	31.5	1

Table 10: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating (A)	Estimated length (km)
Driffield - Fraisthorpe	66	300mm ² Cu XLPE	284	5.9

Expected delivery date

Quarter 4, 2015.

Reasons for carrying out the work

A request was received for the connection of a windfarm.

Impact on distribution system

The table below illustrates the change in fault levels at the nominated busbars as a result of this connection:

Table 11: Change in fault levels

Busbar	Voltage (kV)	Break fault level (kA RMS)		Make fault level (kA Peak)	
		Before connection	After connection	Before connection	After connection
Driffield	66	10.7	11.3	26.8	28.2
Brett Street	11	12.2	12.2	30.4	30.6
Martongate	11	7.03	7.08	17.6	17.7

4.6 (Creyke Beck GSP, Driffield SP) – Tansterne biomass generation connection*

Outline of planned work

This project will connect 18MW of new biomass and energy crops generation facility at Nr Flinton, East Yorkshire. The connection is to be made by looping into the existing Seaton to Burton Pidsea 66kV circuit.

Table 12: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Customer site - bus section CB	66	2,000	31.5	1
Customer site - feeder CB	66	1,250	31.5	1
Customer site - transformer metering CB	66	2,000	31.5	1

Table 13: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating (A)	Estimated length (km)
Loop into existing Seaton to Burton Pidsea circuit	66	500 mm ² Cu XLPE	685	0.7

Expected delivery date

Project on hold.

Reasons for carrying out this work

A request was received for the connection of a biomass and energy crops generation facility.

Impact on distribution system

The table below illustrates the change in fault levels at the nominated busbars as a result of this connection (please note that the “After connection” fault levels this include contributions from Withernwick Windfarm):

Table 14: Change in fault levels

Busbar	Voltage (kV)	Break fault level (kA RMS)		Make fault level (kA Peak)	
		Before connection	After connection	Before connection	After connection
Beverley	66	9.30	10.22	24.3	23.54
Driffield	66	10.10	11.46	25.7	26.65
Seaton	66	4.85	5.87	10.2	11.88
Seaton	11	9.64	10.34	25.3	24.51
Burton Pidsea	66	4.30	5.76	8.8	11.79
Burton Pidsea	11	5.74	8.35	14.8	20.54
Withernwick	66	-	5.83	-	11.77

4.7 (Drax GSP, Osgodby SP) – Spaldington windfarm generation connection*

Outline of planned work

This project will connect 12.5MW of wind generation at Spaldington Airfield near Howden. The connection is to be made via an underground cable teed onto the Osgodby - Thorpe Road 33kV feeder and installed to a 33kV metering circuit breaker at Spaldington.

Table 15: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Spaldington - metering circuit breaker	33	1,250	25	1

Table 16: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating (A)	Estimated length (km)
Tee - Spaldington	33	300mm ² Cu XLPE	490	3.6

Expected delivery date

Quarter 4, 2015.

Reasons for carrying out this work

A request was received for the connection of a windfarm.

Impact on distribution system

The table below illustrates the change in fault levels at the nominated busbars as a result of this connection:

Table 17: Change in fault levels

Busbar	Voltage (kV)	Break fault level (kA RMS)		Make fault level (kA Peak)	
		Before connection	After connection	Before connection	After connection
Osgodby 3/4	33	11.72	11.83	32.85	33.12
Thorpe Road	11	8.17	8.82	21.14	23.12

4.8 (Drax GSP, Osgodby SP) – Whitemoor diesel generation connection*

Outline of planned work

This project is to connect 20MW of diesel generation located on the Colliery site adjacent to Whitemoor 33kV primary substation. The generation is to be used for STOR purposes. The existing switchgear arrangement is adequate to cater for this generation connection, subject to modifications.

Expected delivery date

Completed.

Reasons for carrying out the work

A request was received for the connection of the diesel generation.

Impact on distribution system

The table below illustrates the change in fault levels at the nominated busbars as a result of this connection:

Table 18: Change in fault levels

Busbar	Voltage (kV)	Break fault level (kA RMS)		Make fault level (kA Peak)	
		Before connection	After connection	Before connection	After connection
Osgodby	33	10.7	10.9	26.6	27.2
Whitemoor	33	7.14	7.36	17.8	18.4

4.9 (Elland GSP, Thornhill SP) – Horbury 33/11kV substation transformer replacement*

Outline of planned work

Horbury substation is located in Horbury, West Yorkshire. This project is to replace transformer T2 and T1 at Horbury substation. The replacement work planned to carry out in two phases. Replacement of T2 is now complete. Initially, it was only planned to tap change T1. However, the condition and performance of T1 also indicated end of its operational life.

Table 19: Transformers to be installed

Circuit	Voltage (kV)	Nameplate rating (MVA)	Vector group	Impedance (100MVA base)	Type	Quantity
Horbury T1	33/11	12/24	Yy0	80%	CER	1
Horbury T2	33/11	30	Yy0	80%	CER	1

Expected delivery date

Quarter 4, 2015 .

Reasons for carrying out this work

The condition and performance of transformers indicate that it is approaching the end of its operational life and it requires replacing.

