Open Networks Project

Good Practice ahead of Connection Applications

Document Control

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Executive Summary

As DNOs begin to charge customers for receiving connection offers, the information that is available to customers so that they can have an initial assessment of the capacity that is available in any geographical area becomes even more important. As the network is dynamic no approach can replicate a full network study. There can be changes on a daily basis with new applications, connections offers expiring, projects cancelling, and changes to planned or existing connections. All of these can have implications for new applications and therefore any information provided by DNOs can only act as a guide to the likely level of capacity and ability for any additional connections to be made. An additional challenge for DNOs is to balance the amount of information that they provide with the ease of assessment of the available capacity by customers.

There are three principle ways that DNOs provide information to customers in advance of them making formal applications.

Firstly all DNOs provide 'surgeries' where customers can meet with DNO design staff to look at particular areas and gain an insight to the likely costs to connect. Good practice has been identified as DNOs providing pre-bookable meetings (particularly useful for customers working in that area for the first time) but also more bespoke meetings at a mutually convenient time and location (useful for customers with established relationships).

Secondly, DNOs all provide various forms of 'heat maps'. Whilst these all differ, a number of key aspects of good practice have been identified. Clear explanation of the assumptions used to colour code the network, typically red/amber/green should be available as well as the quantification of the headroom available. Information should be available for both demand and generation and down to the HV busbars of primary substations. Information on the maps should be refreshed at least monthly and available in both geographically and in downloadable formats. The information should be based on connected and contracted generation and also taking account of formal connection offers issued.

Thirdly, good practice has been identified for DNOs to offer an 'Optioneering' approach. This allows customers to submit a number of different capacities for the same site, receive budget costs and progress any one that is viable through to a formal offer based on the original submission date.

This analysis focuses on current DNO practice to ascertain a level of good performance to act as a benchmark for customer service in advance of making formal connection offers. Further work would be needed to assess what, if any, additional information would be required to support the transition to DSO.

Introduction

This document is the output of Open Networks project, Workstream 2, Product 1 which covers:

Good Practice ahead of Connection Applications - Review network operator approaches for handling prospective connection applications and publish good practice for supporting customers pre-application.

This product focuses specifically on the engagement and information that is available for customers before they apply. Other products cover later stages in the process as shown in the diagram below.

	Application management (Pre-application)	Offer management (Post-application, pre-offer)	Interactivity management (Post-offer, pre-acceptance)	Queue management (Post-acceptance, pre-connection)	Operational management (Post-connection)
WS2 Product coverage	Product 1 Good Practice ahead of Connection Applications				
Stage in connection timeline					
Capacity in pipeline		Potential network capacity requirement	Network capacity offered	Network capacity contracted	Network capacity used
2018 product number	WS1: 7 WS2:1,3,4	WS1: 9, 10, 11 WS2: 5	WS1: 9, 10, 11 WS2: 5	WS1: 9, 10, 11 WS2: 5	WS1: 8 WS2: 2,6,7
Queue management requirements	Information provision. A+D fees.	Allocation of start date. Continued information provision. Allowable changes. Network studies to determine capacity.	Interactivity. Allowable changes.	Allocation of post-acceptance queue position. Management of timely progress / milestones. Allowable changes.	Management of capacity utilisation Review of constraints Constraint information

The scope is limited to the approaches carried out by the DNOs and has not considered customer engagement carried out by National Grid. The work has focused on the current approaches of DNOs to seek to establish good practice. It does not explicitly cover what might be required for a complete DSO world but does act as a solid foundation for considering this as a future piece of work. This document therefore aims to set the standards that all DNOs should seek to achieve.

As most DNOs charge or intend to charge customers for receiving a connection offer, the information that is available to customers in advance of incurring costs becomes even more important.

The review has focused on three aspects and these are covered in turn below:
- Pre application engagement
- Provision of information
- Optioneering

Pre application

All DNOs will engage with customers before they make a formal application. Typically there are two types of engagement offered:

- Bookable surgeries where the DNO advertises and customers can register and book a 'slot' to speak to a designer.
- Ad hoc requests where the DNO responds to customer requests and agree mutually convenient dates.

All DNOs offer one or other of these approaches and a number offer both. Those that undertook bookable surgeries reported positive feedback with many being booked well in advance. Other DNOs had limited the pre advertised surgeries due to reduced take up and instead responded to customer requests on an ad hoc basis.

Approach	Pros	Cons
Bookable surgery	Clearly advertised in advance Useful for customers that are new to area Allows DNO to manage resources and monitor uptake	Dates may not be suitable Can get booked up in advance
Ad hoc requests	More flexible for customers	Harder for DNOs to manage resources Need to have existing contacts to arrange

Table 1 Pros and cons of approaches to surgeries

Good practice would be considered to offer both approaches. This provides clear routes to engagement for new customers but also caters for the more bespoke requirements of others.

A number of DNOs provide flexibility of engagement and these would be seen as examples of best practice. These included the location of the engagement may not always be at DNOs site (the developers or other mutually convenient location) and options for virtual meetings where appropriate.

Information provision

All DNOs provide information on availability of capacity in both tabular forms in the Long Term Development Statement (LTDS) and through 'heat maps'.

The LTDS sets out information on substation loadings and fault level in a standard tabular form that provides useful information, primarily for 33kV and 132kV voltages. This is a licence requirement for DNOs and is provided in a consistent format so has not been assessed for good practice.

'Heat maps' represent similar information but through a geographical representation of the information. It is this aspect that has been assessed for good practice.

