



Public Comment No. 42-NFPA 70B-2025 [Global Input]

The Correlating Committee directs the Technical Committee for 70B to reference the specific section or part applicable instead of the entire Chapter (Chapter 9), in accordance with the NFPA Manual of Style, Section 10.1.1.4. This occurs in the following sections: 11.2, 12.2, 13.2, 14.2, 15.2, 16.2, 17.2, 18.2, 19.2, 20.2, 21.2, 22.2,24.2, 25.2, 27.2, 28.2, 29.2, 30.2.1, 31.2, 32.2, 33.2, 34.2, 35.2, 36.2, and 39.2.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
70B_CN8.pdf	70B_CN8	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 8 appeared in the First Draft Report.

The Correlating Committee directs the Technical Committee for 70B to reference the specific section or part applicable instead of the entire Chapter (Chapter 9), in accordance with the NFPA Manual of Style, Section 10.1.1.4. This occurs in the following sections: 11.2, 12.2, 13.2, 14.2, 15.2, 16.2, 17.2, 18.2, 19.2, 20.2, 21.2, 22.2,24.2, 25.2, 27.2, 28.2, 29.2, 30.2.1, 31.2, 32.2, 33.2, 34.2, 35.2, 36.2, and 39.2.

Related Item

- Correlating Committee Note No. 8

Submitter Information Verification

Submitter Full Name: CC Notes
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Fri Jan 03 17:28:36 EST 2025
Committee: EEM-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: [SR-7-NFPA 70B-2025](#)
Statement: The NFPA Manual of Style Section 10.1.1.4 requires references to specific sections or applicable parts rather than entire chapters.



Public Comment No. 15-NFPA 70B-2025 [Section No. 1.2]

1.2 Purpose.

~~The purpose of this standard is to provide~~

To provide a means and/or method for the practical safeguarding of persons, property, and processes

~~from the~~

during the maintenance of electrical equipment and systems. The risks associated with failure, breakdown, or malfunction

~~and a means~~

will be addressed to establish a condition of

~~maintenance of electrical equipment and systems for~~

safety and reliability.

Statement of Problem and Substantiation for Public Comment

Reason for change: Make it easier to read and understand.

Improves Readability Ease from a score of 2.5 to 21.7.

Reduces words per sentence from 44 to 21.5.

Source: Microsoft Word - Flesch Kincaid Readability and level statistics

Related Item

- None

Submitter Information Verification

Submitter Full Name: Andrew Salvatore

Organization: Carr & Duff, LLC

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 10:48:31 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected

Resolution: The recommendation does not improve the wording and is inconsistent with other standards.



Public Comment No. 16-NFPA 70B-2025 [Section No. 3.2.3]

3.2.3 – Labeled:

Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction

~~and concerned with product evaluation;~~

. The labeling shall address product evaluations that maintains periodic inspection of production

~~of labeled equipment or materials, and by whose labeling the manufacturer indicates~~

. The manufacturer's labeling shall indicate compliance with appropriate standards or performance in a specified manner.

Statement of Problem and Substantiation for Public Comment

Reason for change: Make it easier to read and understand.

Improves Readability Ease from a score of 0.0 to 8.5.

Reduces words per sentence from 59 to 17.6.

Reduces reading grade level from 32 to 16.4

Source: Microsoft Word - Flesch Kincaid Readability and level statistics

Related Item

- None

Submitter Information Verification

Submitter Full Name: Andrew Salvatore

Organization: Carr & Duff, LLC

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 11:06:12 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected

Resolution: Definitions in Section 3.2 are official NFPA definitions and cannot be modified by the technical committee in accordance with NFPA Manual of Style Section 7.3.1.1.

**Public Comment No. 17-NFPA 70B-2025 [Section No. 3.2.4]**

~~3.2.4 *~~ – ~~Listed:~~

~~Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction~~

~~and concerned with~~

~~. The listing shall address the evaluation of products or services~~

~~;~~

~~that~~

~~maintains~~

~~maintain periodic inspection of production~~

~~of listed equipment~~

~~or~~

~~materials or~~

~~periodic evaluation of~~

~~services, and whose listing states that~~

~~service. The manufacturer listing shall indicate either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.~~

Statement of Problem and Substantiation for Public Comment

Reason for change: Make it easier to read and understand.

Improves Readability Ease from a score of 0.0 to 8.6

Reduces words per sentence from 70 to 22.3

Reduces reading grade level from 35 to 17.6

Source: Microsoft Word - Flesch Kincaid Readability and level statistics

Related Item

- None

Submitter Information Verification

Submitter Full Name: Andrew Salvatore

Organization: Carr & Duff, LLC

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 11:13:26 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected

Resolution: Definitions in Section 3.2 are official NFPA definitions and cannot be modified by the technical committee in accordance with NFPA Manual of Style Section 7.3.1.1.

**Public Comment No. 18-NFPA 70B-2025 [Section No. 3.3.16]****3.3.16 * – Electrical Maintenance Program (EMP):**

~~A managed program~~

A management system or process of inspecting, testing, monitoring, analyzing, and servicing electrical systems and equipment

~~with the purpose of maintaining safe operations and production by reducing or eliminating system interruptions and equipment failures~~

~

Statement of Problem and Substantiation for Public Comment

Reason for change: Make it easier to read and understand.

Reduces words per sentence from 32 to 16

Reduces reading grade level from 23.4 to 18.6

Source: Microsoft Word - Flesch Kincaid Readability and level statistics

Related Item

- None

Submitter Information Verification

Submitter Full Name: Andrew Salvatore

Organization: Carr & Duff, LLC

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 11:34:10 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected

Resolution: The existing definition is clear and sufficient substantiation was not provided to change the existing definition.



Public Comment No. 19-NFPA 70B-2025 [Section No. 3.3.47]

~~3.3.47 – Power Quality:~~

~~Electrical phenomena that can be used to quantify the quality of the electrical supply, including, but not limited to, voltage transients, voltage sags, voltage swells, voltage interruptions, voltage and current harmonics, voltage fluctuations resulting in~~

The quantitative state of electrical supply at any given moment in time that produces reliable or substandard service. Substandard service may include light flicker, voltage and current unbalance, power frequency deviations, voltage and current interharmonics, and electrical noise (conducted or radiated) which may be caused by electrical phenomena. Electrical phenomena may include, but not limited to, voltage transients, voltage sags, voltage swells, voltage interruptions, voltage and current harmonics, and voltage fluctuations.

Statement of Problem and Substantiation for Public Comment

Reason for change: Make it easier to read and understand.

Improves Readability Ease from a score of 0.0 to 7.6

Reduces words per sentence from 54 to 23.6

Reduces reading grade level from 30.3 to 18.0

Source: Microsoft Word - Flesch Kincaid Readability and level statistics

Related Item

- None

Submitter Information Verification

Submitter Full Name: Andrew Salvatore

Organization: Carr & Duff, LLC

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 11:48:19 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected

Resolution: The existing definition is clear and sufficient substantiation was not provided to change the existing definition.



Public Comment No. 6-NFPA 70B-2024 [New Section after 4.1.1]

4.1.2

This standard is not intended to duplicate, supersede, or add to manufacturer's instructions.

Statement of Problem and Substantiation for Public Comment

4.1.2 needs to be retained because any specific maintenance step in NFPA 70B that is not part of the manufacturer's instructions could present a hazard to personnel.

Related Item

- FR60

Submitter Information Verification

Submitter Full Name: Megan Hayes

Organization: NEMA

Street Address:

City:

State:

Zip:

Submittal Date: Thu Dec 19 15:04:29 EST 2024

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected

Resolution: The Technical Committee reaffirms its position on this revision from the first draft action and statement that this is redundant to 1.3.1.



Public Comment No. 7-NFPA 70B-2024 [Section No. 4.1.2]

4.1.2

In the absence of manufacturer's instructions, equipment shall be maintained in accordance with this standard ~~and applicable industry consensus standards~~.

Statement of Problem and Substantiation for Public Comment

As NFPA 70B has become a standard, no other documents should be referenced in the absence of the manufacturer's instructions.

Related Item

- FR 61

Submitter Information Verification

Submitter Full Name: Megan Hayes

Organization: NEMA

Street Address:

City:

State:

Zip:

Submittal Date: Thu Dec 19 15:07:18 EST 2024

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected

Resolution: There are other applicable industry consensus standards that could be acceptable to be used in the absence of manufacturer's instructions.



Public Comment No. 21-NFPA 70B-2025 [Section No. 4.2.4.2]

4.2.4.2 * –

The EMP shall include the following elements:

- (1) **Safety** : Input addressing the condition of maintenance and impact on electrical safety.
- (2) **Program** : An electrical safety program that addresses the condition of maintenance
- (3) **Responsibilities** : Identification of personnel responsible for implementing each element of the program
- (4) **Assessment** : Survey and analysis of equipment and systems included in the EMP to determine maintenance requirements and priorities
- (5) **Maintenance Procedures** : Developed and documented maintenance procedures for equipment
- (6) **Field Service Plan** : An inspection, servicing, and testing plan
- (7) **Documentation** : A maintenance, equipment, and personnel documentation and records-retention policy.
- (8) **Corrective Actions** : A process to prescribe, implement, and document corrective measures based on collected data
- (9) **Design Consideration** : A process for incorporating design for maintainability in installations included in the EMP
- (10) **Continuous Improvement** : A program review and revision process that considers failures and findings for continuous improvement

Statement of Problem and Substantiation for Public Comment

Reason for change: Enable single or short word phrase reference to enable field speak and checklist compliance.

The change only added a single or short work phrase at the beginning of each element.

Consideration may be given to change the order to reflect NFPA section ordering.

Related Item

- None

Submitter Information Verification

Submitter Full Name: Andrew Salvatore

Organization: Carr & Duff, LLC

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 12:18:17 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected

Resolution: The proposed changes do not offer any technical clarity, the unusual formatting does not match the rest of the Standard and conflicts with editorial style of Chapter 14 of the NFPA Manual of Style.

**Public Comment No. 40-NFPA 70B-2025 [Section No. 4.3.3.2]****4.3.3.2**

The employer shall determine through regular supervision or through inspections conducted on at least an annual basis that each employee is complying with the maintenance procedures and testing required by this standard as appropriate for that employee's work tasks.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
70B_CN2.pdf	70B_CN2	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 2 appeared in the First Draft Report.

The Correlating Committee instructs the Technical Committee for 70B to review the first revision language in 4.3.3.2 as enforceable. The phrase “as appropriate for that employee’s work tasks” needs to be reviewed to confirm that it is compliant with Section 4.2.2.1 of the NFPA Manual of Style for enforceable terms.

