Distributed Generation Owner/Operator Forum

8 October 2019

Agenda

13.30 **Arrival, registration and buffet lunch**

14.00 **Introduction, action review and objective setting from the chair and WPD**

14.10 **Improving industry and WPD communication to address outages/constraints**

- Forum member feedback on communication
- Report back from single point of contact
- Progress on updating outage portal

14.30 **Reducing outage impact on DG customers**

15.10 **Update on the Accelerated Loss of Mains protection programme**
Peter Aston, primary system design manager, Western Power Distribution

16.00 AOB

16.30 **Networking and close**

Forum webpage

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Distributed Generation Owner Operator Forum

We hold a regular forum aimed at owners and operators of MW scale renewables connected to WPD's network. Working in partnership with Regen, these meetings provide an opportunity for DG owners and operators to engage with us, contribute towards improved processes and tackle arising issues.

Previous areas of discussion have included:

- WPD work to address grid constraints;
- Improving communication with generators on outages and constraints; and
- Potential approaches for forecasting and mitigating outages.

Meeting notes & slides from previous events

Future Forum Meeting Dates

8th October 2019

If you or a colleague would like to join the forum then please contact Olly at Regen on: ofrankland@regen.co.uk for further details.

Attendance is free of charge and limited to MW scale owner/operators of DG assets.

yourpowerfuture.westernpower.co.uk/distributed-generation-owner-operator-forum

Generation portal

Log in

You are being granted access to Western Power Distribution's Generation Portal. You understand that your access to this website is subject to the website's **Terms of Use** and **Privacy Policy**.

User name:

Password:

PLEASE NOTE, THESE TERMS AND CONDITIONS GOVERN THE USE OF OUR GENERATOR PORTAL. BY CLICKING ON THE "ACCEPT" BUTTON BELOW OR USING THE GENERATOR PORTAL, YOU AGREE TO THESE TERMS AND CONDITIONS, WHICH WILL BIND YOU. IF YOU DO NOT AGREE TO THESE TERMS AND CONDITIONS, YOU MAY NOT USE THE GENERATOR PORTAL AND YOU AGREE THAT YOU WILL CEASE TO DO SO IMMEDIATELY.

https://generation.westernpower.co.uk/

WPD ICE plan 2018/19

Section 2 – Availability of information

Initiative		Initiative description
2.1*	Provide historic and forecast outage information and improved curtailment information for DG EHV connections at the point of issue of the connection offer	Develop systems and processes to provide better historical and forecast outage information, for a proposed DG EHV connection at the point of issue of the connection offer. Where the connection offer is for an alternative connection, we will also undertake developments to provide improved curtailment information. This improved information is intended to provide clarity on the likelihood of the level of curtailment
2.2	Further develop the WPD DGOO	Continue to develop the WPD DG Owner Operator Forum, developing an action plan with members to deliver further improvements to outage information provision. Host 4 forums including a visit to a WPD Control Centre providing further insight to members.
2.3	Continuing 2017/18 initiative: report on lost generation due to outages	Continuing 2017/18 initiative: Publish the report developed with the DGOO, on the quantity of generation loss (in MWh) caused due to WPD and National Grid system outages (132kV, 66kV & 33kV only) by generation technology type.
2.4	Further develop the report on lost generation due to outages	Further develop the report on lost generation due to outages to include an estimation of the £ value lost due to outages in the published report.
2.5	Report on reduced DG losses avoided during outages	Develop a report on the amount of DG losses avoided with the processes and procedures which have been developed to reduce the impacts of outages on DG. Develop ways of both quantifying reduced losses and of reporting case studies.
2.6	DG Constraints information leaflet	Produce a leaflet which will provide guidance to DG customers on how outages and constraints on the distribution system may effect their connections.

