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# Six Steps to Compliance with Electrical Safety Standards

Using NFPA 70, 70B, and 70E standards to create an electrical safety cycle and build a more robust maintenance and safety compliance strategy

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In 2023, the NFPA promoted the NFPA 70B publication from a status of "recommended practices" to a Standard for Electrical Equipment Maintenance. Since then, we've seen many articles and posts regarding this change and its impact on our industry. Overall, the electrical contracting industry is excited about the additional opportunities this may bring, as facilities may now prioritize additional testing and maintenance services to comply with elements of the new standard.

In February 2025, the NFPA hosted a webinar that discussed the "Electrical Cycle of Safety," which described the relationships between the NEC [NFPA 70], NFPA 70B, and NFPA 70E. As we assess the compliance requirements of all three documents, a strategic plan and structure for facilities is more well-defined than ever before.

The core of 70E compliance requirements is the electrical safety plan with the elements defined in [70E (2024) Sec. 110.3]. These requirements have been present for many revision cycles of the 70E standard, but the 2018 edition carried a new emphasis with the introduction of Sec. 105.3 to establish, document, and implement an electrical safety program.

70B has a compliance requirement of a written Electrical Maintenance Program (EMP) whose elements are defined in Chapter 4.

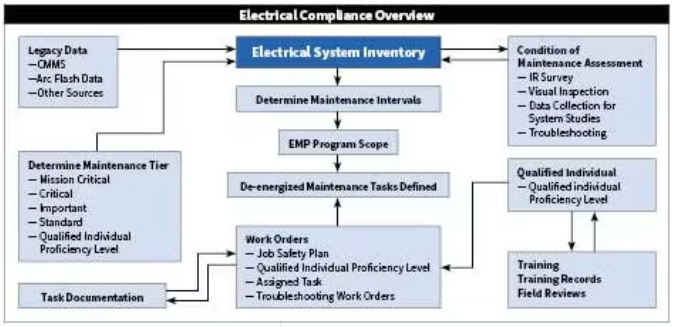
For most facilities, various programs and practices are in place, but there's a typical common question: Have we gone far enough to assess that we comply with today's standards?

Frequently, the documentation tools to address various programs have not always been consistent. For example, a computerized maintenance management system may be used to track maintenance activities, but the inventory elements in this platform are not the same as those created for the arc flash risk assessment. Even the standards themselves, at times, can provide a bit of conflicting information. For example, the 70B standard requires an incident energy study [Sec. 6.7] while the 70E standard still includes an option of assessing arc flash hazards with the table method [70E (2024) Sec. 130.5(F)]. NFPA 70B has no similar reference.

With this background in place, a facility should create an overall strategic plan using the following steps to address the compliance requirements across the entire NFPA Electrical Cycle of Safety.

## Step 1: Develop a complete electrical system inventory

The first step of the electrical system strategic plan is the development of a detailed electrical system inventory of the facility. Almost all other compliance requirements




Elements for implementing the Electrical Cycle of Safety

are based on risk analysis and various maintenance and testing procedures specific to the electrical devices.

The term complete **electrical system inventory** can be defined as the serviceable components and devices that can be documented on a one-line diagram and affect the flow of electrical energy. For most facilities, only 3-phase devices are documented. All devices, such as panels, motor control centers, disconnects, and 3-phase breakers, as well as switchgear configurations, are included in the electrical system inventory (see the **Figure**).

## Step 2: Conduct a risk assessment

The elements of a risk assessment begin with an Infrared (IR)/Condition of Maintenance survey. It is recommended that the scope of this survey includes a data collection effort of all device attributes required by the incident energy study and the additional system studies as outlined in 70B Chapter 6.

Standard 70B [Sec. 9.2] specifies that all electrical devices shall receive an infrared assessment on an annual basis. Chapter 7 of 70B outlines standards for the completion of an infrared assessment. These standards include removing protective covers to create a line of sight to the connections and conductors and ensuring that the devices are energized with electrical loads of ongoing operations. These requirements then extend to the qualified individual safety standards for the testing technicians.

It will not always be feasible to have all equipment running during the infrared testing sweep, so it is suggested to track whether testing was completed or not and potentially create smaller task groups to address equipment missed in the first site assessment.

The embellishment of the tasking to complete this IR survey should also include a visual inspection for assessment of NEC and reliability anomalies. A survey

completed with this scope can result in the accomplishment of a facility-wide condition of maintenance assessment. The data collection tasking within this survey contributes to the COMPLETE electrical system inventory.

A risk assessment will also include the elements of the 70B Survey and Analysis [70B 4.4]. A key element of risk assessment is determining the status of the equipment as it relates to ongoing operations and the impact on those operations if an equipment failure should occur. Establishing a site operation assessment of devices (such as mission-critical, critical, important, and standard) is an example of this defined structure. Additionally, 70B Sec. 9.3 describes the rating of devices according to their levels of physical condition. These two parameters are required elements in the EMP Program Development.

