



Open Networks Project DSO Service Requirements: Definitions

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Introduction

The WS1 P2 work group has identified the following five active power services to meet different distribution network congestion management needs (i.e. to manage P2/network security). These could be used for demand turn down (generation turn up) or demand turn up (generation turn down). Further DSO services may be required in future (e.g. reactive power for voltage control, or to facilitate a whole-system approach to black start), however we are focused on active power services as a first development priority.

Service Descriptions

1. **Scheduled Constraint Management** - The DSO procures a pre-agreed change in input or output over a defined time period to prevent a network going beyond its firm capacity (thereby ensuring all load remains secure following the next fault). For example a reduction in demand is procured over an evening peak period to mitigate risk of overload that might result following a fault on one of two in-feeds to a group;
2. **Pre-fault Forecast Constraint Management** – The DSO procures Service Provider availability well ahead of time. Utilisation is then instructed closer (but still ahead) to real time to prevent a network going beyond its firm capacity based on loading forecasts. This will generally be a manual call. For example a Service Provider is contracted to be available to the DNO over winter evening peaks. The DNO then calls the Service Provider on the day of the worst predicted loadings;
3. **Pre-fault Real-time Constraint Management** - The DSO procures Service Provider availability well ahead of time. Utilisation is then instructed when the network goes beyond its firm capacity. This will generally be instructed through an automated system. For example a Service Provider is contracted to be available to the DSO over winter evening peaks. The DSO system then calls the service when the loading reaches the firm capacity;
4. **Post-fault Constraint Management** - The DSO procures Service Provider availability well ahead of time. Utilisation is then instructed when the fault occurs on the network (and loading is beyond the post fault rating). This will generally be instructed through an automated system and will utilise the short term ratings of the assets, such that a sustainable post-fault flow can be achieved. For example a Service Provider is contracted to be available to the DNO over winter evening peaks. The DSO calls the Service Provider when the fault occurs; and
5. **Restoration Support** – Following a loss of supply, the DSO instructs a provider to either remain off supply (or to reconnect with lower demand) to support increased and faster load restoration under depleted network conditions. For example a Service Provider may be restored at minimal load to allow for other (perhaps less flexible) customers to be restored.

Service Characteristics	Scheduled Constraint Management	Pre-fault Forecast Constraint Management	Pre-fault Real-time Constraint Management	Post-fault Constraint Management	Restoration Support
When to act	Pre-fault	Pre-fault	Pre-fault	Post-fault	Post-fault
Triggering action	Time	DSO Forecast	Asset Loading	Network Fault	Network Fault
Certainty of utilisation	Very certain	Uncertain	Uncertain	Uncertain	Very uncertain
Efficiency of utilisation	Low	Medium	Medium	High	Low
Risk to network assets	Low	Low	Medium	High	Low

Examples of How Services Might Be Used

The following examples show scenarios where each service might be utilised. Note that these examples are not intended to be exhaustive, however they give an indication of the circumstances under which DSOs might wish to procure and utilise each service.

Scheduled Constraint Management

The peak demand of a BSP load group is in excess of the rating of the supplying 132/33kV transformers during an outage of one of the transformers. The peak demand in excess of the transformer rating occurs only within the period 17:00hrs to 20:00hrs; October to March. The DSO contracts with a dominant demand customer to limit their import each day during the stated period to avoid the peak demand in excess of the transformer rating.

Pre-fault Forecast Constraint Management

The peak demand of a BSP load group is in excess of the rating of the supplying 132/33kV transformers during an outage of one of the transformers. The peak demand in excess of the transformer rating occurs only within the period 17:00hrs to 20:00hrs; October to March. The DSO contracts with a dominant demand customer to limit their import on days when the DSO forecasts peak demand will exceed the transformer rating. Note that, depending on circumstances, service call-off may be limited to the period 17:00hrs to 20:00hrs; October to March, or there may exist the potential for further optional utilisation outside these windows. .

Pre-fault Real-Time Constraint Management

The peak demand of a BSP load group is in excess of the rating of the supplying 132/33kV transformers during an outage of one of the transformers. The peak demand in excess of the transformer rating occurs only within the period 17:00hrs to 20:00hrs; October to March. The DSO contracts with a dominant demand customer to constrain-down their demand when the monitored demand exceeds the transformer rating; typically this would be an automatic process.

Post-fault Constraint Management

The peak demand of a BSP load group is in excess of the rating of the supplying 132/33kV transformers during an outage of one of the transformers. The peak demand in excess of the

transformer rating occurs only within the period 17:00hrs to 20:00hrs; October to March. The DSO contracts with a dominant demand customer to ramp-down [within prescribed timescales] their demand immediately post the fault loss of one of the transformers to maintain peak demand within the rating of the remaining transformer. This service makes use of the short-term ratings of assets – the magnitude of those ratings will determine whether the service could be instructed manually, or whether it would need to be triggered automatically.

Restoration support

The peak demand on a HV feeder is traditionally managed to ensure that following the fault loss of that feeder the demand can be fully restored via another feeder by opening and closing appropriate network circuit breakers. This means that there is inherently capacity on the network that is only used under fault or maintenance conditions. Contracting for *Restoration Support* allows this ‘spare’ capacity to be used whilst the network is operating in its normal state on the basis that, following a fault, these contracted Service Providers would remain off supply until the fault was rectified– thereby facilitating restoration of customers not contracted for Restoration Support.