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Why Electrical Preventative Maintenance Matters More Than Ever

Understanding The Financial Impact of Non-Compliance in Critical Electrical Systems



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Executive Summary

Non-compliance isn't just risky—it's expensive. And the rules have changed.

Electrical systems are critical to operations — but too often, they're overlooked. Inconsistent maintenance, outdated equipment, and missing documentation can lead to costly consequences: fires, arc flashes, downtime, fines, denied insurance claims, and lawsuits.

In 2023, NFPA 70B — the industry's key electrical maintenance standard — was formally updated.

What was once guidance is now a requirement. The language shifted from “*should*” to “*shall*”, signaling that documented, risk-based programs are now expected across all industries.

For today's facility leaders, maintenance teams, and risk officers, the question is no longer “*Should we do this?*” but “*Can we afford **not** to?*”

This paper provides a practical guide to what's changed, what's required, and what steps you can take to stay compliant, reduce risk, and protect uptime.

This paper explains:

- ✔ What NFPA 70B is, why it matters
- ✔ What's required under the updated standard
- ✔ The financial, legal, and operational impact of non-compliance
- ✔ Practical steps to help your team strengthen compliance, reduce risk and protect uptime

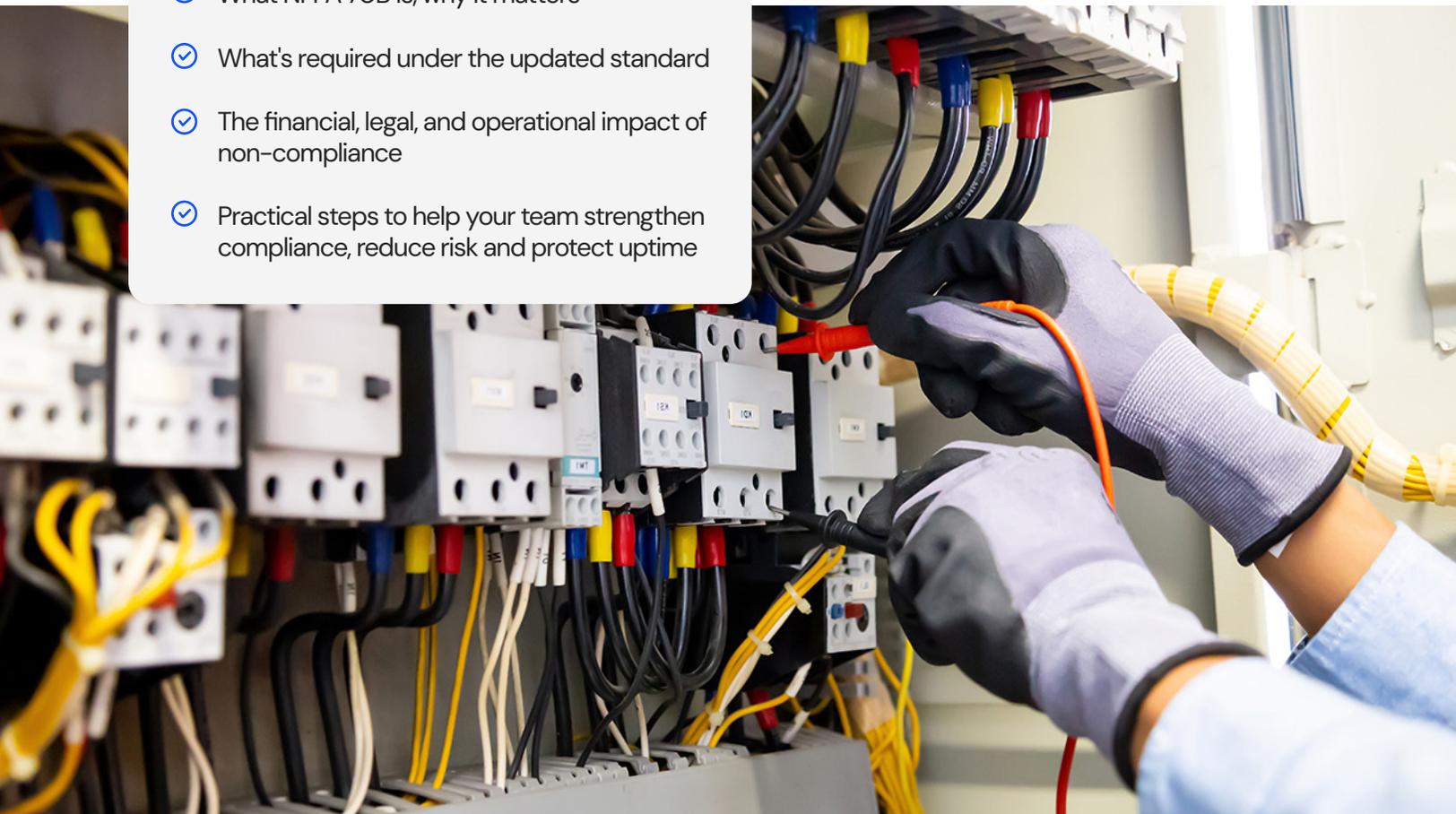


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Understanding NFPA 70B and Why It's Changing How Facilities Manage Risk

The National Fire Protection Association (NFPA) is a U.S.-based nonprofit that has defined electrical safety codes for over 100 years. Best known for the National Electrical Code (NFPA 70), the NFPA also publishes 70B — the go-to standard for maintaining electrical systems.

What is NFPA 70B?

