DG Mapping Tool User Guide

The DG map shows the approximate locations of our 33kV and 132kV overhead electricity network towers and poles. It also shows where our HV (>1kV and < 22kV), EHV (>22 kV) and 132kV substations are approximately in the East of England and the South East. Please note the data provided is indicative only.

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Registration

To register for access to the UK Power Networks' DG map

1. From the 'Distributed Energy Resources webpage'
2. Select 'Check capacity in your area'

![Figure 1– Distribution Energy Resources Webpage](image-url)
The following screen will display:

**Figure 2 – DG Mapping Tool**

1. Click the 'Need access to the map? Register now' button.
The following screen will appear:

![Registration Form](image)

Figure 3 – Registration Form

1. Complete the form to complete registration.
   A version of the DG Mapping tool is available without logging in. This map contains a smaller set of layers and information. To access this map, click on the home link in the top left of the registration page and click on the link named ‘DG Mapping (no login required)’.
   More details of this map can be found in the section entitled ‘Access to DG map without logging in’.
2. Read our Terms and Conditions and if you agree tick the box ‘Accept Terms and Conditions of Use’.
3. Click ‘Create new account’
Figure 4 – Registration Confirmation

We will email you within 5 working days once we have reviewed your application.
Login

You will be able to view the DG map once you have received an email advising you access has been approved.

1. Visit the ‘Distributed Generation’ webpage
2. Click on ‘DG mapping tool’
3. Click ‘Already registered? Login’

The screen below will appear:

![Login Screen](image)

4. Either enter the ‘username’ or ‘email address’ that you registered with. Please note this field is case sensitive.
5. Enter the password you created upon registration.
6. Click ‘Log in’.

If you have forgotten the password you chose when you registered, click ‘Forgot Password?’. For further instructions on how to reset your password see the section entitled Password Reset.
Once successfully logged in, the screen below will appear:

![DG Mapping Home Screen](image1)

**Figure 6 – DG Mapping Home Screen**

This is your home page; from here, you can access the map, download files, user guide, contact page or various help documents.

7. Click on ‘Click here to access DG map’ or the British Isles map icon.

The screen below will appear:

![DG Map](image2)

**Figure 7 – DG Map**
Access to DG map without logging in

It is possible to access the DG map without registering. This map view will not permit viewing of the enquiries, planned works or historic faults layers visible to registered users. Click on the link in the bottom half of the window.

To access the DG Mapping tool without logging in click here:

DG Mapping (no login required)

![DG Mapping Tool User Guide](image)

Figure 8 – DG Map access without logging in
The map that can be accessed without logging in contains a subset of the available layers. These layers are illustrated in the image below:

![Figure 9 – DG Map unregistered map](image)

**Password Reset**

If you forget your password, click on the ‘Forgot Password?’ link on the login page to get the screen below. Enter your username or email address and click ‘E-mail new password’. You will be emailed a link to reset your password. Ensure you check your spam/junk folders if the email does not arrive in your Inbox. The link is valid for 24 hours.

![Figure 10 – Password Reset](image)
Log Out

To sign out of your account, click on the 'Log out' link:

![Log Out](image-url)
Map Navigation

The following icons are situated on the borders of the map screen.

- Full Screen Mode
- Address Search
- Map Layers Menu
- Substation Search
- Save map settings
- Clear map settings
- Zoom and Pan Control
- Contact Information
- Map Key

Figure 12 – Map Controls
Full Screen Mode

Use this button to toggle full screen mode on the map.

Figure 13 - Full Screen Mode
**Address Search**

Simply enter either a place or postcode into the ‘Address search’ box and click ‘Search’. The chosen area is then identified with a purple information marker as highlighted in the red circle below.

Please note that only results from the map extent are shown.

![Address Search](image)

**Figure 14 - Address Search**

**Substation Search**

Click this icon and the substation search popup will appear. Start to type the name of a substation and a list of matches will appear, click one to zoom to the substation in question.
Map Layers Menu

The right-hand side of the page contains the toolbar to turn layers off and on. Click on the map layers icon and simply check or uncheck to add or remove a layer in the popup presented.

![Map Layers Menu](image)

Figure 15 - Map Layers Menu

Saving map settings

Clicking the save button will save the map centre point, zoom level and selected layers. A prompt will appear indicating that the settings have been saved.

When returning to the map in a new session the view will match the last saved settings.

Clearing map settings

Clicking this button will clear any saved settings stored for the map. A prompt with OK/Cancel will appear to confirm the clear settings actions. If OK is clicked, a prompt will appear indicating that the settings have been cleared.