Impact on distribution system

The table below illustrates the change in fault levels at the nominated busbars as a result of this connection:

Table 20: Change in fault levels

Busbar	Voltage (kV)	Break fault level (kA RMS)		Make fault level (kA Peak)	
		Before connection	After connection	Before connection	After connection
Horbury	11	9.13	8.38	22.9	21.0

4.10 (Ferrybridge A GSP, Ferrybridge A SP) – Hemsworth 66/11kV substation replacement of 11kV switchboard*

Outline of planned work

This project will replace the 11kV switchboard at Hemsworth 66/11kV substation located in Fitzwilliam, West Yorkshire.

Table 21: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Hemsworth - Transformer circuits	11	2,000	25	2
Hemsworth - Bus section	11	2,000	25	1
Hemsworth - Feeder circuit	11	630	25	7

Expected delivery date

Completed.

Reasons for carrying out this work

The condition and performance of the 11kV switchgear indicates that it is approaching the end of its operational life and requires replacing.

Impact on distribution system

This project does not alter the capabilities of the existing system.

4.11 (Ferrybridge A GSP, Ferrybridge A SP) – Hut Green biomass generation connection*

Outline of planned work

This new application is for a 40MW export non-firm 66kV connection to the Northern Powergrid network for a proposed biomass generation installation at Rocwood Power Station near A19 Junction, Selby Road, Eggborough, Yorkshire. This site was previously energised as an 8MVA of generation export site, which was de-

commissioned some years ago but the equipment left on site.

The existing connection is only capable of supporting a maximum export of 40MW due to the rating of the 66kV circuit from Ferrybridge A to Hut Green.

No new underground cables or switchgear are required for this work as the existing infrastructure will be reused for the new connection.

Expected delivery date

Quarter 1, 2016 (reforecast from Quarter 1, 2017).

Reasons for carrying out this work

A request was received for the connection of a biomass generation facility.

Impact on distribution system

The table below illustrates the fault levels at the nominated busbars as a result of this connection:

Table 22: Change in fault levels

Busbar	Voltage (kV)	Break fault level (kA RMS)		Make fault level (kA Peak)	
		Before connection	After connection	Before connection	After connection
Ferrybridge A	66	16.11	17.01	47.00	48.79

4.12 (Ferrybridge A GSP, Ferrybridge A SP) – South Kirkby 66/11kV substation switchgear replacement*

Outline of planned work

South Kirkby 66/11kV substation is located to the south of Pontefract, West Yorkshire. This project is to replace all the existing 66kV and 11kV circuit breakers

Table 23: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
South Kirkby - transformer circuit breakers	66	2,000	31.5	2
South Kirkby - bus section circuit breakers	66	2,000	31.5	1
South Kirkby - feeder circuit breakers	66	1,250	31.5	10
South Kirkby - transformer circuit	11	2,000	25	2

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
breakers				
South Kirkby - bus section circuit breakers	11	2,000	25	1
South Kirkby - feeder circuit breakers	11	630	25	9

Expected delivery date

Quarter 3, 2015.

Reasons for carrying out this work

The condition and performance of the 66kV and 11kV switchgear indicates that they are approaching the end of their operational life and require replacing.

Impact on distribution system

This project does not alter the capabilities of the existing system.

4.13 (Ferrybridge B GSP, Bramham SP) – Hook Moor windfarm generation connection*

Outline of planned work

This project connected 10.25MW of new wind generation at Hook Moor, Yorkshire. The connection of Hook Moor Windfarm will require the cabled loop in of a new switchboard on the existing 33kV circuit from Bramham 33kV to Sherburn T1 HV Overhead Line.

Table 24: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Hook Moor WF – Metered CB	33	1,250	31.5	1
Hook Moor WF – Feeder CB	33	1,250	31.5	2

Table 25: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating(A)	Estimated length (km)
POC to Hook Moor WF	33	300mm ² Cu XLPE	570	8.0 (2 x 4.0km)

Expected delivery date

Quarter 4, 2015.

Reasons for carrying out this work

A request was received for the connection of a windfarm.

Impact on distribution system

The connection of this wind farm has no impact on existing equipment due to fault level increase.

4.14 (Grimsby West GSP, Great Coates SP) – Grimsby West CHP generation connection*

Outline of planned work

This project will connect 65MW of CHP generation at Great Coates, South Humberside. The connection is to be made via an underground Cable to be installed from a new 132kV circuit breaker at Grimsby West substation to a 132kV metering circuit breaker at the customer's site.

Table 26: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Grimsby West - feeder circuit breaker	132	2,000	40	1
Customers site - metering circuit breaker	132	2,000	40	1

Table 27: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating (A)	Estimated length (km)
Grimsby West - Customers site	132	400mm ² Cu XLPE	600	4

Expected delivery date

Project on hold.

Reasons for carrying out this work

A request was received for the connection of generation.