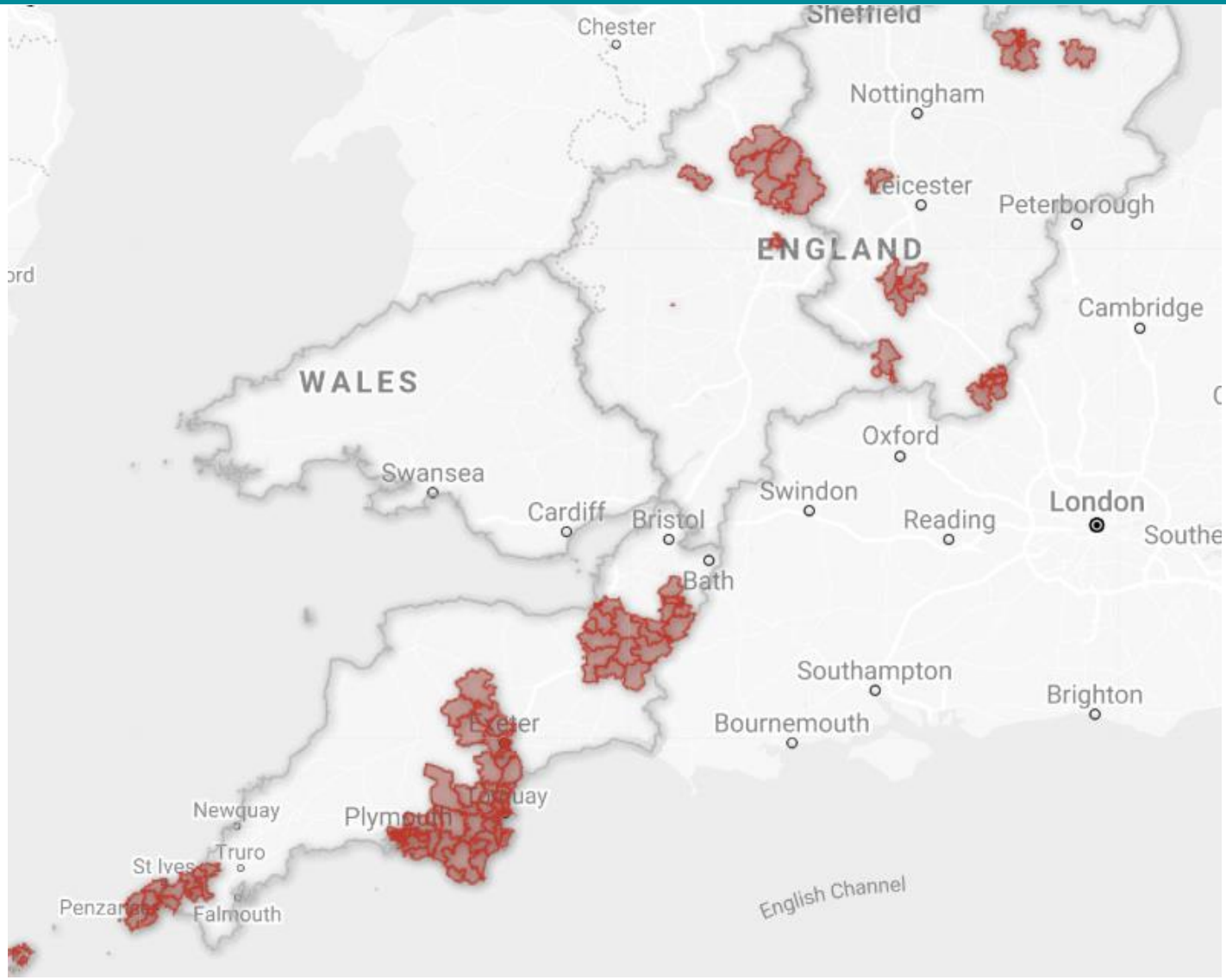
* Initiative shared between Control and Connections Policy