When returning to the map it will display the default view and set of selected layers for that map.
Zoom and Pan Control

Upon initial entry to the DG map you will be presented with 132kV network, the EVH (>22kV) network will become visible once you have zoomed in three times and the HV (>1kV and <22kV) substations after five zooms (where the network exists).

The layers below are enabled at the following levels. Zoom levels run from 1-19 with 19 being the closest zoom.

The default zoom is 6.

<table>
<thead>
<tr>
<th>Type</th>
<th>Sub Type</th>
<th>Zoom Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Map</td>
<td></td>
<td>1-19</td>
</tr>
<tr>
<td>Substations, towers</td>
<td>132kV</td>
<td>1-15</td>
</tr>
<tr>
<td>and overhead lines</td>
<td>EHV (&gt; 22kV)</td>
<td>9-19</td>
</tr>
<tr>
<td></td>
<td>HV (&gt;1kV and &lt; 22kV)</td>
<td>11-19</td>
</tr>
<tr>
<td>Planned Works</td>
<td></td>
<td>1-15</td>
</tr>
<tr>
<td>Historic Faults</td>
<td></td>
<td>1-15</td>
</tr>
<tr>
<td>Enquiries</td>
<td></td>
<td>1-19</td>
</tr>
</tbody>
</table>

You can pan around the map with this icon or by holding down the Ctrl button on your keyboard and holding down left click on your mouse.
Contact Information

Click this icon to display the contact information box which gives contact information for the various regions covered by UKPN.

![Contact Information](image)

Figure 16 – Contact Information
Map Key

The map key is dynamic, and icons will be added and removed as selected from the map layers menu.

Some examples are given below:

- **HV Substation**
  (>1kV and < 22kV)
- **EHV substation (>22kV)**
- **132kV substation**
- **33kV pole or tower**
- **132kV pole or tower**
Network Status Key

There are six colours applied to the map:

**Significant capacity available**
This area of our network has capacity available for new connections.

**Capacity available**
There is some capacity available. However, connections may be subject to an interactive queue with other schemes or require some network reinforcement.

**Highly utilised and or reinforcement required**
Connections can be made but reinforcement may be required, or the connection offered may be at a higher voltage or be some distance away from the proposed site.

**132kV and/or transmission network capacity highly utilised**
The 132kV and/or transmission network is highly utilised in this area, network reinforcement may be required at transmission level or the connection point offered may be some distance away from the proposed site.

**Limited capacity subject to assessment by National Grid**
This area of our network is known to have an impact on the transmission system; all DG connections in this area will be subject to assessment by National Grid.

**Flexible Distributed Generation (FDG) zone**
In line with our FDG strategy, certain highly utilised areas of our network will be opened to receive applications for constrained connection offers. These will make use of appropriate active network management techniques to curtail generation when operational limits are/could be exceeded.

A prerequisite to connection will be the establishment of an area monitoring and control system to restrict or turn off generation output as and when required.
Information

You can find the substation name or tower/pole route by clicking on the icon. The information pop-up also details the voltage of the asset.

Figure 18 – Substation Information

Figure 19 – Tower Information
LTDS Information

Long Term Development Statement information for substations can be found within the 132kV and EHV substation popup.

This contains a substantial amount of technical information for that substation. The LTDS header is always visible in the popup but the content is initially hidden. Click the “See more…” link to view the information.

![LTDS Header](image)

The LTDS information is displayed. To hide this information, scroll to the bottom of the LTDS information and click on the “See less…” link at the bottom.

![LTDS Information](image)

Link to System wide Resource Register (SWRR)

A link has been included on the ‘Substation Information’ pop-up (Figure 18) to the SWRR webpage. The SWRR provides a list of generators above 1MVA that are connected to our network and details accepted projects (at the time the report was produced). We have detailed the generation type, capacity, point of connection voltage along with the associated substation/grid.

![SWRR Link](image)
Constraint Types

Known constraints have been included on the EHV and 132kV ‘Substation Information’ pop up shown below.

![Substation Information](image)

**Fault level**

This is where equipment such as switchgear on the network is approaching or has reached its maximum capacity to safely turn off when a fault is detected. Exceeding these levels by connection of further generation, could result in equipment failing catastrophically causing injury or damage.

**Thermal**

This is normally associated with overhead lines and underground cables. It is where the power flowing through these items exceeds their rating to a point where they will start to overheat. For overhead lines once they exceed their maximum design temperature, they will start to sag causing ground clearance problems. Underground cables can also be permanently damaged if operated above design temperatures.

