Guidance for Essential Service Operators

Making Your Service More Resilient to Power Outages

Purpose of Document

The purpose of this document is to provide organisations, particularly those that operate essential services in Great Britain, with guidance to support contingency, continuity and resilience planning for short-term power outages.

Essential services are those that the public rely on a daily, or near daily, basis. Disruption to these services could impact the normal patterns of daily lives or the health and safety of the public. Essential services include those that provide:

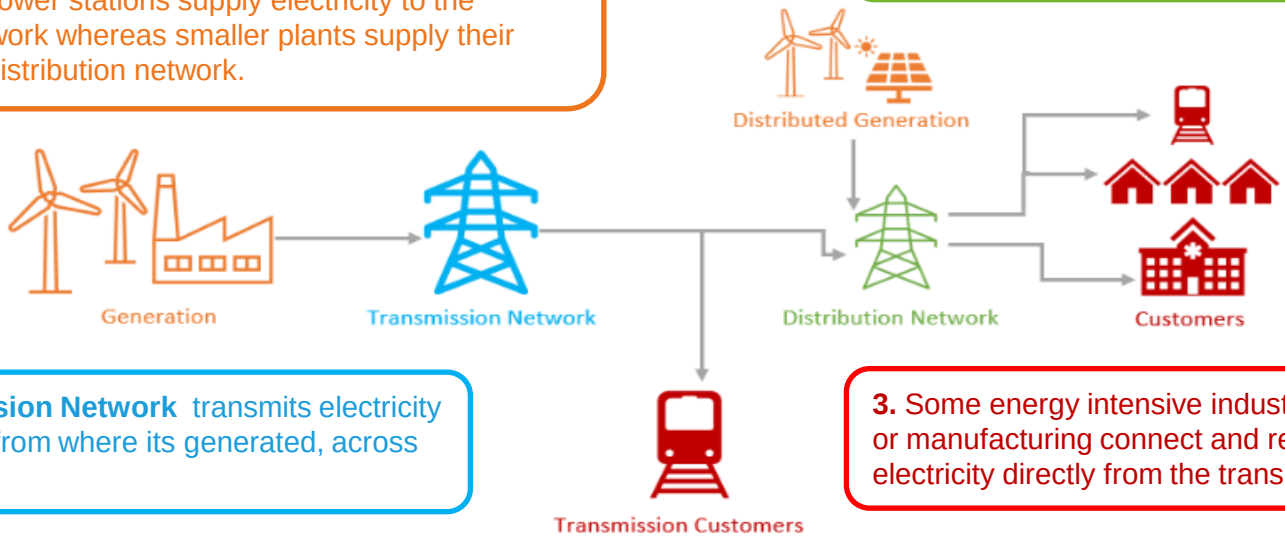
- Health and social care
- Transport
- Utilities, telecommunications or financial services
- Food production, distribution or sale
- Public order and national security
- Public safety at hazardous sites such as civil nuclear, chemicals or large manufacturing plants
- Education or childcare
- Other public services such as the running of the justice system or public broadcasting

This document does not address planning for longer term power outages that could last a few days, or planned power outages such as rota load disconnections.

GB Electricity Network

1. Our electricity is **generated** from a variety of sources including renewables, gas, nuclear, oil and coal-fired power stations. Large power stations supply electricity to the transmission network whereas smaller plants supply their electricity to the distribution network.

4. Distribution networks carry electricity at a lower voltage from the transmission network, to industrial, commercial and domestic customers across Great Britain.



2. The Transmission Network transmits electricity at a high voltage from where its generated, across the country.

3. Some energy intensive industries such as rail or manufacturing connect and receive their electricity directly from the transmission network.

The **Electricity System Operator** ensures that the right amount of electricity is where it's needed, when it's needed – by keeping supply and demand in perfect balance on a second-by-second basis.

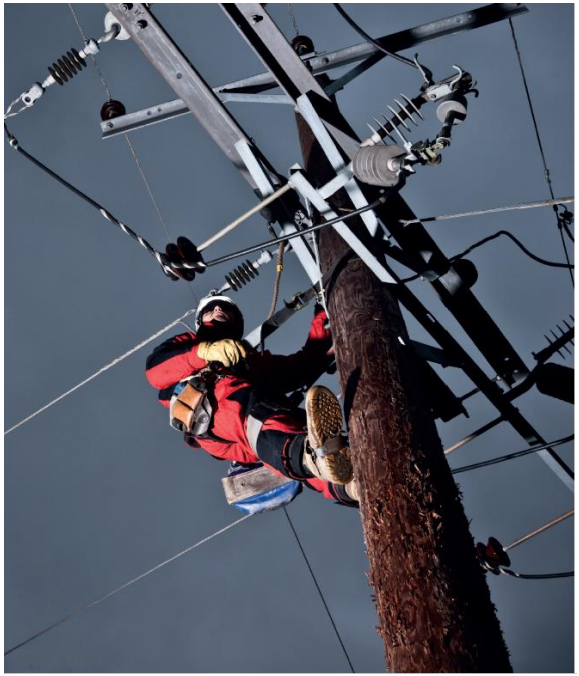
Why do power cuts happen?