Impact on distribution system

The table below illustrates the change in fault level at the nominated busbar as a result of this connection:

Table 28: Change in fault levels

Busbar	Voltage (kV)	Break fault level (kA RMS)		Make fault level (kA Peak)	
		Before connection	After connection	Before connection	After connection
Grimsby West	132	9.6	10.8	27.3	30.4

4.15 (Grimsby West GSP, Humberston SP) – Newton Marsh windfarm generation connection*

Outline of planned work

A customer has applied for connection of 20MW (8 x 2.5MW turbines) of wind generation at a proposed site in the vicinity of Tetney, North East Lincolnshire, East Riding of Yorkshire.

The connection to the windfarm will be made via a new 33kV cable directly into a spare circuit breaker panel installed at the Humberston Supply Point. A new substation will be established at the customer's site where the connection will be terminated into a 33kV metering circuit breaker.

Table 29: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Newton Marsh Windfarm substation – feeder CB	33	1,250	31.5	1
Newton Marsh Windfarm substation – metering CB	33	1,250	31.5	1

Table 30: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating (A)	Estimated length (km)
Humberston 33kV to Newton Marsh Extension Windfarm substation	33	300mm ² Cu XLPE	570	7.5

Expected delivery date

Quarter 2, 2016 (reforecast from Quarter 4, 2015).

Reasons for carrying out the work

A request was received for the connection of a windfarm.

Impact on distribution system

The table below illustrates the change in fault level at the nominated busbar as a result of this connection:

Table 31: Change in fault levels

Busbar	Voltage (kV)	Break fault level (kA RMS)		Make fault level (kA Peak)	
		Before connection	After connection	Before connection	After connection
Humberston	33	10.15	11.83	30.92	35.34

4.16 (Grimsby West GSP, Immingham SP) – Immingham biodiesel generation connection (Stallingborough Properties Ltd)*

Outline of planned work

A customer requested a firm connection for 24MW generation facilities at Stallingborough. A second customer has also requested a non-firm connection for 2x24MW (48MW) generation facilities. Therefore, the development at this site is proposed to facilitate both connections.

Northern Powergrid will have to establish a new replacement 33kV switchboard for the existing outgoing circuits with the facility to provide a new 24MW firm connection to Stallingborough Properties Ltd.

The proposed 24MW generators will be connected to the system via 33kV metered circuit breakers on the new switchboard. The first customer will be connected through two metered circuit breakers to facilitate a firm connection.

Table 32: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Immingham - Feeder metering CB	33	1250	25	4

Expected delivery date

Quarter 1, 2017 (Reforecast from Quarter 1, 2015).

Reasons for carrying out this work

A request was received for the connection of biodiesel generation.

Impact on distribution system

The minimum demand at Grimsby West Grid Supply Point (GSP) is 50MVA and hence the additional 72MW of generation could cause export into the NGET system via Grimsby West GSP at times of low demand and maximum generation. There will therefore be a need to constrain the export capacities of both connections due to export limits imposed by NGET at grid supply points. The export from the proposed generators would also have to be considered together with the export from Helius who have a partial Transmission Entry Capacity (TEC).

A generation management scheme (GEMS) has been proposed in the scheme for generators at Immingham to ensure that the total ONAN rating of the two transformers at Immingham is not exceeded during times of minimum demand and maximum generation.

The transformers at Immingham are 45/90MVA units. Therefore the maximum amount of reverse power flow the system can accommodate is 45MVA during single circuit conditions. In the event of a single circuit condition the non-firm connection will be constrained off first and if the export is still above 45MVA, then the firm connection would be the next to be constrained.

The table below illustrates the change in fault levels at the nominated busbars as a result of this connection (please note that the “After connection” fault levels apply when both biodiesel generation are connected):

Table 33: Change in fault levels

Busbar	Voltage (kV)	Break fault level (kA RMS)		Make fault level (kA Peak)	
		Before connection	After connection	Before connection	After connection
Grimsby West	132	10.7	11.2	30.4	30.9
Immingham	33	18.6	18.8	53.8	54.5

4.17 (Grimsby West GSP, Immingham SP) – Immingham biodiesel generation connection (UK Power Reserve Ltd)*

Outline of planned work

This project will connect 48MW of new biodiesel generation at Stallingborough, Immingham. UK Power Reserve Ltd has requested a non-firm connection for 2x24MW biofuel generation facility. The connection is to be made via a tee off the existing Grimsby West - Immingham 132 kV number 1 feeder.

At the same site, Stallingborough Properties Ltd has also requested a firm connection for 24MW biofuel generation facilities. Therefore, the development at this site is proposed to facilitate both connections

Table 34: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Immingham - feeder CB	132	2,000	40	1
Customers site - metering CB	132	2,000	40	1

Table 35: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating (A)	Estimated length (km)
Tee off Grimsby West - Immingham feeder 1	132	400mm ² Cu XLPE	228	3.3

Expected delivery date

Quarter 4, 2016 (Reforecast from Quarter 4, 2015).

Reasons for carrying out this work

A request was received for the connection of biodiesel generation.