WPD ICE plan 2018/19

Section 2 – Availability of information

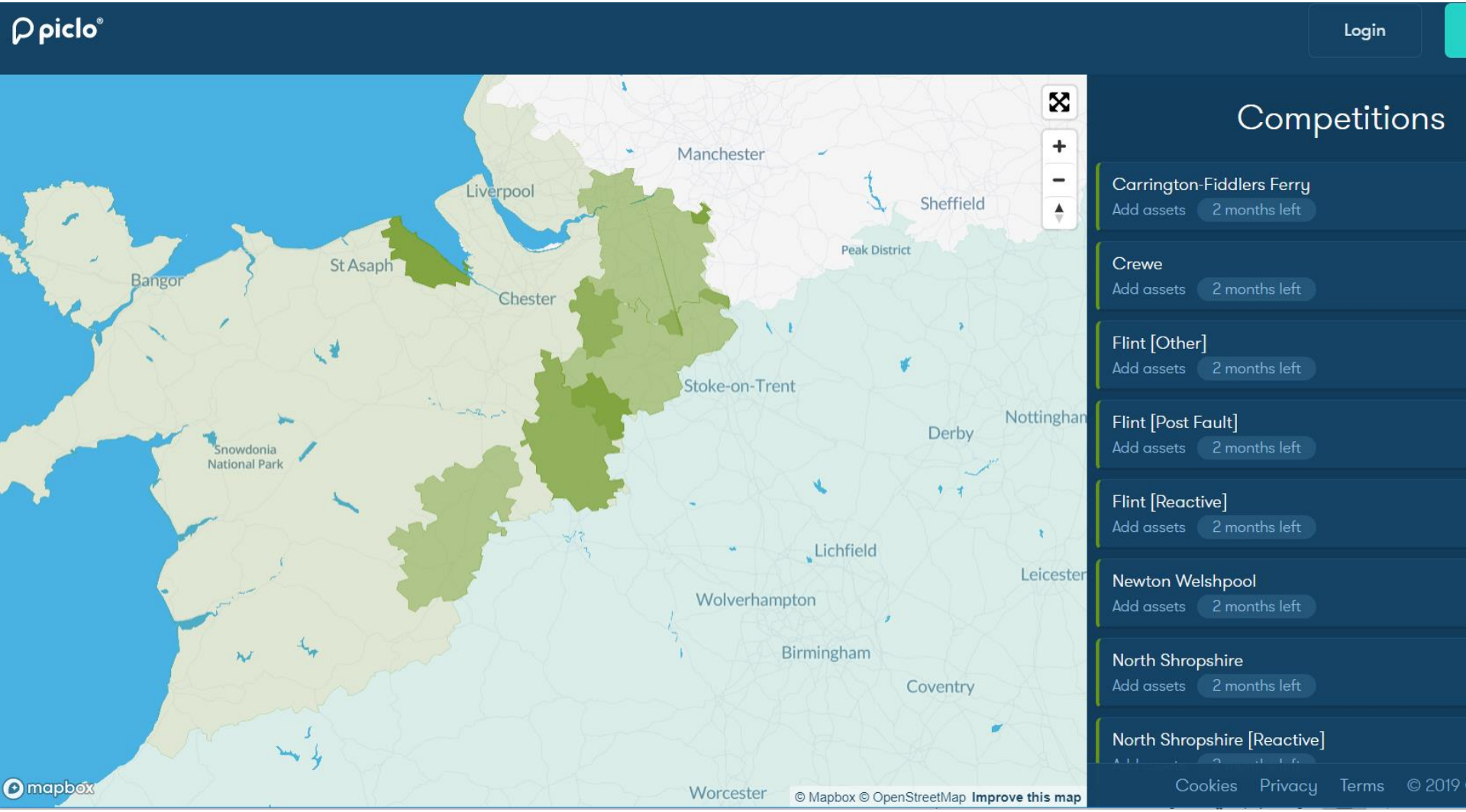
Initiative		Initiative description
2.7	Pro-active fault explanation email	In conjunction with the WPD DGOO, develop a pro-active email notification process to provide DG customers with explanations regarding faults on the distribution system which may have effected their connection.
2.8	Contacts for assistance with DG portal	Provide contact details for users to obtain assistance with the WPD DG portal.
2.9	Present to the WPD DGOO on ANM	Present to the WPD DGOO forum on Active Network Management connections and their bearing on outages and constraints.
2.10	Present to the WPD DGOO on operational best practice	Present to the WPD DGOO forum on operational best practice, raising awareness with stakeholders regarding the operation of their connections assets, in particular around outages and constraints.
2.11	Continuing 2017/18 initiative: DNO best practice on outages and constraints	Continuing 2017/18 initiative: WPD to work with Distributed Generation stakeholders to establish DNO industry good practice initiatives with regard to the management & notification of Network outages and generation constraints.

