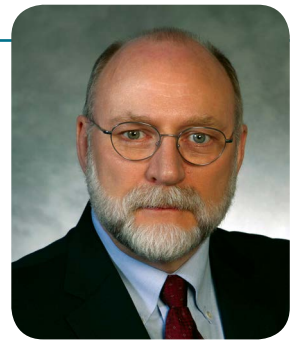
Clarifications and Expectations

With The Joint Commission's Director of Engineering: George Mills

How to Plan for Emergency Utility System Disruptions

EC.02.05.01, EPs 8–13 and 16



Environment of Care® News *publishes the column* ***Clarifications and Expectations,*** *authored by George Mills, MBA, FASHE, CEM, CHFM, CHSP, director, Department of Engineering, The Joint Commission, to clarify standards expectations and provide compliance strategies.*

Health care organizations depend on utility systems to deliver important facility resources such as electricity, water, fuel, steam, and medical gas. Disruptions to the systems that deliver these utilities, whether caused by an act of nature like an electrical storm, equipment failure due to aging infrastructure, or even an act of terrorism, can severely affect your organization's ability to deliver quality treatment in the care environment. Having the right contingency planning and processes in place to isolate, repair, and/or replace affected systems and resolve manageable emergencies can position your organization to respond effectively to disruptions and continue to meet patient care needs without having to evacuate occupants. Joint Commission Environment of Care (EC) Standard EC.02.05.01 and its elements of performance (EPs) help address these concerns by requiring that a health care facility manage risks associated with its utility systems.

Previously, this column tackled EPs 2–7,* which cover various utility system aspects, including the following: designing and installing; maintaining a written inventory of all/select operating components of utility systems; identifying inspection/maintenance activities and intervals for these operating components; and ensuring that the ventilation system provides appropriate pressure relationships, air-exchange rates, and filtration efficiencies in areas designed to control airborne contaminants.

This installment of the column concentrates on EPs 8–13 and 16, which concern the following:

- Properly labeling utility system controls for emergency shutdowns
- Developing written procedures for responding to utility system disruptions
- Turning off malfunctioning systems and alerting affected staff
- Performing emergency clinical interventions
- Securing emergency repair services
- Responding to utility system disruptions
- Mapping utility systems

Subsequent installments of the column will delve into emergency power supply and distribution; spills and exposures; Emergency Management standards; and other issues related to utility contingency planning.

* Mills, G. Clarifications and expectations: Revised equipment maintenance standards for hospitals. *Environment of Care News.* 2014 Sep;17(9):1, 3, 4, 11.

Joint Commission Environment of Care Standard *EC.02.05.01:* The hospital manages risks associated with its utility systems.

EC.02.05.01, EP 8: The hospital labels utility system controls to facilitate partial or complete emergency shutdowns.

A utility system can begin to fail for a number of reasons—such as excess vibration, reduced output, or loss of ability to consistently deliver the expected utility. When this occurs, the organization has to be prepared to safely shut down the system to isolate, repair, or replace it and to mitigate the adverse event. But improper shutdown can lead to catastrophic results. For example, improperly cutting off the water supply to a malfunctioning boiler can cause an explosion. Hence, proper labeling of the utility system's control is vital. Labeling can include detailed instructions—often derived from the manufacturer's information—as well as a checklist to follow, if necessary, to ensure correct shutdown of the system.

Naturally, labeling protocols won't be written for the inexperienced. A third-shift charge nurse can't be expected to rush to the power plant at 3 A.M., read through the punch list, and adequately shut down the system. However, the protocols should be written so that anyone on the facilities team (manager, engineer, or general maintenance staff person) can follow the

labeled protocols accurately enough to securely and safely shut down the system.

EC.02.05.01, EP 9: The hospital has written procedures for responding to utility system disruptions.

An organization needs written procedures and contingency plans that identify reliable alternative methods to offset the disruption caused by a utility system failure. These plans will help ensure that patient care can still be provided safely. They may also be used to give guidance for planned shutdowns. For instance, if your facility loses city water, written responses for this scenario can dictate what you need to do to isolate the water supply you currently have in the building, distribute water to the users who need it, and manage systems that are dependent on water. Written procedures should be clear enough to identify the scope and magnitude of the utility emergency and what needs to be done to mitigate or offset the event. Also, these procedures should be stored in and accessible from multiple locations, including your organization's Emergency Operations Plan (EOP) or manual.

EC.02.05.01, EP 10: The hospital's procedures address shutting off the malfunctioning system and notifying staff in affected areas.