Impact on distribution system

The minimum demand at Grimsby West Grid Supply Point (GSP) is 50MVA and hence the additional 72MW of generation could cause export into the NGET system via Grimsby West GSP at times of low demand and maximum generation. There will therefore be a need to constrain the export capacities of both connections due to export limits imposed by NGET at grid supply points. The export from the proposed generators would also have to be considered together with the export from Helius who have a partial Transmission Entry Capacity (TEC).

A generation management scheme (GEMS) has been proposed in the scheme for generators at Immingham to ensure that the total ONAN rating of the two transformers at Immingham is not exceeded during times of minimum demand and maximum generation.

The transformers at Immingham are 45/90MVA units. Therefore the maximum amount of reverse power flow the system can accommodate is 45MVA during single circuit conditions. In the event of a single circuit condition the non-firm connection will be constrained off first and if the export is still above 45MVA, then the firm

connection would be the next to be constrained.

The table below illustrates the change in fault levels at the nominated busbars as a result of this connection (please note that the “After connection” fault levels apply when both biodiesel generation are connected):

Table 36: Change in fault levels

Busbar	Voltage (kV)	Break fault level (kA RMS)		Make fault level (kA Peak)	
		Before connection	After connection	Before connection	After connection
Grimsby West	132	10.7	11.2	30.4	30.9
Immingham	33	18.6	18.8	53.8	54.5

4.18 (Grimsby West GSP, Immingham SP) – Reality Energy Centre biomass generation connection*

Outline of planned work

This project connected 49.9MW of new biomass generation at Immingham, Lincolnshire. The connection of Reality Energy Centre Biomass will require an underground cable connected at Immingham 132/33kV substation teed from Transformer T1 HV.

Table 37: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Immingham 132/33kV Substation – Feeder CB	132	2,000	40	1
Reality Energy Centre – Metered CB	132	2,000	40	1

Table 38: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating (A)	Estimated length (km)
Immingham to Reality Energy Centre	132	400mm ² Cu XLPE	228	3.3

Expected delivery date

Project on hold.

Reasons for carrying out the work

A request was received for the connection of a biomass generator.

Impact on distribution system

Grimsby West 400/132kV substation has an existing operational restriction due to high fault levels on the obsolete 132kV switchboard. These restrictions will be unaffected by the new connection, and the new 132kV switchboard fault rating will be sufficient to include the new biomass generation.

4.19 (Keadby GSP, Blyton SP) – Harpswell 33/11kV substation 11kV switchgear replacement*

Outline of planned work

Harpswell 33/11kV substation is located in Gainsborough, Lincolnshire. This project is to replace the 11kV switchgear.

Table 39: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Harpswell	11	2,000	25	8

Expected delivery date

Quarter 2 2015.

Reasons for carrying out the work

The condition and performance of the switchgear indicates that it is approaching the end of its operational life and it requires replacing.

Impact on distribution system

The table below illustrates the change in fault levels at the nominated busbars as a result of this connection:

Table 40: Change in fault levels

Busbar	Voltage (kV)	Break fault level (kA RMS)		Make fault level (kA Peak)	
		Before connection	After connection	Before connection	After connection
Harpswell	11	4.46	4.52	11.2	11.3

4.20 (Keadby GSP, Santon SP) – Brigg biomass generation connection*

Outline of planned work

This project will connect 40MW of new biomass generation at Brigg, Lincolnshire. The connection is to be made via a new 33kV feeder circuit from Santon 132/33kV substation.

Table 41: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Santon - feeder CB	33	1,250	31.5	1
Brigg Biomass - metering CB	33	1,250	31.5	1

Table 42: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating (A)	Estimated length (km)
Santon to Brigg Biomass	33	630mm ² Cu XLPE	780	12.5

Expected delivery date

Quarter 2 2015 (Reforecast from Quarter 4, 2015).

Reasons for carrying out this work

A request was received for the connection of biomass generation.

Impact on distribution system

The table below illustrates the change in fault level at the nominated busbar as a result of this connection:

Table 43: Change in fault levels

Busbar	Voltage (kV)	Break fault level (kA RMS)		Make fault level (kA Peak)	
		Before connection	After connection	Before connection	After connection
Santon	33	12.81	13.87	36.77	39.79

4.21 (Keadby GSP, Scunthorpe North SP) – Grange windfarm generation connection*

Outline of planned work

Xero Energy has made a request to connect 14MW of wind generation located at Scunthorpe to the Northern Powergrid distribution network.

Connection to the 33kV network will be made via a direct 33kV circuit from a new three panel 33kV switchboard at Flixborough 33/11kV substation to the customer's site.

Table 44: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Flixborough substation (T1 side)	33	1,250	25	2
Grange Windfarm substation – metering CB	33	1,250	25	1

Table 45: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating (A)	Estimated length (km)
Flixborough 33kV to Grange Windfarm substation	33	300mm ² Cu XLPE	490	2.3

Expected delivery date

Quarter 4, 2015.

Reasons for carrying out the work

A request was received for the connection of a windfarm.

4.22 (Keadby GSP, Scunthorpe North SP) – Station Road transformer replacement*

Outline of planned work

This project will replace the existing 33/11kV power transformers at Station Road primary substation.

