THE TRANSFORMER OWNER'S GUIDE TO NFPA 70B

The Challenges and Benefits to DEVELOPING AN ELECTRICAL MAINTENANCE PROGRAM

NFPA 70B, the National Electrical Code (NEC) Standard for Electrical Equipment Maintenance, sets forth guidelines for the development, implementation, and operation of an Electrical Maintenance Program (EMP). As of January 2023, NFPA 70B transitioned from a recommended practice to being recognized as the *Standard for Electrical Equipment Maintenance*. The transition means the NFPA recommendations on what should be done are now standards for electrical equipment maintenance—setting the stage for OSHA to enforce what must be done.

The changes to NFPA 70B are a major positive for both the reliability of electrical equipment and the safety of those systems. The standards will make for safer workplaces with fewer injuries and increased reliability for the electrical equipment. Yet, many organizations are unprepared to meet the new standard's requirements and lack critical aspects of a required **Electrical Maintenance Program (EMP)**. This is a significant, transformational change from the previous version with far-reaching impacts related to commercial and industrial maintenance, regardless of facility type.

NFPA 70B QUICK FACTS

- It was first published in 1975 to outline recommended electrical maintenance practices.
- Revised as the consensus standard, effective January 16, 2023
- Used in conjunction with NFPA 70 – National Electrical Code® and NFPA 70E – Standard for Electrical Safety in the Workplace®.
- Requires organizations to develop an Electrical Maintenance Program (EMP)
- It is not intended to supersede or duplicate manufacturers' recommendations.
- It can become the basis for many enforceable OSHA practices.
- Insurance companies can often require it as a condition for coverage.

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Developing an **ELECTRICAL MAINTENANCE PROGRAM (EMP)**

Essential to the 2023 NFPA 70B updates is how facilities are now required to have an EMP— a systematic approach to managing the maintenance and upkeep of electrical equipment and systems within an organization. It encompasses a set of policies, procedures, and practices to ensure the safety, reliability, and efficiency of electrical infrastructure. Critical aspects of an EMP include:

- Equipment Assessment
- Inspection, Testing, and Monitoring
- Frequency of Maintenance
- Documentation and Record-Keeping
- Training and Education

Five Common Challenges to Developing an EMP:

1. **Resource Allocation:** Allocating sufficient resources, including personnel, time, and budget, for the development and implementation of an EMP can be challenging for organizations, especially smaller ones with limited resources.

2. **Complexity of Electrical Systems:** Many organizations operate complex electrical systems with diverse equipment, making it challenging to develop a comprehensive maintenance program that addresses the specific needs of each component.

3. **Compliance Monitoring:** Ensuring ongoing compliance with NFPA 70B standards requires continuous monitoring and updates to the maintenance program, which can be resource-intensive and time-consuming.

4. **Technological Advancements:** Rapid advancements in technology and equipment may necessitate frequent updates to maintenance procedures and practices to incorporate new best practices and guidelines.

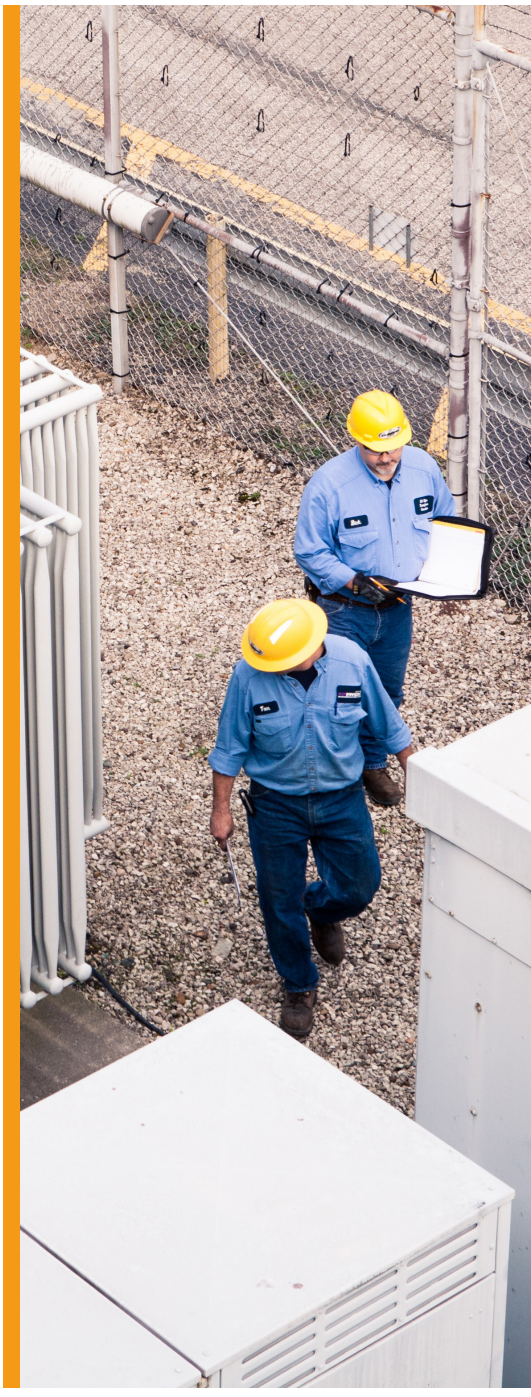
5. **Change Management:** Implementing a new EMP may require significant changes in organizational culture, processes, and workflows, which can meet resistance from employees accustomed to traditional maintenance practices.