**Tap changer reverse power flow**

Tap changers are devices installed to primary and grid transformers for the purpose of maintaining correct voltages on our high voltage networks. Many of these devices were never intended to cope with power flows in the reverse
direction and have limited or no capability to deal with this. Failure to comply with reverse power flow limits could result in equipment failing catastrophically causing injury or damage.

**Directional Overcurrent Protection (DOC)**

Most grid and primary transformers are equipped with this type of protection. Its purpose is to detect faults in the upstream networks, and it does so by tripping off transformers when it detects power flowing back through them to the higher voltage network. When levels of generation exceed demand and the reverse flows exceeds the maximum allowable protection settings this can result in tripping of transformers and loss of supply to large numbers of customers.

**Transformer reverse power flow**

Where tap changer and DOC constraints are not an issue then there comes a point when the levels of generation exceed the reverse power capability of the transformers themselves. This can result in windings overheating and tripping of the transformers with a resulting loss of supply to large numbers of customers.

**National Grid Network Issues**

When levels of DG exceed the demand of the distribution network, then power starts to flow back up into the transmission network. If this flow is too high, it can cause a number of issues with National Grids network. These could include thermal, voltage, and transient stability issues.

This constraint will be applied to all network downstream of a supergrid site where National Grid have advised that their network is no longer able to cope with the level of accepted distributed generation connected to it.

**Voltage Concerns**

Generation connecting to the network will in most cases affect the voltage of the network either directly or because of voltage control systems. Unbalanced generation on three winding transformers will also cause issues. Where generation would adversely affect our ability to supply all our customer within the statutory voltage limits, then we may apply this constraint.
Load Capacity Import Indicator

Capacity is represented by a number of heat maps. The following heatmaps are available:

- Demand Capacity
- Generation Capacity (Unconstrained)
- Flexible Distributed Generation (Constrained)
  - Solar Curtailment
  - Wind Curtailment
  - Non-Variable Curtailment

- These colour codes are indicated in the map legend and match the heat map colours.

Overhead Line Capacity Indicator

The colour surrounding some overhead lines is an indication of capacity available on them. These colour codes are indicated in the map legend and match the heat map colours.

Download Map Data

From the homepage, in the 'Download Map Data' section you will find a link to download shape files along with other spatial data files. You will be presented with the following screen where you can find links to download spatial data from the site in various formats.
Basic principles for the connection of DG to the Distribution Network

Introduction

When assessing DG or Electricity storage for connection to the distribution network a number of factors need to be considered, some similar to those required for all new connections but in addition, some are unique to the technology types being installed. This document is intended to give an overview of some of the requirements that need to be considered when assessing a connection point.

Main Technical requirements for determining a Point of Connection (POC)

1. Connection Point Voltage

The connection point voltage is determined by the size of generation wishing to connect. In some instances, a customer may request a connection point voltage based on suitability or preferred ownership boundary. Whilst UK Power Networks (UKPN) aims to accommodate customers’ requirements, it is the responsibility of a Distribution Network Operator (DNO) to determine the connection point based on the results of network studies.

In general, the typical connection voltage levels for generation sizes are dependent on the generator size as shown in the table below. It is normally possible to connect at this voltage level, however where the network is constrained, a connection point at a higher voltage level may be required to avoid these and providing for the least cost technical solution:

<table>
<thead>
<tr>
<th>Voltage Level</th>
<th>Generator size</th>
</tr>
</thead>
<tbody>
<tr>
<td>LV (400V)</td>
<td>Up to 500KVA depending on transformer size</td>
</tr>
<tr>
<td>11kV Feeder</td>
<td>200 KVA to 4,000KVA</td>
</tr>
<tr>
<td>11kV Primary</td>
<td>2,000 KVA to 7,500 KVA</td>
</tr>
<tr>
<td>11kV Grid</td>
<td>2,000 KVA to 15,000 KVA</td>
</tr>
<tr>
<td>33kV Feeder</td>
<td>4,000 KVA to 20,000 KVA</td>
</tr>
<tr>
<td>33kV Grid</td>
<td>10,000 KVA to 50,000KVA</td>
</tr>
<tr>
<td>132kV Feeder</td>
<td>50,000 KVA to 99,000 KVA</td>
</tr>
<tr>
<td>132kV Supergrid</td>
<td>50,000 KVA to 400,000KVA</td>
</tr>
</tbody>
</table>

Figure 26 – Typical connection voltage levels (Indicative)

2. Voltage step change at the Point of Common Coupling (PCC)

When connecting any load to the network, it is important that the connection of the generation does not affect other customers already connected to the network or those that are connecting in the future. For this reason, any new connection has to comply with the step change limits defined in EREC P28.

