Emergency Power Management System (EPMS)

A system for assuring CMS compliance and reliability of Emergency Power Supply Systems (EPSS)
Topics

NFPA 110

Requests for Proposals for EPSS Administration and Testing

CMS – Final Rule Enforcement

Fuel Polishing

Emergency Power Systems Management
Presentation Summary

The new Final Rule enacted on 15 November 2016 gives hospitals more latitude in installation, maintenance and testing programs regarding their EPSS. With that latitude however, more responsibilities are placed on the facility manager’s shoulders to prove their Best Practices are equal to or better than standards found in some NFPA standards, state regulations and building codes.

There has been a reversal in what readers are interested in now versus 25 years ago when we first started publishing HCN. Compliance has now taken over the 1st spot from reliability and technical text on equipment reliability. There were 141 slides in last TJC Spring update.
Plaintiff’s Attorney Position if Client Has Been Compromised

“I would ask for their protocols and then I would depose everyone I could find looking for examples where the protocols were not followed. Then I’d hire an expert to pick apart their protocols for any deficiencies. I only need one point of failure if I’m the plaintiff’s attorney; either bad protocols or failure to follow those protocols are enough. Keep in mind that the equipment manufacturer can also be sued, so inevitably there will be cross claims between the hospital and the equipment manufacturer.

If the hospital’s protocols result in a use or maintenance schedule that goes against the manufacturer’s recommendations, then that’s another point of potential liability.”
EPOs
NFPA 110, 5.6.5.6* All installations shall have a remote manual stop station of a type to prevent inadvertent or unintentional operation located outside the room housing the prime mover, where so installed, or elsewhere on the premises where the prime mover is located outside the building.

*A.5.6.5.6 For systems located outdoors, the manual shutdown should be located external to the weatherproof enclosure and should be appropriately identified.

NFPA 110, 5.6.5.6.1 The remote manual stop station shall be labeled.

2019 Public Comment reaction was mixed.
NFPA – TJC Interpretations

Remote Annunciators:
NFPA 110, 5.6.6* Remote Controls and Alarms. A remote, common audible alarm shall be provided as specified in 5.6.5.2(4).

NFPA 110, 5.6.6.1 Alarms and annunciation shall be powered by the prime mover starting battery unless operational constraints make this impracticable. In that circumstance an alternate source from the EPS, such as a storage battery, UPS, or branch circuit supplied by the EPSS, shall be permitted.
Remote Annunciators:
NFPA 99, 6.4.1.1.18.7 A centralized computer system (e.g., building automation system) shall not be permitted to be substituted for the alarm annunciator in 6.4.1.1.18 but shall be permitted to be used to supplement the alarm annunciator.

NFPA 99, 6.4.1.1.18 Alarm Annunciator. A remote annunciator that is storage battery powered shall be provided to operate outside of the generating room in a location readily observed by operating personnel at a regular work station (see 700.12 of NFPA 70, National Electrical Code).
NFPA – TJC Interpretations

Triennial Testing – ATS Transfer

The Joint Commission, EC 02.05.07, EP9 – At least once every 36 months, hospitals with a generator providing emergency power for the services listed in EC.02.05.03, EPs 5 and 6, test each emergency generator for a minimum of 4 continuous hours. The test results and completion dates are documented. Note: For additional guidance, see NFPA 110-2010, Chapter 8.

NFPA 110, 2010 edition, 8.4.9.3 The test shall be initiated by operating at least one transfer switch test function and then by operating the test function of all remaining ATSs, or initiated by opening all switches or breakers supplying normal power to all ATSs that are part of the EPSS being tested.
SR.1 The organization must provide a comprehensive Emergency Management System to respond to emergencies in the organization or within the community and region that may impact the organization’s ability to provide services.

SR.2 The organization shall meet the requirements set forth in NFPA 99 (2012), Chapter 12, Emergency Management.

SR.3 The organization shall have policies, procedures, and decision criteria for the determination of protection in place or evacuation of patients in the event of a disaster.
NFPA - State

“North Carolina references NFPA 99, 2012 edition (Per DHSR), so that would reference NFPA 110, 2010 edition. Don’t believe there is a separate statute (used to be). Not sure how the guidelines adoption affects this.”
8.1.1 The routine maintenance and operational testing program shall be based on all of the following:

  (1) Manufacturer's recommendations
  (2) Instruction manuals
  (3) Minimum requirements of this chapter
  (4) The authority having jurisdiction

8.1.2 Consideration shall be given to temporarily providing a portable or alternate source whenever the emergency generator is out of service and the criteria set forth in Section 4.3 cannot be met.

