



Power failures are a frequent challenge for health care facilities. Unplanned electrical outages can occur due to damaged transmission lines, malfunctioning switches, other infrastructure failure, or sabotage. Planned outages conducted by power companies are designed to unload the electrical grid and/or reduce fire risk. Facility planners should identify the risks and develop a plan for unexpected, prolonged power loss as well as frequent, episodic losses of power (i.e., brownouts) that will increase the stress placed on backup (generator) power systems. A multidisciplinary team of subject matter experts must identify hazards that may interrupt electric power and ensure code and regulatory/accreditation compliant measures are in place to maintain essential services and a safe environment of care through backup power methods (this may require capacity that goes beyond historical plans that solely powered emergency systems). Facility planners should conduct and/or participate in local exercises with facility engineers and other relevant multidisciplinary staff, electric utility providers, contracted vendors, the jurisdictional emergency management agency, and other key partners to improve resiliency.

# Utility Failure Tip Sheet

## ELECTRICITY

The following considerations can be combined with facility plans for maintaining backup power and related operational needs:

- Understand specific vulnerabilities related to how electrical power currently supplies the facility (e.g., overhead versus underground power lines, local strategies on usage during demand peaks, natural hazard risks).
- Determine average and peak power consumption rates and specify backup power requirements that allow continued safe operation as well as continued full operation. This may involve a combination of onsite generators for essential functions and portable generators for additional capacity; understanding total needs is key to making accurate generator requests.
- Test load-shed modules to ensure continuity of critical systems is prioritized.
- Identify operations/functions (both clinical and support functions, including HVAC equipment) that need to be maintained by emergency or standby power and ensure they are connected to backup power sources.
- Know how to manually switch to backup power if automatic switch fails.
- Establish a process for rapid assessment of an electrical disruption affecting clinical or support operations and determine triggers for activating incident command.
- Follow processes outlined in business continuity plan.
- Establish and maintain routine and 24/7 contact information for electric utility provider.
- Ensure utility and jurisdictional/state emergency management partners prioritize the facility for power restoration.
- Determine whether other local health care facilities are on the same portion of the electric grid and may be affected at the same time. Consider working with the local health care coalition (HCC) to develop coordinated electrical outage plans and exercises.
- Protect standby power components (e.g., switches, generator, battery, fuel) from hazards (e.g., wind, inundation, seismic).
- Identify and establish alternatives to facility operations not listed (e.g., electronic cash registers, exterior lighting, electronic safes, gas pumps).
- Consider how much ice will be needed to support usual and incident needs (e.g., temperature control, dietary needs) during outages lasting longer than hours. Determine where ice will be stored and explore contracts with ice vendors to provide an emergency supply.
- Establish criteria for relocating services to an area with power during a partial outage and evacuating the facility during a complete outage as appropriate to the hazards/services available in the area.
- Understand local, state, and federal regulatory and licensure requirements associated with reporting electrical outages, disruptions, and restoration.
- Explore feasibility of establishing an alternate power source (e.g., solar, wind, combined heat and power cogeneration) and/or battery storage for the facility.
- Determine the role of the facility in supporting staff (e.g., temporary housing and feeding of staff and their families) and the affected community when power loss is prolonged.
- Collaborate with HCC and other key partners to raise awareness of the emPOWER program as a resource to address the needs of electricity-dependent community members outside of health care facilities.

## **N** GENERATOR MAINTENANCE AND USAGE

- C** • Ensure backup generators are maintained and appropriate for prolonged operations or frequent stops/starts.
- Have at least two generators for redundancy and/or increased power generation.
- Establish agreements with local electricians to connect portable/mobile generators if the need arises.
- Implement emergency generator replacement plan that corresponds with expected longevity.
- Map the facility to identify what is powered by each generator.
- Place generators and generator transfer switches above grade and protect them against flooding and other threats.
- Install external wiring quick-connect tap boxes for generator connections as well as transfer switches as required to add them safely to the system.
- Ensure emergency power quick connect ports can be reached by generator cables and cables are sufficient length to connect quick connect ports to portable/mobile generators that power select elements (e.g., chillers, absorbers).
- Align fuel need projections with 96-hour sustainability assessments.
- Ensure contracts are in place for additional fuel supply, including 24/7 contact information and provisions on emergency delivery timeline. Consider identifying more than one fuel provider in case of a regional disaster, including secondary or tertiary sources outside the state/region.
- Understand availability of external generators through contracts, mutual aid, and emergency management agencies, including their origin, timeframes, siting requirements, and operating ranges.