Generally, this limits the step change seen at the point of common coupling with other network customers, to 3%. Therefore, in the event of the site going from full generation export to full load import the connection should be robust enough to cater for this generation loss without imposing a 3% voltage dip on the site or other customers.

3. Voltage rise at the Point of Common Coupling (PCC)

Unlike load connections that normally result in a voltage drop due to their connection, the influence of a generator connecting to the network is normally to create a voltage rise at the point of connection as the power flow is heading from the generator into the network. This can result in a rise in voltage as seen at the point of connection and by other customers connected to the network.
Unlike voltage step change, which is a change that occurs on either the start-up or, more likely, by the sudden loss of generation, the effects can result in a high voltage situation occurring on the network with the possibility of customers receiving voltage above statutory limits.

It is therefore important to undertake a voltage rise study to confirm the effect of the generation on existing customers as the first stage of any network assessment. At LV and HV, it is likely that this may well be the determining factor for the amount of generation that can be connected to the network, before any thermal constraints are breached.

For LV and HV, an increase in voltage of 2% above background levels is normally considered acceptable. This is not a measure of actual system voltage but of the system since it is affected by the source impedance and the power factor of the export. It is important therefore, to bear in mind the effects of any other generation in the vicinity since the cumulative effect of a number of schemes that each pushes the voltage up by 2% could exceed statutory voltage limits.

For EHV schemes, a voltage rise of 3% is considered acceptable in line with the requirements in EREC P28. The cumulative effect of a number of generators on the same network is also potentially less noticeable as the voltage at the 11kV Busbars is normally controlled via on load Tapchangers. At this voltage level, the thermal effects tend to come into play to limit the size of generation that can be accepted before voltage rise.

For 132kV Connected generation where sites are classified as type D or are 50MW or greater and are classified as Medium Power Stations then there is a requirement for the generation to operate in a voltage control mode.

4. Thermal Ratings of Circuits and Plant

Thermal ratings of circuits and plant are taken into consideration in the same way that they are considered for load, however, the following differences need to be considered when looking to connect generation.

Most loads have a cyclic rating by nature, and when considering the network as a whole are diversified across many customers. In addition, for network loads most of the EHV network is designed to comply with EREC P2 in terms of security of supply. This means that many substations and circuits are designed to carry no more than half of their full capacity even at peak load times.

When considering generation export, it is necessary to re consider the likely thermal impact different profiles may have on ratings.

Some generation plants such as biomass and energy from waste plants are designed to operate at full output continuously. Therefore, there is no period of time for cables to cool down. Even where generation is intermittent such as with solar farms the period of time when they can be operating at high output is between 10am and 5pm in the summer, distribution ratings typically assume that peak load demand will only occur for a couple of hours during the winter.

Most distribution transformers are nameplate rated at 20 °C and many primary transformers are emergency rated at only 5 °C. Experience has shown that operating grid and primary transformers for long periods of time, even well within their nameplate rating can have a significant impact on transformer life.

Therefore, when assessing the thermal capacity of a network it is necessary to consider the impact of load and generation on all parts of the network through which it can flow.

5. Fault level

When assessing the connection of generation to the network it is necessary to determine the impact of generation on the existing fault level across the network. All sources of energy will increase the fault level across the network if the generation is connected in parallel with the distribution network.

The exception to this is generation designed as backup only where the generator is interlocked with the mains supply so the two supplies can never be paralleled. A variation on this arrangement is a short term parallel. These are normally provided to allow a customer with standby generation to reconnect to the mains following an outage without having to shut down their generation (and hence site) to reconnect the incoming supply. It is also used to test generators on a
regular basis to ensure they are working correctly. In this case, an infrequent short term parallel connection can be made for a maximum time period of 5 min in any month, and no more frequently than once per week.

Even if the site is not designed to export any power, just having the generation operating in parallel will cause the fault level to increase. By how much will depend on the type of generator and how it is connected:

- Most synchronous generators will initially produce 6 to 7 times its rated RMS (Root Mean Square) output in fault contribution.
- An inverter-connected source may be as low as 1.2 to 2.5 times it rated output. It will very much depend on the type of machine characteristics and how it is connected to the network.