Technicians Qualifications – 8.4.8 EPSS components shall be maintained and tested by qualified person(s).
RFP Contract Language

OSHA
  Lockout/Tagout
  PPE
  NFPA 70E – Labeling and PPE
EPA – All State requirements (Houston issues)
Manifests
Training Certificates and CDL
Load Bank Procedures
Load Bank Procedures

• Connect Load Bank to Dedicated Connection
• Start generator
• Transfer all ATS to Emergency
• Supplement Load to Desired Level

If you loose the generator you will be immediately transferred back to utility power
If you loose the utility during a test you are already on emergency
The CMS “Final Rule” Applicable to the EPSS
42 CFR Part 482

482.15(d) - Training
482.15(d)(2)(iii) – Documentation
482.15(e) – Protocols
482.15(e)(1) – Location
482.15(e)(2) – Testing
482.15(e)(3) – Fuel

Nothing more than a repeat of NFPA 110, Chapter 8....but with additional maneuvering room – subjective in some cases
The hospital must develop and maintain an emergency preparedness training and testing program that is based on the emergency plan set forth in paragraph (a) of this section, risk assessment at paragraph (a)(1) of this section, policies and procedures at paragraph (b) of this section, and the communication plan at paragraph (c) of this section. The training and testing program must be reviewed and updated at least annually.
CMS - 482.15(d)(1) Training and Testing (continued)

Training program. The hospital must do all of the following:

(i) Initial training in emergency preparedness policies and procedures to all new and existing staff, individuals providing services under arrangement, and volunteers, consistent with their expected role.

(ii) Provide emergency preparedness training at least annually.

(iii) Maintain documentation of the training.

(iv) Demonstrate staff knowledge of emergency procedures.
(ii) Conduct an additional exercise that may include, but is not limited to the following:

(A) A second full-scale exercise that is community-based or individual, facility-based.

(B) A tabletop exercise that includes a group discussion led by a facilitator, using a narrated, clinically-relevant emergency scenario, and a set of problem statements, directed messages, or prepared questions designed to challenge an emergency plan.
CMS - 482.15(d)(2)(iii) – Emergency Exercise

Analyze the hospital's response to and maintain documentation of all drills, tabletop exercises, and emergency events, and revise the hospital's emergency plan, as needed.

Bring 3rd parties into the plan – do they have generators, how are they maintained, and are the records available?
CMS – All-Hazards Approach

“An all-hazards approach is an integrated approach to emergency preparedness planning that focuses on capacities and capabilities that are critical to preparedness for a full spectrum of emergencies or disasters, including internal emergencies and a man-made emergency (or both) or natural disaster. This approach is specific to the location of the provider or supplier and considers the particular type of hazards most likely to occur in their areas. These may include, but are not limited to, care-related emergencies, equipment and power failures, interruptions in communications, including cyber-attacks, loss of a portion or all of a facility, and interruptions in the normal supply of essentials such as water and food.”  CMS - April 27, 2017
CMS - 42 CFR 482.15(e) – Agreement with Emergency Plan

Emergency and standby power systems. The hospital must implement emergency and standby power systems based on the emergency plan set forth in paragraph (a) [Emergency Plan] of this section and in the policies and procedures plan set forth in paragraphs (b)(1)(i) and (ii) [Policies and Procedures] of this section.
CMS - 482.15 (e)(1) Emergency Generator Location

Open season on all EPSS protocols

The generator must be located in accordance with the location requirements found in the Health Care Facilities Code (NFPA 99 and Tentative Interim Amendments TIA 12-2, TIA 12-3, TIA 12-4, TIA 12-5, and TIA 12-6), Life Safety Code (NFPA 101 and Tentative Interim Amendments TIA 12-1, TIA 12-2, TIA 12-3, and TIA 12-4), and NFPA 110, when a new structure is built or when an existing structure or building is renovated.

Grandfather has been shot
CMS - 482.15(e)(2) Emergency Generator Inspection and Testing

The hospital must implement the emergency power system inspection, testing, and maintenance requirements found in the Health Care Facilities Code, NFPA 110, and Life Safety Code. [Which editions? If you follow an earlier edition of 110 (2010 version) and there are improved methods adopted in later editions, what then?]
Hospitals that maintain an onsite fuel source to power emergency generators must have a plan for how it will keep emergency power systems operational during the emergency, unless it evacuates.

On-site fuel filtration and polishing will be mandatory. ”During” is defined as: “throughout the duration, continuance, or existence of”

Five million dollars has been committed for lease-purchase programs in North Carolina whereby equipment can be paid for over 2-15 year periods. Operational vs. Capital budgets.
Fuel Polishing – Prevents Most Fuel Issues

Rule #1 – NFPA does not approve any fuel filtering or polishing equipment. Nor is any system NFPA compliant. Any statement to the contrary is false and misleading.
Fuel Polishing

Closed loop fuel dialysis system: Fuel must be suctioned out, treated, and return in order to properly achieve optimal fuel quality. Having the return line at the opposite end of the tank forces debris and other contaminants to the suction end for removal.

Fuel additives: Although most fuel additives only treat the symptom, not the problem itself, regularly using a fuel additive that help prevent corrosion and sludge build up while stabilizing and optimizing feel will increase fuel longevity.
Fuel Sensing Cable

In light of the removal of automated shut off valves in fuel lines, several insurance companies have issued instructions to their insureds to install conductive polymer base leak detection systems that will report the presence of fuel over the BAS.

This system does not have to be a budget killer. The same group whom stepped up to the plate with the five million dollars for the fuel polishing systems will include these products in the package.
Single Points of Failure – Not Here
A proper fuel maintenance system is the ideal way to stay on top of the status of stored fuel. Alarms for fuel maintenance system could include:

- High vacuum
- High-pressure
- High water level
- Leak detection
- No flow
Fuel Polishing Expected Surveyor Interpretations

42 CFR 482.15(e)(3) – Emergency Generator Fuel
Hospitals that maintain an onsite fuel source to power emergency generators must have a plan for how it will keep emergency power systems operational during the emergency, unless it evacuates.

NFPA 110, 8.3.8
A fuel quality test shall be performed at least annually using tests approved by ASTM standards. [ASTM D975 is not a requirement]

FOR to main tank versus day tank
Emergency Power Management System (EPMS)

An expanded concept of an old idea
Developed As An Answer To

EPSS Failures and Non-Compliance Issues

- Ever changing, federal, state and local regulations has resulted in exhaustive record keeping and time consuming processes to satisfy all AHJs and insurance company underwriting requirements
- **Budget cuts** have reduced the number of full time facility employees to maintain both aged and newer EPSS components
- **Less time spent on important facility maintenance tasks** increasing the odds of failures during power outages and non-compliant surveys
- **Loss of administrative control** when tasks are outsourced
- **Lack of trained staff and certified health care vendors**
- **Staff and vendor turn over** results in lack of continuity of protocols
- **Increased exposure** to legal actions
EPMS – An Overview*

- On-site risk analysis on every EPSS component and protocols
- Review and development of RFPs for contractual services
- Reviewing of staff and contractor maintenance, testing, and repair reports as they are submitted
- Directing all repairs and upgrades until completion and final testing
- Educational protocol development, hosting and monitoring
- Annual required emergency plan review and training

*All protocols based on the CMS Final Rule (42 CFR 482.15) and latest editions of NFPA 99, 101, 110, 111, Joint Commission, and DNV standards
EPMS Phase 1 – Initial Visit and Risk Assessment

- Engineering and technical risk analysis of each EPSS component including installation issues and end-of-life projections
- Records collection and EPSS history review
- Review of EPSS function in the Emergency Management Plan
- Sequence of Operation observation during a monthly test
- Review of plans for collaboration and extended services with: Fuel depots, water companies, lift stations, 911 centers, ambulance services and communication hubs
- Verification of OSHA compliance – LOTO/PPE/Arc Flash Labeling
- Review of annual educational protocols
- Verification of fuel storage protocols
EPMS Phase 2 – The Report

• **Recommendations for corrective actions** for any non-compliant, or reliability issue
• **Development of best practice** applications
• **Gap analysis** when applicable
• **Modifications** if needed to Emergency Management Plan
• **Modifications**, if needed, to EPSS training protocols
• **Scheduling** of educational sessions
• **Drafting of templates** for suggested collaboration with outside services
EPMS Phase 3 – Continuing Oversight

- Electrical loads on each ATS and switchgear
- Fuel burn rates
- Load-bank reports
- Infrared testing reports
- Breaker and ATS testing reports
- Oil, fuel and coolant lab analysis
- Contractor service reports and repair orders
- Development of RFPs for service
- Monthly and tri-annual review of required testing of all EPSS components
- Weekly inspection reports
- Annual CMS required educational program (42 CFR 482.15(d))
EPMS MGI Data and Information Center

- All documents stored and available by password.
- When an inspection or test report is not received within one week of its due date a reminder will be sent.
- Real time presentation binders for TJC/CMS
- Customizable dashboards and templates
- Subscription to MGI’s Newsletter on timely emergency power compliance topics
- Unlimited phone conferences on compliance and EPSS issues.
# EPMS Dashboard Example

## EPMS Dashboard

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<td>Sequence of Operation</td>
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