## Step 3: Develop an EMP program

Now that the values have been assigned to the operational rating and the equipment physical condition, the EMP metrics of testing and frequency can be defined. 70B Sec. 9.2.2 [Maintenance Intervals] is an extensive table that references all electrical devices and their Physical Condition classification per [70B Sec. 9.3.1] to provide a resulting maintenance frequency designation. Once these default values are applied, the facility management team can review these results, taking into account the operational status of each electrical asset. Devices have been rated as mission-critical, critical, important, and standard, which may alter the frequency recommendations offered within Sec. 9.2.2 [Maintenance Interval Table].

If the maintenance interval assessment process extends an interval to a longer timeline, 70B Sec. 9.2.2.3 describes a compliance requirement to document this justification. The conclusion of this step is the overall project scope of maintenance tasking and frequency for all inventoried assets.

Note: In 70E 2024, Annex S – Assessing the Condition of Maintenance was added.

## Step 4: EMP-qualified individual development




The next step of EMP implementation will rely on the electrician/technician resources. Maintenance activities, of course, will be documented by those who complete them. Thus, the qualified individual becomes the resource for creating EMP tasking documentation. All three NFPA documents reference the qualified individual. NFPA 70B states that electrical maintenance shall be per formed only by qualified individuals [70B Sec. 5.1.1].

NFPA 70E [Sec. 110.4] provides the most detail related to the attributes and required elements of training for the qualified individual.

Through electrical safety classroom instruction as well as on-the-job training, a qualified individual achieves an assessment of qualified task proficiency. The qualified individual must also have a working knowledge to develop the job safety plan [70E Sec. 110.3I], and to utilize the risk assessment procedures [70E Sec. 110.3H] and the incident reporting system [70E Sec. 110.3J].

As strong EMP implementation would enable a proficiency rating on both the electrical devices and the qualified individual.

Qualified individuals would know their proficiency rating and, by metrics of the Electrical Safety Plan, are assigned tasks only on devices equal to or less than their proficiency level.

## Step 5: EMP implementation

Implementation includes the scheduling and completion of the maintenance and inspection activities. NFPA 70B outlines the basic tasks of cleaning, tightening connections, and replacing worn/damaged parts as well as making repairs to resolve problems and issues reported during the inspection/condition of maintenance assessment. The implementation task can also include additional data gathering on the missing device attributes per the EMP device specifications. Creating tasking documentation records of all maintenance activities, including work performed,

findings, and any corrective actions, is a critical element of the overall electrical maintenance program.

## Step 6: Review and update

NFPA 70E [Sec. 110.3] states that an electrical safety program shall be reviewed at least every three years. NFPA 70B has that a compliance requirement of program review must not exceed five years [70B Sec. 4.2.7].

Other more frequent reviews, such as arc flash labels on newly installed equipment, can be site-level principles documented within the written plans.

It is appropriate that a facility develops and keeps current, three specific documents including the electrical safety plan, electrical maintenance plan, and lockout/tagout plan. Specifically, a separate written document for lockout/tagout is recommended because additional hazards that are not electrical may also be present. Reducing these hazards to a zero-energy work environment should also be documented. Many times, these documents may cross-reference each other.  For example, the condition of maintenance site survey and maintenance tasks are detailed in the EMP written program, which is then referenced in a summary description as a required element of the Electrical Safety Program.

The electrical safety plan will have a much larger focus on what has been done to develop and train the qualified individual to make that individual ready to work on the equipment, maintenance, and tasking activities as outlined within the electrical maintenance plan.

## Looking forward

One emerging trend in the industry is the use of software platforms to support a wide variety of electrical safety compliance requirements.

Many platforms incorporate artificial intelligence (AI) technology in multiple ways. Newer EMP platforms, for example, will:

- Analyze existing inventory data and highlight missing/required data attributes,

- Create a first pass of maintenance frequency on the site's electrical system inventory, built upon 70B [Sec. 9.2],
- Use predefined tasking based upon 70B device tasking, and establish labor hour estimates,
- Formulate a total EMP forecasted budget
- Include many other compliance features beyond a basic device inventory and the tracking of device inspections.

One key metric from the facility viewpoint is a structure of open architecture where access to create program documentation for the various required maintenance activities can be updated with a user ID that is not constrained by a single vendor relationship. These user profiles of qualified individuals shall also include documentation of their current level of training and skill development.

## Conclusion

The inclusion of the NFPA 70B Standard as part of the overall Electrical Cycle of Safety has resulted in compliance directives to review construction results and implement programs of recurring maintenance. These results will strongly contribute to the reduced risk of equipment failure and more complete device profiles that can be accessed by the qualified individual assigned to various equipment tasks. Implementing these steps will result in significantly improved electrical safety practices and reduced injury potential.

