

# Electrical Preventive Maintenance for Small Businesses

Inadequately maintained electrical systems are a leading cause of business interruption, poor energy efficiency, and premature equipment breakdown. A well planned and executed electrical preventive maintenance (EPM) program will reduce equipment failures, unplanned down time and unbudgeted expenditures. Unfortunately, many small businesses do not have the technical personnel experienced with EPM programs. This guide serves as an overview describing the basic components of an effective EPM program.

## Safety

An EPM program involves working with energized and rotating equipment, a lock-out/tag-out



program and a variety of electrical test equipment. Only personnel properly trained and qualified in electrical work and electrical safety should perform these tasks. All work associated with electrical power systems and equipment should be performed in accordance with appropriate manufacturer's instructions and guidelines and accepted industry practices. The required safety equipment or specialty tools should be determined and should always be readily available.

## An EPM Program

An EPM program is simply the scheduled inspection, testing and maintenance of critical electrical components and their support systems. The intent of an EPM program is to identify and address any issues before a failure occurs. For an EPM program to

achieve long term success, it must be within available resources, well defined, well understood and properly implemented and documented. To make this happen there are three basic steps required: assess, implement and sustain.

**Assess**—What is the amount of lost time and product that can be attributed to failures? What in-house technical resources are available? Are one-line drawings of the power system available? Are the critical production components and their support circuits known? What is the age and overall condition of the equipment? These questions should be answered during the assessment stage.

**Implement**—This step involves both planning and accomplishing the work. The required maintenance activities and frequencies as well as the procedures and schedules to accomplish the work should be documented. An individual should be assigned to oversee the program. Once these steps are completed, the work should be accomplished according to plan and the results documented.

**Sustain**—The ongoing performance of the program is critical. The program results should be reviewed and be utilized as an input to continuously improve the program.

## Technical Components of an EPM Program

EPM programs involve maintenance and testing activities to keep electrical apparatus clean, cool, dry and tight. These activities should be scheduled based on the condition of the equipment, historical information concerning the equipment and the manufacturer's recommendations. If no guidance is available, Hartford Steam Boiler Inspection and Insurance Company (HSB) recommends that electrical preventive maintenance be performed at three-year intervals. More frequent maintenance should occur if conditions warrant.

### Keep it Clean and Dry

Electrical equipment rooms should:

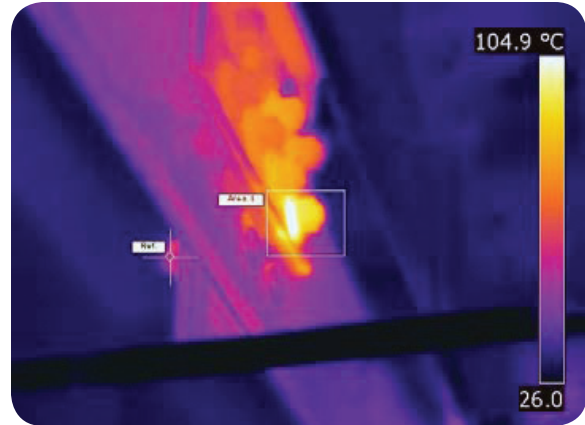
- be free of excessive dust and dirt
- not be used for storage
- have limited access for required personnel only
- have adequate lighting
- be free from airborne contaminants
- be free from water or potential sources of water



Electrical equipment should be:

- free from signs of moisture contamination
- vacuumed to remove loose dirt or debris
- wiped down with lint free rags and solvents as needed

### Keep it Cool



Images courtesy of HSB Thermography Service.



Minimize heat buildup in electrical apparatus and in equipment rooms by:

- keeping outside surfaces clean
- maintaining cooling fans or blowers operational and clean
- keeping ventilation openings clean and free from obstruction
- changing or cleaning any filters according to the manufacturer's recommendations
- inspecting seals and gaskets and repairing/replacing as needed
- keeping equipment spaces well ventilated

## Keep it Tight



Image courtesy of HSB Thermography Service.

Electrical connections should be:

- scanned using infrared imaging to identify hot spots
- inspected for signs of arcing
- inspected for signs of corrosion
- inspected for signs of excessive heating
- checked for proper tightness

The above suggestions are basic checks and inspections to minimize the most common and frequent problems. However, these checks and inspections do not constitute a comprehensive EPM program. Additional testing and maintenance activities based on a facility's components and sensitivity to down time are required for a complete EPM program. HSB Recommended Practice for Electrical Preventive Maintenance should be

reviewed for additional information concerning this subject. Experienced electrical contractors and electrical testing companies are also good sources of information.

## Conclusion

It is important to fully understand and appreciate the importance of an EPM program. An effective EPM program will reduce equipment failures as well as unplanned down time. The time and effort to establish, implement and maintain an effective program has proven to be well worth the effort.

## For further reading

Additional information is available on HSB.com. Just click on Information Resources and Equipment Care to find the HSB Electrical Preventive Maintenance standard (Document #420).

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