



Powering through winter

Protecting businesses against seasonal outages



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1. Introduction

The UK's winter storm season is fast approaching. With it comes an increased risk of severe weather conditions, such as heavy rainfall, snow, and high winds. Coupled with seasonal pressure on the National Grid, there is a higher likelihood of outages.

These conditions mean that many UK businesses will face challenges in maintaining a continuous power supply.

The resulting power loss has a wide range of consequences, from significant financial losses to dangerous operating conditions.

Despite these risks, many organisations are unprepared for winter power cuts.

This whitepaper outlines the reasons why power cuts are likely, and the necessary steps to protect against disruptions.





2. The challenges of maintaining continuous power during winter

In the UK, winter brings severe weather that poses a significant threat to power. Adverse conditions can disrupt the power supply by damaging power infrastructure. Much of the UK's power is delivered through power lines, which regularly get knocked down in storms or strong winds. Substations can get flooded in heavy rainfall.

Over recent years, winter storms in the UK have become more severe and more unpredictable. Although we can't predict exact conditions, there has been a clear trend in more extreme weather than ever before.

It's not just the bigger, named storms that cause problems. In the winter, the cold and dark leads to more people turning on lights and heating. This increases the strain on the National Grid.



CASE STUDY

How CPS helped organisations during Storm Desmond

Storm Desmond, which hit the UK in December 2015, caused unprecedented floods to Cumbria and Lancashire. One of Lancaster's main electrical substations was flooded, causing a city-wide power cut. More than 100,000 people were left without electricity for almost a week.

It's not just the lights that went down. With no signal and no power to run routers, much of the mobile phone and internet connectivity in the area was lost. High-rise flats that used electric-powered booster pumps lost water access.

Businesses were unable to operate as normal, in part because electronic payment systems (tills and card readers) were unusable without electricity.

CPS quickly delivered and installed emergency back-up generators to 80 businesses across the area, including supermarkets, railway stations, petrol stations, dairy farms, local councils and hospitals.

One university needed to keep its students safe during the outage. Instead of leaving them stuck in the cold and dark in university halls of residence and private rented accommodation, the university urged students to congregate on key locations in the campus.

The university required six megawatts of power, which CPS delivered within four hours. This kept key infrastructure on the site running for student safety.



3. The impact of winter power outages on businesses

There are a number of potentially damaging consequences of power cuts. These include:

1

Operational risks

A lack of power can bring businesses to a complete standstill. Whether it's a factory unable to run its machinery, a hotel unable to heat and light rooms, or an office building in sudden darkness, the unexpected halt leads to a loss of productivity. IT systems such as servers and security systems become inoperative, and there is a risk of data loss. Even brief interruptions can cause extensive backlogs. For local councils, who have responsibility for maintaining public infrastructure, continuous power is crucial to keep everything from traffic lights to emergency communications systems up and running.

2

Financial risks

The costs associated with power outages can be substantial. In some cases, businesses can lose thousands of pounds each hour they are without energy. The reasons for this include operational downtime, loss of custom, damaged equipment and goods or cancelled bookings. The unexpected cost of needing to rent a generator at short notice is another strain on finances.



3 Reputational risks

In all sectors, customers expect reliability. Negative customer experience interactions, such as failure to deliver promised goods or services due to power issues, can lead to a loss of trust. Disappointed clients can express their frustration through social media, word of mouth, or even the news media. This damages the brand's reputation and discourages customers from ordering again. For example, hospitality venues rely on large amounts of power to provide services to guests; if an expensive, once-in-a-lifetime event such as a wedding is ruined due to power cuts, it will reflect negatively on the venue's reputation.

4 Safety risks

In some cases, a power outage can be dangerous and frightening. Without adequate lighting, people are more likely to have accidents such as tripping over obstacles – this is even more critical where an evacuation might be necessary. Without heat in winter, the temperature can drop below the minimum recommended levels. Safety systems and equipment are also at risk - for example, fire or carbon monoxide alarms can be impacted by a loss of power. Continuous power is especially important in the healthcare sector, to operate critical medical equipment and administrative systems. A power-outage is potentially life-threatening for patients on life support systems or undergoing surgery.





4. Preparing for winter power outages with a generator in place

A common misconception for businesses is that owning a generator is sufficient protection against power cuts. In reality, without regular testing and maintenance, a generator may fail at the most crucial time.

This is particularly true in winter conditions. Even without severe winter storms, regular seasonal cold weather can have a significant impact on a generator's ability to operate throughout the season.