Related Item

- Correlating Committee Note No. 2

Submitter Information Verification

Submitter Full Name: CC Notes

Organization: NEC Correlating Committee

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 17:23:06 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-1-NFPA 70B-2025

Statement: This revision removes the unenforceable and vague phrase “as appropriate”.



Public Comment No. 5-NFPA 70B-2024 [Section No. 4.3.3.4]

4.3.3.4 –

Training

Training for person(s) shall be documented in accordance with the following:

~~Documentation shall be issued when the person demonstrates~~

- (1) Demonstrates proficiency in the maintenance procedures and testing requirements.
- (2) ~~Documentation shall be retained for the duration of the person's employment.~~
~~Documentation shall specify the content of the~~
- (3) Content of the training, the person's name, the trainer's name and
~~the dates of training~~
- (4) training dates.
- (5) Maintained for the duration of the person's employment .

Statement of Problem and Substantiation for Public Comment

Reasons

Readability Score Improved from 24.5 to 33.9

Grade Level Score reduced from 12.5 to 10.6

Source: Microsoft Word - Flesch Kincaid Readability and level statistics

Related Item

- None

Submitter Information Verification

Submitter Full Name: Andrew Salvadore

Organization: Carr & Duff, LLC

Street Address:

City:

State:

Zip:

Submittal Date: Tue Dec 17 10:34:35 EST 2024

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected

Resolution: The existing requirement is clear and sufficient substantiation was not provided to change the existing text.



Public Comment No. 22-NFPA 70B-2025 [Section No. 4.5]

4.5 Planned Inspections.

The following considerations shall be reviewed during development of planned inspections:

- (1) **Personnel Safety** : Potential of equipment failure to endanger or threaten personnel safety.
- (2) **Manufacturer's recommended service**
- and
- (1) : maintenance practices and procedures
- (2) **Area of Operation:** Operating environment
- (3) **Load Requirements:** Operating load conditions and equipment rating
- (4) **Repair Schedule:** Failure and repair of equipment causing extensive downtime and lost production dollars
- (5) **Equipment condition**
- (6) **Production and operating schedules**
- (7) **Failure history.**
- (8) **Inspection history.**

Statement of Problem and Substantiation for Public Comment

Reason for change: Use of single or short phrase word recognition for field speak and checklist use.

Consider reordering consistent with NFPA sections

Related Item

- None

Submitter Information Verification

Submitter Full Name: Andrew Salvatore

Organization: Carr & Duff, LLC

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 12:45:50 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected

Resolution: The proposed changes do not offer any technical clarity, the unusual formatting does not match the rest of the Standard and conflicts with editorial style of Chapter 14 of the NFPA Manual of Style.



Public Comment No. 2-NFPA 70B-2024 [New Section after 4.8]

4.9 Operational Technology (OT) Cybersecurity

4.9.1* Where electrical, electronic, and communications systems or equipment has internet connectivity, the Operational Technology (OT) Cybersecurity maintenance requirements in 4.9.2 through 4.9.4 shall be completed.

4.9.2 OT Asset Inventory

4.9.2.1 A documented asset inventory of OT devices shall be maintained.

4.9.2.2 The OT asset inventory shall include current version information.

4.9.3 Software and Firmware Updates

4.9.3.1 Software updates shall be installed as directed by the provider.

4.9.3.2 Firmware updates shall be installed as directed by the provider.

4.9.4 OT Risk Control

4.9.4.1 An OT risk assessment shall be conducted.

4.9.4.1 OT Risk reduction actions shall be implemented in accordance with the results of the risk assessment.

A.4.9.1 Maintenance of Operational technology (OT) Cybersecurity which helps protect networks and critical infrastructure from cyber threats, is an integral part of modern connected electrical, electronic, and communications systems and equipment. It is important to not only include protection from cyber threats at installation, but also to maintain protection as the threats evolve over time. Further information on meeting the 2023 NEC cybersecurity requirements is found in NEMA CY 7001.

Cyber security is especially important for critical infrastructure where there could be a negative impact on public or worker safety. In addition to safety risks, industrial or process automation, control, and monitoring can also be disrupted because of cyber threats. For further information, refer to NIST SP 800-82r3 for guidance in establishing secure operational technology (OT) performance, reliability, and safety requirements. Further information on Risk Assessments is in Section 3.3.6 as well as in ANSI/ISA/IEC 62443-3-2.

Statement of Problem and Substantiation for Public Comment

Comprehensive Cybersecurity related requirements for NFPA 70B were initially proposed by PI 31 and PI 260. The committee statement for these PI's indicated the TC felt the requirements were overly broad. This PC consolidates the provisions to a minimum set of maintenance related operational technology (OT) cybersecurity requirements and places informative material in the associated Annex A.

The provisions have been reformatted to match the style found in NFPA 70B and have been condensed to list only the basic, essential cybersecurity needs for existing operational technology (OT) systems. All these requirements are for maintaining existing systems. The continued cyber-attacks on connected OT systems provide a need to make sure these systems have cybersecurity protection, and this protection is maintained. A look through any search engine and you will find attacks on different areas of the electrical infrastructure, automation/controls, and HVAC. The addition of maintenance requirements for cybersecurity protections will prevent the loss of protection over time. This is a major concern after starting an installation with the correct protection then losing it over time by not maintaining it. Several examples of how cybersecurity threats are seen within buildings, electrical

control systems and infrastructure can be seen as follows:

<https://www.industrialdefender.com/blog/florida-water-treatment-plant-cyber-attack>

<https://www.facilitiesnet.com/security/article/The-Facility-Managers-Role-in-Cybersecurity--20054>

<https://www.databreaches.net/exclusive-attack-on-hvac-vendor-gave-threat-actor-access-to-boston-childrens-hospital/>

<https://www.reliaquest.com/blog/cyber-threats-to-manufacturing-industry-1h-2023/>

Further examples and reports can be found easily and the need to better secure our electrical infrastructure is essential for personal safety and protection of property. The average cost of single cyber-attack is \$2.8M as found by a Trend Micro's "State of Industrial Cybersecurity" published in 2022. As we see initial Cybersecurity requirements within the NEC, NFPA 72, NFPA 79, and NFPA 1660 the need to keep these systems up to date and secure is important. I ask the committee to recognize the importance of this topic and add the revised requirements to NFPA 70B.

Related Item

- PI-31

Submitter Information Verification

Submitter Full Name: Keith Waters

Organization: Schneider Electric

Street Address:

City:

State:

Zip:

Submittal Date: Tue Dec 03 20:16:47 EST 2024

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-36-NFPA 70B-2025

Statement: This revision and associated annex adds operational technology (OT) cybersecurity as an element that must be included in the EMP to ensure network connected equipment is maintained for cybersecurity. The addition of maintenance requirements for cybersecurity protections will help prevent the loss of protection over time.



Public Comment No. 23-NFPA 70B-2025 [Section No. 4.8.1.2]

4.8.1.2 –

The persons assigned to equipment cleaning shall be educated and trained in the following:

- (1) **Equipment Damage Precautions:** _ Potential damage to the equipment from cleaning procedures
- (2) **Personnel Safety Precautions:** _ Potential personal injury
- (3) **Procedures:** _ Specific cleaning procedures
- (4) **Exclusions:** _ Equipment not to be cleaned

Note: The manufacturer's cleaning instructions shall be followed in conjunction with the owner/operator's electrical work practices.

-

Statement of Problem and Substantiation for Public Comment

Reason for change: Add education to entry sentence to ensure knowledge transfer (education) as well as skill (training).

Provide single word or short phrase to each item to enable clarity and section ordering.

Give consideration for the owner/operator's electrical work practices as they may have additional needs based upon local code, etc.

Related Item

- none

Submitter Information Verification

Submitter Full Name: Andrew Salvatore

Organization: Carr & Duff, LLC

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 13:06:15 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected

Resolution: The proposed changes do not offer any technical clarity, the unusual formatting does not match the rest of the Standard and conflicts with editorial style of Chapter 14 of the NFPA Manual of Style.



Public Comment No. 1-NFPA 70B-2024 [Section No. 5.1.2]

5.1.2*

Safety-related work practices to identify hazards and reduce associated risks shall be instituted and followed in accordance with NFPA 70E and applicable state, federal, or local codes and standards.

Statement of Problem and Substantiation for Public Comment

NFPA 70E is an example of a standard that is permitted to be a mandatory reference by both the NEC Style Manual and the NFPA Manual of Style. Additionally, per A.5.1.2 (an explanation of the application of the requirements of 5.1.2), NFPA 70E is considered an example of applicable standards referenced in 5.1.2. Per A.5.1.2: "[i]n addition to NFPA 70E, IEEE C2, National Electrical Safety Code; applicable legal requirements (e.g., 29 CFR 1926, "Occupational Safety and Health Standards," and 29 CFR 1910, "Safety and Health Regulations for Construction"); and NFPA 70 are among the references that should be utilized for the development of programs and procedures associated with electrical maintenance activities and are necessary to be used in conjunction with this document. Equipment should be placed in an electrically safe work condition for inspections, tests, repairs, and other servicing. Where electrical maintenance tasks must be performed when the equipment is energized, provisions are to be made to allow electrical maintenance to be performed safely." The NEC Style Manual was specifically changed to make it a standard (enforceable rather than a recommendation) and allow NFPA 70B to be mandatory in NFPA 70E as well as so that NFPA 70E can be mandatory in NFPA 70B. As it stands today, one would only need to follow OSHA requirements to meet the requirements of Chapter 5 in NFPA 70B.

Related Item

- PI-5 • PI-1

Submitter Information Verification

Submitter Full Name: Palmer Hickman
Organization: Electrical Training Alliance
Street Address:
City:
State:
Zip:
Submittal Date: Mon Oct 21 12:31:26 EDT 2024
Committee: EEM-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-2-NFPA 70B-2025
Statement: This revision adds NFPA 70E as means to provide safety-related work practices and to identify hazards and reduce associated risks.

**Public Comment No. 41-NFPA 70B-2025 [Section No. 7.2.1]****7.2.1**

The quality of undisturbed bolted electrical bus connections, conductor terminations, and conductor connectors shall be verified using one or more of the methods described in 7.2.1.1 through 7.2.1.4.

7.2.1.1 Infrared Thermographic Inspection.

Infrared thermographic inspection of electrical connections and terminations shall be performed in accordance with Section 7.4.

7.2.1.2 Thermal Sensors.

Permanently mounted thermal sensors shall be permitted to monitor the temperature of electrical connections and terminations.