Flexible Power tenders



https://www.flexiblepower.co.uk/our-schemes

Forum webpage



https://picloflex.com/dashboard

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Peter Aston, primary system design manager, Western Power Distribution

16.00 AOB

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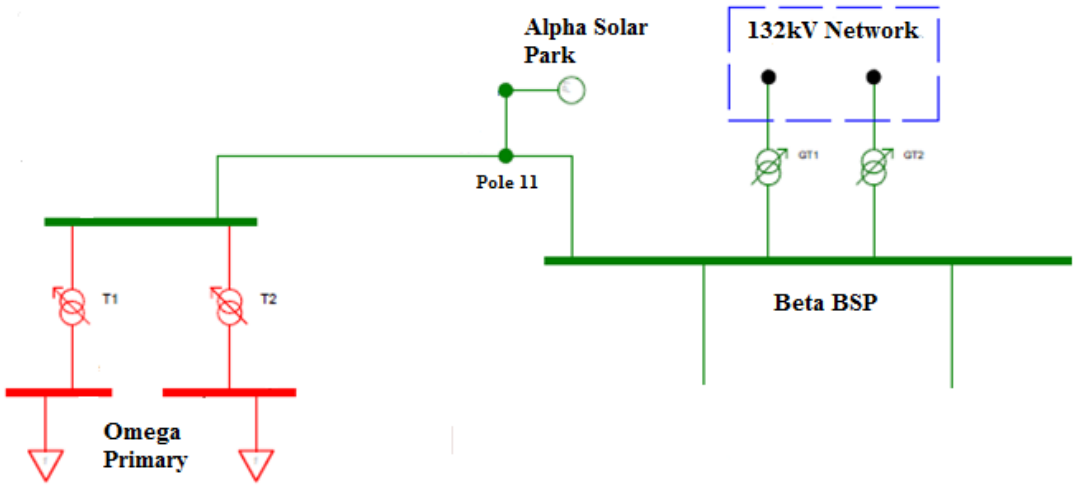
ALPHA Solar Park

Background

ALPHA Solar Park has an agreed export capacity of 5MVA and is connected at 33kV to a BETA BSP Substation 33kV circuit via a teed circuit at Pole 11.
The connection arrangement is shown below:



The 33kV circuit extends a further 62 spans of 33kV OHL toward OMEGA Primary Substation plus a short length of approximately 60m of 33kV underground cable.