It is therefore necessary to ensure that the generator provides an adequate data submission of both the generator and the transformer data, before UK Power Networks can undertake network studies, to determine its impact.

6. Circuit Complexity

Before deciding on the suitability of a connection point, it is also necessary to determine if a connection can be made to that point without creating an overly complicated network. A simple network is a safer network in that it is easier to operate and manage when switching out to undertake works. Protection grading and operation is likely to be easier and more reliable so faults on such networks are less prone to take out multiple sites and risk CI’s and CML’s.

Much of the current network was built during times of lower demand and centralised generation. Circuits were extended as power was required in more remote areas and so now the costs to supply all parts of the network on simple clean feeders would be significant not just from a financial perspective but from an environmental and planning perspective. It is therefore necessary to strike a balance between circuit complexity and cost.

To that end a number of documents exist that define how complex circuits can be. For 132KV networks, an ENA EREC P18 has been in place for many years, covering all DNO networks in the country and adopted in UK Power Networks under EDS 08-4000 EHV Customer Demand and Generation Supplies. This limits the number of sites that need to be visited in order to isolate one circuit or piece of equipment to 4. In addition, to ensure that protection would correctly function to clear a fault no more than 7 end circuit breakers should need to trip at no more than 4 sites.

At HV, guidance on circuit complexity can be found in the Distribution Network Design standard EDS 08-3000 HV Network Design, that includes worked examples of typical designs. For LV networks, circuit complexity rules don’t normally apply.

7. Grid Code Compliance RfSoW and LEEMPS

Where the cumulative export capacity of generation connections on a super grid supply point exceeds 50 MW it will be necessary to submit a Request for Statement of Works (RfSoW) to National Grid ESO to determine if the generation is likely to have an impact on the transmission system. A new process has been set up to simplify the process to notify National Grid ESO of the quantities of generation being connected, who in turn will give Materiality Headroom limits to enable UKPN to manage enquiries within that limit. Typically, this has to date been of the order of 50 MW and 3 kA.

Information on the generator needs to be submitted along with details of the connection arrangement. Once considered technically competent National Grid will need to respond to the RfSoW within one month. The response will normally be one of two options either the generation has no material impact on the transmission system and no works are required; or yes it does have an impact and further works are required, which in turn will require a modification application (mod app) to be requested, again with a further fee required. National Grid as part of the mod app will then make a further offer within two months providing costs for the transmission reinforcement works.

For all single generation sites of 50 MW and above, a single site specific Project Progression (PP) is required. National Grid ESO will have 90 calendar days from clock start to provide an offer.

Generation between 50 MW and 100MW not subject to a bilateral agreement is known as a Licence Exempt Embedded Medium Power Station or LEEMPS. This type of Power Station is required to conform to a subset of conditions laid down.
in the Grid Code. Unlike Large Power Stations of 100MW plus where National Grid monitors the compliance. Medium Power Stations have to provide compliance information to the DNO. It is then the DNO’s responsibility to ensure this data is provided and of adequate quality before passing on to National Grid.

8. Requirement for LV Auxiliary supplies.

Any generator/storage site connecting at EHV will require an LV auxiliary supply to power the heating lighting and dehumidifier in metering switchgear room. It will also need to power substation protection tripping battery and the Scada Battery.

Failure of these supplies could render the site unable to operate for a fault or for normal switching duties, and failure to keep the substation environment stable could result in damage to plant and equipment. It is therefore important that the LV supplies to the substation are provided to a high standard of security.

Where switchgear forms an integral part of our network i.e. ringed in, then the LV aux supplies should be derived from our 11kV distribution network. Where the switchgear is at the end of our network i.e. a Teed connection then an LV Auxiliary supply should still be derived from our 11kV distribution system wherever possible however if this is not cost effective UK Power Networks can accept supplies derived from a customer network providing certain criteria are met. These requirements can be found in EDS 08-1112 Substation LVAC Supplies.

9. Reactive Power Range for Generation and Storage

Traditionally generation has normally operated at around unity power factor with the exception of Medium and Large power stations that have needed to demonstrate a power factor range to comply with the Grid Code.

The proliferation of embedded generation alongside changing load profiles and the widespread use of underground cable has resulted in the network appearing capacitive at light load. This has resulted in problems with an increasing incidence of high voltage on the transmission network.

In order to control this there is a requirement that all new generation and storage connections should be capable of operating over a power factor range from 0.95 Lead to 0.95 Lag. In addition, when the site is not exporting real power the site should not export reactive power due to onsite cabling and inverters etc. When assessing power factor range for storage devices it should be considered that storage customers may wish to provide reactive power services in the future. Therefore, it is important to assess the maximum power range that the connection point is suitable for and make sure that these limits are clearly identified in the connection offer letter and CUSA.