7.2.1.3 Contact Resistance Test.**7.2.1.3.1**

A calibrated tester shall be used to obtain contact resistance test values.

7.2.1.3.2

Where contact resistance tests are used, the resistance values shall not exceed the maximum values published by the manufacturer.

7.2.1.3.3

If contact resistance values exceed the maximum values published by the manufacturer, the cause for the excess values shall be investigated.

7.2.1.4 Torque Verification.**7.2.1.4.1**

When confirming the torque of previously installed threaded hardware, the retightening value shall not exceed 90 percent of the manufacturer's specified initial torque value.

7.2.1.4.2

Where initial threaded hardware torque value data is not available, torque values for US standard fasteners shall comply with Table 7.2.1.4.2(a), Table 7.2.1.4.2(b), or Table 7.2.1.4.2(c).

Table 7.2.1.4.2(a) Bolt-Torque Values for Electrical Connections, US Standard Fasteners — Cadmium or Zinc Plated

<u>Bolt Diameter (in.)</u>	<u>Torque (Pound-Feet)</u>
1/4	6
5/16	11
3/8	20
7/16	32
1/2	48
9/16	70
5/8	96
3/4	160
7/8	240
1.0	370

Notes:

(1) This table is based on national coarse thread pitch.

(2) The fastener grade is SAE 5.

(3) This table is based on bolts having a 105,000 lb/in.² tensile strength.

Table 7.2.1.4.2(b) Bolt-Torque Values for Electrical Connections, US Standard Fasteners — Silicon Bronze

<u>Bolt Diameter (in.)</u>	<u>Torque (Pound-Feet)</u>	
	<u>Nonlubricated</u>	<u>Lubricated</u>
5/16	15	10
3/8	20	15
1/2	40	25
5/8	55	40
3/4	70	60

Notes:

(1) This table is based on national coarse thread pitch.

(2) This table is based on bronze alloy bolts having a minimum 70,000 lb/in.² tensile strength.

Table 7.2.1.4.2(c) Bolt-Torque Values for Electrical Connections, US Standard Fasteners — Aluminum

<u>Bolt Diameter (in.)</u>	<u>Torque (Pound-Feet), Lubricated</u>
5/16	10
3/8	14
1/2	25
5/8	40
3/4	60

Notes:

- (1) This table is based on national coarse thread pitch.
- (2) This table is based on aluminum alloy bolts having a minimum 55,000 lb/in.² tensile strength.
- 7.2.1.4.3**
- Torque values for metric fasteners shall comply with the manufacturer’s instructions.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
70B_CN5.pdf	70B_CN5	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 5 appeared in the First Draft Report on First Revisions No. 83, 84 and 85.

Section titles for subdivisions of a section are optional but shall be consistent within the section. The CC directs the Technical Committee for 70B to look at Sections 7.2.1and 7.2.2 and be consistent in accordance with NFPA Manual of Style Section 3.4.5.3.2.1.

Related Item

- First Revision No. 83 • First Revision No. 84 • First Revision No. 85

Submitter Information Verification

Submitter Full Name: CC Notes
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Fri Jan 03 17:25:56 EST 2025
Committee: EEM-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-3-NFPA 70B-2025
Statement: Title added to 7.2.1 to be consistent with 7.2.2.



Public Comment No. 37-NFPA 70B-2025 [Section No. 7.2.1.4]

7.2.1.4 Torque Verification.

7.2.1.4.1

When confirming the torque of previously installed threaded hardware, the retightening value shall not exceed 90 percent of the manufacturer's specified initial torque value.

7.2.1.4.2

Where initial threaded hardware torque value data is not available, torque values for US standard fasteners shall comply with Table 7.2.1.4.2(a), Table 7.2.1.4.2(b), or Table 7.2.1.4.2(c).

Table 7.2.1.4.2(a) Bolt-Torque Values for Electrical Connections, US Standard Fasteners — Cadmium or Zinc Plated

<u>Bolt Diameter (in.)</u>	<u>Torque (Pound-Feet)</u>
1/4	6
5/16	11
3/8	20
7/16	32
1/2	48
9/16	70
5/8	96
3/4	160
7/8	240
1.0	370

Notes:

(1) This table is based on national coarse thread pitch.

(2) The fastener grade is SAE 5.

(3) This table is based on bolts having a 105,000 lb/in.² tensile strength.

Table 7.2.1.4.2(b) Bolt-Torque Values for Electrical Connections, US Standard Fasteners — Silicon Bronze

<u>Bolt Diameter (in.)</u>	<u>Torque (Pound-Feet)</u>	
	<u>Nonlubricated</u>	<u>Lubricated</u>
5/16	15	10
3/8	20	15
1/2	40	25
5/8	55	40
3/4	70	60

Notes:

(1) This table is based on national coarse thread pitch.

(2) This table is based on bronze alloy bolts having a minimum 70,000 lb/in.² tensile strength.

Table 7.2.1.4.2(c) Bolt-Torque Values for Electrical Connections, US Standard Fasteners — Aluminum

<u>Bolt Diameter (in.)</u>	<u>Torque (Pound-Feet), Lubricated</u>
5/16	10
3/8	14
1/2	25
5/8	40
3/4	60

Notes:

(1) This table is based on national coarse thread pitch.

(2) This table is based on aluminum alloy bolts having a minimum 55,000 lb/in.² tensile strength.

7.2.1.4.3

Torque values for metric fasteners shall comply with the manufacturer's instructions.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
70B_CN3.pdf	70B_CN3	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 3 appeared in the First Draft Report on First Revisions No. 84 and 85.

The Correlating Committee instructs the Technical Committee for 70B to review the first revision language in Note 3 of Table 7.2.1.4.2(a). "minimum" was removed to the tensile strength value without substantiation. This would be acceptable if it was confirmed by the technical committee that this value was only used for calculation.

Related Item

- First Revision No. 84 • First Revision No. 85

Submitter Information Verification

Submitter Full Name: CC Notes

Organization: NEC Correlating Committee

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 17:05:01 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-4-NFPA 70B-2025](#)

Statement: "Minimum" is added to be consistent with Table 7.2.1.4.2(b) and (c).

**Public Comment No. 36-NFPA 70B-2025 [Section No. 8.4.6]****8.4.6**

Proper tools, instruments, and other test equipment shall be used when performing maintenance activities.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
70B_CN6.pdf	70B_CN6	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 6 appeared in the First Draft Report.

The Technical Committee for 70B should determine if the use of the word “proper” is potentially vague and unenforceable in accordance with the NFPA Manual of Style, A.4.2.2.1.

Related Item

- Correlating Committee Note No. 6

Submitter Information Verification

Submitter Full Name: CC Notes

Organization: NEC Correlating Committee

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 16:36:38 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-5-NFPA 70B-2025](#)

Statement: This section is reworded to remove the unenforceable and vague word “proper”.



Public Comment No. 24-NFPA 70B-2025 [Section No. 8.5.2]

8.5.2 –

Test records shall contain the following minimum information:

- (1) **Person and Organization:** _ Identification of the testing person and organization
- (2) **Equipment** : Identification of the equipment under test
- (3) **Manufacturer** : Nameplate or label data from the equipment under test
- (4) **Environmental** ~~conditions, such~~ **Conditions:** such as humidity and temperature, that could affect the results of the tests or calibrations
- (5) **Date** - of the test
- (6) ~~Indication of test performed~~
~~Indication of pass/fail criteria~~
- (7) **, Time and Duration**
- (8) **Test Performed**
- (9) **Pass/Fail Criteria** , _ where applicable
- (10) **Abnormal Condition(s)**: _ Indication of as-found and as-left test results that may affect operation , where applicable
- (11) **Comments and Recommendations:** _ Test operator's comments or recommendations, where applicable

Statement of Problem and Substantiation for Public Comment

Reason for change:

Enable single or short phrase reference for field speak and checklist use.

Related Item

- None

Submitter Information Verification

Submitter Full Name: Andrew Salvatore

Organization: Carr & Duff, LLC

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 13:32:33 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected

Resolution: The proposed changes do not offer any technical clarity, the unusual formatting does not match the rest of the Standard and conflicts with editorial style of Chapter 14 of the NFPA Manual of Style.



Public Comment No. 25-NFPA 70B-2025 [Section No. 9.1.2.1 [Excluding any Sub-Sections]]

Once the
An initial frequency for inspections and tests
~~has been~~
shall be established based on the intervals listed in Table 9.3.2 and the equipment condition assessment
~~, this~~
. This frequency shall be followed for at least two maintenance intervals unless unexpected failures occur.

Statement of Problem and Substantiation for Public Comment

Reason for change: Make it easier to read and understand.

Improves Readability Ease from a score of 6.7 to 25

Reduces words per sentence from 39 to 19

Reduces reading grade level from 22 to 14.4

Source: Microsoft Word - Flesch Kincaid Readability and level statistics

Related Item

- None

Submitter Information Verification

Submitter Full Name: Andrew Salvatore

Organization: Carr & Duff, LLC

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 13:44:05 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected

Resolution: The proposed text does not improve the content. The existing requirement is clear and sufficient substantiation was not provided to change the existing text.



Public Comment No. 26-NFPA 70B-2025 [Section No. 9.2.1.1]

9.2.1.1 –

Equipment Physical Condition 1 shall be assigned where all the following criteria apply:

- (1) **Equipment Condition:** _ The equipment is in like new condition.
- (2) **Environmental Condition:** _ The enclosure is clean, free from moisture intrusion, and tight.
- (3) **Continuous Monitoring:** _ There are no unaddressed notifications from the continuous monitoring system.
- (4) **Corrective Actions:** _ There are no active recommendations from maintenance activities or predictive techniques.
- (5) **Maintenance Cycle:** _ Previous maintenance has been performed in accordance with the EMP.

Statement of Problem and Substantiation for Public Comment

Reason for change:

Enable single or short phrase reference for field speak and checklist use.

Related Item

- None

Submitter Information Verification

Submitter Full Name: Andrew Salvatore

Organization: Carr & Duff, LLC

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 14:26:24 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected

Resolution: The proposed changes do not offer any technical clarity, the unusual formatting does not match the rest of the Standard and conflicts with editorial style of Chapter 14 of the NFPA Manual of Style.