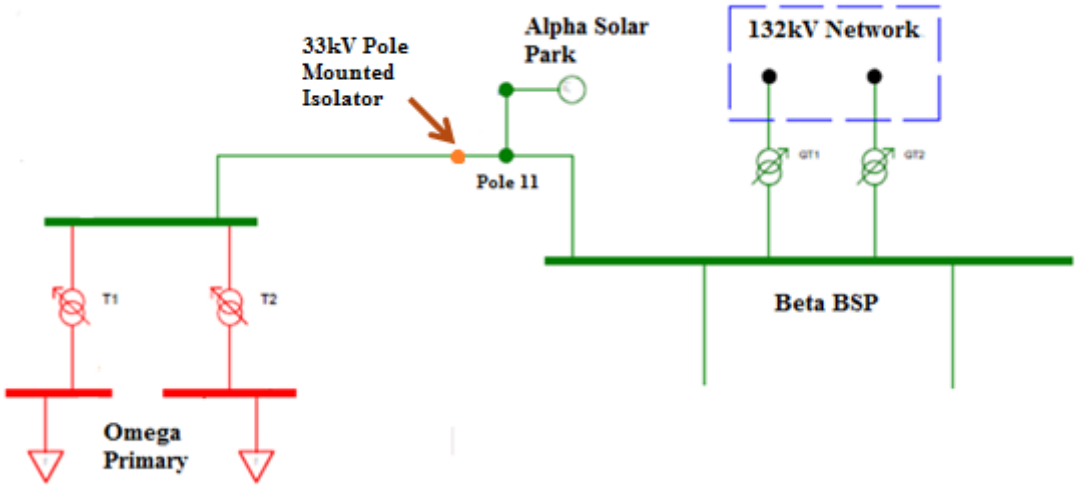
Outage History

The outage history for this 33kV circuit from 2011 to date that would have required a constraint of this generation export is shown below.

Year	Number of Outages	Constraint/Outage Days
2011	1	1
2012	2	4
2013	0	0
2014	1	4
2015	1	4
2016	2	2
2017	1	1
2018	2	3
Totals	10	19

Potential Option For Reduction of Planned Outages

A proposal for the installation of a 33kV pole mounted line isolator on the Omega side of pole 11 would result in an immediate reduction of required outages / constraints of Alpha Solar Park for planned works downstream of pole 11 toward Omega.

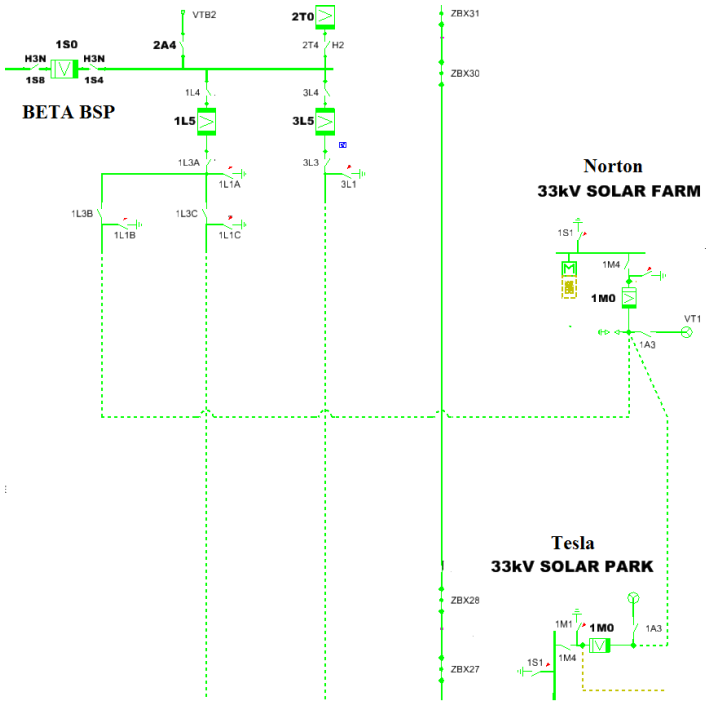


The cost for such works would be in the range of between £10,000 - £30,000 inclusive of VAT (subject to site survey).