Key reasons for this include:

- ❖ **Oil thickness:** Colder temperatures increase resistance of the oil in a generator. This means the starter motor has to work harder to get the engine up and running, and in some cases won't start at all.
- ❖ **Fuel issues:** In colder weather, diesel fuel can "gel". Combustible paraffin wax is added to diesel fuel to provide power when burned in the engine. However, in cold temperatures the wax in the fuel crystallises, also called "gelling". The diesel solidifies, which can lead to a clogged fuel line or filters. As a result, the engine can't draw fuel properly.
- ❖ **Battery failure:** Lower temperatures can reduce battery performance, draining batteries more quickly – so it's important to make sure they are fully charged. When the temperature drops to freezing or below, some batteries will deliver less than half the current it would in normal temperatures.

A key aspect of winter preparedness is therefore ensuring that backup systems are operational and capable of meeting power needs during an outage.



There are a number of steps to take that will provide this peace of mind:

Regular testing. Scheduling regulator generator tests ensures the generator works and keeps the moving parts lubricated. These should take place every month as a minimum, and be planned into site maintenance regimes on a regular basis.

Inspecting the generator. Fuel and coolant hoses should be checked for cracks or leaks. Engine heaters and battery chargers need to be inspected for correct operation and replaced or repaired where necessary to ensure optimum performance of the generator. This is also a good opportunity to check your changeover system for peace of mind that the whole system will support you in the event of an outage.

Staff training. Any employees who will be responsible for maintaining or running the generator should be thoroughly trained on how to check the generator, as well as what to do in the event of an unexpected power cut.

Understand battery health. Batteries tend to perform poorly in extreme weather, and the cold can reduce their lifespan. Properly checking battery health is crucial. If charge levels are depleted or the battery is dead, it should be swapped for a new one.

Check the fuel. Make sure your generator has enough fuel to last through the winter. Generators can be damaged by empty fuel tanks or old, stale fuel, so fill it up or replace where necessary.

Check the oil. Generator oil should be changed regularly to avoid a build-up of particles. This also provides an opportunity to top up oil levels to ensure that the parts can keep running smoothly. The safety features of generators often include a function that shuts the generator off if oil is running too low, so it's important to keep oil levels high enough.

Check the generator's placement. Generators run on combustion engines and require oxygen for the combustion process. So, generators need ventilation around it. It's also important to clear any dirt or debris that may fall on the generator and block vents, such as snow or leaves. This will also help to prevent any rust from forming.

Test during fair weather. Waiting until a winter storm arrives to check a generator makes it more difficult due to the poor weather conditions, and in some cases it may be too late. Instead, generators should be tested during fair-weather conditions when support and resources are readily available.



5. Preparing for winter power outages without a generator in place

Organisations without a generator in place should start by conducting a thorough risk assessment to assess the power needs. It's important to understand what critical systems need to remain operational in a power outage.

From there, businesses are in a better position to assess what back-up systems they need in place. Experts such as CPS can help develop a bespoke solution based on an organisation's specific needs and threats.

When choosing a generator, there are a number of factors to consider such as power output and reliability.

Some key areas to consider include:

- ❖ **Usage:** Understanding what the generator will be used for will help you to understand the power requirements needed to ensure a continuous power supply for your unique circumstances. This will determine what type and size of generator you need.
- ❖ **Fuel type:** Diesel generators can typically run in temperatures as low as -29 degrees Celsius – this is colder than the lowest ever temperature recorded in the UK (-27 degrees). However, it's important to ensure the generator is installed, maintained and serviced properly for the best performance.
- ❖ **Location:** Many generators can be located outside to avoid taking up valuable indoor space. If the area is prone to flooding, the generator may need to be raised off the ground. It should also be located in an accessible spot to make refuelling and regular checks as easy as possible.



Once you have chosen your generator, working with a reputable firm to ensure the generator is expertly installed is essential.

A generator is an investment, but in the event of a disruption to power supply, it will maintain operations, protect against financial losses and reputational risks, and help to keep employees and customers safe.



5. A message from CPS managing director, Stuart Brakewell

Winter presents significant challenges for organisations of all sizes, across all sectors. It's impossible to accurately predict the impact of storms, but we can say with certainty that UK businesses will face power cuts over the coming months.

As the weather becomes more unpredictable, and storms more severe, we are seeing increasing numbers of organisations caught out by power disruption. Many are businesses who already have back-up generators in place, but haven't tested them – so they have an unpleasant surprise when the power cuts out.

The consequences of losing power can be severe, leading to operational difficulties, financial loss, reputational risks and health and safety challenges.

When it comes to winter preparedness, starting early and testing regularly is the best approach.

However, it's not too late; there is still time for businesses to get suitable back up options in place and ensure they are protected against power outages. By taking steps now, organisations can feel confident that they can power through the winter season.





6. About CPS/Contact details

To speak to CPS about protecting your business against winter power outages, contact our experts.

Call 0845 437 9750

Visit www.central-power.co.uk