After accessing the labels and written procedures, appropriate personnel need to follow the indicated steps and actually shut down the faulty system(s). First, however, everyone must understand the implications of doing so in order to prepare staff who might be affected by the shutdown. Steps should include contacting all departments and related supervising staff, informing them that a particular system shutdown is needed, and letting them know what to expect and for how long so they can plan accordingly. Failure to contact affected personnel and communicate clearly can lead to disastrous results. For example, if you turn off an oxygen supply system without warning clinical staff, a patient who's receiving that oxygen could be harmed.

EC.02.05.01, EP 11: The hospital's procedures address performing emergency clinical interventions during utility system disruptions.

Facilities and engineering personnel should stress to clinical staff how important it is for them to have clinical interventions ready to quickly implement during utility disruptions. A clinical intervention is a contingency plan involving a series of steps that a nurse, a physician, or another caregiver can execute to ensure that quality patient care is delivered, despite a utility shutdown. Each department and/or area—whether it be the operating room, intensive care unit, nursing unit, radiology department, and so on—needs to develop its own clinical interventions based on various scenarios, which should be practiced during drills and emergency management exercises. Even supporting departments such as food services and materials management need to have contingency plans. For example, to respond to a loss of heat following a boiler shutdown, staff can implement a clinical intervention that includes distributing warming blankets to patients and clustering several patients together in warmer areas of the facility. Staff also should consider using designated codes or pages (for example, "Code Green" or "Code Yellow") that can be communicated across departments to quickly indicate that a major utility system disruption is about to occur and that clinical interventions are required.

EC.02.05.01, EP 12: The hospital's procedures address how to obtain emergency repair services.

Properly shutting down a utility system and knowing how to work around the lack of that resource is crucial, but so is getting that system operational again and performing emergency repairs on related components and equipment. For example, if a minor earthquake caused the elevator to malfunction and there will continue to be patients in a lower-level radiology room who need to get upstairs, you need a plan for getting that elevator fixed as soon as possible. Or, if you lose water during an emergency event and your facility has a chiller system with a water cooling tower, you may need to call in an outside water resource that can supply the chiller with water until the normal water supply is restored.

This EP addresses not only procedures for securing repair services but also performing improvisational contingency planning based upon available assets. Both are often accomplished by creating a Memorandum of Understanding (MOU)—a contractual arrangement made with an outside subcontractor that can be summoned in an emergency to supply a temporary fill-in resource (such as a backup generator) or repair service.

EC.02.05.01, EP 13: The hospital responds to utility system disruptions as described in its procedures.

This EP emphasizes the importance of following your set protocols—including your EOP, specific contingency plans, and written procedures—to effectively respond to an emergency involving a utility system disruption or failure. Instead of "winging it" or acting on instincts, hunches, or best guesses, it's vital that you implement and conform to the procedures you already have—the same ones your organization has carefully documented and included in its drills and exercises. The moral of the story here is to stick to the plan, not shoot from the hip, whenever possible.

EC.02.05.01, EP 16: The hospital maps the distribution of its utility systems.

An organization needs to map utility

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systems in order to create a large overview of each system and thus provide specific information related to each system. For example, the electrical distribution drawings provide the location of the building main, each subpanel, and, ultimately, each distribution panel. The details of each receptacle are often summarized at the local or distribution panel. This allows the designated appropriate personnel to quickly respond to any interruption because they can go directly to the affected panel and begin troubleshooting. Another example is the sprinkler system, starting with the water entering the building, the fire pump (if required), and then the distribution through the zone valves and up through the risers. The accidental activation of a sprinkler head will release many gallons of suppressant (water), and knowing the valves' location can mitigate such an accidental release. Accurately mapping utility systems will provide the answers; for this and many other reasons, these maps must be kept current.

Safety first—safety last

Organizations have an obligation to ensure that their buildings are consistently supplied with reliable sources of energy and utilities so that high-quality, safe patient care can be delivered. It's important to anticipate potential failures of any specific systems, intervene clinically when necessary to ensure that patient care is rendered safely, and follow written/labeled procedures carefully to avoid wasting time when correcting or mitigating utility system problems in order to avoid adverse outcomes.

When addressing these issues, refer additionally to Joint Commission Emergency Management (EM) Standard EM.02.02.09 (and its EPs 2–8), which states that, as part of its EOP, the health care organization prepares for how it will manage utilities during an emergency. This EM standard is the natural progression from EC.02.05.01 in that the EC standard requires organizations to manage risks related to utility systems, while the EM standard requires organizations to manage risks *during* an actual event that involves utilities. EC