

HAZARD/THREAT CATEGORY	SUB-CATEGORIES
Industrial technical failure	Technical failure of electricity network
Hazard and threat description including scale:	RISK REFERENCE NO:
Total shutdown of the electricity supply over an entire region or Devolved Administration, occurring during working hours and lasting 24 hours	H45
DATE OF REVISION	NEXT REVIEW DATE
November 2007	November 2008
Version	2
Author	Utility through TVP

1. Overview of hazard or threat

There have been occurrences of power cuts affecting large areas in the UK but such incidents are usually restored within 24 hours.

The Security of Supply standards are common across the UK and although there are local differences that for historical reasons could have improved security of supply in the past the current standards should be applied to all new works unless the customer is prepared to contribute the costs of any improvement.

2. Key historical evidence

There have been no failures of supplies of 24 hours duration to a whole region (or entire LRF area) in the recent past. The most well known recent examples of power cuts affecting large areas are detailed below but these events did not cause power cuts for over twenty four hours and so are included for information only.

As the electricity network does not match LRF boundaries neither of the two examples quoted below affected only one LRF area, and did not cover the whole of an LRF area but it is possible that an incident could affect only one region.

2003 South London

An incident resulted in the loss of supplies to parts of South London and commuter services during the evening rush hour. Supplies were restored in stages with all supplies restored by within 37 minutes.

2003 Birmingham

An incident resulted in loss of supplies in N E Birmingham. Demand was restored in stages after 11 minutes.

Summary:

There are potential events that could cause the complete failure of the electricity network for a period of 24 hours for a complete region. It is considered these events to be rare and each Distribution Network Operator has robust, well developed and resilient emergency and contingency plans to recover the electricity network from such a failure. These plans may not initially allow for the recovery of power to all customers and that some form of rota disconnection, or rolling power cuts, would be necessary to share evenly the available power until full repairs are completed.

3. Likelihood (CCA Assessment)

HAZARD	Outcome Description	Likelihood
Power cut affecting the whole of an entire region	100% of region demand	Unlikely (3)

There has been no increase in the likelihood of a power cut affecting the whole of a region for twenty-four hours in recent years. The UK electricity system remains well managed, robust and resilient and is operated to minimise the effect of any failure.

The Security of Supply standards have not changed significantly since privatisation.

The industry remains well regulated and managed.

4. Impact

HAZARD	Outcome Description	Impact				
		Health	Social	Environ	Financial	Overall
Technical failure of electricity network	Total shutdown of the electricity supply over an entire region or Devolved Administration, occurring during working hours and lasting 24 hours	3	3	3	3	3

Summary

The hazards below are ones the civil community may wish to consider:

Details

IMPACTS ASSOCIATED WITH POWER CUTS
PRIMARY:
Care of the vulnerable
Services will be stretched for those services and businesses without good business continuity plans
If concurrent with cold temperatures, fatalities due to hyperthermia may occur due to the failure of power, through the failure of, for example: electric space heating; pumps and boiler controls for gas and oil central heating systems; and ability to cook and make hot drinks.
Increase in property fires caused by: <ol style="list-style-type: none"> 1. candles and oil lamps; 2. portable space heaters such as portable gas fires, paraffin heaters; 3. increase in the use of coal fires; 4. householders leaving on cooker rings and electric fires which when the power is restored cause a fire because of their proximity to flammable material.
Crime may increase in unlit streets and houses. Fire alarms may spuriously operate during power cuts which could reduce their effect and encourage burglaries.

Increase in the number of food poisoning cases, if power cuts are for greater than 12 hours, caused by: <ol style="list-style-type: none"> 1. foodstuffs in refrigerators warming up; 2. inadequate heating of food; 3. food defrosting and refreezing in deep freezers.
Potential for loss of power supplies to telephone exchanges, water and sewage treatment and pumping stations where they do not have alternative power supplies (UPS or generators)
Short-term loss of production due to closure of businesses during power cut
Widespread disruption to the food chain. For example: <ol style="list-style-type: none"> 1. Frozen food will be difficult to keep frozen unless stores have generators 2. Food production may be affected e.g. bakeries, processed food manufacturers etc 3. Restaurants and bars etc may be unable to open
Widespread disruption to mobile telephone networks during power cuts to sites that do not have backup supplies or inadequate backup supplies.
Potential disruption to rail and underground services where stations cannot remain open without power supplies for ticketing, lighting, lifts and escalators, public announcement communications etc
Major disruption to transport entire transport infrastructure

