

## Utilities Management Plan 2009

### EC.02.05.01

- 1) The Hospital designs and installs utility systems that meet patient care and operational needs

The EOC Utilities Sub Committee has developed this document to identify and educate staff on the processes utilized to provide safe and secure environment. The document is reviewed annually by the Committee and updated as needed.

- 2) The hospital maintains a written inventory of all operating components of utility systems or maintains a written inventory of selected operating components of utility systems based on risks for infection, occupant needs, and systems critical to patient care

The Physical Plant has set criteria for determining utilities and their components that need to be included in the utility equipment inventory. Mission Critical components are those that are necessary for the facility to deliver safe reliable healthcare. The following systems are found in the utility management plan:

- Electrical Distribution System
  - Emergency Power System
  - Elevators
  - Heating, Ventilation and Air Conditioning Systems
  - Plumbing and Water Delivery Systems
  - Medical Gas Distribution Systems
  - Communication Systems

Equipment critically criteria take into consideration system redundancy, equipment age, accessibility, and repair parts availability. Mission Critical systems associated with Healthcare occupancy are monitored by the building maintenance system (BMS). The Physical Plant utilizes a computerized maintenance management system (CMMS) to schedule corrective, preventive, and predictive maintenance. Mission critical component failures are reported to the EOC Utilities Sub Committee.

**3) The hospital identifies, in writing, inspection and maintenance activities for all operating components of utility systems on the inventory**

The Physical Plant utilizes the strategies identified in element 7.10.10 to determine the appropriate intervals for inspecting, testing and maintaining systems. Manufacture recommendation and industry standards are consulted as well as use of the BMS technology for metering and real time monitoring. Previous experience as well as repair history and equipment alarms is utilized to fine-tune the intervals of service.

**4) The hospital identifies in writing the intervals for inspection, testing and maintaining all operating components of the utility systems on the inventory based on criteria such as manufactures recommendations, risk levels or hospital experience.**

The Physical Plant deploys the following strategies to ensure effective, safe, and reliable operation of the utility system components:

**Utility Systems Strategies**

Strategy	Description
<b>Preventive Maintenance</b>	Maintenance is scheduled based upon historical data and manufacture recommendations. This is typically a set time frame such as annual, semi-annual, quarterly, monthly or weekly. These strategies are used for low priority components or those where other strategies are not available.
<b>Predictive Maintenance</b>	Maintenance is based upon real-time monitoring of known parameters. Examples of predictive maintenance activities are pressure differential monitoring on filters, harmonics monitoring of pumps and motors and flow monitoring on steam and water systems. Some Predictive Maintenance activities are not capable of being monitor real time but are utilized to provide indication of problems such as inferred scans of electrical components and eddy current testing on chiller tubes.
<b>Corrective Maintenance</b>	The BMS system is utilized to monitor mission critical systems twenty-four hours a day, seven days a week. Alarms activity is monitored by the Building Engineer.

**5) The hospital minimizes pathogenic biological agents in cooling towers, domestic hot and cold water systems, and other aerosolizing water systems.**

Water systems are monitored by the Physical Plant and Campus Facilities to ensure appropriate temperature, chemical treatment, and operational efficiency. Upon notification from the Infection Control Coordinator of potential waterborne pathogens, the Physical Plant and Campus Facilities will test the following systems for contamination: patient's shower and faucets, humidifiers, cooling tower, evaporative condensers and decorative fountains.

**6) In areas designed to control airborne contaminants (such as biological agents, gases, fumes, dust), the ventilation system provides appropriate pressure relationships, air-exchange rates, and filtration efficiencies.**

Areas requiring pressure relationships or specific flow rates are continuously monitored by the Physical Plant through manual testing. Preventive maintenance and testing is performed when isolation rooms are in use. Rates and location are based upon community profile and recommendations from industry regulators such as AIA, OSHA, CDC, and ASHRE. In the event of a pressure relationship outside of normal operating parameters, notifications are directed to the appropriate personnel.

**7) The hospital maps the distribution of its utility systems.**

The Physical Plant maintains one line drawing of the utility systems in the Plant Operations office. System mapping is also traceable through the BMS. The Building Engineers are trained on the location and reading of the mapping systems.

**8) The hospital labels utility system controls to facilitate partial or complete emergency shutdowns.**

The Physical Plant maintains drawings mapping the distribution of utility systems that indicate the controls for partial or complete shutdown of each utility system. Emergency shutoff controls for the utility systems components are labeled throughout the facility

**9) The hospital has written procedures for responding to utility system disruptions.**

*\* What to do if utility systems malfunction*

*\* Identification of an alternative source of hospital defined essential utilities*

*\* Shutting off of the malfunctioning systems and notifying staff in affected areas*

*\* Obtaining repair services*

**10) The hospital's procedures address shutting off the malfunctioning system and notifying staff in affected areas.**

The Physical Plant attempts to schedule all shutoff of utilities in advance of the event. Departments are notified as to the duration and the need of the shutoff. In an emergency situation, shutoffs are delayed as long as possible and affected areas are contacted in person to communicate the problem and the anticipated duration of down time.

