

NFPA 70B: 2023 Edition Review

From Recommendation to a Standard

Overview

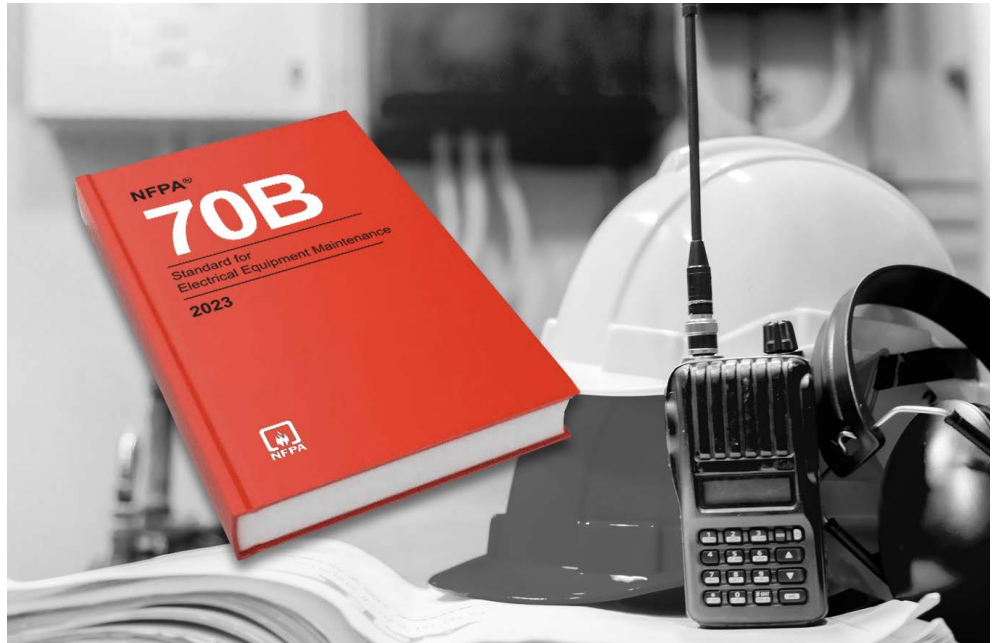
National Fire Protection Association (NFPA)

NFPA is a nonprofit organization devoted to eliminating death, injury, property, and economic loss due to fire, electrical, and related hazards. The association publishes many key standards for the electrical industry:

1. The National Electrical Code (NEC) covers safe installation of electrical wiring and installation.
2. Originally developed at OSHA's request, NFPA created the 70E standard to help companies and employees avoid workplace injuries and fatalities due to shock, electrocution, arc flash, and arc blast, and assists in complying with OSHA 1910 Subpart S and OSHA 1926 Subpart K.
3. NFPA 70B details preventive maintenance for electrical, electronic, wiring and equipment.

A preventive maintenance program should be performed in accordance with accepted industry standards and safety practices, such as NFPA 70B, *Standard for Electrical Equipment Maintenance*.

With proper maintenance and regular testing, you can identify and correct problems that would otherwise go undetected. We encourage you to learn more about the recent changes to NFPA 70B.



NFPA 70B has evolved from a recommended practice into an industry standard.

Since NFPA 70B's inception in 1973, it has provided non-mandatory suggestions and recommendations for maintaining electrical equipment. As of 2023, these recommendations are now standards. The dialog within NFPA 70B has changed from "should" and "may" to "shall" and "will." The 2023 revision makes it an enforceable standard.

Some of the recommended practices that were not seen as mandatory requirements were removed, leaving only strictly prescriptive language. Similar to other industry standards and codes, like NEC, the authority having jurisdiction (AHJ) will need to adapt this new standard to make it fully enforceable. We expect many to begin implementing these requirements immediately, to not only ensure improved equipment reliability but, most importantly, ensure worker safety.

Given the tremendous number of changes involved, this document will summarize the key revisions and provide a review of the modifications made within the following categories of the new NFPA 70B standard:

- Definition Changes
- Maintenance Intervals
- Condition Equipment Assessment
- Fundamental Tests
- Field Testing & Test Methods
- Periodic Maintenance Procedures
- Electrical Maintenance Programs
- System Studies

Definitions

The revisions made in chapter 3, Definitions, is what makes this an enforceable standard. One of the most notable revisions is section 3.2.6 (Standard) where it states, "An NFPA standard, the main text of which contains only mandatory provision using the word 'shall' to indicate requirements and that is in a form generally suitable for mandatory reference by another standard or code or for adoption into law."

Several definitions have been added for consistency within the document and with NFPA 70 and NFPA 70E standards. For example, section 3.3.47 (Qualified Person) states, "One who has demonstrated skills and knowledge related to the construction and operation of electrical equipment and installations and has received safety training to identify the hazards and reduce the associated risk. [70E, 2021]." It is the employer's responsibility to have a worker demonstrate skills and knowledge when it comes to job specific tasks, such as maintenance of electrical equipment.

Maintenance Intervals

NFPA 70B now includes a new chapter identifying the required frequency of maintenance for electrical equipment.

Maintenance Interval (section 3.3.37) is defined as: "The frequency of inspecting, testing, monitoring, analyzing, and servicing electrical equipment that is determined by the type, criticality, and condition of the equipment."

Having an Electrical Maintenance Program (EMP) in place is critical in ensuring the safety of your personnel. The new "Equipment Condition Assessment" chart (Table 9.2.2) will help you examine and identify areas to update within your maintenance plan.

As you review the maintenance intervals in Table 9.2.2, you will need to familiarize yourself with the physical condition criteria for your electrical equipment. NFPA 70B breaks down the conditions into three categories.

Condition 1 (section 9.3.1.1)

Equipment that fits into this category is "like new," and maintenance has been performed in accordance with the EMP.

Condition 2 (section 9.3.1.2)

Equipment that fits into this category means the maintenance results deviate from past results, or there are issues that require repair or replacement of components. When your equipment reaches this condition, it is recommended that you partner with a reliable and professional testing provider to ensure any deficiencies are identified and addressed so your equipment can return to the "like new" status of Condition 1.

Condition 3 (section 9.3.1.3)

Equipment that fits into this category have either missed maintenance cycles in accordance with the EMP, the previous two cycles have revealed issues requiring repair, or action is needed based on continuous monitoring system notifications or other predictive techniques.

The standard also provides instructions regarding how to assign Criticality Condition and Operating Environment Condition to equipment.





Electrical Maintenance Program (EMP)

Updating your electrical maintenance program is critical to ensure you are compliant. Chapter 4 provides new details and requirements on the development and execution of an EMP. It is now required that it shall include (4.2.4.2):

- An electrical safety program that addresses the condition of maintenance
- Identification of personnel responsible for implementing each element of the program
- Survey and analysis of electrical equipment and systems to determine maintenance requirements and priorities
- Developed and documented maintenance procedures for equipment
- A plan of inspections, servicing, and suitable tests
- A maintenance, equipment, and personnel documentation and records-retention policy
- A process to prescribe, implement, and document corrective measures based on collected data
- A process for incorporating design for maintainability in electrical installations
- A program review and revision process that considers failures and findings for continuous improvement

Fundamental Tests

Chapter 7 identifies specific tests that are fundamental to electrical equipment maintenance and are relevant to many of the equipment-specific chapters (Chapters 11-38) within this standard.

Field Testing and Test Methods

Chapter 8 provides details and requirements for field testing and test methods to assess the overall condition of service-aged electrical equipment and systems.

The new standard includes tables and recommended tests. Tests are divided into four category types:

- Category 1 - Online standard test
- Category 1A - Online enhanced test
- Category 2 - Offline standard test
- Category 2A - Offline enhanced test

The NFPA 70B defines enhanced tests (section 3.3.61.4) as, "Tests performed on equipment that is thought or known to be defective or equipment that has been subjected to conditions that could adversely affect its condition or operating characteristics."

Standard tests (section 3.3.61.5) are defined as, "Tests that are performed at regular intervals over the service life of equipment, typically in conjunction with maintenance on the equipment."

Periodic Maintenance Procedures

Chapters 11-38 cover the maintenance requirements for electrical equipment and were developed to reduce hazards to life and property that can result from failure or malfunction of the equipment or systems.

The five key procedures are:

1. Visual inspections
2. Cleaning
3. Lubrication
4. Mechanical Servicing
5. Electrical Testing

Personnel Safety

To avoid duplication of safety related work practices already covered by NFPA 70E, Chapter 5 briefly mentions personnel safety. Please reference NFPA 70E as it provides detailed information for the development of programs and procedure requirements associated with electrical maintenance activities.



SUMMARY

As NFPA 70B moves from a recommended practice to an enforceable standard, now is the time to update your EMP to ensure your facility is compliant. We encourage you to utilize the "Equipment Condition Assessment" chart to conduct an assessment of the condition of your electrical equipment as outlined in the document.

Next Level Reliability

With EMPs now requiring to be audited at intervals not to exceed 5 years, it is important for your team to understand these new revisions.

We have an in-depth knowledge of these requirements and are ready to help to ensure your program is compliant. Contact us today and let us know how we can help create an updated EMP that is customized for your facility. We can also provide on-site training to get your team up to speed with all of the new requirements.

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System Studies

Chapter 6 makes it clear that single line diagrams shall be accurate and legible, and that short circuit and coordination studies shall be created and reviewed for accuracy at intervals not to exceed five years. An incident energy analysis (arc flash study) must also be performed and updated when changes occur that may affect the results of the analysis.

This chapter details updated requirements for various electrical system studies such as:

- Short-Circuit Studies
- Coordination Studies
- Load-Flow Studies
- Reliability Studies
- Incident Energy Analysis

We Are Here For You

ERS is here to help you understand the changes and to inform you on how they impact your maintenance program. We can help you with the following:

- Assist in the creation of an Electrical Maintenance Program (EMP) that is specific to your facility
- Perform electrical preventive maintenance on all low, medium, and high voltage equipment to improve reliability and extend the life of components and systems
- Develop up-to-date single-line drawings, perform and maintain short circuit and coordination studies, and conduct incident energy analyses to increase the safety and reliability of your systems
- Provide safety and technical training that is customized for your facility and equipment
- Perform protection & controls system upgrades to ensure reliability and compliance with standards
- Conduct acceptance testing for new or updated equipment and systems, providing baseline data for comparison to future maintenance test results
- Offer DC power systems services such as testing, maintenance and upgrades of UPS and battery systems