## **N** SAFETY AND SECURITY

- C** • Ensure lighting is adequate to continue safe patient care including surgical services.
- Maintain emergency lighting with flashlights, lanterns, headlamps, glow sticks, and similar devices. Develop and follow deployment plan.
- Remove tripping hazards from low-light locations.
- Maintain enough backup power to sustain fire alarms and fire suppression systems.
- Ensure backup power is available to support access/egress controls (e.g., door card readers, garage entrances/exits) or consider manual operations.
- Increase surveillance and restrict ingress/egress if cameras and other security devices cannot be powered.
- Restrict use of elevators (and ensure elevators are unoccupied if they were in operation when power was interrupted).

## **N** PATIENT CARE

- C** • Maintain backup power sufficient to sustain life support systems.
- Ensure an uninterruptible power supply (UPS) is in place for systems that cannot experience power-cycle time (e.g., catheterization lab fluoroscopy units and displays, pharmacy).
- Work with appropriate stakeholders to confirm that existing UPS devices are functional and are tested as appropriate.
- Establish alternatives to electronic patient monitoring systems.
- Identify diagnostic and monitoring equipment (including laboratory equipment) that requires electrical power and determine alternatives if not connected to backup system.
- Identify medical devices that can be operated manually or via battery backup.
- Unlock/manually manage drug dispensing systems.
- Determine procedures that should be postponed until electrical power is restored.
- Determine if patient evacuation or transfer is required.
- Maintain stock of multi-port power taps with surge protectors. Ensure usage meets safety requirements and does not exceed power draw rating. Consider the use of brightly colored tape or cord covers to avoid trip hazards.
- Address functionality of pneumatic tube system.

## **N** TEMPERATURE CONTROL

- C** • Maintain backup power sufficient to sustain safe facility operating temperatures.
- Ensure temperature and humidity alarms are set where appropriate.
- Identify units/areas of the facility that require cool temperatures or consistent refrigeration (e.g., morgue, blood bank, pharmaceutical storage).
- Determine services that may need to be curtailed or halted if minimum or maximum temperatures cannot be maintained for an extended time. Prioritize and monitor functions that have strict environmental standards (e.g., surgical and sterile processing).
- Maintain an emergency stock of supplies to supplement heating (e.g., blankets) and cooling (e.g., ice maker) of patients.
- Modify environment to regulate temperature (e.g., close blinds/curtains, open windows).
- Identify computer servers, operating rooms, and other components that must be maintained below a maximum temperature. Consider portable heating or air conditioning units for selected spaces that may be affected (e.g., CT suite).
- Increase monitoring for water, leaks, and sweating or slippery floors and other surfaces due to increased moisture from high humidity. Ensure supplies (e.g., towels, squeegee, etc.) are available to address.
- Consult with infection prevention on mitigation measures for mold and other concerns if high humidity conditions occur for hours to days in the facility.

### KEY

**N** Need

**C** Considerations

## **N** COMMUNICATIONS AND INFORMATION TECHNOLOGY

- C** • Establish alternative to patient call buttons if not connected to backup power.
- Determine which data systems are backed up by generator power.
- Determine the availability, location, and capacity of UPS devices.
- Identify alternates to internet systems reliant on electricity (e.g., VoIP, wireless service).
- Ensure robust downtime procedures for electronic records and results systems. Ensure appropriate numbers of downtime forms and procedures are pre-printed and available for emergencies.
- Confirm video monitoring and telemetry monitoring systems are supported or implement alternatives.
- Turn off unused equipment to prevent potential surge damage when power is restored.

## **N** DIETARY

- C** • Ensure refrigerators/freezers are connected to backup power or establish alternate methods to maintain safe food temperatures.
- Maintain non-perishable food items and menu sufficient for continued operations during power failure. Develop an emergency feeding plan that focuses on patients' dietary restrictions.

## **N** HOUSEKEEPING

- C** • Consider outsourcing laundry and other services that require significant energy usage.
- Switch to disposable items as practicable and account for increased waste generated.

### KEY

**N** Need

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### Related ASPR TRACIE Resources

- [Utility Failures](#) Topic Collection
- [Impacts of Planned and Unplanned Power Disruptions on California's Public Health and Medical Systems](#)
- [Managing the Storm After the Storm: Healthcare in Texas Recovers from Severe Winter Weather](#)
- [Utility Failures in Health Care Toolkit](#)

### Other Resources

- [Best Practices for Hospital Power System Reliability](#)
- [Categorical Waiver – Health Care Microgrid Systems](#)
- [Categorical Waiver for Power Strips in Patient Care Areas](#)
- [Emergency Power Facility Assessment Tool](#)
- [HHS emPOWER Program Platform](#)
- [Healthcare Facilities and Power Outages: Guidance for State, Local, Tribal, Territorial, and Private Sector Partners](#)
- [Planning for Power Outages: A Guide for Hospitals and Healthcare Facilities](#)
- [Resilience to Power Outages in Healthcare Facilities](#)