On an average day, short-term power outages can impact between 5k-50k properties across Great Britain. These disruptions can occur for a number of reasons, including:

- ***Severe Weather*** **-** high winds, heavy snow or rain and lightning strikes can damage network infrastructure such as overhead power lines or substations.

- ***Infrastructure Failure*** **-** technical faults or third parties (either through an accident, vandalism or theft) can similarly damage electricity infrastructure and disrupt power supplies.

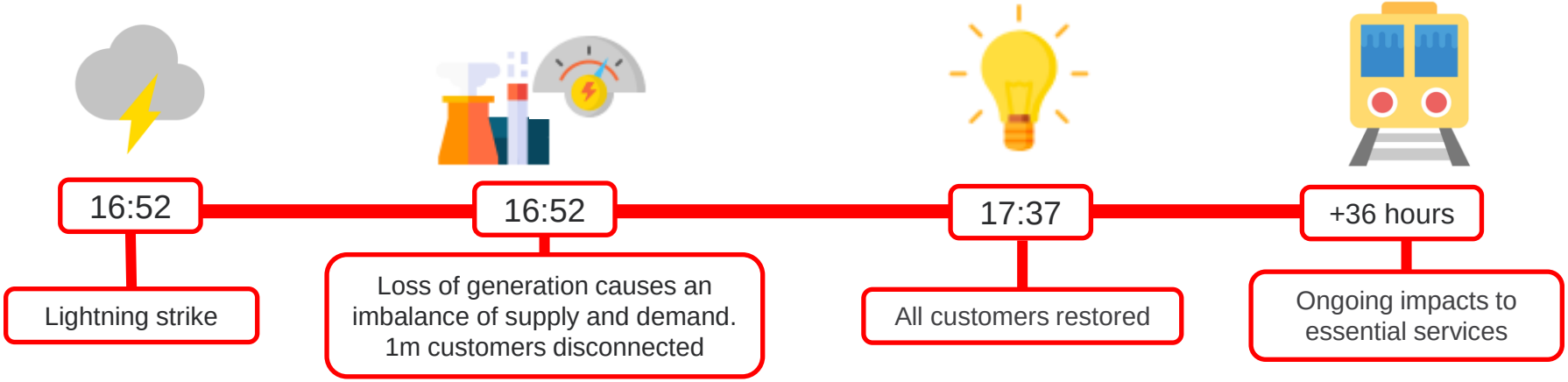
In exceptional circumstances, a short-term power outage can also be caused when the electricity system is out of balance i.e. when electricity supply and demand are not aligned. In such an event, as a last resort, electricity companies can disconnect some demand (customers) to keep the system in balance.



Case Study – 9th August 2019

On Friday 9th of August 2019, over 1 million customers were affected by a major power disruption that occurred across England and Wales and some parts of Scotland. The incident was triggered by a lightning strike to an overhead transmission line and the near simultaneous loss of a number of generators.

The loss of generation caused an imbalance between the amount of electricity being generated and the amount of electricity being used by businesses and the public. This triggered an automatic protection system (known as Low Frequency Demand Disconnection) which had the effect of disconnecting over 1 million customers to address the imbalance and protect the electricity network from a total shut down. Though the power disconnection itself was relatively short lived – all customers were restored within 45 minutes - the knock-on impacts to other services were significant.



Case Study – 9th August 2019

The services that were affected by the power disruption on the 9th August included:

- ***Rail*** – 371 cancelled services, 220 part cancelled services and 870 delayed trains; some signalling assets were also affected.
- ***Hospitals*** – 4 hospitals automatically switched to their back-up generators.
- ***Water Treatment*** – 3000 customers experienced a reduction in water pressure and 1 water treatment plant needed to switch to its back-up generator.
- ***Airports*** – 2 airports automatically switched to their back-up generators.

The majority of these services were not disconnected by the Low Frequency Demand Disconnection Scheme. Instead, the service disruptions were caused by protection systems under the control of individual essential service operators, as they reacted to the disturbance on the electricity network.

This case study illustrates that whilst these types of power disruptions are rare, it's important to adequately prepare and plan for them, to minimise any disruption to your customers and the public.

What can you do to prepare for a power outage?

As seen on the previous slide, short term power outages can cause significant disruption to businesses and other organisations. As the provider of an essential service, you should put in place arrangements to mitigate the impact of any power disruptions.

These arrangements can help you limit the impact to your service during the power outage and return to normal levels of business more rapidly. Here are three steps you should consider when trying to improve your resilience to a power outage:

Be Aware – Know which experts you need to engage with to help you prepare for a power outage

Prepare - Develop robust Business Continuity and Communications Plans and exercise these regularly

Respond and Recover – Activate your plans during a power outage to minimise disruption to the public

Be Aware

There are many organisations that can help you prepare for and respond to power disruptions. Engaging with these parties can help you to understand how a power outage will impact your operations, identify mitigation options and produce emergency plans to minimise these impacts. Here's an overview of key players and how they can help you prepare for power disruptions:

Electricity Network Operator

- Responsible for the power supply and cable(s) coming into your site up to the electrical fuse (sometimes called main fuse, service head, cut out).
- Can help you to identify mitigation options to *minimise the likelihood* of a power disruption affecting your site or property.

