WESTERN POWER DISTRIBUTION

INNOVATION

NEXT GENERATION NETWORKS

SOLAR YIELD NETWORK CONSTRAINTS (SYNC)

Technique 3: DSR Turn-Up

2016 trial

Glossary

Abbreviation	Term
DSR	Demand Side Response
DTU	Demand Turn Up
SYNC	Solar Yield Network Constraint
WPD	Western Power Distribution

1 Project Overview

WPD has connected significant amounts of embedded generation to its distribution network in recent years. This includes a large variety of different technologies, dominated at first by wind and more recently by solar PV.

With so much generation already connected, and significant quantities in the pipeline, most of the latent capacity within the network has now been utilized. As such WPD is looking at ways of releasing extra capacity in the most economically efficient manner. Alongside the use of traditional reinforcement, the roll out of alternative connections has been one of innovative manners this has been done, building on the flexibility of generators. These give the option of trading off potential curtailment against capital expenditure and time delays.

Whilst we are now using the inherent flexibility of generation, at the moment the flexibility of the demand side is as yet untapped.

As part of the SYNC project we are looking to test a range of Demand Side Response (DSR) techniques with industrial and commercial customers to help address many of the different challenges being posed by PV generation. .

There are 4 techniques that project SYNC will look to investigate:

(T1) - Automated demand increase / generation limiting in line with variation in solar yields.

(T2) - Directly matching flexible load with flexible generation

(T3) - Manually dispatched response signals from a WPD control facility (DSR)

(T4) - Creation of suitable ToU (Time of Use) tariffs to encourage appropriate demand

The project will require significant engagement and involvement of third parties including demand customers, generators, storage operators and National Grid. WPD will look to build on the learning gained in the FALCON project to maximize value to the industry and minimize the cost to customers.

2 T3 Overview

One of the key issues with the connection of large amounts of solar generation to the distribution network is the lack of diversity in peak output. Whilst there is some variability due to cloud cover, in general times of peak output coincide as they are all drawing power from the same source. Whilst these peaks may only occur for small periods of the year, when operating a passive network, they can limit any further generation to be connected. When planning for the worst case scenario this infrequent occurence will generally be the limiting factor especially as it tends to coincide with a time of low demand on the network.

In **T3** we will be seeking to build upon the experience of previous successful WPD DSR service trials looking to alleviate winter peaks. These principals can be applied in reverse during summer months.

Under normal operating conditions the network is designed to enable maximum generation even at times of lowest summer demand. However as the system background load changes, either through energy efficiency or additional embedded generation, certain networks may require reinforcement

to continue to accommodate the existing generation. These works can be costly and lengthy, as such using existing demand in the area may be a viable and cost effective way of mitigating any issues, either temporarily or permanently.

In addition to our own requirements to manage local network conditions, National Grid have also identified that a similar capability to increase demand could help with national system balancing. They have called this requirement Demand Turn Up.

Both parties have come together to launch a collaborative service to help address both needs. By joining the two services, each operator can optimize their requirements as well as offer the customer a single clear service. With a joint contract, dispatch and settlement process, customers in WPD's area will participate in both services helping deliver both operators requirements in a cost effective manner.

3 T3 2016 trial method

For the summer (May to September) of 2016 National Grid's Demand Turn Up service and WPD's SYNC T3 trial shall be working in unison through a joint service. For this summer the customer contracting, dispatch and settlements process shall be delivered by National Grid. Full details of the requirements can be found on their Power Responsive website: www.powerresponsive.com.

3.1.1 Potential sites and sizes

The trial is looking for customers who can either turn their demand up or their generation down on request. For this service we will be engaging with sites, or aggregated sites of no less than 1MW in size. National Grid's trial will operate nationally whereas WPD's site shall be focussed on its South West and South Wales licence areas. Site will be required to ensure that the service is being used responsibly to shift load and not to encourage wastage.

3.1.2 Service windows

The required service windows are detailed in the table below. Please note these are the service periods for the joint service. The daytime requirement is only valid for weekends. WPD shall not be calling any services during the overnight service window.

Months	Overnight	Day (weekends only)
May/Sep	23.30 to 08.30	13.00 to 16.00
Jun/Jul/Aug	23.30 to 9.00	13.00 to 16.00

3.1.3 Availability

Participants must declare their availability via email by 12.00 on the Friday prior to the service week. The service week runs form Monday to Sunday, as such availability is declared a week before any daytime utilisation is required.

3.1.4 Utilisation

A utilisation instruction may be received up the start time. Such calls will consider the customer specific response times.

Whilst instructions can be received late, the majority of the volume will be instructed much further ahead of time. WPD will give its requirements to National Grid early on the Friday of the service week. It is anticipated that the first round of instructions shall be called later that day. The instruction shall not specify which operator has requested it.

It should be noted that WPD's requests are locational; as such they may not follow the overall DTU price stack, prioritising services in specific locations. These requests shall be sent to National Grid who will then offset them procure their requirement based on a price hierarchy.

There is a minimum utilisation period of 2 hours; the maximum is to be specified by the customer

3.1.5 Contracts

A single contract has been designed for the provision of the service. This will be administered by National Grid but will allow for the requirements of both operators.

3.1.6 Pricing

Customers must bid for a utilisation fee between £60/MWh and £75/MWh with an availability fee of £1.50/MW/hour. Customers may bid higher than £75/MWh if desired, although these sites will not receive the availability fee.

3.1.7 Metering and settlement

Settlement of this trial will use existing half hourly metering. This process shall be administered by National Grid.

Additional monitoring shall be installed in trial sites to help with project learning. This will collect minute by minute data. This equipment shall be provided by WPD.

3.1.8 Future of the service

Further trials are anticipated in 2017. As these will build on the learning from 2016 details are not yet available.

4 Participation

WPD has lead significant engagement with customers about this trial to understand their ability to shift. WPD has then directed customers to National Grid for the running of the 2016 trial.

Participation for the 2016 trial is now closed.

However if you require any more information, would like to added to the trial mailing list or would like to consider participation in the 2017 trial please contact the WPD project representatives – Matt Watson - mwatson@westernpower.co.uk or Gary Swandells - ggswandells9@westernpower.co.uk

Also please be aware that as well as running a T3 trial again in 2017, WPD shall also be trialling T2 , looking at matching flexible demand with generators on alternative connections. For more details contact the representative mentioned above.