Public Comment No. 27-NFPA 70B-2025 [Section No. 9.2.1.2]

9.2.1.2 –

Equipment Physical Condition 2 shall be assigned where both the criteria from 9.2.1.1(1), 9.2.1.1(2), and 9.2.1.1(5) and the criteria from any of the following apply:

- (1) **Maintenance Deviations:** Maintenance results deviate from past results or have indicated more frequent maintenance in accordance with manufacturer's published data.
- (2) **Major Repairs:** The previous maintenance cycle has revealed issues requiring the repair or replacement of major equipment components.
- (3) **Continuous Monitoring:** There have been notifications from the continuous monitoring system since the prior assessment.
- (4) **Corrective Actions:** There are active recommendations from maintenance activities or predictive techniques.

Statement of Problem and Substantiation for Public Comment

Reason for change:

Enable single or short phrase reference for field speak and checklist use.

Related Item

- None

Submitter Information Verification

Submitter Full Name: Andrew Salvadore

Organization: Carr & Duff, LLC

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 14:33:15 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected

Resolution: The proposed changes do not offer any technical clarity, the unusual formatting does not match the rest of the Standard and conflicts with editorial style of Chapter 14 of the NFPA Manual of Style.



Public Comment No. 28-NFPA 70B-2025 [Section No. 9.2.1.3]

9.2.1.3 –

Equipment Physical Condition 3 shall be assigned where changes in operation are noted or where any of the following criteria applies:

- (1) **Maintenance Deviations:** _ The equipment has missed the last two successive maintenance cycles in accordance with the EMP.
- (2) **Major Repairs:** _ The previous two maintenance cycles have revealed issues requiring the repair or replacement of major equipment components.
- (3) **Continuous Monitoring:** _ There is an active or unaddressed notification from the continuous monitoring system.
- (4) **Corrective Actions:** _ There are urgent actions identified from maintenance activities or predictive techniques.

Statement of Problem and Substantiation for Public Comment

Reason for change:

Enable single or short phrase reference for field speak and checklist use.

Related Item

- None

Submitter Information Verification

Submitter Full Name: Andrew Salvatore

Organization: Carr & Duff, LLC

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 14:38:59 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected

Resolution: The proposed changes do not offer any technical clarity, the unusual formatting does not match the rest of the Standard and conflicts with editorial style of Chapter 14 of the NFPA Manual of Style.

**Public Comment No. 29-NFPA 70B-2025 [Section No. 9.2.1.4.1]****9.2.1.4.1 –**

When there is evidence that equipment failure could

fail such that it would

lead to

injury of personnel or pose an imminent risk to health or the environment

personnel injury, harm to the environment or an uncontrolled imminent hazard , the equipment shall be de-energized and identified as nonserviceable.

Statement of Problem and Substantiation for Public Comment

Reason for change: Preferred word choice to align with other sections.

Related Item

- None

Submitter Information Verification

Submitter Full Name: Andrew Salvatore

Organization: Carr & Duff, LLC

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 14:41:48 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-6-NFPA 70B-2025

Statement: The revised wording improves clarity and more closely aligns with Section 130.8(K) of NFPA 70E.



Public Comment No. 8-NFPA 70B-2024 [Section No. 9.3.2]

9.3.2*

Where the manufacturer's instructions are not provided or where predictive methods specified in 9.1.1 are not available, equipment maintenance shall be performed at not greater than the intervals specified in Table 9.3.2, in accordance with the equipment condition assessment in Section 9.3, and as modified by the other parts of this chapter.

Table 9.3.2 Maintenance Intervals

<u>Product</u>	<u>Scope of Work</u>	<u>Equipment Condition Assessment</u>			
		<u>Condition 1</u>	<u>Condition 2</u>	<u>Condition 3</u>	
All equipment	Infrared thermography	12 months	12 months	6 months	
Batteries	Visual inspection	60 months	36 months	12 months	
-	-	Cleaning	60 months	36 months	12 months
-	-	-	-	-	
-	-	-	-	-	
	-	Electrical testing	60 months	36 months	12 months
Busways	Visual inspection	60 months	60 months	12 months	
	-	Cleaning	60 months	36 months	12 months
	Lubrication	60 months	36 months	12 months	
	-	Mechanical servicing	60 months	36 months	12 months
	-	Electrical testing	60 months	36 months	12 months
-	-	-	-	-	
Cable trays	Visual inspection	12 months	12 months	6 months	
	-	Cleaning	60 months	36 months	12 months
-	-	-	-	-	
-	-	-	-	-	
	-	Electrical testing	60 months	36 months	12 months
Electric vehicle power transfer systems	Visual inspection	60 months	36 months	12 months	
	-	-	-	-	
-	-	-	-	-	
-	-	-	-	-	
Fuses	Visual inspection	60 months	36 months	12 months	
	-	Cleaning	60 months	36 months	12 months
	Lubrication	60 months	36 months	12 months	
	-	Mechanical servicing	60 months	36 months	12 months
	-	Electrical testing	60 months	36 months	12 months

<u>Product</u>	<u>Scope of Work</u>	<u>Equipment Condition Assessment</u>			
		<u>Condition 1</u>	<u>Condition 2</u>	<u>Condition 3</u>	
GFCIs	Visual inspection	12 months	12 months	6 months	
	-	Cleaning	60 months	36 months	12 months
	-	-	-	-	
	-	-	-	-	
Grounding and bonding	Visual inspection	12 months	12 months	6 months	
	-	-	-	-	
	-	-	-	-	
	-	-	-	-	
	-	Electrical testing	60 months	36 months	36 months
High-voltage substation insulators	Visual inspection	12 months	12 months	6 months	
	Corona detection	12 months	6 months	4 months	
	-	Maintenance and testing	60 months	36 months	12 months
Lighting	Visual inspection	60 months	36 months	12 months	
	-	Cleaning	60 months	36 months	12 months
	-	Mechanical servicing	60 months	36 months	12 months
			-	-	Reseal
Low-voltage ground-fault protection systems	Visual inspection	12 months	12 months	6 months	
	Cleaning	60 months	36 months	12 months	
	-	-	-	-	
Mechanical servicing	60 months	36 months	12 months		
	-	Electrical testing	60 months	36 months	12 months
Medium-voltage ground-fault protection systems	Visual inspection	12 months	12 months	6 months	
	Cleaning	60 months	36 months	12 months	
	-	-	-	-	
Mechanical servicing	60 months	36 months	12 months		
	-	Electrical testing	60 months	36 months	12 months
Medium-voltage power circuit breakers	Visual inspection	60 months	36 months	12 months	
	Cleaning	60 months	36 months	12 months	
	Lubrication	60 months	36 months	12 months	

		<u>Equipment Condition Assessment</u>			
<u>Product</u>	<u>Scope of Work</u>	<u>Condition 1</u>	<u>Condition 2</u>	<u>Condition 3</u>	
	-	Mechanical servicing	60 months	36 months	12 months
	-	Electrical testing	60 months	36 months	12 months
Molded-case/insulated-case/low-voltage power circuit breakers	Visual inspection	60 months	36 months	12 months	
	Cleaning	60 months	36 months	12 months	
	Lubrication	60 months	36 months	12 months	
	Mechanical servicing	60 months	36 months	12 months	
	-	Electrical testing	60 months	36 months	12 months
Motor control equipment	Visual inspection	60 months	36 months	12 months	
	Cleaning	60 months	36 months	12 months	
	-	Lubrication	60 months	36 months	12 months
	-	Mechanical servicing	60 months	36 months	12 months
	-	Electrical testing	60 months	36 months	12 months
Panelboards and switchboards	Visual inspection	60 months	36 months	12 months	
	Cleaning	60 months	36 months	12 months	
	-	Lubrication	60 months	36 months	12 months
	-	Mechanical servicing	60 months	36 months	12 months
	-	Electrical testing	60 months	36 months	12 months
Photovoltaic systems	Visual inspection	60 months	36 months	12 months	
	-	-	-	-	
	-	-	-	-	
	-	Mechanical servicing	36 months	24 months	12 months
	-	Electrical testing	60 months	36 months	12 months
Portable electrical tools and equipment	Visual inspection	Before each use	Before each use	Before each use	
	Cleaning	Before each use	Before each use	Before each use	
	Lubrication	In accordance with the manufacturer's instructions	In accordance with the manufacturer's instructions	In accordance with the manufacturer's instructions	
	-	Mechanical servicing	In accordance with the	In accordance with the	In accordance with the

		<u>Equipment Condition Assessment</u>			
<u>Product</u>	<u>Scope of Work</u>	<u>Condition 1</u>	<u>Condition 2</u>	<u>Condition 3</u>	
	-	Electrical testing	3 months	3 months	3 months
Power and distribution transformers	Visual inspection	12 months	12 months	6 months	
	Cleaning	60 months	36 months	12 months	
	-	-	-	-	
-	-	Mechanical servicing	60 months	36 months	12 months
-	-	Electrical testing	60 months	36 months	12 months
Power cables and conductors	Visual inspection	60 months	36 months	12 months	
	Cleaning	60 months	60 months	36 months	12 months
-	-	-	-	-	
-	-	Electrical testing	60 months	36 months	12 months
Power-factor correction capacitors	Visual inspection	60 months	36 months	12 months	
	Cleaning	60 months	36 months	12 months	
	-	-	-	-	
-	-	Mechanical servicing	60 months	36 months	12 months
-	-	Electrical testing	60 months	36 months	12 months
-	-	-	-	-	
Protective relays, electromechanical	Visual inspection	36 months	24 months	12 months	
	Cleaning	36 months	24 months	12 months	
-	-	-	-	-	
-	-	Mechanical servicing	36 months	24 months	12 months
-	-	Electrical testing	36 months	24 months	12 months
Protective relays, solid state and microprocessor	Visual inspection	60 months	36 months	12 months	
	Cleaning	60 months	36 months	12 months	
	-	-	-	-	
	-	Mechanical servicing	60 months	36 months	12 months
	-	Electrical testing	60 months	36 months	12 months
-	-	-	-	-	

		Equipment Condition Assessment				
Product	Scope of Work	Condition 1	Condition 2	Condition 3		
Rotating equipment	Visual inspection	60 months	36 months	12 months		
	Cleaning	60 months	36 months	12 months		
	-	Lubrication	60 months	36 months	12 months	
	-	Mechanical servicing	60 months	36 months	12 months	
	-	Electrical testing	60 months	36 months	12 months	
Stationary standby batteries	Visual inspection	60 months	36 months	12 months		
	Cleaning	60 months	36 months	12 months		
	-	-	-	-		
	-	Electrical testing	60 months	36 months	12 months	
Substations	Visual inspection	12 months	12 months	6 months		
	-	Cleaning	60 months	36 months	12 months	-
	Lubrication	60 months	36 months	12 months		
	-	Mechanical servicing	60 months	36 months	12 months	
	-	Electrical testing	60 months	36 months	12 months	
	-	Special	60 months	36 months	12 months	
	-	Mechanical checks	60 months	36 months	12 months	
Switches	Visual inspection	60 months	36 months	12 months		
	-	Cleaning	60 months	36 months	12 months	-
	Lubrication	60 months	36 months	12 months		
	-	Mechanical servicing	60 months	36 months	12 months	
	-	Electrical testing	60 months	36 months	12 months	
Switchgear	Visual inspection	12 months	12 months	6 months		
	-	Cleaning	60 months	36 months	12 months	-
	Lubrication	60 months	36 months	12 months		
	-	Mechanical servicing	60 months	36 months	12 months	
	-	Electrical testing	60 months	36 months	12 months	
	-	Special	60 months	36 months	12 months	
Transfer switch equipment	Visual inspection	12 months	6 months	3 months		
	-	Cleaning	60 36 months	<u>24</u> months	12 months	-