NFPA 70B was created to guide how electrical equipment is maintained in commercial and industrial facilities. It helps reduce the risk of costly failures, fire, and injury by defining best practices for inspection, testing, and upkeep.

Why it Matters

Previously considered a recommended practice, **NFPA 70B became a formal ANSI-accredited standard in 2023**. This shift means compliance is now an expectation, not a suggestion — and regulators, insurers, and facility owners are treating it as such.

What NFPA 70B Requires from Facility Leaders

To comply with NFPA 70B, your facility needs a structured, documented Electrical Maintenance Plan. That includes:

- Risk-based equipment classification**
Group equipment by criticality, environment and condition to determine how often it needs to be serviced.
- Record keeping and documentation**
Including test results, technician names, and dates of service.
- Defined maintenance intervals**
Based on environment, usage, and risk level.
- Service based on condition and priority**
Adjust maintenance activities based on equipment condition and operational importance.
- Diagnostics and testing**
Including infrared thermography, torque checks, insulation testing, and visual inspections.

The goal: Catch problems before they become failures, extend asset life, and show proof of compliance to insurers and regulators.



The Role of NFPA 70B and Related Regulatory Standards

How OSHA Uses NFPA 70B

While NFPA 70B isn't law, it's widely referenced by **OSHA** (Occupational Safety and Health Administration) when investigating electrical incidents. OSHA's **29 CFR 1910** standards require employers to identify electrical hazards and ensure safe work practices — and NFPA 70B is a key benchmark used in those evaluations.

What Insurers May Ask For

More insurers are requiring NFPA 70B compliance as a condition for coverage. Following an incident, carriers may request:

- A documented electrical maintenance plan
- Records of inspections, test results, and thermal scans (including dates and technician names)
- Written corrective actions and service follow-up