Norton & Tesla Solar Park

Background

Norton Solar Park has an agreed export capacity of 6MVA and Fermi Solar Park have an agreed export capacity of 4MVA.
They are connected at 33kV to a BETA BSP Substation 33kV circuit via a 33kV tee'd busbar connection between isolator 1L3A and 33kV line isolator 1L3C.
The connection arrangement is shown below:



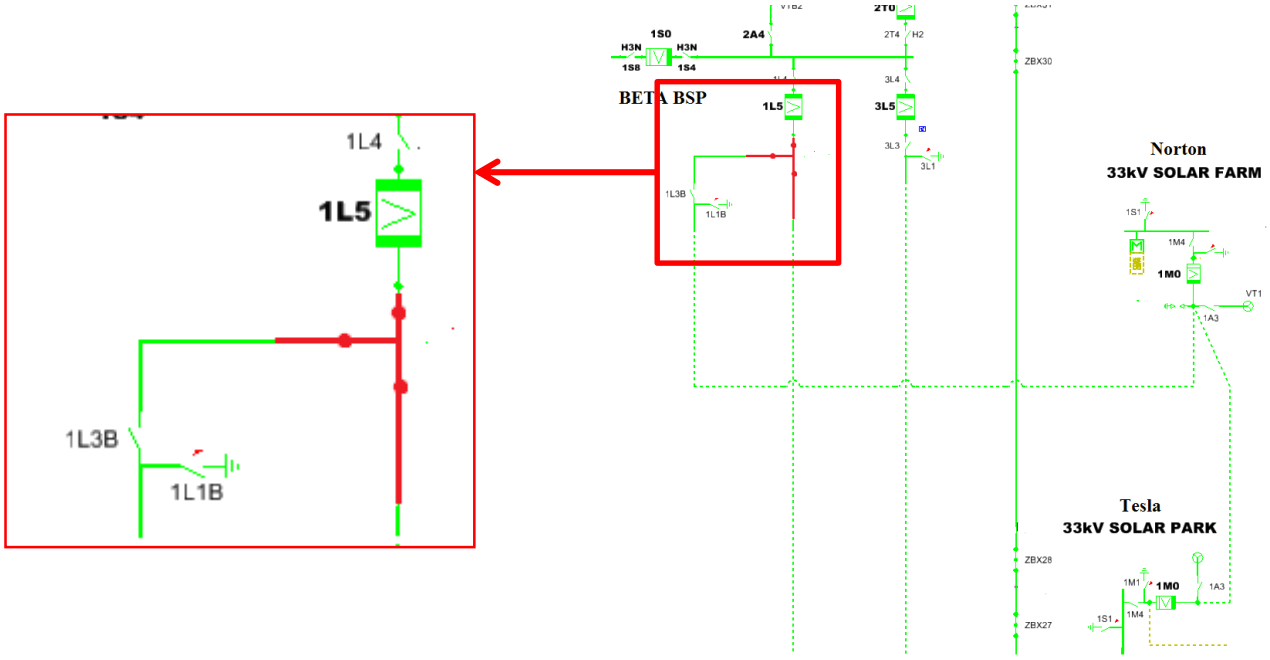
Outage History

The outage history for this 33kV circuit from 2014 to date that would have required a constraint of this generation export is shown below.

Year	Number of Outages	Constraint/Outage Days
2014	1	4
2015	4	6
2016	4	1.5
2017	2	2
2018	0	0
2019	2	2
Totals	13	15.5

Potential Option For Reduction of Planned Outages

A proposal for the installation of a 33kV Ring Main Unit (RMU) downstream of 33kV Circuit Breaker 1L5 would allow a simpler operational approach / switching on the 33kV circuit beyond 1L5. Such an arrangement would negate the implementation of castell key interlocking between 1L3a, 1L5 and 1L3, hence fewer generation constraints.



The cost for such works would be in the range of between £50,000 - £60,000 inclusive of VAT (subject to site survey).