The purpose of 'heat maps' is to provide customers with an indication of how easily they would be able to make a connection in any DNO area. This is done by indicating the capacity that is available and any constraints that apply. As these have been developed over similar time periods there is no standard approach and the following sections analyse the important features.

RAG status

All heat maps use some form of Red/Amber/Green (RAG) status to indicate the likely ease of connecting. Whilst this gives a relative indication of different levels of constraints that exist on the network, the parameters and assumptions are not always clear. Even for networks shown as green there would be a size or type of connection that could not be accommodated. This is one of the challenges in balancing simple clear information that gives a guide and more precise information that might be favoured by some customers. Inclusion of information on the 'headroom' for each constraint does allow a further level of self assessment by the customer.

Good practice should clearly indicate the assumptions and parameters that sit behind the RAG status. Functionality that allows each status to be included or excluded is useful. For amber and green status, quantified information that shows the extent of the headroom would be considered good practice.

Headroom assessment

A number of different approaches have been taken to assess the 'headroom' and hence the RAG status. For thermal capacity, the most simplistic approach is to consider the difference between the transformer rating and the maximum peak demand. This gives a very prudent view from the DNOs perspective as the peak may be of short duration and it takes no account of connected generation and whether these are co-incident. Fault level assessment is generally undertaken at the substation.

In most cases information is provided that would allow the user to calculate the differences between installed capacity and peak demand, however good practice is to show the quantified level of headroom available. This has the benefit of allowing easier search facilities; an example of best practice is on the WPD heat map that allows additional parameters to be included that further refines the criteria eg a desired capacity, say 10MW, can be added that filters out all network where 10MW could not be connected.

Demand and Generation

Heat maps were initially developed to provide information for generators wishing to connect. A number of DNOs now also provide similar information relating to demand.

Good practice is therefore the provision of information to aid both types of connection. Best practice incorporates these into the same map.

Voltage levels

Most heat maps show information from 132kV down to the HV busbars of primary transformers. Some also cover HV circuits. No maps attempt to cover low voltage. In many cases, transmission constraints are also included.

Good practice is to cover 132kV down HV busbars and to include any known transmission constraints.

Network information

All heat maps focus on providing information in relation to substations at different voltage levels, often with the ability to select the desired voltage level. Some DNOs also provide information on circuit capacity.

Good practice is to provide information in relation to substations at different voltage levels with the ability to select the desired voltage level.

Examples for best practice are Northern Powergrid and WPD where the heat maps show the areas supplied by each substation when it is selected with Northern Powergrid also including the postcodes covered. Scottish Power heat maps show the HV circuits with RAG status.

Refresh frequency

DNOs have sought to balance accuracy with effort in considering refreshing the data behind their heat maps. All DNOs reported that considerable time and effort were required to keep their heat maps up to data. As connections are dynamic with the situation potentially changing on a daily basis, the shortest refresh cycle identified was monthly. For some data such as peak demand, this was only refreshed annually.

Good practice is to refresh the majority of the data monthly.

Accessibility of information

Most DNOs provide the information based on a geographical map background. This allows the map to be panned and zoomed to look at specific areas. Some include layers showing national parks etc. Most allow the user to click on a substation to display the information relative to that substation. Some also allow the reference data to be downloaded as an Excel download.

Good practice is to allow both geographically searchable information and also to export the data behind it.

Contracted and connected registers

All DNOs provide information on connected and contracted generation to the HV network in tabular form. In some cases this is also shown geographically. Some DNOs also provide information on connection offers issued and applications received for each substation.

Good practice is for heat map information to be based on connected, contracted and connection offers issued.

An example of best practice is SSEN which shows the connected and contracted generation at each substation via their heat map.

Optioneering

In advance of formal applications all DNOs provide Budget Estimates which give an indication of the likely costs for the connection but will not have involved any network study and are based on the experience of the designer. These cannot be accepted and the costs provided are only indicative.

Most DNOs also provide an option that falls part way between a budget estimate and formal connection offer for generation and storage. Typically this will allow a customer to submit a number of variations for a single site, all that offer this allow a number of different capacities and some also allow different technology types. The DNO will typically consider three options (but some considering up to six) and provide budget costs for each variant. The customer then has a prescribed time to decide if they wish to progress one of these through to a formal connection offer. If they progress one option though, importantly for the customer, the original date for the submission of the options will be considered is deemed to be the application received date if the formal application becomes part of an interactive queue.

In some cases DNOs charge for this extra service. In all cases, the customer would pay the same costs for the connection offer as if they had applied directly to the DNO.

Commented [BAH1]: Need to validate this with each DNO, as not explicitly checked during interviews

Approach	Pros	Cons
Optioneering	Gives another option for customers Queue position recognised if application becomes interactive Allows cost sensitivity to capacity required to be identified	Budget costs not guaranteed and could change when goes to formal connection offer Limited to one site

Table 2 Optioneering options pros and cons

Good practice would be considered to offer an 'optioneering' approach. This should allow a customer to request three variations of capacity to a single site. The DNO should respond with published timescales and give the customer the option to progress any variant though to formal connection offer and recognise the original date of submission as the relevant date for interactivity purpose (conditional on the required information having been provided and any required payment received).

Best practice would allow more capacity options to be considered and/or different technology types to be considered.

Appendix 1: Glossary

The following terms are used throughout this document:

LTDS –To follow

RAG status – to follow

HV – to follow

Appendix 2: