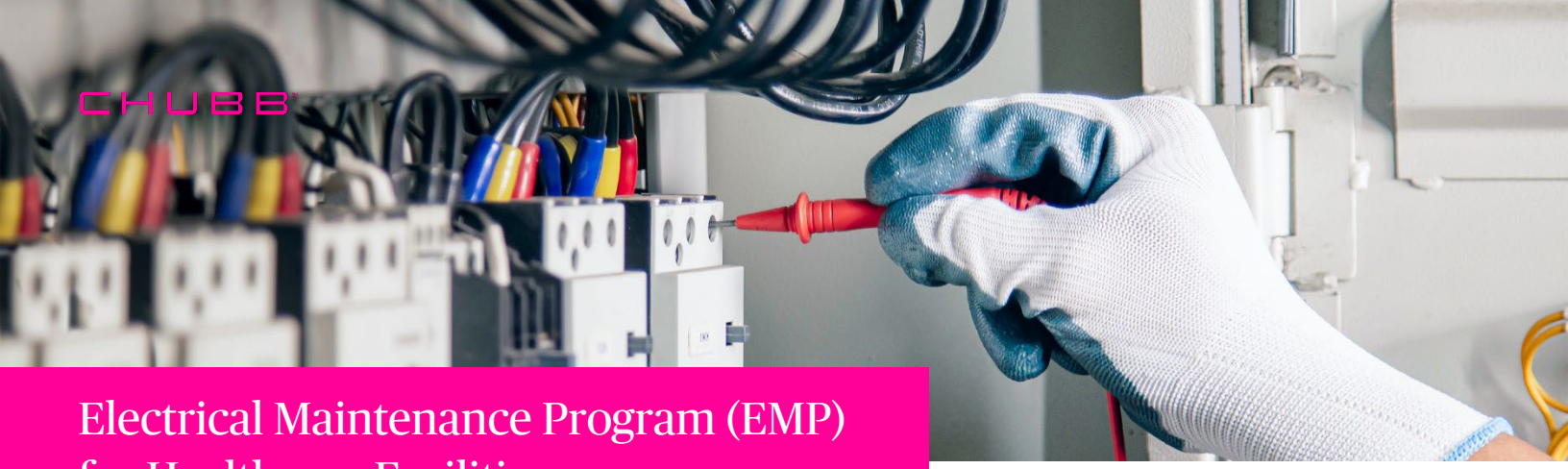

Electrical Maintenance Program (EMP) for Healthcare Facilities

Lack of consistent electrical equipment inspection and maintenance can result in severe safety risks, decreased efficiency, and higher maintenance expenses. According to the Institute of Electrical and Electronics Engineers (IEEE), the failure rate of electrical equipment increases by 300% without an Electrical Maintenance Plan (EMP).[1] Undoubtedly, healthcare facilities are integral to the well-being and sustainability of the communities they serve. It is essential to maintain the functionality, reliability, and safety of the electrical equipment within these facilities for the benefit of all stakeholders.

Potential Dangers of Electrical Systems

Electrical systems present some of a healthcare facility's most critical property damage and business interruption exposures. Electrical deficiencies caused by faulty connections, load imbalances, or overloaded circuits can lead to arcing and fires. The National Fire Protection Association (NFPA) 99[2], Health Care Facilities Code, requires the implementation of an Electrical Maintenance Program, which aligns with the new standards found in NFPA 70B[3], Standard for Electrical Equipment Maintenance. Chapter 6 of NFPA 99 has a primary goal of providing practical measures that effectively safeguard individuals, property, and processes against the inherent risks of an electrical distribution system's failure, breakdown, or malfunction. It is a valuable framework for establishing and maintaining the proper condition of electrical equipment and systems for safety and reliability within care facilities

According to the U.S. Fire Administration (USFA), nonconfined fires—considered larger and more serious—made up 27% of all hospital fires. Of these nonconfined fires, the leading cause was electrical malfunction. Even among smaller, confined fires within medical facilities, electrical malfunction is the second leading cause.[4]

New electrical equipment deteriorates over time once energized. If left unaddressed, deterioration caused by normal operations can lead to malfunction or complete electrical failure. Accelerating factors such as hostile environments, overload, or demanding duty cycles can accelerate the rate of deterioration. A well-designed EMP efficiently identifies and acknowledges these factors while offering measures to mitigate equipment failure.

EMP Components

The following elements are key requirements of an effective EMP:

- Comprehensive assessment of maintenance needs.
- Identification of personnel responsible for implementing the program.
- Survey and analysis of equipment and systems to establish maintenance priorities.
- Development and documentation of maintenance procedures.
- Plan for regular inspections, servicing, and suitable testing.
- Records retention policy.
- Process for taking corrective measures based on collected data.
- Designing equipment for maintenance while minimizing outage or disruption to facility operations.
- Periodic review and revision of the program to ensure continuous improvement.

Determining Maintenance Intervals and Frequency

Maintenance should adhere to the manufacturer's specifications. If they are unavailable or not provided, maintenance is performed as outlined in NFPA 99 and/or NFPA 70B, and specified in the EMP. While the requirements in NFPA 99 for electrical maintenance typically apply when manufacturer specifications are unavailable, there are situations where local or state Authority Having Jurisdiction (AHJ) has adopted the new requirements in NFPA 70B instead of NFPA 99. In these cases, the AHJ may not acknowledge any conflict between the two standards. It will be important to keep an eye on future adoptions and ensure that the requirements already established by NFPA 99 are considered in any local adoption efforts.

Learn More & Connect

For more information on protecting your business, contact your local risk engineer, visit the Chubb Risk Consulting Library, or check out www.chubb.com/riskconsulting.

Once the initial inspection, maintenance, and testing frequency is established based on those intervals and the EMP equipment condition assessment, the frequency should be followed for at least two cycles.

The frequency and intervals for inspections, maintenance, and testing can be adjusted according to the equipment condition assessment in the EMP and the results obtained from cycle inspections. When failures occur, the cause of failure is used to determine if the maintenance interval needs to be reduced and the frequency increased. When two maintenance cycles have been completed without issue, the frequency and interval can be extended. Any deviations and the justification to extend are documented in the EMP.

The equipment's overall maintenance condition assessment is based on physical, criticality, and operating environment conditions. The assessed overall condition is then used to determine the maintenance interval. The condition assessments and maintenance intervals are adapted from NFPA 70B standard and 99 code requirements. Refer to the code and standard for comprehensive requirements, informational notes, and sample forms.

Benefits

A well-administered Electrical Maintenance Program (EMP) offers a range of significant advantages:

- Reduces the potential for electrical failure or fire and saves lives by implementing proactive safety measures.
- Enhances safety and reliability of electrical systems by conducting regular inspections and maintenance.
- Identifies and addresses potential issues in advance, preventing them from escalating into major problems.
- Manages electrical maintenance costs effectively.
- Minimizes costly breakdowns and unplanned equipment outages through regular preventive maintenance and prompt troubleshooting.

Routine preventive maintenance is essential to an electrical equipment safety and reliability program. An effective EMP reduces the risk and cost of failures significantly.

Resources

Located on the Chubb Risk Consulting Library:

- Infrared Thermography for Healthcare Facilities

1. Institute of Electrical and Electronics Engineers (IEEE), www.ieee.org/
2. NFPA 99: Health Care Facilities Code, www.nfpa.org/codes-and-standards/nfpa-99-standard-development/99
3. NFPA 70B: Standard for Electrical Equipment Maintenance, www.nfpa.org/codes-and-standards/nfpa-70b-standard-development/70b
4. U.S Fire Administration: www.usfa.fema.gov/statistics/reports/where-fires-occur/snapshot-hospital.htm

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