Table 46: Transformers to be installed

Circuit	Voltage (kV)	Nameplate rating (MVA)	Vector group	Impedance (100MVA base)	Type	Quantity
Station Road transformers	33/11.5	15/30	Yy0	100%	CER	2

Expected delivery date

Quarter 4, 2015.

Reasons for carrying out this work

Fault levels at 11kV exceed current switchgear fault rating when two 33/11kV transformers at Station Road are operated in parallel.

Impact on distribution system

The table below illustrates the change in fault levels at the nominated busbars as a result of this connection:

Table 47: Change in fault levels

Busbar	Voltage (kV)	Break fault level (kA RMS)		Make fault level (kA Peak)	
		Before connection	After connection	Before connection	After connection
Station Road	11	13.17	8.66	35.42	24.39

4.23 (Keadby GSP, Scunthorpe South SP) – Raventhorpe Farm solar PV generation connection

Outline of planned work

Kinetica Energy has requested a non-firm connection to the Northern Powergrid network for a 38MW Solar PV generation facility at a site to the east of Scunthorpe. The connection will be provided into a spare 33kV circuit breaker panel installed at the Scunthorpe South. The feeder circuit breaker will connect via approximately 5.0km of 33kV underground cable to a 33kV metering substation at the solar farm site.

Table 48: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (kA)	Break rating (kA)	Quantity
Raventhorpe Solar Farm	33	1.25	31.5	2

Table 49: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating (A)	Estimated length (km)
Scunthorpe South – Raventhorpe Solar Farm	33	630 mm ² Cu XLPE	850	5.0

Expected delivery date

Quarter 4, 2015.

Reasons for carrying out the work

A request was received for the connection to solar farm.

Impact on distribution system

The connection of this new generation does not impact the existing equipment due to increased fault levels.

4.24 (Keadby GSP, Scunthorpe South SP) – Sandy Vale solar farm generation connection*

Outline of planned work

This project connected 35MW of Solar generation near Scunthorpe, East Riding of Yorkshire. The connection of Sunny Vale Solar Farm will require the connection of an underground cable circuit to an existing spare CB at Scunthorpe South 33kV.

Table 50: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Sandy Vale PV Substation – Non Auto Feeder CB	33	1,250	31.5	1
Sandy Vale PV Substation – Metered CB	33	1,250	31.5	1

Table 51: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating (A)	Estimated length (km)
Scunthorpe South to Sandy Vale PV	33	630mm ² Cu XLPE	780	2

Expected delivery date

Quarter 1, 2017

Reasons for carrying out the work

A request was received for the connection of a Solar Farm.

Impact on distribution system

The connection of this Solar Farm has no impact on existing equipment due to fault level increase.

4.25 (Keadby GSP, Wold Newton SP) – Gayton le Marsh windfarm generation connection*

Outline of planned work

This project is to connect 20MW of new windfarm generation at Gayton le Marsh, Lincolnshire. The connection will be made via an underground cable from a 33kV three circuit arrangement at Keddington Road 33/11kV substation to a 33kV metering arrangement at Gayton le Marsh.

Table 52: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Keddington Road – transformer breaker	33	1,250	25	1
Keddington Road – feeder breaker	33	1,250	25	1
Keddington Road – Incomer non-auto CB	33	1,250	25	1
Gayton le Marsh – metering circuit breaker	33	1,250	25	1
Gayton le Marsh – non auto CB	33	1,250	25	1

Table 53: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating (A)	Estimated length (km)
Keddington Road – Gayton le Marsh	33	300mm ² Cu XLPE	570	15

Expected delivery date

Quarter 4, 2015.

Reasons for carrying out the work

A request was received for the connection of this windfarm.

Impact on distribution system

The table below illustrates the change in fault levels at the nominated busbars as a result of this connection:

Table 54: Change in fault levels

Busbar	Voltage (kV)	Break fault level (kA RMS)		Make fault level (kA Peak)	
		Before connection	After connection	Before connection	After connection
Wold Newton	33	8.94	12.0	22.3	29.9
North Thoresby	11	4.72	5.30	11.8	13.2
Keddington Rd	11	4.09	9.91	10.2	24.8
Gayton le Marsh	33	-	9.91	-	24.8

4.26 (Keadby GSP, Wold Newton SP) – Wold Newton 132/33kV substation 132kV switchgear replacement*

Outline of planned work

Wold Newton 132/33kV substation is located in North East Lincolnshire. This project is to replace the existing 132kV circuit breakers.

Table 55: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Wold Newton - bus section circuit breaker	132	2000	40	4

Expected delivery date

Completed.

Reasons for carrying out this work

The condition and performance of the 132kV switchgear indicates that it is approaching the end of its operational life and requires replacing.

Impact on distribution system

This project does not alter the capabilities of the existing system.

4.27 (Saltend North GSP) – Reality generation connection, Salt End Lane*

Outline of planned work

This project is to connect 50MW of new generation at a site at Salt End Lane, Hull. The connection will be made via an underground cable to be installed from a new 132kV circuit breaker at Saltend North GSP to a new 132kV metering circuit breaker at Salt End Lane.