		<u>Equipment Condition Assessment</u>			
<u>Product</u>	<u>Scope of Work</u>	<u>Condition 1</u>	<u>Condition 2</u>	<u>Condition 3</u>	
Uninterruptible power supplies	Lubrication	60-36 months	<u>24</u> months	12 months	
	-	Mechanical servicing	60-36 months	<u>24</u> months	12 months -
	Electrical testing	60-36 months	<u>24</u> months	12 months	
	Visual inspection	6 months	3 months	1 month	
	Cleaning	12 months	6 months	3 months	
	-	-	-	-	
	-	Mechanical servicing	12 months	6 months	3 months
	-	Electrical testing	12 months	6 months	3 months
	-	Special	24 months	24 months	24 months
Wind power electric systems	Visual inspection	60 months	36 months	12 months	
-	-	-	-	-	
-	-	-	-	-	
-	-	-	-	-	
-	-	Electrical testing	60 months	36 months	12 months
Wiring devices	Visual inspection	12 months	3 months	1 month	
-	-	Cleaning	60 months	36 months	12 months
-	-	-	-	-	
-	-	Mechanical servicing	60 months	36 months	12 months
-	-	Electrical testing	60 months	36 months	12 months

9.3.2.1

The intervals in Table 9.3.2 shall only be required if referenced by a specific section in another chapter.

9.3.2.2

The maintenance interval for electrical equipment shall be permitted to be altered based on the potential risk to personnel or facility operations due to a failure of the equipment to operate as expected.

9.3.2.3

Any deviations from the maintenance intervals described in Table 9.3.2 to extend the maintenance interval and the justification for the deviation shall be documented in the EMP.

Statement of Problem and Substantiation for Public Comment

The intervals specified in FR152 are not representative of transfer switch maintenance practices. Except for visual inspections, transfer switches require more frequent intervals for each element of the

scope of work.

Related Item

- FR 152

Submitter Information Verification

Submitter Full Name: Megan Hayes

Organization: NEMA

Street Address:

City:

State:

Zip:

Submittal Date: Thu Dec 19 15:09:14 EST 2024

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected

Resolution: Insufficient substantiation was provided to justify more frequent maintenance intervals. The major maintainable components of transfer switch equipment are circuit breakers and/or switches which have the same maintenance intervals.



Public Comment No. 10-NFPA 70B-2025 [Section No. 10.1]

10.1 Scope.

This chapter identifies the maintenance requirements for ~~power and distribution transformers~~ Electrical Equipment located in Hazardous (Classified) Locations .

Statement of Problem and Substantiation for Public Comment

FR50 added “scope” to 10.1 to be consistent with the numbering format in other chapters. There appears to have been a typographical error when this was added. This PC corrects the scope to align with the contents of Chapter 10.

Related Item

- FR50

Submitter Information Verification

Submitter Full Name: Rodney West

Organization: Schneider Electric

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 08:42:10 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-8-NFPA 70B-2025

Statement: The title of Chapter 10 is Hazardous (Classified) Location Electrical Equipment, and the scope improperly identifies power and distribution transformers. The language is modified for consistency with other sections.



Public Comment No. 35-NFPA 70B-2025 [Section No. 10.1]

10.1 Scope.

This chapter identifies the maintenance requirements for power and distribution transformers.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
70B_CN1.pdf	70B_CN1	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 1 appeared in the First Draft Report.

The Correlating Committee instructs the Technical Committee for 70B to review the first revision language in 10.1 and make the appropriate corrections. Chapter 10 addresses Hazardous (Classified) Location Electrical Equipment whereas the scope identifies power and distribution transformers.

Related Item

- Correlating Committee Note No. 1

Submitter Information Verification

Submitter Full Name: CC Notes

Organization: NEC Correlating Committee

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 16:33:39 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-8-NFPA 70B-2025

Statement: The title of Chapter 10 is Hazardous (Classified) Location Electrical Equipment, and the scope improperly identifies power and distribution transformers. The language is modified for consistency with other sections.



Public Comment No. 12-NFPA 70B-2025 [Section No. 11.3.1]

11.3.1 Visual Inspection.

Transformers shall be visually inspected in accordance with Table 11.3.1.

Table 11.3.1 Transformer Visual Inspections

No.	Task	Small, Windings, ≤600 V, ≤167 kVA 1- ph, ≤500 kVA 3-ph	Large, Windings, >600 V, >167 kVA 1- ph, >500 kVA 3-ph	Liquid- Filled	Test Type*	
					Dry Type, Air-Cooled	
1	Bolted Inspect the physical condition of the following for signs of damage or contamination: 1.1 Bolted connections	2	2	2		
-	1.2 Cooling devices		2	2	1 or 2	-
1.3	Liquid level gauges and alarms	NA	NA	1 or 2	-	
1.4	Neutral grounding impedance devices	1 or 2	1 or 2	1 or 2	-	
1.5	Nitrogen bottle pressure systems	NA	NA	1 or 2	-	
1.6	Pressure relief devices	NA	NA	2	-	
1.7	Sudden pressure relays	NA	NA	2	-	
1.8	Tank over/under pressure gauges and alarms	NA	NA	1 or 2	-	
1.9	Transformer enclosures	1 or 2	1 or 2	1 or 2	Ensure ventilation and equipment enclosure integrity has not been compromised.	

NA: Not applicable.

*Types specified in accordance with Section 8.3, as follows: Type 1 = online standard test; Type 1A = online enhanced test; Type 2 = offline standard test; Type 2A = offline enhanced test.

Statement of Problem and Substantiation for Public Comment

The tasks listed in the NFPA 70B tables should provide clear requirements for users of the standard. Most tables have tasks such as "Inspect labeling for readability and condition" or "Inspect external physical condition", but that is not the case in this table. The proposed revision adds charging language to the table to improve clarity without changing the contents of the table.

Related Item

- FR88

Submitter Information Verification

Submitter Full Name: Rodney West

Organization: Schneider Electric

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 09:44:35 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-9-NFPA 70B-2025](#)

Statement: Appropriate charging language has been added to the tasks, providing clear direction to the user on the requirements without changing the technical contents of the table.



Public Comment No. 13-NFPA 70B-2025 [Section No. 11.3.4]

11.3.4 Mechanical Servicing.

Transformers shall be mechanically serviced in accordance with Table 11.3.4.

Table 11.3.4 Transformer Mechanical Servicing

No.	Task	Test Type*			Notes	
		Dry Type, Air-Cooled		Liquid-Filled		
		Small, Windings, ≤600 V, ≤167 kVA 1-ph, ≤500 kVA 3-ph	Large, Windings, >600 V, >167 kVA 1-ph, >500 kVA 3-ph			
1	Bolted Service bolted connections	-	-	-	-	as follows:
1A	Verify tightness of accessible bolted electrical connections	2	2	2	-	
1B	Verify as-left tap connections are as specified	2	2	2	-	
2	Inspect anchorage, alignment, and grounding	1 or 2	1 or 2	1 or 2	-	
3	<u>Inspect</u> Cooling devices for proper operation	2	2	2	-	
4	<u>Inspect</u> Transformer enclosures, ventilation filters, and screens inspected and replaced or cleaned <u>replace or clean</u> , as needed	1 or 2	1 or 2	NA	-	
5	<u>Inspect</u> Control cabinets cabinets cabinet connections and cleaning <u>clean as needed</u>	2	2	2	-	

NA: Not applicable.

*Types specified in accordance with Section 8.3, as follows: Type 1 = online standard test; Type 1A = online enhanced test; Type 2 = offline standard test; Type 2A = offline enhanced test.

Statement of Problem and Substantiation for Public Comment

The tasks listed in the NFPA 70B tables should provide clear requirements for users of the standard. Most tables have tasks such as "Inspect labeling for readability and condition" or "Inspect external physical condition", but that is not the case in this table. The proposed revisions add provisions to improve clarity without changing the technical contents of the table.

Related Item

- FR94

Submitter Information Verification

Submitter Full Name: Rodney West

Organization: Schneider Electric

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 10:38:03 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-10-NFPA 70B-2025](#)

Statement: Appropriate charging language has been added to the tasks, providing clear direction to the user on the requirements without changing the technical contents of the table. Task 2 has been deleted because it is an inspection already covered in Table 11.3.1 where it appropriately belongs.



Public Comment No. 14-NFPA 70B-2025 [Section No. 11.3.5]

11.3.5* Electrical Testing.

Transformers shall be electrically tested in accordance with Table 11.3.5.

Table 11.3.5 Transformer Electrical Tests

				<u>Test Type*</u>	
				<u>Dry Type, Air-Cooled</u>	
		<u>Small, Windings, ≤600 V, ≤167 kVA 1-ph, ≤500 kVA 3-ph</u>	<u>Large, Windings, >600 V, >167 kVA 1-ph, >500 kVA 3-ph</u>	<u>Liquid-Filled</u>	<u>Notes</u>
<u>No.</u>	<u>Task</u>				
1	<u>Measure</u> Core insulation resistance	NA	2A	2A	-
2	<u>Measure</u> Excitation current on each phase	NA	2	2	-
3	<u>Measure</u> Insulation power factor	NA	2	2	-
4	<u>Measure</u> Insulation power factor tip-up	NA	2A	NA	-
5	<u>Measure</u> Main insulation resistance	2	2	2	-
6	<u>Measure resistance on</u> Neutral grounding impedance devices	NA	2	2	-
7	<u>Measure</u> Online partial discharge on MV/HV windings	NA	1A	1A	-
8	<u>Measure</u> Insulation power factor on each bushing	NA	NA	2†	-
9	<u>Perform</u> Sweep frequency response analysis	NA	NA	2A	-
10	<u>Verify</u> Turns ratio on all load tap changer (LTC) taps	NA	NA	2A	-
11	<u>Verify</u> Turns ratio on all no-load tap changer (NLTC) taps	2A	2A	2A	-
12	<u>Verify</u> Turns ratio on designated tap	2	2	2	-
13	<u>Measure</u> Winding resistance at designated tap	2A	2A	2	-
14	<u>Measure</u> Bolted connection resistance	2	2	2	-
15	<u>Perform</u> Applied voltage test	NA	2A	NA	-
16	Sample insulating fluid and test for:	-	-	-	-
16A	Dielectric breakdown	NA	NA	1 or 2	-
16B	Acid neutralization number	NA	NA	1 or 2	-
16C	Specific gravity	NA	NA	1 or 2	-
16D	Interfacial tension	NA	NA	1 or 2	-
16E	Color	NA	NA	1 or 2	-
16F	Visual condition	NA	NA	1 or 2	-

No.	Task			<u>Test Type*</u>	
				<u>Dry Type, Air-Cooled</u>	
		<u>Small, Windings, ≤600 V, ≤167 kVA 1-ph, ≤500 kVA 3-ph</u>	<u>Large, Windings, >600 V, >167 kVA 1-ph, >500 kVA 3-ph</u>	<u>Liquid-Filled</u>	<u>Notes</u>
16G	Water content	NA	NA	1 or 2	-
16H	Power factor	NA	NA	1 or 2	-
16I	Dissolved gas analysis	NA	NA	1 or 2	-
16J	Furan analysis	NA	NA	1A or 2A	-
17	<u>Perform</u> Sweep frequency response analysis	NA	NA	2A	-
18	<u>Determine</u> Percent oxygen in insulating blanket	NA	NA	2A	-
19	<u>Perform</u> Testing of transformer alarms, including temperature, liquid level, nitrogen bottle pressure, tank over/under pressure, sudden pressure	NA	2	2	-

NA: Not applicable.

*Types specified in accordance with Section 8.3, as follows: Type 1 = online standard test; Type 1A = online enhanced test; Type 2 = offline standard test; Type 2A = offline enhanced test.

†Transformers applied at voltages greater than 1000 volts.

Statement of Problem and Substantiation for Public Comment

The tasks listed in the NFPA 70B tables should provide clear requirements for users of the standard. Most tables have tasks such as "Inspect labeling for readability and condition" or "Inspect external physical condition", but that is not the case in this table. The proposed revisions add verbs to improve clarity without changing the technical contents of the table.

Related Item

- FR90

Submitter Information Verification

Submitter Full Name: Rodney West

Organization: Schneider Electric

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 10:45:29 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action:	Rejected but see related SR
Resolution:	<u>SR-11-NFPA 70B-2025</u>
Statement:	Appropriate charging language has been added to the tasks, providing clear direction to the user on the requirements without changing the technical contents of the table.



Public Comment No. 34-NFPA 70B-2025 [Section No. 17.3]

17.3* Periodic Maintenance Procedures.

17.3.1 Visual Inspection.

Switches shall be visually inspected in accordance with Table 17.3.1.

Table 17.3.1 Switch Visual Inspections

<u>No.</u>	<u>Task</u>	<u>Test Type*</u>		<u>Notes</u>
		<u>1000 V or Less</u>	<u>Greater than 1000 V</u>	
1	Inspect the switch enclosure for dents, deteriorated paint, missing or unreadable labels, corrosion, missing hardware, and doors and latches for improper fit	1 or 2	1 or 2	
2	Inspect insulating materials and switch base for evidence of physical damage, cracks from stresses of operation, or contamination	2	2	
3	Inspect wiring, bus, cables, and connections for damaged insulation, broken leads, tightness of connections, crimping, and overall general condition, including corrosion	2	2	
4	Check that exposed switch contacts, both moving and stationary, are free from environmental contamination	2	2	
5	Inspect visible current-carrying parts and control devices, if applicable, for signs of overheating or deterioration	2	2	
6	Check that fuses are secured	2	2	
7	Examine switches with exposed contacts for evidence of high short-circuit closing operation	2	2	
8	Check the main body of the switch blades and the arcing contacts for arc erosion	2	2	Mild pitting and burning is permitted.
9	Inspect each arc chute for cracks or excessive erosion	NA	2	

NA: Not applicable.

*Types specified in accordance with Section 8.3, as follows: Type 1 = online standard test; Type 1A = online enhanced test; Type 2 = offline standard test; Type 2A = offline enhanced test.

17.3.2 Cleaning.

If contamination is present, switches shall be cleaned in accordance with Table 17.3.2.

Table 17.3.2 Switch Cleaning

<u>No.</u>	<u>Task</u>	<u>Test Type*</u>		<u>Notes</u>
		<u>1000 V or Less</u>	<u>Greater than 1000 V</u>	
1	Clean the switch and barriers	2	2	
2	Clean exposed switch contacts with a multi-purpose precision lubricant before lubricating	2	NA	
3	Wipe contact surfaces with a lint-free cleaning cloth	2	NA	
4	Wipe contact surfaces with a noncorrosive cleaning agent	NA	2	
5	Clean insulators	NA	2	

NA: Not applicable.

*Types specified in accordance with Section 8.3, as follows: Type 1 = online standard test; Type 1A = online enhanced test; Type 2 = offline standard test; Type 2A = offline enhanced test.

17.3.3* Lubrication.

Switches shall be lubricated in accordance with Table 17.3.3 and the manufacturer's published instructions.

Table 17.3.3 Switch Lubrication

<u>No.</u>	<u>Task</u>	<u>Test Type*</u>		<u>Notes</u>
		<u>1000 V or Less</u>	<u>Greater than 1000 V</u>	
1	Apply a thin coating of conductive lubricant to exposed switch contacts.	2	NA	Enclosed and dead-front (safety) switches do not require lubrication.
2	Apply nonconductive lubricant as needed to mechanism parts as specified by the manufacturer.	2	NA	
3	Apply conductive lubricant to pivot points, as well as moving and sliding surfaces.	NA	2	

NA: Not applicable.

*Types specified in accordance with Section 8.3, as follows: 1 = online standard test, 1A = online enhanced test, 2 = offline standard test, 2A = offline enhanced test.

17.3.4 Mechanical Servicing.

Switches shall be mechanically serviced in accordance with Table 17.3.4.

Table 17.3.4 Switch Mechanical Servicing

<u>No.</u>	<u>Task</u>	<u>Test Type*</u>		<u>Notes</u>
		<u>1000 V or Less</u>	<u>Greater than 1000 V</u>	
1	If accessible, verify main blade alignment, penetration, travel stops, and mechanical operation	2	2	
2	Check all accessible electrical hardware connections	2	2	See Chapter 7.
3	Operate the switch at least three times to work the lubricant between the contacts	2	NA	
4	Verify operation and alignment of mechanical interlocks	2	2	
5	Verify the contact pressure is within specification using a force gauge or other device that measures forces	NA	2A	
6	With the door closed and latched, close and open the switch at least three times to confirm the switch and operator lever is operating; view switch position through the window after each operation, where available; when open, verify that switch blades have cleared the arc chutes; when closed, verify that the switch blades are inside the arc chutes and vertical; if they are not, perform alignment adjustments per the manufacturer's instructions	NA	2	

NA: Not applicable.

*Types specified in accordance with Section 8.3, as follows: Type 1 = online standard test; Type 1A = online enhanced test; Type 2 = offline standard test; Type 2A = offline enhanced test.

17.3.5 Electrical Testing.

Switches shall be electrically tested in accordance with Table 17.3.5.

Table 17.3.5 Switch Electrical Tests

<u>No.</u>	<u>Task</u>	<u>Test Type*</u>		<u>Notes</u>
		<u>1000 V or Less</u>	<u>Greater than 1000 V</u>	
1	Perform infrared thermography	1A	1	
2	Measure contact resistance of each switching pole	2A	2	
3	Perform insulation-resistance tests, phase-to-phase and phase-to-ground with switch closed and across each open pole	2A	2	
4	Functional tests only for switches with motor operators:			
4A	Verify control power for close and trip functions	1 or 2	1 or 2	
4B	Verify the electrical operation of switch	1 or 2	1 or 2	
4C	Perform trip and close tests	1 or 2	1 or 2	
4D	Verify operation of the switch from local switches or terminal blocks	1 or 2	1 or 2	
5	Functional tests only for switches with shunt trip capabilities	1 or 2	1 or 2	
6	Measure the resistance between the line and load terminal pads on each phase	NA	2	
7	Verify operation of space heaters, if equipped	NA	2	
8	Perform overpotential test one pole at a time with the other poles and structure grounded	NA	2A	
9	Perform overpotential test on control wiring	NA	2A	WARNING: Do not perform this test on wiring connected to solid-state components.
10	Test arc reduction technology in accordance with the manufacturer's instructions	2	2	

NA: Not applicable.

*Types specified in accordance with Section 8.3, as follows: Type 1 = online standard test; Type 1A = online enhanced test; Type 2 = offline standard test; Type 2A = offline enhanced test.

17.3.6 Special. (Reserved)**Additional Proposed Changes**

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
------------------	--------------------	-----------------

70B_CN4.pdf 70B_CN4

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 4 appeared in the First Draft Report on First Revision No. 71, 72 and 73.

The Correlating Committee directs the Technical Committee for 70B to review Section 17.3.4 and the phrase “at least”, in accordance with the NFPA Manual of Style Section 4.2.5.

Related Item

- First Revision No. 71 • First Revision No. 72 • First Revision No. 73

Submitter Information Verification

Submitter Full Name: CC Notes
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Fri Jan 03 16:30:07 EST 2025
Committee: EEM-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: [SR-41-NFPA 70B-2025](#)
Statement: Re phased the tasks to include the required language in the statement per the NFPA Manual of Style 4.2.5 for maximum and minimum limits.



Public Comment No. 30-NFPA 70B-2025 [Section No. 22.3.6.1]

22.3.6.1 * – Maintenance Program:

In addition to the required inspection, servicing, and testing requirements in this chapter, the EMP shall include the following elements:

- (1) **Replacement Options:** Criteria for determining group or spot replacement options to maintain the required illuminance levels
- (2) **Repair and replacement strategy**
- (3) **Illumination Levels:** Assessment of illuminance levels

Statement of Problem and Substantiation for Public Comment

Reason for change:

Enable single or short phrase reference for field speak and checklist use.

Related Item

- None

Submitter Information Verification

Submitter Full Name: Andrew Salvatore

Organization: Carr & Duff, LLC

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 14:54:57 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected

Resolution: The proposed changes do not offer any technical clarity, the unusual formatting does not match the rest of the Standard and conflicts with editorial style of Chapter 14 of the NFPA Manual of Style.



Public Comment No. 32-NFPA 70B-2025 [Section No. 32.1]

32.1 Scope.

32.1.1

This chapter identifies maintenance requirements and applies to all battery energy storage systems (ESS) having a capacity greater than 3.6 MJ (1 kWh) that could be stand-alone or interactive with other electric power production sources. These systems are primarily intended to store and provide energy during normal operating conditions. This chapter does apply to flow batteries and electric double layer capacitors.

32.1.2*

This chapter does not apply to the following:

- (1) Stationary standby batteries that meet the requirements of Chapter 36 and are comprised of lead-acid ~~or nickel-cadmium (NiCd) cells~~
- (2) ~~Uninterruptible power supplies (UPS)~~
- (3) ~~Standby battery systems for substation or switchgear control power~~
- (4) ~~Batteries for telecommunications backup power~~
- (5) or Aqueous alkaline chemistries (Ni-Cd, Ni-Zn, Ni-Fe, and ZnMnO2) cells
- (6) Flywheels

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
70B_Scope_Graphic.PNG	This graphic shows the inconsistencies between the scope of chapters 32 and 36	

Statement of Problem and Substantiation for Public Comment

There is a significant issue between the scopes of chapters 32 and 36. See attached graphic. The original intent was for Chapter 36 to be only for lead-acid and NiCd standby applications. Chapter 32 was to be for all other chemistries and applications. However, several exceptions were added to the scope of 32 that created a situation where neither chapter would apply to many situations. Also, this change also clarifies the flywheels do not apply, but flow batteries and electric double-layer capacitors do. The last three exceptions in clause 32.1.2 create the confusion. These three exceptions describe stationary standby applications, which are covered by the first exception. The problem is the last three exceptions will direct users with Li-ion (for example) batteries in stationary standby applications away from this chapter (32) but chapter 36 would not apply because they are covered in the chemistry exclusion in the scope of chapter 36. Furthermore, chapter 32 was mainly written around Li-ion batteries, so it does not make sense that any application using Li-ion batteries would be directed away from chapter 32. There are several chemistries that are similar to nickel-cadmium (NiCd) and have similar maintenance requirements. From a safety perspective, NFPA 855 has grouped these chemistries together in the second revision of the 2026 revision. The codes working group of the IEEE PES Energy Storage and Stationary Battery Committee developed these recommended changes.

Related Public Comments for This Document

<u>Related Comment</u>	<u>Relationship</u>
Public Comment No. 31-NFPA 70B-2025 [Section No. 36.1]	

Related Item

- PI 255

Submitter Information Verification

Submitter Full Name: William Cantor

Organization: TPI Corporation

Affiliation: IEEE IAS/PES JTCC

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 15:42:51 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-13-NFPA 70B-2025 Electric double-layer capacitors are not “battery” energy storage systems that are covered by Chapter 32 and no maintenance tasks have been developed for them. The Chapter could be renamed “Energy storage system” and separate maintenance tasks developed for electric double-layer capacitors. The standard does not contain any information on the maintenance of flywheels which may confuse readers if called out.

Statement: The scope is clarified that flow batteries are included in this maintenance chapter. Specific common applications of stationary battery applications are listed to assist the reader to the appropriate maintenance chapter.

3.3.55 * Stationary Standby Battery.

A battery that spends the majority of the time on continuous float charge or in a high state of charge, in readiness for a discharge event.

A.3.3.55 Stationary Standby Battery.

Uninterruptible power supply (UPS) batteries fall under this definition.

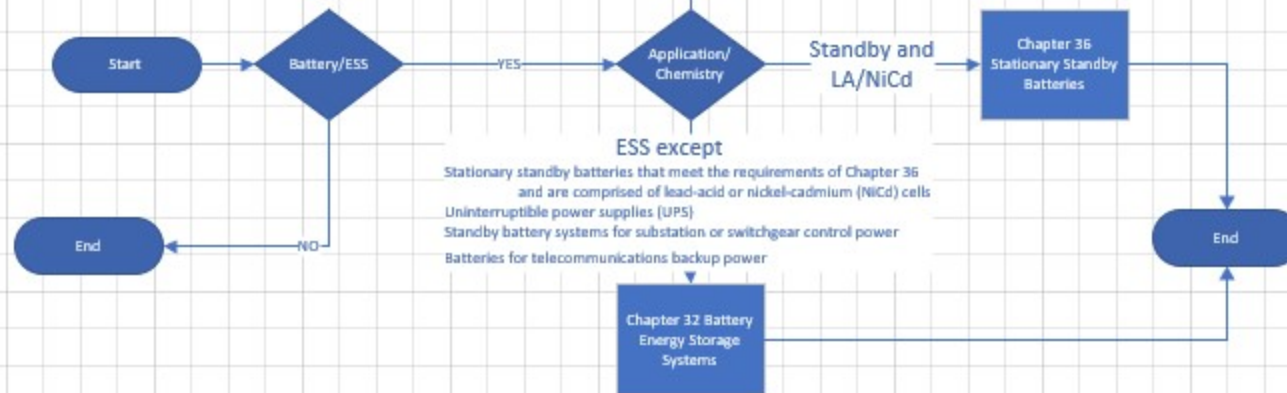
????????????????
????????????????

These applications non- LA or NiCd

Uninterruptible power supplies (UPS)
Standby battery systems for substation or switchgear control power
Batteries for telecommunications backup power

	32	36
Li UPS	NO	NO
Solar LA (48V)	?	?
House Li	?	NO
LA Grid	YES	NO

NFPA 70B 2023





Public Comment No. 38-NFPA 70B-2025 [Section No. 32.2]

32.2 Frequency of Maintenance.

The periodic maintenance procedures in Section 32.3 shall be performed in accordance with the frequencies in Chapter 9, unless otherwise specified in Table 32.2.

Table 32.2 Maintenance Intervals

<u>Test to be Performed</u>	<u>Equipment Condition Assessment</u>			<u>Notes</u>
	<u>Condition 1</u>	<u>Condition 2</u>	<u>Condition 3</u>	
Visual	12 months	12 months	1 month	When batteries are accessible, see Section 36.2 for specific battery technology and maintenance test intervals.
Connection resistances	Electrical - all but battery performance	12 months	12 months	1 month -
Battery management system data and associated alarms	12 months	12 months	1 month	-
Battery Electrical - Battery performance testing	36 months	36 months	12 months	-

Statement of Problem and Substantiation for Public Comment

The interval tables have been modified to be consistent with the categories in the chapter and consistent with the categories for the maintenance intervals in chapter 9. The frequencies for the various chemistries have been updated to be consistent with IEEE 2962 (soon to be published). The codes working group of the IEEE PES Energy Storage and Stationary Battery Committee developed these changes based on the aforementioned international IEEE document. The note was removed because chapter 36 only applies to lead-acid and aqueous batteries.

Related Public Comments for This Document

<u>Related Comment</u>	<u>Relationship</u>
Public Comment No. 20-NFPA 70B-2025 [Section No. 36.2]	
<u>Related Item</u>	
• PI 256	

Submitter Information Verification

Submitter Full Name: William Cantor
Organization: TPI Corporation
Affiliation: IEEE IAS/PES JTCC
Street Address:

City:**State:****Zip:****Submittal Date:** Fri Jan 03 17:08:41 EST 2025**Committee:** EEM-AAA

Committee Statement

Committee Action: Rejected but see related SR**Resolution:** [SR-14-NFPA 70B-2025](#)**Statement:** The maintenance intervals in Table 32.2 have been updated and aligned with IEEE PES Energy Storage and Stationary Battery Committee developed changes in IEEE 2962 and formulated consistently with other equipment chapters.



Public Comment No. 31-NFPA 70B-2025 [Section No. 36.1]

36.1* Scope.

This chapter identifies maintenance requirements for all stationary installations of storage stationary standby batteries comprised of lead-acid or ~~nickel-cadmium (NiCd)~~ or aqueous alkaline chemistries cells.

Informational note: A queous alkaline chemistries include Ni-Cd, Ni-Zn, Ni-Fe, and ZnMnO2.

Statement of Problem and Substantiation for Public Comment

There are several chemistries that are similar to nickel-cadmium (NiCd) and have similar maintenance requirements. From a safety perspective, NFPA 855 has grouped these chemistries together in the second revision of the 2026 revision. The codes working group of the IEEE PES Energy Storage and Stationary Battery Committee developed these recommended changes.

Related Public Comments for This Document

<u>Related Comment</u>	<u>Relationship</u>
<u>Public Comment No. 32-NFPA 70B-2025 [Section No. 32.1]</u>	

Related Item

- PI 256

Submitter Information Verification

Submitter Full Name: William Cantor
Organization: TPI Corporation
Affiliation: IEEE IAS/PES JTCC
Street Address:
City:
State:
Zip:
Submittal Date: Fri Jan 03 15:14:57 EST 2025
Committee: EEM-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-16-NFPA 70B-2025
Statement: NFPA 855 has categorized several chemistries similar to nickel-cadmium (NiCd) under aqueous alkaline chemistries, which share similar maintenance requirements.



Public Comment No. 20-NFPA 70B-2025 [Section No. 36.2]

36.2 Frequency of Maintenance.

The periodic maintenance procedures in Section 36.3 shall be performed in accordance with the frequencies in Chapter 9, unless otherwise specified in Table 36.2.