Further information on assessing electricity storage connections can be found in EDS 08-5010 Energy Storage.


In common with any load connection, consideration has to be given to the Power Quality requirements of the site. Flicker and Step Change in accordance with EREC P28 and the requirements for voltage unbalance as defined in EREC P29 should be followed.

The other main power quality requirement is with regard to harmonics on the network in accordance with EREC G5. Where single type tested inverters are used this will form part of the type testing. For larger sites, a Stage 2 or stage 3 assessments will be required. It is expected that the customer should supply a harmonic study for all 33kV and 132KV sites. In order to do this, it will be necessary to supply the customer with background network harmonics for a site as close to their connection point as possible, and preferably at the same voltage level. This may prove difficult at 132kV where a wound VT will be required to obtain background data. CVT’s are not suitable for harmonic measurements unless a suitable modification kit has been installed.
11. Small Scale Generation

When undertaking any assessment for generation or storage it is necessary to consider how the network demand may change over the immediate short-term timescales. When assessing general load growth UK Power Networks Engineers use Planning Load Estimates (PLE’S) and actual power flow information to give an indication of how demand is likely to grow. This can then be factored into any calculations for load increases, to ensure that sufficient margin is available to allow for general load growth, to give time to reinforce assets before they become overloaded.

Growth in small-scale generation may result in minimum demand at peak generation times reducing from current day values. If calculations of generation headroom is based on last year’s minimum demands then this headroom may have already reduced due to connection of EREC G98 generation.
Main Physical requirements for determining a Point of Connection (POC)

In addition to the main Technical requirements to consider when offering a DG or storage connection, it is also worth remembering the physical requirements for the connection point. Otherwise, on customer acceptance it may not be possible to achieve the connection point offered. Whilst it is not necessary to undertake site visits before making an offer, some simple checks can be undertaken to ensure the connection point being offered is viable. Tools such as Netmap and Google Street View can be useful in determining equipment on site e.g. Tower configuration etc. The following list is not exhaustive but gives some common issues.

1. **Point of Connection to an Overhead Line**

   When determining a POC to an existing overhead line it is necessary to determine if an ABSD is required at the POC and that the location needs to be accessible for switching and subject of an ESQCR risk assessment.

   Various factors determine the connection to an overhead line as this could be of single or double circuit, wood pole or steel tower line construction.

2. **Point of Connection to an Underground Cable Network.**

   When considering a POC to an underground cable network then again it is necessary to determine if switchgear is needed at the POC. If it is then a new substation may be required. Moving the connection point to within the boundaries of an existing substation may be a cheaper solution particularly at HV, if a suitable secondary is nearby. However, Unit substations within a GRP housing may not have sufficient space to install further switchgear.

   Whilst it is acceptable to tee off an existing HV underground network, this is avoided at 33kV. A connection point at a substation en route or ringing the circuit in and out of the substation would be preferred, providing it does not introduce significant cable length into the circuit. Having a double cable box on the switchgear is another alternative to teeing in and avoids the need to create a ringing in of the circuit. When connecting into and existing transformer feeder circuit at 33kV and if the transformer is cable fed, means of transformer isolation need to be provide to enable the transformer to be taken out for maintenance without switching off the generator site.

3. **Point of connection within an existing substation site.**

   When making a POC at an existing grid or primary site the layout of the site should be designed to maintain separation to adjacent equipment. This is important not only to maintain electrical clearance, but also to allow plant to be taken out of service and worked on safely without having to switch off other items of plant.

4. **Shared Customer Switch Rooms**

   This practice is no longer allowed and all metering rooms should be sole UK Power Networks access. It is possible to share the same building with a customer however the switchgear room(s) should be physically separated with fire rated walls and access limited to UK Power Networks staff via standard locking arrangements. Where meter operator's equipment is also installed, this should be in a separate room and the meter operator should have no access to our HV switch room(s).

   Any LVAC fuse boards controlling heating, lighting and power within our switch rooms should be installed in our room to allow ready access to it should it be required.

   For buildings on customer sites, the customer is normally responsible for the upkeep and maintenance of the building. For shared buildings and buildings of non-standard construction materials, e.g. Containers or GRP then UK Power Networks will not adopt these buildings.
Further Help
If you need help or assistance, please email DG-Q&A@ukpowernetworks.co.uk