



# Electrical Preventive Maintenance

## Small businesses

HSB, a Munich Re company, is a technology-driven company built on a foundation of specialty insurance, engineering and technology, all working together to drive innovation in a modern world.

### Introduction

This is a brief overview of Electrical Preventative Maintenance (EPM) for small businesses. Use this as an introduction to the topic and as a starting place for additional research. 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 program will reduce equipment failures, unplanned downtime 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. Specific questions should be directed to your HSB representative.

### Safety

An EPM program involves working with electrically energized and mechanical equipment. Only properly trained and qualified personnel should work on electrical equipment. All work associated with electrical power systems and equipment should be performed in accordance with applicable state and federal and local regulations including, OSHA electrical safety regulations, NFPA 70E and the equipment manufacturer's instructions.

### EPM Programs

EPM programs are 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 well defined, well understood and properly implemented and documented. EPM programs required a financial commitment to spend a little now to prevent a major unexpected cost later.

These are the three basic steps to make this happen:

- **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 execution of the program is critical. The program results should be reviewed and then 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 manufacturers' recommendations. If no guidance is available, 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
- used for electrical equipment only and not for general storage
- accessible only to qualified personnel
- adequately illuminated
- free from airborne contaminants
- 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
- maintained according to the manufacturers' recommendations



### Keep it Cool

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

- keeping outside surfaces clean
- maintaining cooling fans or blowers
- keeping ventilation openings clean and free from obstruction
- maintaining any filters according to the manufacturers' recommendations
- inspecting seals and gaskets and repairing or replacing as needed

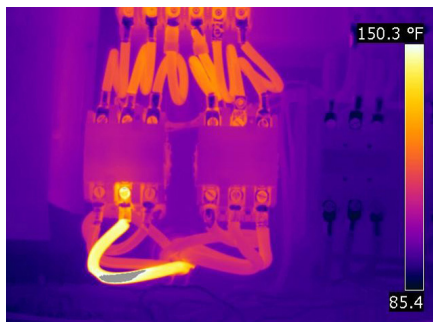


## Keep it Tight

Electrical connections should be inspected for:

- arcing
- corrosion
- hot spots using infrared thermography
- proper tightness and connection torque values

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's *Recommended Practice for Electrical Preventive Maintenance* should be reviewed for additional information. Experienced electrical contractors and testing companies should also be consulted when deemed appropriate.



## Conclusion

It is important to fully understand and implement an EPM program. An effective EPM program will reduce equipment failures as well as unplanned downtime. The time and effort to establish, implement and maintain an effective program is well worth the effort.

## For Further Reading

HSB Recommended Practice for Electrical Preventive Maintenance; Document no. 420.