

Power Outage

This Action Plan applies to events that result in power outages. Note that this Action Plan may need to be implemented in conjunction with other Action Plans (for example, Hurricane) as necessary.

Consider agreement with the power company to determine the priority of drinking water and wastewater systems for recovery prior to the emergency.

INITIATION AND NOTIFICATION

Initiate this AP upon a loss of offsite power

Notify:

- Waterworks Manager
- Waterworks Operations Management

Others as appropriate, examples include:

- Fuel supplier (backup generator)
- Critical Care Customers
- Large Water Users.

EQUIPMENT IDENTIFIED:

Equipment	Location
Mobile battery-powered radios	
Mobile/cellular phones	
Flashlights	
Spare batteries	
Accessory requirements (cables for generators, transformers, load banks, bus bars, distribution panels, feeder panels, fuses, outlets, load centers, etc)	
Emergency kits	

SPECIFIC ACTIVITIES

I. **Assess the Problem**

Consider agreements with a fuel supply company to supply fuel automatically upon a power loss if the capability to store fuel on site is not practical. A fuel tank with capacity for at least 24 hours of run time is advisable.

If on-staff personnel are not experienced with power-generation equipment, it is necessary to arrange for professional assistance to install and operate the mobile units.

Evaluate back-up power with controllers that sense problems with purchased power and come up automatically.

Complete assessment as quickly as possible.

In general, the waterworks should organize a team to undertake the following activities:

1. Call local electric supply company – request information on the estimated down time.
2. IF backup generation is available, THEN assess the ability to supply fuel for extended periods.
3. Assess ability for HVAC or alternate to provide proper temperatures for SCADA, computer, and control systems.
4. Estimate potable water requirements under the emergency condition and determine if the utility can still meet requirements.
5. IF telephone or internet is also down, THEN SCADA communications may be blocked.
6. Loss of power could affect utility access gates, CCTV, intrusion alarms and other remote monitoring abilities. Loss of power may be a diversionary tactic for other terrorist activity. Be alert.

Earthquakes can cause significant power outages because of the impact on outside generation and transmission lines. After a major earthquake, power interruptions may occur for an extended period over the entire operations area. In this instance, power restoration will most probably be slow and, depending upon the infrastructure damage, localized. Some isolated areas could take considerably longer for power restoration than others could.

II. **Isolate and Fix the Problem**

General procedures during a power outage are as follows:

1. Turn off unnecessary electrical equipment
2. Start backup generators as necessary for key components: Note: Uninterruptible Power Supply (UPS) for SCADA and computers, battery backup for Remote Terminal Unit (RTU) may only supply power for a few hours.

This can prevent injuries and damage from unexpected equipment startups, power surges to the equipment and possible fires. If power goes out, an Uninterruptible Power Supply (UPS) provides battery power at a constant rate for several minutes, allowing you to turn off equipment with minimal risk or loss.

If you permanently connect a backup electrical generator, the connection may have to meet certain technical standards required by law. Some states also require you to notify your electric utility. If you do not, utility personnel working nearby may receive serious injuries.

3. Increase disinfectant residual as a precaution to potential contamination.
4. IF not able to meet community requirements for water THEN arrange for a water source from another source.
5. Notify priority customers.
6. Notify users of interruption of service if backup pump(s) is/are not capable of maintaining supply.
7. Issue "Boil Water", "Do not drink", or "Do not Use" orders and Press Releases as appropriate. See Section VIII.A.1 of ERP for Press Release Forms.
8. Initiate back up plan for retrieval of current information from outside sources.

This is an analysis of all available sources of water, not just those used under conditions of normal operation. These sources might include both new intakes or wells, public or private ponds, reservoirs, swimming pools, interconnections with other water utilities, water stored within building water systems, water provided in bottles or tank trucks from outside sources of potable water, local dairies or bottling plants, etc.

Since computers may be down, access to Water ISAC, police, government, etc. could be unavailable.

9. Consider initiating back-up portable pumping and generating capability to serve areas with limited storage, critical wastewater collection and treatment operations.
10. Facilities with freezing temperatures should turn off and drain the following lines in the event of a long term power loss:
 - a. Fire sprinkler system
 - b. Standpipes
 - c. Potable Water Lines
 - d. Toilets

III. **Monitoring**

Ask your vendors about specific limitations of your equipment. Find out how long it would take to repair or replace damaged equipment.

At all times, personnel should observe the following general steps:

1. IF damage to equipment occurs, THEN contact vendor/mutual aid companies to replace/repair damaged equipment.
2. Monitor the status of the backup power supply and regularly test whether battery levels are adequate and the backup generators are functional.

IV. **Recovery and Return to Safety**

General earthquake procedures after a power outage are as follows:

1. Conduct disinfection, flushing, and bacteriological sampling after repairs of equipment lost.
2. IF power outage occurs during freezing conditions THEN allow electronic equipment to reach ambient temperatures before energizing to prevent condensate from forming on circuitry.
3. Fire and potable water piping should be checked for leaks from freeze damage after the heat has been restored to the facility and water turned back on.
4. Notify public/customers when it is safe to use the drinking water again.

V. **Report of Findings**

Assemble relevant personnel to review effectiveness of action plan and reinforce lessons learned. Write down and correlate all the components of the incident. Include response management and suggestions to improve the facility / community response in the future. The report should incorporate all relevant data from the incident and suggested changes in the emergency response plans and procedures.

Submit suggestions from the report to the governing board/individuals for evaluation and actions to be taken.