

# Case Study: NFPA 70B Non-Compliance in a Church Facility

## Executive Summary

This case study examines non-compliance with NFPA 70B Required Practice for Electrical Equipment Maintenance in a historic church located in a suburban community. The church, built in 1960 and expanded in 1990, serves a congregation of 500 members and hosts various community events. An electrical safety audit revealed significant lapses in maintenance practices, posing risks to safety, operational continuity, and property integrity. This case details the issues, consequences, corrective actions, and lessons learned to achieve NFPA 70B compliance.

## Background

The church facility spans 20,000 square feet, including a sanctuary, fellowship hall, classrooms, and administrative offices. Its electrical system supports lighting, sound systems, HVAC, and kitchen equipment for community events. Managed by a volunteer facilities committee with limited oversight from a part-time maintenance worker, the church had no formal electrical maintenance program. NFPA 70B provides guidelines for preventive maintenance to ensure electrical system reliability and safety, critical for a facility hosting large gatherings.

## Issues Identified

A 2024 electrical safety audit, prompted by a minor electrical fire in the fellowship hall, uncovered multiple areas of non-compliance with NFPA 70B:

1. **Absence of a Preventive Maintenance Program:**
  - NFPA 70B recommends a documented maintenance schedule for electrical equipment. The church lacked any formal program, with maintenance limited to ad-hoc repairs after failures.
  - Electrical panels and wiring, some dating back to the 1960s, had not been inspected in over a decade, far exceeding NFPA 70B's recommended intervals.
2. **No Maintenance Records:**
  - NFPA 70B requires detailed records of maintenance activities, including inspections and test results. The church had no documentation, relying on verbal reports from the maintenance worker.
  - This lack of records hindered tracking the condition of aging electrical components, such as the main service panel and sanctuary lighting circuits.
3. **Failure to Conduct Infrared Thermography:**
  - NFPA 70B advises periodic infrared thermography to identify hot spots and potential faults. The church had never performed such scans, increasing the risk of undetected issues, as evidenced by the fellowship hall fire caused by an overheated connection.

#### 4. **Unqualified Maintenance Personnel:**

- The part-time maintenance worker lacked formal electrical training and was unfamiliar with NFPA 70B standards, such as insulation resistance testing or circuit breaker maintenance.
- Volunteers occasionally performed minor electrical work, violating NFPA 70B's requirement for qualified personnel.

#### 5. **Neglected Emergency Systems:**

- The church's emergency lighting and exit sign systems were not tested regularly, as required by NFPA 70B. Several battery-powered emergency lights were found non-functional during the audit.
- The facility lacked a backup generator, and no provisions were made for testing critical systems under load conditions.

## **Consequences of Non-Compliance**

The audit findings led to significant consequences:

- **Safety Hazards:** Unmaintained electrical systems increased the risk of fires, shocks, and arc flashes. The 2024 fellowship hall fire, caused by a loose connection, resulted in \$10,000 in damages and temporary closure of the space.
- **Operational Disruptions:** Frequent electrical issues, such as flickering lights and tripped breakers during services, disrupted worship and community events, eroding congregational confidence.
- **Financial Costs:** Emergency repairs, including the fire-related restoration, cost the church \$15,000 in 2024, far exceeding the cost of preventive maintenance. Insurance premiums also increased due to the fire incident.
- **Regulatory Risks:** Non-compliance with NFPA 70B risked violations of local fire codes, which reference the standard, potentially leading to fines or closure orders from the fire marshal.

## **Corrective Actions Taken**

Following the audit, the church leadership, with support from a hired electrical consultant, implemented corrective measures to align with NFPA 70B:

#### 1. **Establishment of a Preventive Maintenance Program:**

- A maintenance schedule was developed, prioritizing annual inspections of critical systems (e.g., main panel, sanctuary wiring) and biennial checks for less critical components.
- A cloud-based maintenance tracking tool was adopted to schedule and monitor tasks, ensuring consistency.

#### 2. **Improved Record-Keeping:**

- A digital log was created to document all maintenance activities, including inspection dates, test results, and repairs. The system was accessible to the facilities committee and external auditors.

- Historical data on equipment, such as panel specifications, was compiled to support future maintenance.
- 3. **Implementation of Infrared Thermography:**
  - The church contracted an electrical firm to conduct annual thermographic scans. The first scan identified a potential fault in the sanctuary's lighting circuit, which was repaired promptly.
  - Scans were scheduled during low-usage periods to minimize disruption.
- 4. **Training and Qualified Personnel:**
  - The maintenance worker received NFPA 70B-specific training, focusing on safety protocols and basic testing procedures.
  - The church budgeted for a licensed electrician to perform complex tasks, such as circuit breaker testing, ensuring compliance with NFPA 70B's qualified personnel standards.
- 5. **Emergency System Upgrades:**
  - All emergency lighting and exit sign systems were tested and repaired, with monthly checks implemented to verify functionality.
  - The church installed a small backup generator to support critical systems during outages, with quarterly load testing as per NFPA 70B guidelines.

## Outcomes

The corrective actions produced measurable improvements:

- **Enhanced Safety:** No electrical incidents have occurred since the maintenance program was implemented, and the fire risk was significantly reduced.
- **Improved Reliability:** Electrical disruptions during services dropped by 80%, enhancing the worship experience.
- **Cost Efficiency:** Preventive maintenance reduced repair costs by 50%, saving the church approximately \$7,000 annually.
- **Regulatory Compliance:** A follow-up audit in early 2025 confirmed NFPA 70B compliance, satisfying local fire code requirements and stabilizing insurance costs.

## Lessons Learned

- **Proactive Maintenance Saves Resources:** Preventive maintenance is far less costly than emergency repairs and protects against safety risks.
- **Qualified Personnel Are Essential:** Untrained staff or volunteers should not perform electrical work, as it compromises safety and compliance.
- **Documentation Ensures Accountability:** Proper records streamline maintenance and demonstrate compliance during audits.
- **Community Safety Is Paramount:** Churches, as public gathering spaces, must prioritize electrical safety to protect congregants and visitors.

## **Conclusion**

This case study highlights the critical need for NFPA 70B compliance in church facilities, where aging electrical systems and limited resources can exacerbate risks. By implementing a structured maintenance program, training staff, and leveraging professional expertise, the church mitigated hazards, reduced costs, and ensured a safe environment for its community. This serves as a model for other religious institutions to prioritize electrical maintenance and adhere to NFPA 70B standards.