Table 56: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Saltend North	132	2,000	40	1
Reality Generation	132	2,000	40	1

Table 57: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating (A)	Estimated length (km)
Reality Generation site – Saltend North GSP	132	400mm ² Cu XLPE	600	2.0

Expected delivery date

Project on hold.

Reasons for carrying out the work

A request was received for the connection of this generation.

Impact on distribution system

This project does not alter the capabilities of the existing system.

4.28 (Saltend GSP, Hull East SP) – Kingeo transformers and switchgear replacement

Outline of planned work

This project will replace the existing 33/6.6kV power transformers and 6.6kV switchgear at Kingeo primary substation. Replacement of the equipment will be carried out by the construction of a new 33/11kV substation.

Table 58: Transformers to be installed

Circuit	Voltage (kV)	Nameplate rating (MVA)	Vector group	Impedance (100MVA base)	Type	Quantity
Kingeo transformers	33/11.5	15/30	Yy0	80%	CER	2

Table 59: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Kingeo substation	11	2,000	25	9

Table 60: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating (A)	Estimated length (km)
Extension of existing cables to new substation location	33	300mm ² Cu XLPE	NNN	1

Expected delivery date

Quarter 4, 2016.

Reasons for carrying out the work

The 33/6.6kV transformers and 6.6kV switchgear have been identified to be in poor condition.

Impact on distribution system

The new 33/11kV substation will have an 11kV fault level of 176MVA.

4.29 (Sheffield City GSP, Sheffield City SP) – Park Hill 33/11kV substation 11kV switchboard replacement*

Outline of planned work

This project will replace the 11kV switchboard at Park Hill 33/11kV substation.

Table 61: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Park Hill - Transformer circuit breaker	11	2,000	25	2

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Park Hill - Bus section circuit breaker	11	2,000	25	1
Park Hill - Feeder circuit breaker	11	630	25	11

Expected delivery date

Quarter 2, 2015.

Reasons for carrying out this work

The condition and performance of the 11kV switchgear indicates that it is approaching the end of its operational life and requires replacing.

Impact on distribution system

This project does not alter the capabilities of the existing system.

4.30 (Skelton Grange GSP, Leeds East SP) – Newmarket Approach (Leeds Waste to Energy) generation connection*

Outline of planned work

This project connected 16MW of new CHP/diesel generation at Former Wholesale Market site, Newmarket Approach, off Pontefract Lane, Leeds. The connection of Leeds Waste to Energy will be made via two underground cable loop of a new switchboard on the existing 33kV cable circuit from Leeds East 33kV to Pontefract Lane T2.

Table 62: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Leeds Waste to Energy 33kV Substation – Feeder CB	33	1,250	31.5	1
Leeds Waste to Energy 33kV Substation – Non Automatic Feeder CB	33	1,250	31.5	1
Leeds Waste to Energy Moor WF – Metered CB	33	1,250	31.5	1

Table 63: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating(A)	Estimated length (km)
POC to Leeds Waste to Energy Substation	33	400mm ² Cu XLPE	629	1.54 (2 x 0.77km)

Expected delivery date

Quarter 3, 2015 (reforecast from Quarter 4, 2015)

Reasons for carrying out this work

A request was received for the connection of a Waste to Energy CHP generator.

Impact on distribution system

The table below illustrates the change in fault levels at the nominated busbars as a result of this connection:

Table 64: Change in fault levels

Busbar	Voltage (kV)	Break fault level (kA RMS)		Make fault level (kA Peak)	
		Before connection	After connection	Before connection	After connection
Leeds East	33	12.6	13.2	40.13	40.90
Pontefract Lane	11	8.29	8.50	14.27	26.64

4.31 (Skelton Grange GSP, Rodley SP) – Rawdon transformers and switchgears replacement*

Outline of planned work

This project will replace the existing 33/11kV power transformers and 11kV switchgear at Rawdon primary substation.

Table 65: Transformers to be installed

Circuit	Voltage (kV)	Nameplate rating (MVA)	Vector group	Impedance (100MVA base)	Type	Quantity
Rawdon transformers	33/11.5	15/30	Yy0	80%	CER	2

Table 66: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Rawdon - Transformer circuit breaker	11	2,000	25	2
Rawdon - Bus Section circuit breaker	11	2,000	25	1
Rawdon - Feeder circuit breaker	11	630	25	9

Expected delivery date

Completed.

Reasons for carrying out this work

The 33/11kV transformers and 11kV switchgear have been identified to be in poor condition and have exceeded their recommended service life.

Impact on distribution system

The table below illustrates the change in fault levels at the nominated busbars as a result of this connection:

Table 67: Change in fault levels

Busbar	Voltage (kV)	Break fault level (kA RMS)		Make fault level (kA Peak)	
		Before connection	After connection	Before connection	After connection
Rawdon	11	8.92	7.56	22.7	19.14

4.32 (West Melton GSP, Potteric Carr SP) – Connection of Doncaster Inland Port new 40 MVA load

Outline of planned work

Harlaxton Engineering Services Ltd has requested a connection capable of supporting a maximum load of 40MVA at the new Inland Port development on Rakes Lane, Doncaster, South Yorkshire. It is proposed that the connection will via two new 33kV circuit breaker bays installed on the planned Potteric Carr supply point.