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Accelerated Loss of Mains Change Programme

Peter Aston, Primary System Design Manager, WPD

8th October 2019

Loss of mains protection

- Loss of mains protection
  - Part of G59 / G99 generator protection for distribution connected generation
  - Vector shift or Rate of Change of Frequency (ROCOF)
- Vector shift – has experienced mal-operation following 400kV faults
- ROCOF – historical setting of between 0.125Hz/s and 1Hz/s has led to frequent trips
- General volatility of system frequency, which will increase as system inertia reduces with the closure of coal fired plant

G59/3

- G59 – modified to v3 on 1 Feb 2018 to include new LOM settings:
  - Removed Vector Shift as Loss of Mains protection
  - Increased ROCOF settings to 1Hz/s, 500ms time delay
  - Over frequency increased to 52Hz from 50.5Hz
  - Applied immediately to new connections
  - Retrospective for existing sites. Implementation by 31 Aug 2022.

Cost of balancing the system

- Due to potential loss of DG for ROCOF and VS, National Grid Electricity System Operator (NGESO) holds a large amount of reserve on the network to cover these losses.
- £30.3m (2015/16), £30.7m (2016/17), £59.2m (2017/18)
- Predicted to cost £600m between 2018 and 2024, as DG penetration increases and system frequency is less stable, due to reduced inertia.

Accelerated Loss of Mains Change Programme

- NGESO has identified a system need to accelerate this change before 31 Aug 2022:
  - System stability, emphasised by 9th Aug 2019 low frequency event
  - Cost of operating the system and holding reserve for LOM trips
- NGESO have decided to pay customers connected prior to 1 Feb 2018 to change their LOM protection to the new settings
- From Oct 2019 – Oct 2021 (approx.)
- Either a settings change, disabling of settings, or relay change
- Payment is £1500 / £500 for a settings change or £4000 for a relay change
- Total payments to customers approx. £175m, plus £10m admin
- This will ultimately reduce BSUoS charges with a good pay back

Accelerated Loss of Mains Change Programme - WPD

- Helped to develop a contract with NGESO and other network operators, which is now signed
- Number of sites in WPD approx. 10,000
- Represents about 9GW
- Payments to WPD customers approx. £40-50m
- 114 applications received so far
- Dedicated administration resource in place to undertake this work

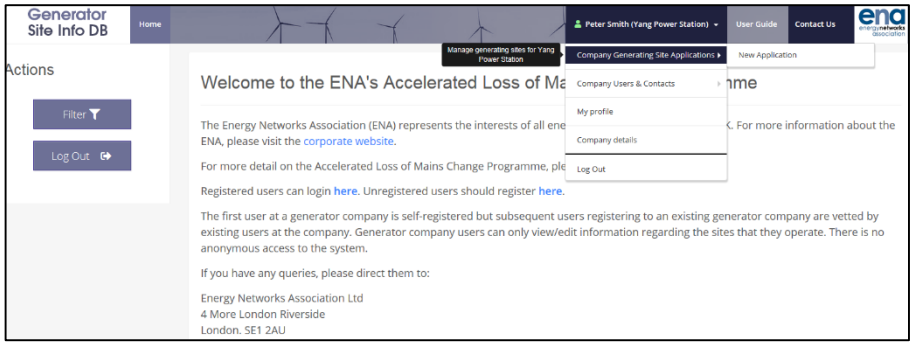
Process

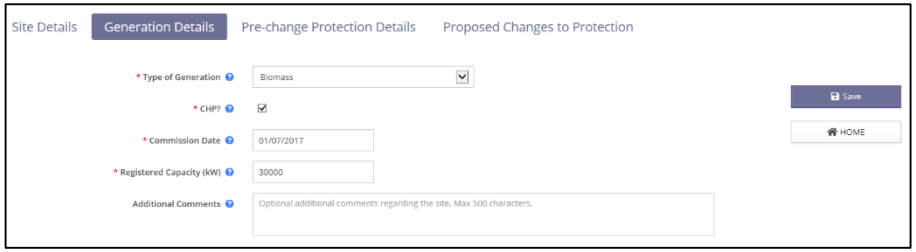
- Apply through the ENA Portal – went live 2nd Oct 2019
- DNO verifies application and approves for a window
- NGESO assesses and accepts applications against budget
- Generator undertakes works and provides evidence
- DNO pays generators for works completed
- DNO invoices NGESO for payments to generators plus admin costs
- Further information available at:

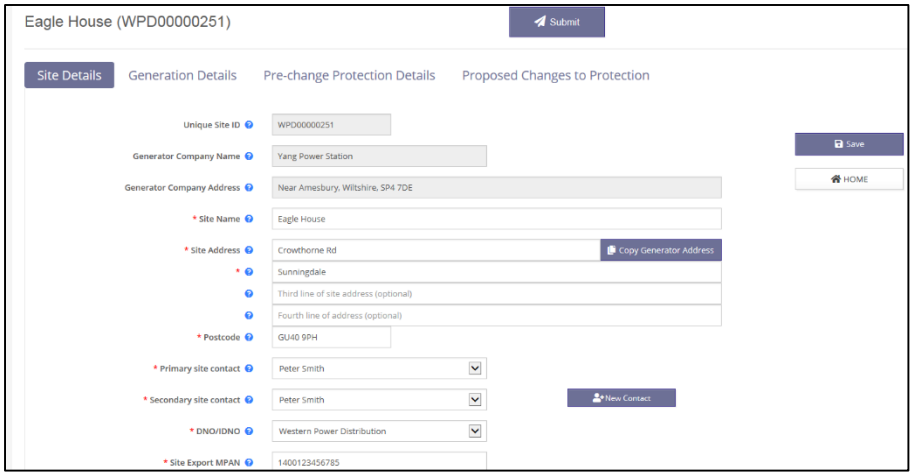
http://www.energynetworks.org/electricity/engineering/accelerated-loss-of-mains-change-programme.html

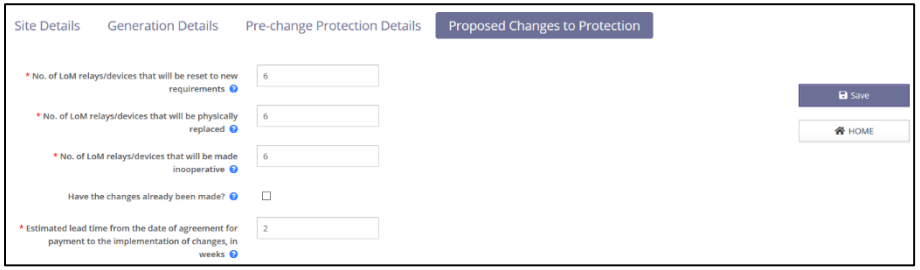
WPD dedicated email address: ALOMCP@westernpower.co.uk

Portal screenshots









Criteria

For participation, sites must meet the following criteria:

- Operate in long term parallel with the distribution network
- Connected prior to 1st Feb 2018
- Currently has the following LOM protection:
  - Vector Shift
  - ROCOF with settings more sensitive than 1Hz/s (i.e. not compliant with G59/3)
  - ROCOF where the settings have already been modified to meet G59/3
- Have not previously received payment

Witnessing and sample site visits

- Relay changes and disabling of settings are required to be witnessed, unless works are undertaken by a registered contractor.
- A % of sites where changes were not witnessed will be subject to a sample site visit.
- Sample site visits (for selected sites) are required for payment to be released.

Questions?

Feel free to contact me:

paston@westernpower.co.uk

0117 933 2481

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Future forum dates and key events

Next **WPD DGOO forum** (Bristol):
23 January 2020

Connections workshop
Villa park, Birmingham
6 November

Balancing Act
One Birdcage walk, London
26 November

Other events

2019 Sponsors

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THRIVE RENEWABLES

WALES&WEST UTILITIES

: Bradninch Court, Castle Street, Exeter, EX4 3PL

: 01392 494 399

9 October, 2019