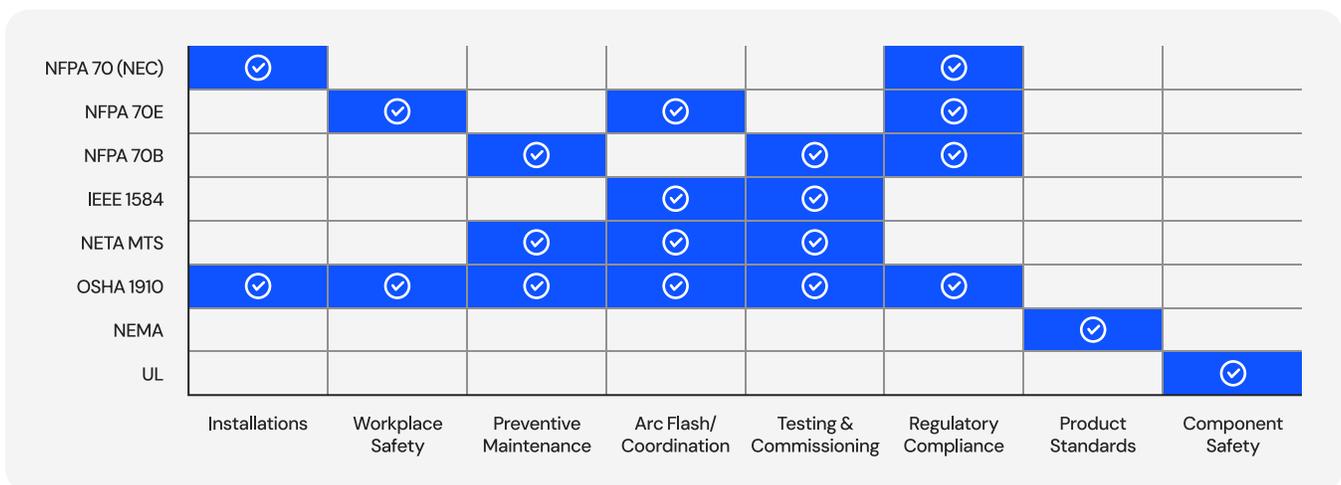
If documentation is missing or standards weren't followed, **claims may be denied.**^{[6][9]} **Up-to-date records are just as critical as the maintenance itself.**

Other Standards That Influence Compliance

NFPA 70B doesn't operate in isolation. It works alongside a network of other safety and technical standards — many of which are referenced by regulators, insurers, and engineers. Together, they create a full picture of electrical system safety and reliability:

NFPA 70 (NEC)	National Electrical Code — defines how systems must be installed to meet code.
NFPA 70E	Safety practices for personnel working on or near energized electrical systems.
IEEE Standards	Technical guidelines for system design and analysis, including arc flash modeling (IEEE 1584) and power system studies (IEEE 242).
NEMA (National Electrical Manufacturers Association)	Defines equipment standards, such as enclosure types (e.g. NEMA 1, NEMA 4X).
NETA (InterNational Electrical Testing Association)	Defines maintenance and acceptance testing standards, and certifies test technicians.
UL (Underwriters Laboratories)	Certifies and tests electrical components for product safety and performance.

Visual Overview: U.S. Electrical Standards Vs. Focus Areas



What Equipment Does NFPA 70B Cover?

NFPA 70B applies to most critical electrical systems in industrial and commercial facilities. The standard outlines how and when these components should be inspected, tested, maintained, and documented.



Key equipment covered under NFPA 70B includes:

- Transformers
- Circuit breakers
- Switchgear and switchboards
- Panelboards and distribution boards
- Busways and bus ducts
- Grounding and bonding systems
- Automatic transfer switches
- Protective relays and fuses

Why it Matters: inspect the right equipment, at the right time

Unmaintained equipment increases the risk of fire, failure, and downtime.

- **High-risk equipment** (like mission-critical circuit breakers) must be inspected more often
- **Lower-risk components** (like some distribution panels) still require annual attention
- **Missed maintenance or poor documentation** can lead to fines, outages, and denied insurance claims

Maintaining the right equipment on the right schedule is one of the most effective ways to stay compliant — and avoid preventable incidents.

Why Facilities Fail Compliance

Electrical failures often build up from multiple small oversights, not a single mistake. Without structured maintenance, small issues go undetected, teams lose accountability, and risks escalate quietly over time.

Top contributors to non-compliance:

1. No formal maintenance plan

Without a written Electrical Maintenance Plan, maintenance becomes reactive, inconsistent, and easy to overlook.

2. Poor documentation

If maintenance isn't logged, there's no proof it happened, leaving facilities vulnerable during audits or claims.