**11) The hospital's procedures address performing emergency clinical interventions during utility systems disruptions.**

In the event of a utility malfunction, the end user should shut off the utility and notify the Physical Plant of the event. If the utility directly affects patient care, alternatives should be made until the utility is functional and has been checked by the Physical Plant. The Building Engineer is available 24/7 and is contacted through 4-2400

**12) The hospital's procedures address how to obtain emergency repair services.**

All repairs to the utility systems are authorized by the Physical Plant. Repairs are scheduled in advance unless an emergency occurs. During an emergency, the Duty Engineer is empowered to authorize any repairs deemed necessary

**13) The hospital responds to utility system disruptions as described in its procedures.**

The Physical Plant maintains mission critical systems with redundant back up to eliminate the chance that a specific failure will affect the whole system. In the event of a utility failure, the Physical Plant will follow their established procedure to return service of the utility or supply a secondary source. Backup may be in the form of switching to a secondary energy source, utilizing a secondary feed, or provisions for hooking in temporary service

**EC.02.05.03**

**1) The hospital provides emergency power for the following: Alarm systems, as required by the Life Safety Code.**

The Physical Plant maintains the emergency power system in the areas identified above. Additions or new programs are evaluated to determine emergency power needs

**2) The hospital provides emergency power for the following: Exit route and exit sign illumination, as required by the Life Safety Code.**

The Physical Plant maintains the emergency power system in the areas identified above. Additions or new programs are evaluated to determine emergency power needs.

**3) The hospital provides emergency power for the following: Emergency communication systems, as required by the Life Safety Code**

The Physical Plant maintains the emergency power system in the areas identified above. Additions or new programs are evaluated to determine emergency power needs.

**4) The hospital provides emergency power for the following: Elevators (at least one for nonambulatory patients).**

The hospital maintains at least one elevator on emergency power for nonambulatory patients.

**5) The hospital provides emergency power for the following: Equipment that could cause patient harm when it fails, including life support systems; blood, bone, and tissue storage systems; medical air compressors; and medical and surgical vacuum systems.**

The Physical Plant maintains the emergency power system in the areas identified above. Additions or new programs are evaluated to determine emergency power needs.

**6) The hospital provides emergency power for the following: Areas in which loss of power could result in patient harm, including operating rooms, recovery rooms, obstetrical delivery rooms, nurseries, and urgent care areas.**

The Physical Plant maintains the emergency power system in the areas identified above. Additions or new programs are evaluated to determine emergency power needs.

EC.02.05.05

**1) The hospital tests utility system components on the inventory before initial use. The completion date of the tests is documented.**

Initial documentation of performance and safety testing of critical components are maintained by the Project Management Office and turned over to the Physical Plant after a project is completed.

**3) The hospital inspects, tests, and maintains the following: Life support utility system components on the inventory. These activities are documented.**

The Computerized Work Order system is utilized to maintain documentation of planned

maintenance and repair history

- 4) **The hospital inspects, tests, and maintains the following: Infection control utility system components on the inventory. These activities are documented.**

The Computerized Work Order system is utilized to maintain documentation of planned maintenance and repair history

- 5) **The hospital inspects, tests, and maintains the following: Non-life support utility system components on the inventory. These activities are documented.** The Computerized Work Order system is utilized to maintain documentation of planned maintenance and repair history

**EC.O2.05.07**

- 1) **At 30-day intervals, the hospital performs a functional test of battery-powered lights required for egress for a minimum duration of 30 seconds.**

**The hospital performs** a functional test at 30-day intervals for a minimum of 30 seconds; and an annual test at full load for 60% of the full duration of its class

- 2) **Every 12 months, the hospital either performs a functional test of battery-powered lights required for egress for a duration of 1 1/2 hours; or the hospital replaces all batteries every 12 months and, during replacement, performs a random test of 10% of all batteries for 1 1/2 hours. The completion date of the tests is documented.**

The hospital performs a functional test for 1 ½ hours

- 3) **Every quarter, the hospital performs a functional test of stored emergency power supply systems (SEPSS) for 5 minutes or as specified for its class (whichever is less). The hospital performs an annual test at full load for 60% of the full duration of its class. The completion dates of the tests are documented.** The Hospital tests its stored emergency power supply systems in accordance to the NFPA and NEC standards and guidelines.

- 4) **Twelve times a year, at intervals of not less than 20 days and not more than 40 days,**

**the hospital tests each emergency generator for at least 30 continuous minutes. The completion date of the tests is documented.**

The Physical Plant maintains 9 generators. They are located on the East campus and are tested 12 times a year following the 20/40 rule. Dynamic load requirements are not met and a full load bank test is completed annual. In addition the Physical Plant tests each generator for four continuous hours as part of our annual test to exceed the 36 month requirement. Documentation is maintained in the Plant Operations Office and reported to the EOC Utilities Sub Committee.