How an EMP
BENEFITS TRANSFORMER OWNERS

For more than 58 years, SDMyers has set its sights on helping organizations experience safe, reliable, and low-cost electric power systems. The standardization of NFPA 70B highlights the importance of safety and reliability across the industry in a way that reinforces these efforts. The benefits to an organization's bottom line are real and significant in the following four areas:

- **REDUCING DOWNTIME** that causes loss of operations or disrupts workflow and employee productivity.
- **EXTENDING EQUIPMENT LIFESPAN** with regular and ongoing maintenance practices.
- **MINIMIZING COSTLY REPAIRS** for maintaining all types of electrical equipment, including transformers, circuit breakers, and switchgear.
- **MITIGATING ELECTRICAL HAZARDS** and increasing safety for your personnel, equipment, and property.

Using NFPA 70B as a roadmap helps organizations achieve these results by executing a long-term strategy based on standards, testing, and best practices. This is what we at SDMyers call having a ***MaxLife Philosophy***. The goal is to spend the least in the short term to get the maximum long-term value for your electrical power equipment. We recommend three areas of focus to get started with meeting the requirements of NFPA 70B.



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Three Areas of Focus
TO MAXIMIZE RELIABILITY AND SAFETY

TRANSFORMER MAINTENANCE INTERVALS

One of the most notable changes in the 2023 release of NFPA 70B is the minimum requirements for transformer maintenance intervals. Previously, these were recommendations, and organizations could follow their own maintenance schedules. By establishing 70B as a standard, the NFPA indicates that adherence to regular maintenance intervals as outlined in the standard is necessary for maintaining electrical equipment's safety, reliability, and performance.

FREQUENCY OF MAINTENANCE		
EQUIPMENT TYPE	**SCOPE OF WORK**	**MINIMUM INTERVALS**
All Equipment	Infrared Thermography	12 months*
Transformers	Oil Sampling	12 months*
	Visual Inspection	12 months*
	Cleaning	60 months*
	Mechanical Servicing	60 months*
	Electrical Testing	60 months*

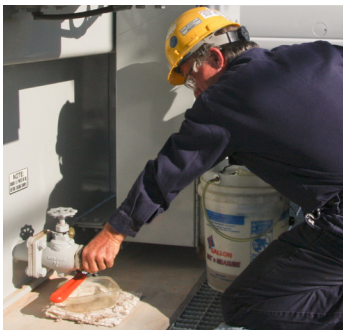
*Conditions and interval frequencies are based off NFPA 70B (9.3.1 Equipment Condition Assessment) and can be more frequent based on condition assessment. SDMyers does not classify equipment based off the conditions outlined in NFPA 70B; equipment condition assessments should be completed by the customer.

INFRARED THERMOGRAPHY

Infrared (IR) thermography is a non-intrusive preventative maintenance inspection technique used to detect patterns and differences in thermal radiation. It is a valuable tool for detecting potential issues in electrical equipment before they become critical. Combining infrared thermography with liquid sampling and DGA testing dramatically improves the accuracy of diagnosing potential issues as early as possible. Any temperature anomalies detected by the thermography can be cross-referenced with the results of the liquid analysis to provide a more complete assessment of the transformer's health. By requiring annual IR scanning for all electrical equipment, the NFPA aims to improve safety and reliability, minimizing the risk of equipment failures, fires, or other hazards associated with poorly maintained electrical systems.