3. Unclear maintenance ownership

When roles and responsibilities aren't clearly defined, maintenance tasks can be delayed or overlooked. Without clear ownership, it's easy for accountability to break down. A documented plan helps ensure coordination and follow-through.

4. Missed inspections

Key tasks like breaker testing or visual checks are often skipped when there's no defined schedule or accountability.

5. Limited diagnostics

Skipping thermography, torque testing, or load studies increases the chance of undetected faults and equipment stress.

Consequences of non-compliance:

- **Arc flashes or electrical fires** causing injury and property loss — the second leading cause of industrial fires.^{[1][2]}
- **Extended outages** halting production and increasing repair costs.
- **OSHA citations** for failing to follow known standards.^{[4][5]}
- **Insurance claim denials** due to missing records.^{[6][9]}
- **Lawsuits and third-party liability** claims after incidents.^{[6][8]}
- **Reputational and indirect costs** relating to customer confidence, investor fallout and employee morale.

Importantly, these consequences often compound or occur at the same time, which can turn a single missed maintenance step into cascading or catastrophic failures.

This is why structured, risk-based maintenance should never be optional — it's essential.

The Financial Fallout of Non-Compliance

The cost of non-compliance extends far beyond fines. Below is a more detailed look of the potential costs non-compliant facilities may face:

Category	Projected Cost
OSHA fines (per violation)	\$15,625–\$156,259 ^{[4][5]}
Property damage (fire/failure)	\$500K–\$10M+ ^{[1][14]}
Workers’ compensation (arc flash)	Avg. \$1.5M+ ^[7]
Insurance claim denial	\$1M–\$10M+ ^{[6][8][9][13]}
Downtime (lost productivity)	\$100K–\$2.4M+ per event ^[12]
Post-incident code upgrades	\$100K–\$1M+ ^[15]
Third-party liability settlements	\$500K–\$10M+ ^[7]
Reputation and trust loss	Long-term impact

Even when maintenance is performed, a **lack of documentation** can still result in non-compliance and denied claims.



Case Example 1

Food Processing Plant Fire – Insurance Claim Denial

Situation

A food processing plant in the Midwest had expanded over the years, adding equipment without upgrading its electrical infrastructure. Several subpanels were overloaded beyond their design limits, and some wiring had been installed in-house without permits. Management knew the system was straining — lights flickered when heavy machinery started — but deferred upgrades due to cost.

One night, an **overloaded circuit sparked a fire**. Oily residue in the area fueled the flames, and the plant's sprinkler system was offline for maintenance. The fire spread rapidly, destroying a large section of the facility.

Findings

The company filed a **property claim for \$10 million in damages and business interruption**. During the **investigation**, the insurer found:

- Circuits lacked proper overcurrent protection
- Non-compliant wiring methods
- Evidence of serious electrical code violations

The insurer cited policy clauses requiring the insured to maintain safety standards and denied the claim, stating the loss was caused by failure to comply with electrical safety codes.

Consequences:

- **\$75,000 fine from OSHA** for fire safety and electrical violations
- **\$10 million in losses** from property damage and business interruption that were denied by insurance
- **Layoffs and near bankruptcy** caused by the uninsured losses and operational downtime

This entire incident could potentially have been prevented with a \$100–200K investment in electrical system maintenance.

Neglecting preventative maintenance can turn manageable fixes into catastrophic losses. Emphasizing the importance of why compliance is critical to protecting people, operations, and financial stability.

Case Example 2

Data Center Downtime – Business Interruption, Liability and Claim Denial

Situation

A regional data center known for its uptime commitments fell behind on maintaining its backup power systems. Protective relays hadn't been recalibrated for years, and no insulation testing program was in place.

One weekend, a short circuit in the main switchboard caused a cascading outage that lasted 12 hours and damaged the data center's own equipment.. Backup generators also failed due to a stuck transfer switch that hadn't been serviced, leaving the facility offline. The outage breached multiple client contracts — including those supporting e-commerce operations — and damaged the data center's own equipment.