Table 68: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Potteric Carr substation	33	1,250	31.5	2

Expected delivery date

Quarter 2, 2018.

Reasons for carrying out the work

A request was received for the connection of a maximum of 40MVA load for a new development.

Impact on distribution system

The connection of this new load does not impact the existing equipment due to increased fault levels.

4.33 (West Melton GSP, Potteric Carr SP) – Doncaster area infeed to Potteric Carr substation installation (132kV works)*

Outline of planned work

This project connects the 132kV infeed for the new (under construction) Potteric Carr Supply Point to the existing West Melton Grid Supply Point. The Connection will be made via 2 new 132kV underground cable circuits from West Melton to Potteric Carr.

Table 69: Transformers to be installed

Circuit	Voltage (kV)	Nameplate rating (MVA)	Vector group	Impedance (100MVA base)	Type	Quantity
Potteric Carr Supply Point	132/33	120	YNd1/YNd11	20.2%	ENAT S 35-3	2
Potteric Carr Supply point - Earthing Tx	33/0.415	0.2	Zy11	N/A	N/A	2
Potteric Carr – Network Aux transformer	11/0.415	0.05	Dy11	5% (on rating)	N/A	1

Table 70: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
West Melton – Feeder CB	132	2000	40	2

Table 71: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating (A)	Estimated length (km)
West Melton – Split Point	132	630mm ² Cu XLPE	525	17.2 (2 x 8.6km)
West Melton – Split Point	132	1000mm ² Cu XLPE	525	4 (2 x 2km)
Split Point – Potteric Carr	132	630mm ² Cu XLPE	525	21.2 (2 x 10.6km)
Split Point – Potteric Carr	132	1000mm ² Cu XLPE	525	4 (2 x 2km)

Expected delivery date

Quarter 4, 2016.

Reasons for carrying out the work

Original Potteric Carr 132kV connection from new NGET Substation (Rossington GSP), cost increase, alternative redesigned 132kV connection required.

Impact on distribution system

This project will provide a new firm capacity of 95MVA at Potteric Carr 132/33kV Supply point. The fault levels at Potteric Carr Supply point are given below.

Table 72: Change in fault levels

Busbar	Voltage (kV)	Break fault level (kA RMS)		Make fault level (kA Peak)	
		Before connection	After connection	Before connection	After connection
Potteric Carr 132/33kV Substation	33	-	11.17	-	32.18

4.34 (West Melton/Thorpe Marsh GSP, Doncaster B/Thorpe Marsh SP) – West End Lane 66/11kV substation 11kV switchgear replacement*

Outline of planned work

This project replaced the existing 11kV switchgear at West End Lane 66/11kV Substation. The age and condition along with identified operation issues, require that the existing board be replaced.

Table 73: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
West End Lane Substation – Tx Incomer CB	11	2000	25	2
West End Lane Substation – Bus Section CB	11	2000	25	1
West End Lane Substation – Feeder CB	11	630	25	9
West End Lane Substation – Metered CB	11	630	25	1

Expected delivery date

Quarter 4, 2015 (Reforecast from Quarter 2, 2015).

Reasons for carrying out the work

The existing switchboard poses a risk to the safety, customer service, environmental, financial, and regulatory elements of Northern Powergrid's business.

Impact on distribution system

This switchgear replacement will have no impact existing equipment due to changing network parameters.

4.35 (West Melton/Thorpe Marsh GSP, Doncaster Central 33kV SP) – Phase 1 Potteric Carr 132/33kV substation*

Outline of planned work

A new 132/33kV substation is to be established at a site located in the Balby area of Doncaster. Phase 1 of this project is to install a 33kV switchboard at Potteric Carr and connect it into the existing 33kV network in the Doncaster area. As part of this project 33kV circuit breakers are to be installed at Belmont Avenue and Jarratt Street.

Table 74: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Potteric Carr - transformer circuit breaker	33	2,500	31.5	2
Potteric Carr - bus section circuit breaker	33	2,500	31.5	1
Potteric Carr - feeder circuit breaker	33	1,250	31.5	6

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Belmont Avenue - transformer circuit breaker	33	1,250	31.5	2
Belmont Avenue - feeder circuit breaker	33	1,250	31.5	4
Jarratt Street - transformer circuit breaker	33	1,250	31.5	1
Jarratt Street - feeder circuit breaker	33	1,250	31.5	2

Table 75: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating (A)	Estimated length (km)
Potteric Carr - Belmont Avenue (feeder 1)	33	300mm ² Cu XLPE	569	2.7
Potteric Carr - Belmont Avenue (feeder 2)	33	300mm ² Cu XLPE	569	2.7
Potteric Carr - Jarratt Street	33	300mm ² Cu XLPE	569	2.7

Expected delivery date

Quarter 4, 2016.

Reasons for carrying out this work

The new 132/33kV substation is to improve the security of supply in the Doncaster area.

Impact on distribution system

This project will have negligible effect on the existing system.