ANNUAL LIQUID SAMPLING AND TESTING

The dielectric insulating liquid inside a transformer contains vital information about its health. Regular testing of insulating liquid can tell transformer owners what's going on inside and provide trending data. The standardization of NFPA 70B means annual liquid sampling and testing is now a minimum requirement for transformer maintenance. Additionally, the equipment's age, condition, and criticality may require more frequent testing based on the new standardization. Testing liquid regularly provides critical data to pinpoint issues, diagnose potential problems, and prevent failures from happening.



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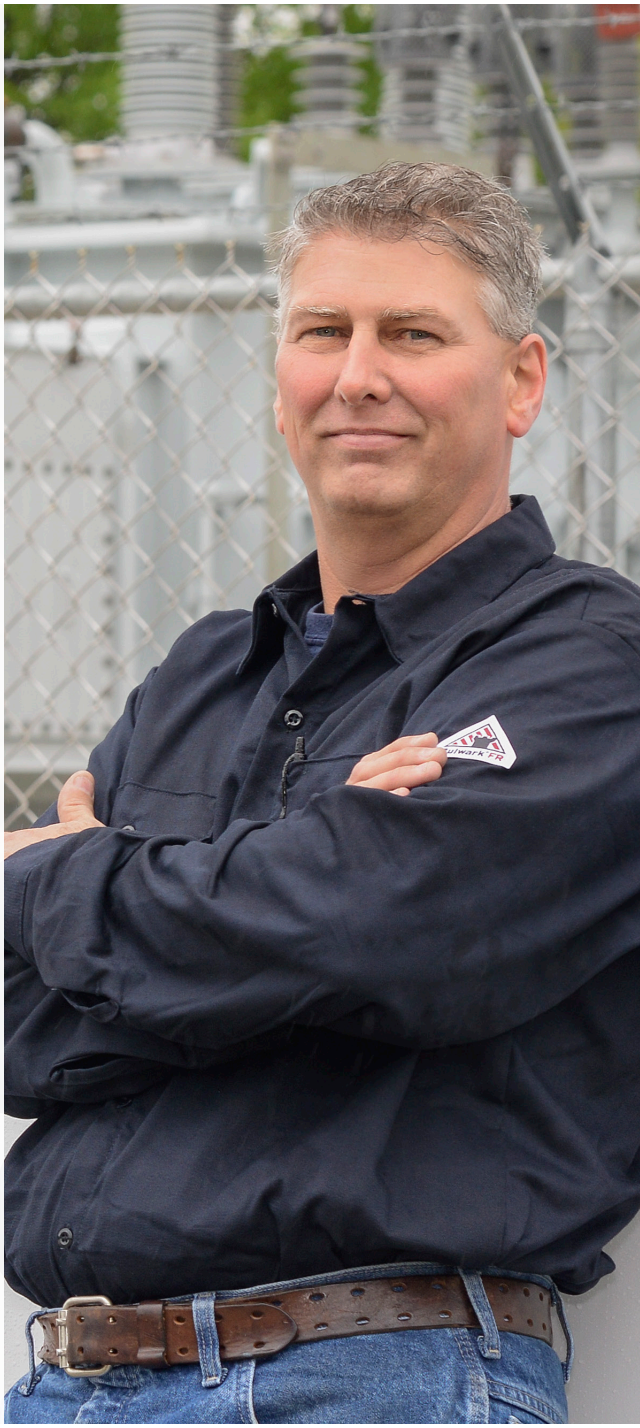
SDMyers Can Help
SIMPLIFY TRANSFORMER MAINTENANCE

SDMyers is a pioneer in transformer maintenance and service. For nearly 60 years, we have helped customers develop and implement preventive maintenance strategies and transformer maintenance best practices to increase reliability, improve safety, and maximize uptime. During that span, we've serviced over 500,000 transformers, processed over one billion gallons of dielectric fluid, and performed millions of test results.

Take charge of your transformer reliability.
Get in touch with the transformer specialists at SDMyers and take the first step towards achieving the maximum reliable life for your transformer.
We're only a click or call away.



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Safe, reliable substations

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