Table 36.2 Maintenance Intervals

<u>Battery Technology</u>	<u>Test to be Performed</u>	<u>Equipment Condition Assessment</u>			
		<u>Condition 1</u>	<u>Condition 2</u>	<u>Condition 3</u>	<u>Notes</u>
Vented lead-acid	Overall float voltage	3 months	3 months	4 months	-
	- Visual inspections		12 months	12 months	1 month -
	- Electrolyte levels	3 months	3 months	4 months	-
	- Ambient temperature	3 months	3 months	4 months	-
	- Float current	3 months	3 months	4 months	-
	- Individual cell/unit float voltages	12 months	12 months	4 months	-
	- Representative cell temperatures		Electrical-Cell/Unit Voltages	12 months	12 months 1 month
	Electrical - Connections	12 months	12 months	1 month	
	Electrical - Performance Testing	60 months	60 months	12 months	
	Electrical - all other items	3 months	3 months	1 month	-
	- Inspect electrical connection for high resistance	12 months	12 months	4 months	-
	- Performance testing	60 months	60 months	12 months	-
Valve-regulated lead-acid	Overall float voltage	4 months	4 months	4 months	- Visual inspections 12 months 4 months
	- Ambient temperature		3 months	3 months	4 months -
	- Float				
	- Electrical - overall voltage and float current	1 month	1 month	1 month	-
	- Ohmic testing	3 months	3 months	4 months	-
-	Individual cell/unit float voltages	3 months	3 months	4 months	-

		<u>Equipment Condition Assessment</u>			
<u>Battery Technology</u>	<u>Test to be Performed</u>	<u>Condition 1</u>	<u>Condition 2</u>	<u>Condition 3</u>	<u>Notes</u>
-	Representative cell temperatures		<u>Electrical - Connections</u>	<u>12 months</u>	<u>12 months</u> <u>1 month</u>
	<u>Electrical - Performance Testing</u>	<u>24 months</u>	<u>24 months</u>	<u>12 months</u>	
	<u>Electrical - all other items</u>	3 months	3 months	1 month	-
-	Inspect electrical connection for high resistance	12 months	12 months	1 month	-
-	Performance testing	24 months	24 months	12 months	-
Ni-Cad	Overall float voltage	3 months	3 months	1 month	-
-	Visual inspections		12 months	12 months	1 month -
-	Electrolyte levels	3 months	3 months	1 month	-
-	Ambient temperature	3 months	3 months	1 month	-
-	Float current	3 months	3 months	1 month	-
-	Individual cell/unit float voltages	12 months	12 months	1 month	-
-	Representative cell temperatures		<u>Electrical - Cell/Unit Voltages</u>	<u>12 months</u>	<u>12 months</u> <u>1 month</u>
	<u>Electrical - Connections</u>	<u>12 months</u>	<u>12 months</u>	<u>1 month</u>	
	<u>Electrical - Performance Testing</u>	<u>60 months</u>	<u>60 months</u>	<u>12 months</u>	
	<u>Electrical - all other items</u>	3 months	3 months	1 month	-
-	Inspect electrical connection for high resistance	12 months	12 months	1 month	-
-	Performance testing	60 months	60 months	12 months	-

Statement of Problem and Substantiation for Public Comment

The interval tables have been modified to be consistent with the categories in the chapter and consistent with the categories for the maintenance intervals in chapter 9. The frequencies for the various chemistries have been updated to be consistent with IEEE 450 (IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications), IEEE 1188 (IEEE Recommended Practice for Maintenance, Testing, and Replacement of Valve-Regulated Lead-Acid (VRLA) Batteries for Stationary Applications), and IEEE 1106 (IEEE Recommended Practice for Installation, Maintenance, Testing, and Replacement of Vented Nickel-Cadmium Batteries for Stationary Applications). The codes working group of the IEEE PES Energy Storage and Stationary Battery Committee developed these changes based on the aforementioned international IEEE documents.

Related Public Comments for This Document

<u>Related Comment</u>	<u>Relationship</u>
<u>Public Comment No. 38-NFPA 70B-2025 [Section No. 32.2]</u>	
<u>Public Comment No. 39-NFPA 70B-2025 [Section No. 36.3.5]</u>	
<u>Related Item</u>	
• PI 256	

Submitter Information Verification

Submitter Full Name: William Cantor
Organization: TPI Corporation
Affiliation: IEEE IAS/PES JTCC
Street Address:
City:
State:
Zip:
Submittal Date: Fri Jan 03 12:08:48 EST 2025
Committee: EEM-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-17-NFPA 70B-2025
Statement: The maintenance intervals in Table 36.2 have been updated and aligned with IEEE PES Energy Storage and Stationary Battery Committee developed changes with IEEE 450, IEEE 1188, and IEEE 1106 and formulated consistently with other equipment chapters.



Public Comment No. 39-NFPA 70B-2025 [Section No. 36.3.5]

36.3.5* Electrical Testing.

Stationary standby batteries and their associated equipment shall be electrically tested in accordance with Table 36.3.5.

Table 36.3.5 Stationary Standby Battery Electrical Tests

<u>No.</u>	<u>Task</u>	<u>Test Type*</u>	<u>Notes</u>
1	Overall float voltage	1	Measured at the battery and verified annually to be in accordance with the battery manufacturer's instructions.
2	Measure cell temperature	1	-
3	Specific gravity	1A	No less than 10% of the units in the string(s).
4	Ohmic testing <u>VRLA only</u>	1A	Resistance, impedance, or conductance.
5	Inspect electrical connection for high resistance	1 or 1A	See Section 7.2.
6	Performance testing	1	-
7	Thermal imaging	1	Under full load of performance testing.
8	Float current	1	-
9	Individual cell/unit float voltage	1	Record voltage measurements on individual cells or units to two decimal places.
10	<u>Overall float voltage</u>	<u>1</u>	<u>Measured at the battery and verified to be in accordance with the battery manufacturer's instructions.</u>

*Types specified in accordance with Section 8.3, as follows: Type 1 = online standard test; Type 1A = online enhanced test; Type 2 = offline standard test; Type 2A = offline enhanced test.

Statement of Problem and Substantiation for Public Comment

The electrical testing for the various chemistries have been updated to be consistent with IEEE 450 (IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications), IEEE 1188 (IEEE Recommended Practice for Maintenance, Testing, and Replacement of Valve-Regulated Lead-Acid (VRLA) Batteries for Stationary Applications), and IEEE 1106 (IEEE Recommended Practice for Installation, Maintenance, Testing, and Replacement of Vented Nickel-Cadmium Batteries for Stationary Applications). The codes working group of the IEEE PES Energy Storage and Stationary Battery Committee developed these changes based on the aforementioned international IEEE documents.

Related Public Comments for This Document

<u>Related Comment</u>	<u>Relationship</u>
Public Comment No. 20-NFPA 70B-2025 [Section No. 36.2]	
<u>Related Item</u>	
• PI 259	

Submitter Information Verification

Submitter Full Name: William Cantor
Organization: TPI Corporation
Affiliation: IEEE IAS/PES JTCC
Street Address:
City:
State:
Zip:
Submittal Date: Fri Jan 03 17:21:43 EST 2025
Committee: EEM-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-19-NFPA 70B-2025

Statement: The maintenance interval was removed from the notes section to prevent conflict with the prescribed maintenance intervals of Table 9.3. Ohmic testing is only applicable to VRLA type batteries which is clarified in the task list.

Appropriate charging language has been added to the tasks, providing clear direction to the user on the requirements without changing the technical contents of the table.



Public Comment No. 33-NFPA 70B-2025 [Section No. A.9.1.1.3]

A.9.1.1.3

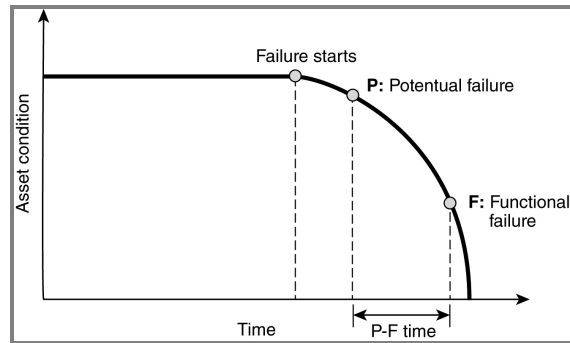
A P–F curve (see Figure A.9.1.1.3) is a graph that shows the health of equipment over time to identify the interval between potential failure and functional failure.

Potential failure indicates the detectable point at equipment is starting to deteriorate and fail.

Functional failure is the point at which equipment has reached its useful limit and is no longer operational.

Even though these failure points might take a very long time to occur, the P–F curve characterizes the behavior of failure and the time between the two points. The time between the two points is the P–F interval. To prevent a failure, the applicable time-based preventive maintenance interval needs to be half of the P–F interval or less. This method also allows for the maximum usage that can be gained from the equipment.

Figure A.9.1.1.3 P–F Curve.



Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
70B_CN7.pdf	70B_CN7	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 7 appeared in the First Draft Report.

At a minimum, editors should correct the spelling of the word “potential” in the diagram, however we ask the Technical Committee for 70B to confirm what is meant and ensure they’re using the proper term in the diagram. Based on the text of A.9.1.1.3, it appears it should be editorially corrected to “potential”.

Related Item

- Correlating Committee Note No. 7

Submitter Information Verification

Submitter Full Name: CC Notes
Organization: NEC Correlating Committee
Street Address:

City:**State:****Zip:****Submittal Date:** Fri Jan 03 16:23:26 EST 2025**Committee:** EEM-AAA

Committee Statement

Committee Action: Rejected but see related SR**Resolution:** [SR-20-NFPA 70B-2025](#)**Statement:** Potential is spelled as "Potentual" in the diagram and is corrected.



Public Comment No. 11-NFPA 70B-2025 [Section No. M.1.2.6]

M.1.2.6 NEMA Publications.

National Electrical Manufacturers Association, 1300 North 17th Street, Suite 900, Arlington, VA 22209.

NEMA AB-4, *Guidelines for Inspection and Preventive Maintenance of Molded-Case Circuit Breakers Used in Commercial and Industrial Applications*, 2023.

NEMA BU1.1, *General Instructions for Handling, Installation, Operation and Maintenance of Busway Rated 600 V or Less*, 2010. Publication NEMA BS 31050-2010 (R2024) reaffirms and supersedes BU 1.1-2010.

ANSI/NEMA C84.1, *American National Standard for Electric Power Systems and Equipment — Voltage Ratings (60 Hz)*, 2020.

NEMA GD 1, *Evaluating Water-Damaged Electrical Equipment*, 2019.

NEMA GD 2, *Evaluating Fire- and Heat-Damaged Electrical Equipment*, 2016.

NEMA ICS 2.3, *Instructions for the Handling, Installation, Operation and Maintenance of Motor Control Centers Rated Not More Than 600 V*, 2019.

NEMA KS-3, *Guidelines for Inspection and Preventive Maintenance of Switches Used in Commercial and Industrial Applications*, 2023.

ANSI/NEMA WD 6, *Wiring Devices — Dimensional Specifications*, 2021.

Statement of Problem and Substantiation for Public Comment

This proposal clarifies that a NEMA BS 31050-2010 (R2024) reaffirms and supersedes BU 1.1-2010. Both document numbers are retained to ease the transition for users of NFPA 70B.

Related Item

- FR143

Submitter Information Verification

Submitter Full Name: Rodney West

Organization: Schneider Electric

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 03 09:20:07 EST 2025

Committee: EEM-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-21-NFPA 70B-2025 Publication NEMA BS 31050-2010 (R2024) is not referenced in NFPA 70B.

Statement: The NEMA address has been corrected and a document referenced in the annex has been added.