Electrical Contractor

- Responsible for the electrical circuits and equipment across your site / property, from the main fuse onwards.
- Can help you to identify any critical assets that will require emergency power and mitigation options to *minimise the impacts* of power loss across your site.

Local Resilience Forums

- Multi-agency partnerships with representatives from the emergency services, local authorities, the NHS, the Environment Agency and others.
- Can help you to develop emergency plans that prevent or mitigate the impact of a power outage on local communities.

Further info on how to engage with these parties is on slide 12.

Prepare

The process of developing plans to cope with disruptive incidents is known as Business Continuity Management. Here are the steps you should take to ensure these plans adequately address the risk of a short-term power outage.

Undertake a Business Impact Analysis

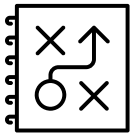
A Business Impact Assessment (BIA) will help you to identify the impacts of a power disruption on the delivery of your essential service. The Business Continuity Institute is an authoritative body on Business Continuity Management and has developed a comprehensive set of Good Practice Guidelines that you should consider when undertaking a BIA. You can access this guide by becoming a member of the Business Continuity Institute or purchasing the guidelines here.

Identify Mitigation Options

Once you've undertaken your BIA you can identify and implement mitigation measures that will minimise the likelihood or impact of a power disruption. Three key mitigation options you should consider are:

- *Installing or checking your protection systems* – these are designed to disconnect your site from the electricity network when a disturbance on the power grid is detected. Your Electrical Contractor will be able to advise on which systems you should install and your Electricity Network Operator will be able to advise you on the correct settings.
- *Installing multiple power feeds to your site* – this can minimise the likelihood of a power disruption affecting your site. Your Electricity Network Operator will be able to advise if installing an additional power feed is feasible and cost effective.
- *Installing back-up generation* – this can provide emergency back-up power to your critical assets or services. Your Electrical Contractor will be able to advise whether this is appropriate and provide other technical support on how to maintain and test your back-up generator.

Prepare



Develop a Business Continuity Plan

Well-written and easily understood procedures, that can be followed without confusion during a power outage will help make your response more effective.

The Business Continuity Institute has developed a comprehensive set of Good Practice Guidelines that you should consider to help you develop a robust business continuity plan. You can access the guidelines here or alternatively you can get in touch with your Local Resilience Forum for further help and advice.

To ensure your Business Continuity plan adequately addresses power loss, you can find further information about the types of impacts you could experience during a short-term power outage here.

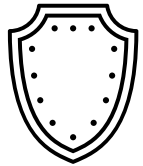
Develop a Communications Plan

When an emergency occurs and your service is disrupted, you will need to communicate immediately with your customers or the public, your staff or even notify the Government or your regulator. You should a develop a clear plan that can be executed in an emergency, that sets out what and how you will communicate during a power disruption.

Test and Exercise your Plans

Your Business Continuity and Communications Plans should be exercised regularly to ensure they are workable and effective in an emergency. If you have a back-up generator, its also important to remember to test this on-load regularly.

Respond & Recover



When a power outage occurs, responding quickly can help minimise the impact to your service. Here are some things to consider during your response:

Implement and Activate your Plans - This will help ensure that the service you provide can continue with minimal impact throughout the length of the power disruption.

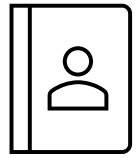
Stay Updated - During a power outage your Electricity Network Operator will post regular updates on their restoration efforts on their social media account. You should regularly check these to get the latest information e.g. expected length of the disruption.

Inform and Report - You can call '105' to report or get more information about a power cut that is affecting your site. It's free of charge and will put you through to your local network operator who can give you help and advice. This number can also be used to inform and report safety issues as well as power outages. The 105 number operates on a regional basis so affected sites will need to report directly in order to get through to the correct network operator.

Communicate - Remember to regularly pass updates on to staff and customers to inform them of what they need to do during the power outage.

Recovery - Once power has been restored your organisation should look to return to business as usual as quickly as possible. You should carry out a review of your Business Continuity Plan and action any improvements that have been identified.

Contacts



Electricity Network Operators

There are three companies that own and operate the electricity transmission networks across GB and six companies that own and operate the regional distribution networks, (as well as other smaller independent operators).

Your local Network Operator will be dependent on your geographic location and whether your site or property is connected to the transmission or distribution network.

- If you are connected to the Distribution Network, you can find out who your Network Operator is and how to contact them here.
- If you are connected to the Transmission Network, you can find out who your Network Operator by accessing the Energy Transmission Map here.
    - Contact details for National Grid Electricity Transmission can be found here
    - Contact details for SP Energy Networks Transmission can be found here
    - Contact details for SSE Transmission can be found here
- You can find more info on what to do in a power cut here

Local Resilience Forums - You can find out who your relevant Local Resilience Forum is and how to contact them here

Business Continuity Management - You can find further information on business continuity management, emergency planning, response and recovery here