Findings

Property insurance covered the physical damage, but denied the business interruption claim, citing that the electrical breakdown was avoidable and not covered without specific equipment breakdown coverage. Several clients sued over losses caused by the outage, leading to a liability settlement through the data center's insurer.

A root cause analysis confirmed that routine maintenance aligned with NFPA 70B would have identified the deteriorating conditions that caused the short circuit.

Consequences:

- **Over \$1 million in business interruption losses** from downtime, customer credits, and repairs
- **\$200,000 in physical damage** to equipment covered via property insurance
- **\$500,000 liability settlement** paid by the insurer to affected clients
- **Reputational harm and contract breaches** that damaged client trust
- **Significant post-incident costs** to upgrade systems and add breakdown coverage

5 Key Takeaways for Facility Teams

1. **NFPA 70B is now a formal standard**, requiring documented, risk-based
2. **Non-compliance has real costs:** injuries, downtime, fines, and denied claims.
3. **Most failures are preventable** with regular testing and maintenance.^{[10][11]}
4. **No documentation = no defense** in audits, claims, or investigations.
5. **Preventative maintenance protects** people, operations, and budgets.

Best Practices to Mitigate Risk and Ensure Compliance

Preventing electrical failures isn't optional — it's mission-critical. Implementing these proven strategies can help your facility reduce risk, protect people, and maintain insurance coverage.

- 1 Implement a formal preventive maintenance program**
 - Follow NFPA 70B for inspection, testing, and servicing of critical equipment.
 - Categorize by criticality/condition; service on risk-based intervals.
 - Maintain detailed records (infrared scans, breaker testing).
 - Annual checks minimum; high-risk equipment every six months.
- 2 Follow NFPA 70E work practices and OSHA safety rules**
 - Only qualified personnel using PPE and lockout/tagout procedures.
 - Conduct training and audits to reduce injury risk and meet OSHA requirements.
- 3 Conduct regular inspections and hazard assessments**
 - Use infrared, ultrasonic, insulation testing and thermographic scans to detect issues early.
 - Correct hazards: frayed wires, overloaded circuits, blocked panels.
 - NFPA 70B requires annual inspections, with more frequent checks for aging systems.
- 4 Upgrade and modernize outdated equipment**
 - Replace aging breakers, panels, or switchgear lacking safety features (arc-flash, ground-fault).
 - NFPA data links older equipment to many industrial fires. Modernizing reduces failures and may lower insurance costs.
- 5 Carry adequate insurance and endorsements**
 - Include equipment breakdown and sufficient business interruption limits.
 - Add ordinance/law coverage for code upgrades and umbrella liability for high-risk operations.

The Bottom Line

Compliance isn't just a safety requirement — it's a competitive advantage. By investing in preventive maintenance and following NFPA and OSHA standards, your facility can avoid costly failures, earn insurer confidence, and protect both people and operations. The cost of staying compliant is always less than the cost of recovering from disaster.

Need a Hand? Start Closing the Gaps with Criticore's Complimentary Risk and Hazard Assessment

Meeting NFPA 70B standards can be complex — especially for facilities with aging infrastructure, limited documentation, or distributed teams. Criticore supports facility leaders with practical, standards-aligned maintenance programs designed to reduce risk and improve system reliability.

How we support your teams



On-site inspection

A qualified electrical technician trained in NFPA 70B and other standards evaluates your facility & equipment firsthand.



Comprehensive assessments

A 16-point checklist of critical system components, paired with infrared thermography to detect hidden faults.



Tailored maintenance plan & execution

Our in-house engineers and technicians develop, implement, and maintain a program tailored to your equipment, risk level, and industry requirements.



Detailed reporting

You get prioritized findings, complete documentation, and reporting that supports audits, insurance reviews, and internal accountability.

Through our group of full-service, engineering-led, non-union electrical services companies, we bring together deep technical expertise, local responsiveness, and national support to help you meet compliance with confidence.

Schedule Your Complimentary Assessment Today

info@criticore.com
(214) 814-4136
criticoregroup.com



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