For those responsible for managing these programs at one or more sites, a deeper understanding of these standards is recommended by utilizing the training programs and content provided by the NFPA and NFPA's Authorized Education Network Providers.

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About the Author

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## Six Steps to compliance with the NFPA Electrical Cycle of Safety



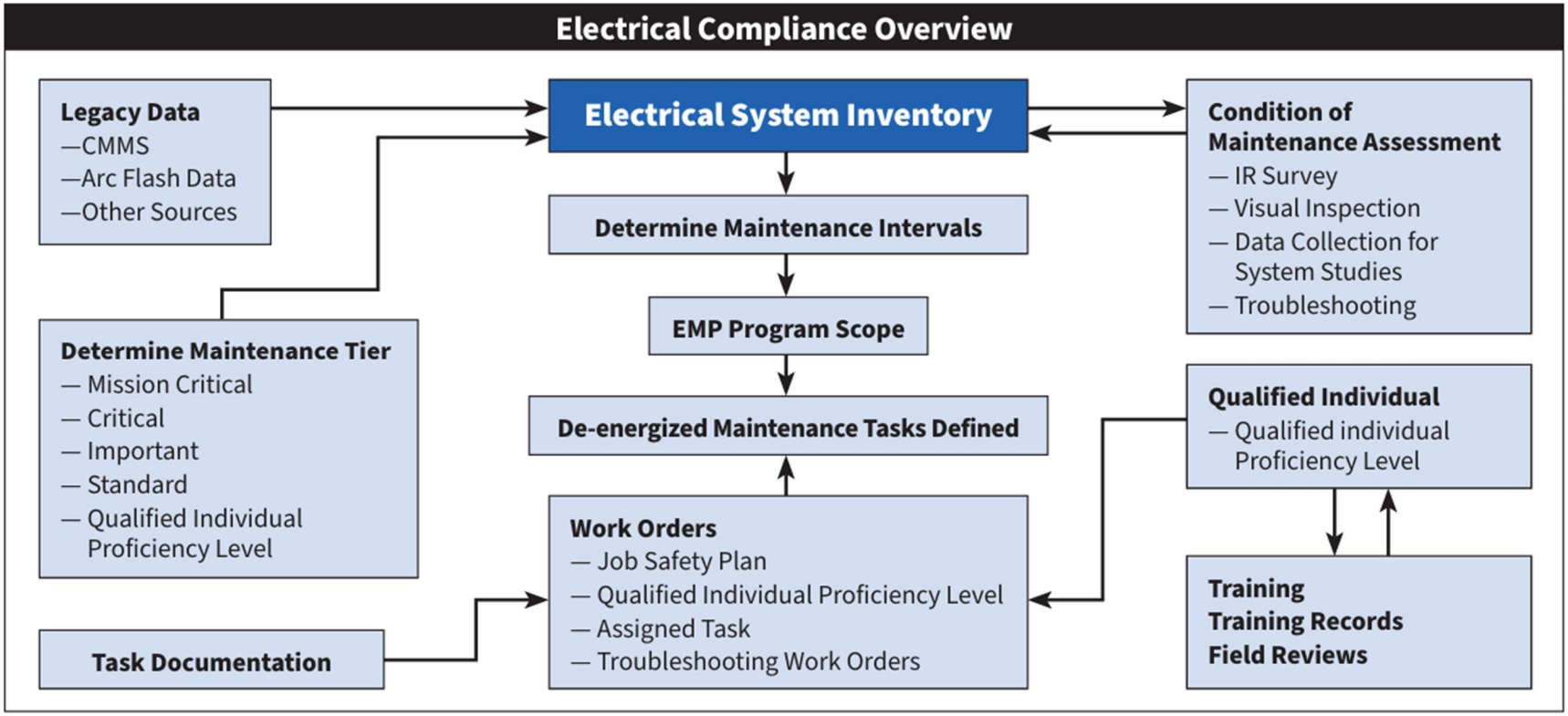

NFPA 70 (NEC)
National Electrical Code

NFPA 70E 2024 Standard for Electrical Safety in the Workplace

NFPA 70B Standard for Electrical Equipment Maintenance

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# Elements for implementing the Electrical Cycle of Safety



**Six Steps to Compliance**

STEP 1: DEVELOP A COMPLETE ELECTRICAL SYSTEM INVENTORY

STEP 2: CONDUCT A RISK ASSESSMENT.

STEP 3: DEVELOP AN EMP PROGRAM.

STEP 4: EMP-QUALIFIED INDIVIDUAL DEVELOPMENT

STEP 5: EMP IMPLEMENTATION

STEP 6: REVIEW AND UPDATE