- 5) **The emergency generator tests are conducted with a dynamic load that is at least 30% of the nameplate rating of the generator or meets the manufacturer's recommended prime movers' exhaust gas temperature. If the hospital does not meet either the 30% of nameplate rating or the recommended exhaust gas temperature during any test in EC.02.05.07, EP 4, then it must test each emergency generator once every 12 months using supplemental (dynamic or static) loads of 25% of nameplate rating for 30 minutes, followed by 50% of nameplate rating for 30 minutes, followed by 75% of nameplate rating for 60 minutes, for a total of 2 continuous hours. The Physical Plant maintains 9 generators. They are located on the East campus and are tested 12 times a year. Dynamic load requirements are not met and a full load bank test is completed annual. In addition the Physical Plant tests each generator for four continuous hours as part of our annual test to exceed the 36 month requirement. Documentation is maintained in the Plant Operations Office and reported to the EOC Utilities Sub Committee.**
- 6) **Twelve times a year, at intervals of not less than 20 days and not more than 40 days, the hospital tests all automatic transfer switches. The completion date of the tests is documented.**

The Physical Plant test all automatic transfer switches 12 times a year. Failures are reported to the EOC Utilities Sub Committee.

- 7) **At least once every 36 months, hospitals with a generator providing emergency power for the services listed in Standard EC.02.05.03, EPs 5 and 6, test each emergency generator for a minimum of 4 continuous hours. The completion date of the tests is documented.**

The Physical Plant tests each generator for four continuous hours as part of our annual test to exceed the 36 month requirement. Documentation is maintained in the Plant Operations Office and reported to the EOC Utilities Sub Committee.

- 8) The 36-month emergency generator test uses a dynamic or static load that is at least 30% of the nameplate rating of the generator or meets the manufacturer's recommended prime movers' exhaust gas temperature.**

The Physical Plant tests each generator for four continuous hours as part of our annual test to exceed the 36 month requirement. Documentation is maintained in the Plant Operations Office and reported to the EOC Utilities Sub Committee.

- 9) If a required emergency power system test fails, the hospital implements measures to protect patients, visitors, and staff until necessary repairs or corrections are completed.**

All failures are evaluated and our generator contractor is notified immediately to commence repairs

- 10) If a required emergency power system test fails, the hospital performs a retest after making the necessary repairs or corrections.**

A retest is performed to check for proper operation

#### **EC.02.05.09**

- 1) In time frames defined by the hospital, the hospital inspects, tests, and maintains critical components of piped medical gas systems, including master signal panels, area alarms, automatic pressure switches, shutoff valves, flexible connectors, and outlets. These activities are documented.**

The Physical Plant maintains the piped medical gas system and documents activities in the Computerized work order system. Critical components are monitored 24/7 by the building Engineer.

- 2) The hospital tests piped medical gas and vacuum systems for purity, correct gas, and**

**proper pressure when these systems are installed, modified, or repaired. The completion date of the tests is documented.**

Certified third party inspectors are utilized to test the medical and vacuum systems any time new systems are installed, systems are modified or repaired. Documentation of testing is maintained in the Respiratory Care Office.

**3) The hospital makes main supply valves and area shutoff valves for piped medical gas and vacuum systems accessible and clearly identifies what the valves control.**

Main supply valves and shut-off valves are labeled and maintained to be accessible at all times. Master mapping and documentation are maintained in the Plant Operations office.

**EC.02.06.01**

- 1) Interior spaces meet the needs of the patient population and are safe and suitable to the care, treatment, and services provided
- 4) The hospital provides space for recreation and social interaction for patients who remain in the care of the hospital for more than 30 days.
- 5) The hospital provides storage space to meet patient needs.
- 6) When the hospital provides care for more than 30 days, it provides outside areas for patient use, suitable to the patient's age, physical or mental condition, or other factors.
  - 11) Lighting is suitable for care, treatment, and services.
  - 13) The hospital maintains ventilation, temperature, and humidity levels suitable for the care, treatment, and services provided
- 18) Interior spaces accommodate the use of equipment, such as wheelchairs, necessary to the activities of daily living.
- 20) Areas used by patients are clean and free of offensive odors.

23) The hospital provides emergency access to all locked and occupied spaces

26) The hospital keeps furnishings and equipment safe and in good repair

#### **EC.02.06.05**

- 1)** When planning for new, altered, or renovated space, the hospital uses one of the following design criteria:
  - State rules and regulations
  - Guidelines for Design and Construction of Hospitals and Health Care Facilities, 2001 edition, published by the American Institute of ArchitectsWhen the above rules, regulations, and guidelines do not meet specific design needs, use other reputable standards and guidelines that provide equivalent design criteria.
- 2)** When planning for demolition, construction, or renovation, the hospital conducts a preconstruction risk assessment for air quality requirements, infection control, utility requirements, noise, vibration, and other hazards that affect care, treatment, and services.  
Note: See LS.01.02.01 for information on fire safety procedures to implement during construction or renovation.
- 3)** The hospital takes action based on its assessment to minimize risks during demolition, construction, or renovation.