4.36 (Wincobank GSP, Wincobank SP) – Blackburn Valley 33/11kV substation replacement*

Outline of planned work

Blackburn Valley 33/11 kV substation is located to the north east of Sheffield. This project is to recover the existing substation and establish a new substation to the south of the existing site with new 33/11kV transformers and an 11kV switchboard.

Table 76: Transformers to be installed

Circuit	Voltage (kV)	Nameplate rating (MVA)	Vector group	Impedance (100MVA base)	Type	Quantity
Blackburn Valley	33/11	30	Yy0	90%	CER	2

Table 77: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Blackburn Valley - transformer circuit breaker	11	2,000	25	2
Blackburn Valley - transformer circuit breaker	11	2,000	25	1
Blackburn Valley - bus section circuit breaker	11	630	25	10

Expected delivery date

Completed.

Reasons for carrying out this work

The condition and performance of the transformers and the 11kV switchgear indicates that it is approaching the end of its operational life and requires replacing. The opportunity has also been taken to increase the available capacity.

Impact on distribution system

The table below illustrates the change in fault level at the nominated busbar as a result of this connection:

Table 78: Change in fault levels

Busbar	Voltage (kV)	Break fault level (kA RMS)		Make fault level (kA Peak)	
		Before connection	After connection	Before connection	After connection
Blackburn Valley	11	11.02	8.80	28.60	21.90

4.37 (Wincobank GSP, Wincobank SP) – Brite Rotherham biomass generation connection*

Outline of planned work

This project is to connect 36.5MW of biomass plant at Brite Rotherham, South Yorkshire. The connection will be made via an underground cable installed from a spare 33kV circuit breaker at Wincobank to a 33kV metering circuit breaker at Brite Rotherham.

Table 79: Switchgears to be installed

Location	Voltage (kV)	Continuous rating (A)	Break rating (kA)	Quantity
Brite Rotherham – non auto feeder breaker	33	1,250	31.5	1
Brite Rotherham – metering circuit breaker	33	1,250	31.5	1

Table 80: Cables to be installed

Circuit	Voltage (kV)	Cable size	Continuous rating (A)	Estimated length (km)
Brite Rotherham - Wincobank	33	630mm ² Cu XLPE	780	4

Expected delivery date

Quarter 1, 2017.

Reasons for carrying out the work

A request was received for the connection of a biomass generation.

Impact on distribution system

The table below illustrates the change in fault levels at the nominated busbars as a result of this connection:

Table 81: Change in fault levels

Busbar	Voltage (kV)	Break fault level (kA RMS)		Make fault level (kA Peak)	
		Before connection	After connection	Before connection	After connection
Wincobank	33	11.6	13.9	29.0	34.7

4.38 Cable asset replacement projects – 132kV, 66kV and 33kV

Outline of planned work

There is a programme of work to replace the 132kV, 66kV and 33kV cables that form all or part of the following circuits. The table below indicates the circuit name, size of the new XLPE cable, the continuous rating and the project completion date.

Table 82: Cables to be installed

Circuit	Cable size	Continuous rating (A)	Current completion date (previous completion date)
Balby Doncaster	630mm ² Cu	730	Q4 2015 (Q2, 2015)
Balme Street - Dudley Hill	630mm ² Cu	730	Q2, 2015 (Q4, 2014)
Creyke Beck - Hull South No 1 & 2	630mm ² Cu	730	Q4, 2015 (Q1, 2015)
Ferrybridge - Osbaldwick	400mm ² Cu	600	Q2, 2015 (Q1, 2015)
Moss Road - Grimsby Dock	300mm ² Cu	490	Q2, 2015 (Q4, 2014)
Rodley - Warm Lane	630mm ² Cu	730	Q2, 2015 (Q4, 2014)
Scunthorpe North - Scunthorpe South	400mm ² Cu	600	Q2, 2015 (Q4, 2014)
Ellin Street - Mansfield Rd 1 & 2	300mm ² Cu	490	Q2, 2015 (Q1, 2015)
Victoria Street - Silver Street	300mm ² Cu	490	Q4, 2015 (Q3, 2015)
Sheffield City - Silver Street 1	300mm ² Cu	490	Q4, 2015 (Q3, 2015)
Beeston Royds - Gildersome 2	630mm ² Cu	730	Completed
Norfolk Park - Saxon Road	300mm ² Cu	490	Completed
Jordanthorpe - Dronfield 2	300mm ² Cu	490	Completed
Sheffield City - Victoria Street 1&2	630mm ² Cu	730	Q4, 2015 (Q3, 2015)
Norton Lees - Marmion Road	630mm ² Cu	730	Completed
Marmion Road - Snaithing Park Rd	300mm ² Cu	490	Completed
Wakefield B - Wakefield Monkton Road	400mm ² Cu	600	Q2 2016

Reasons for carrying out this work

An assessment of the condition, performance and reliability of the above cables has identified that they have reached the end of their useful life.

Impact on distribution system

These cables have been identified for replacement based on their reliability performance, rather than electrical capability. Hence, in most cases, the capability of the system will not be materially affected but the reliability of the system will improve.