SECONDARY:

People trapped in lifts.
If electrical equipment does not have a UPS or generator supply it will fail. For example: <ol style="list-style-type: none"> 1. Telephone switchboards; 2. Computer systems; 3. Tills and cash machines and credit card authentication systems; 4. Traffic Lights, street lights and other street furniture (and congestion charging); 5. Mobile telephone networks; 6. Emergency Services Communication Networks (including Airwave after six hours); 7. fuel pumps (in petrol stations);
Pollution from sewage pumping stations caused by power cuts.
Failures of UPS and back up generators during power cuts could affect even those who believe they are prepared. Battery capacity diminishes with "age". Generators are not usually rigorously tested frequently on load. Generators also have to receive regular maintenance if running and regular fuel supplies.
Damage to power cables during rota cuts will not become apparent until the power is restored which could result in injuries to people working near damaged cables.
Overstretch of key resources (equipment and personnel) and agencies especially the emergency services and care and social services.
Public need for information, advice, benefits and emergency payments. For example, for those without secondary means of heating etc
The vulnerable may need special care

5. Vulnerability and resilience

All businesses that do not have good business continuity plans that take into account the failure of power supplies will be vulnerable to the power cut. Businesses that do not have fuel for back up generators for over twenty four hours may have problems if their plans do not include refuelling of generators etc.

Businesses should ensure that their key suppliers have resilient business continuity plans as power cuts at their suppliers' premises could have knock on effects for their own business. For example, where companies operate on a just-in-time basis if delivery of supplies from a key supplier is affected then the company could be forced to stop production even if they are not directly affected by the power cut.

6. Overall assessment

CATEGORY	SUB-CATEGORY		
Industrial technical failure	Technical failure of electricity network		
SCALE	IMPACT	LIKELIHOOD	RISK
An entire region	Moderate (3)	Unlikely (3)	High
<p>CONTROLS IN PLACE:</p> <ul style="list-style-type: none"> • Industry Black Start Plans • Fuel Security Code • Electricity Supply Emergency Code • Department Trade and Industry (DTI) Incident Response Plan • Royal Berkshire Hospital NHS Trust Business Continuity Plans • Heatherwood and Wexham Park Hospitals NHS Trust Business Continuity Plans • Berkshire Primary Care Organisations Business Continuity Plans • Berkshire Healthcare Trust Business Continuity Plans • Buckinghamshire Hospitals NHS Trust Business Continuity Plans • Milton Keynes Hospital NHS Trust Business Continuity Plans • Buckinghamshire Mental Health Trust Business Continuity Plans • Buckinghamshire Primary Care Organisations Business Continuity Plans • Oxford Radcliffe Hospitals NHS Trust Business Continuity Plans • Oxford Mental Health Trust Business Continuity Plans • Nuffield Orthopaedic Clinic Business Continuity Plans • Oxfordshire Primary Care Organisations Business Continuity Plans • South Central Strategic Health Authority Business Continuity Plans • Berkshire Integrated Emergency Planning Structure • Wokingham District Council Emergency Plan • Reading Borough Council Emergency Plan • West Berkshire Council Emergency Plan • Bracknell Forest Borough Council Emergency Plan • Royal Borough Council of Windsor and Maidenhead Emergency Plan 			

- Slough Borough Council Emergency Plan
- Buckinghamshire County Council Emergency Plan.
- Aylesbury Vale District Council Emergency Plan.
- Chiltern District Council Emergency Plan.
- South Bucks District Council Emergency Plan.
- Wycombe District Council Emergency Plan.
- Environment Agency Incident Management Plans
- Environment Agency 24/7 incident response
- Environment Agency Memorandum of Understanding with Fire Brigades, Police, Local Authorities, Highways Agency, Health Protection Agency and Health Authority.
- South Central Ambulance Service NHS Trust Business Continuity Plans
- Milton Keynes Council Major Incident Guide
- Thames Valley Police Emergency Procedures Manual
- ACPO Emergency Procedures Manual
- ACPO Motorway Manual of Guidance
- Oxfordshire County Council Emergency and Business Continuity Plans
- Royal Berkshire Fire & Rescue Service Major Incident Policy
- Oxfordshire Fire & Rescue Service Major Incident Policy
- Buckinghamshire Fire & Rescue Service Major Incident Policy

Additional risk treatment required

Individual agency business continuity plans