

# Preventive Maintenance Testing

## Why Perform Preventive Maintenance?

Electrical equipment aging and deterioration is normal, but equipment failure is not inevitable. An effective electrical maintenance testing program identifies and recognizes factors leading to deterioration. It provides measures for reversing these effects and avoiding failures. A well-administered testing program can prevent accidents, save lives, minimize costly breakdowns, and reduce unplanned outages.

Facilities are becoming progressively more dependent upon their electrical systems to maintain the continuity of processes and to transmit critical data. The continuing reliability and integrity of an electrical power system is based on an established program of maintenance and operational testing. The maintenance procedures and frequencies should follow those recommended by nationally recognized standards.

In addition, insurance premiums can be more costly if the facility has an inadequate or marginal maintenance program.

## What Maintenance is Recommended and How Often?

Maintenance guidelines and suggested intervals have been compiled by the National Fire Protection Association (NFPA) Standard 70B recommended practice for "Electrical Equipment Maintenance". Another valuable resource is the International Electrical Testing Association (NETA) Standard MTS-2007 "Maintenance Testing Specifications", which has been adopted by the American National Standards Institute (ANSI). These procedures and frequencies are used to develop a maintenance schedule that is based on the type of equipment, the voltage, and ambient conditions. Included are transformers, circuit breakers, switches, protective relays, switch-gear, panelboards, electronic and rotating equipment, bus, and cable. There are basically three types of maintenance approaches:

- Reactive (also known as 'run-to-failure') maintenance where repair or replacement work is done only when the equipment no longer functions properly.
- Time directed or preventive maintenance where tasks are performed on a predetermined interval, regardless of equipment condition.
- Predictive maintenance where condition assessment tasks are performed and the equipment 'health' is monitored or trended such that maintenance tasks can be performed when needed to avoid unacceptable deterioration or drop off in performance.

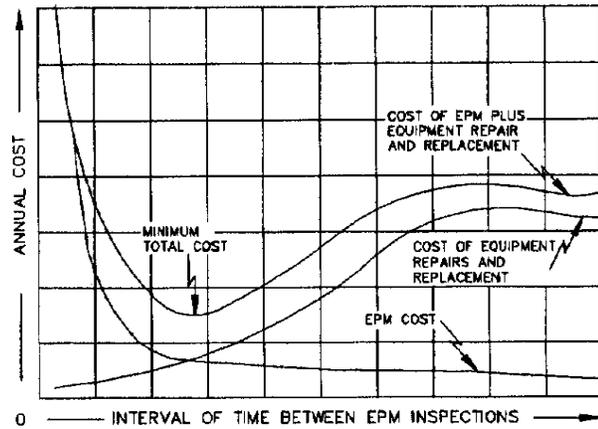
Clearly, the predictive maintenance approach is the most likely to provide system reliability and avoid failures.

## How to Set Up an Electrical Maintenance Program

An effective electrical maintenance program is one that enhances safety and reduces the probability of equipment failure. The following three-phase plan is based on performing regularly scheduled inspections, testing, and servicing by qualified personnel. The three phases are:

- I. System Assessment, Information Review and Update
- II. Maintenance Implementation
- III. Selective Repair and Modifications

It is important to base the program on the fundamental idea that maintenance cannot be performed once and then forgotten.



## Who Should Perform the Maintenance?

Maintenance testing and repair is usually performed by a specialized electrical testing company. This type of company engages solely in the evaluation and testing of electrical equipment and systems. An independent testing firm provides high quality preventive maintenance services and unbiased test results to verify the condition of the installed electrical apparatus. Personnel should be experienced in the maintenance and operation of power systems. Not only does this ensure accurate results, but it allows for more efficient use of in-house personnel during "time critical" shutdowns.

It is important that state-of-the-art test equipment is used to ensure the accuracy of the test results. All equipment utilized should be in calibration with traceability to the National Institute of Standards and Technology.

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