



## SAFETY BULLETIN



### Red Flags in Electrical and Mechanical Rooms



Often we see indications that something is not quite right in other words red flags.

Let us discuss some red flags that, if left unattended, can result in a boiler breakdown and expensive property and/or business income losses. As a boiler owner, operator, service technician, municipal code enforcement official, or insurance professional, we all can learn to recognize them and take the required corrective action before it becomes a burden and cost to our operations.

#### Poor Lighting

When the Mechanical/electrical room is poorly lit, it gives the appearance that no one is taking care of the equipment. Remember, you need to see clearly in order to regularly examine and service the equipment, so be sure to install adequate lighting and replace those burned out or missing bulbs promptly. Ensure the light switch is easy to see and reach.

#### Not a Storeroom

When a Mechanical /electrical room becomes a storage area, routine visual examination and servicing of the equipment is in serious doubt. Boilers and their supporting machinery, controls, piping and valves need to be checked and maintained on a regular basis. If a technician cannot get to the equipment, how are repairs and equipment being properly maintained? It is important to keep the boiler and associated system components readily accessible. Do not store items nearby as items stored near equipment fueled by gas, oil, coal, or wood can contribute to an additional source of combustion. No combustible materials should be stored within 10 feet of the boiler.

#### Operating Certificate

**In Manitoba**, operating certificates are required to be posted near the equipment. This is similar to the certificates that you see in most elevators. Boiler operating certificates let people know that your equipment has been inspected and that the certificate is current. If it has expired, call the Office of the Fire Commissionaire. Posted boiler operating certificates help inform the public and government agencies that you are taking care of your equipment.

### **Open Control Panels**

A key indication that something may not be quite right is to see any of the following: an open control panel; an access panel removed; an electrical junction box cover missing; or equipment circuit wiring in disarray.

While there may be explanations for these conditions, the fact is that the service work has not been professionally completed since some tasks were left undone. It also raises the question: "What was done and who did the job?" Open covers and panels, or messy looking control service may pose worker hazards or result in potential boiler breakdown and significant business interruption.

Remember, control panels and access panels must be put back in place when the job is done. Any electrical work needs to meet the applicable National Electrical Code and should be completed only by authorized licensed personnel.

### **Wet Floors**

Significant water accumulation must be addressed. Floor drains and sump pumps should clear water from an area in a timely fashion — otherwise high moisture will result in mold, mildew, corrosion and general boiler deterioration, thereby reducing its anticipated service life. In severe cases, several inches of water may cover the floor and pose a potential risk for injury or even death from electrocution. In addition, a high water level may compromise the boiler's combustion components.

Remember to keep floor drains clear. The drier the area, the more likely someone will care for the equipment.

### **Cobwebs Everywhere**

There are instances where there are cobwebs and dust located on and around the boiler that one knows instinctively that no one is looking at the equipment. Poorly maintained boilers cannot be expected to provide you with the type of service you expect. Remember, you should keep the mechanical and electrical rooms and surrounding system components clean.

### **Discarded Parts**

Often on the floor or on top of the boiler are found discarded water level controls, old replaced relief valves, empty cans of boiler chemicals used to control water chemistry. Seeing these items may give an indication of poor quality make-up water, dirty/rusty heating system piping, ongoing system leaks, or less than adequate maintenance practices. Any of these conditions may result in a higher probability of premature equipment failure.

Remember to verify the cause of the condition that led to work being needed on your equipment. Has that cause been corrected or is this going to result in another perhaps more serious repair in the near future? Also, a good service technician with professional work practices would remove nonfunctioning parts and repair debris when the job is finished and put away new or reusable spare parts.

### **Logs and Manuals**

Maintaining equipment logs helps to avoid being surprised by slowly developing trends that could result in a serious equipment breakdown unless they are identified and addressed. In addition, log readings enable equipment operators to get familiar with "normal" conditions and help alert them to abnormal sounds, smells, temperature/pressure readings and visual clues.

Attend to your Mechanical/Electrical rooms frequently. Taking a close look can help you understand the proper care of your equipment, and enable you to recognize situations that are not quite right require attention.

## Your guide to... Infrared thermography

You work hard to build and maintain your business. That's why it's important to protect it from all potential losses, especially when they're avoidable.

Part of the preventative maintenance of your business is to identify possible electrical failures and hazards. Infrared thermographic inspections help identify and remediate these issues before they become more serious.

### Did you know?

According to the National Fire Protection Association (NFPA) 10% of fires in industrial and manufacturing facilities are caused by electrical system failures including the failure of electrical insulation, terminals and other related components.

\*Source: NFPA report on Fires in U.S Industrial and Manufacturing Facilities

The NFPA standard 70B suggests that every commercial and industrial building should have an infrared inspection completed at least once a year.

### Why should you have an infrared inspection?

Infrared thermography is used to detect hot spots (due to increased resistance) caused by defects in connections and components of electrical systems. Identifying these issues before they become catastrophic prevents property damage, bodily injury, and the loss of business income.

It's important to know that thermal imaging of electrical systems can show components as being above ambient temperatures. This doesn't mean that they aren't working properly, as the target operating temperature of each electrical component varies.

For a better understanding of what the typical operating temperature of an electrical component should be, technicians typically use historical imaging or comparisons to other similar equipment.

### Conditions that can lead to electrical system failures

- ✓ loose connections
- ✓ component age
- ✓ electrical component fatigue
- ✓ oxidation
- ✓ wear and tear
- ✓ imbalanced circuits
- ✓ defective breakers
- ✓ damaged switchgears
- ✓ faulty fuses or fuse clips
- ✓ overloaded circuits
- ✓ poor workmanship
- ✓ material defects
- ✓ defective products (including new installations)



## Make infrared inspections a part of your preventative maintenance program

Benefits of performing infrared scans:

- ✓ reduces the risk of equipment failure and down time
- ✓ reduces the frequency and severity of losses
- ✓ increases safety
- ✓ improves system performance
- ✓ reduces the risk of injury
- ✓ saves money on repairs and replacements

### Who can perform an infrared inspection?

- ✓ A staff or third party contractor who is certified through the Infrared Training Center (Canada's largest infrared training center) and who is trained to handle live electrical equipment and components. Personal protective equipment (PPE) must also be worn.
- ✓ Infrared inspections must be performed under typical loading periods.
- ✓ There are three levels of certification in infrared thermography. Ensure that the individual performing the inspection is certified level 1.
- ✓ Have a qualified electrician attend the inspection to ensure safe practices.

### Summary

Routine infrared inspections of the electrical systems at your business can help identify potential electrical risks before they cause unwanted damage. This invaluable diagnostic tool should become part of your regular preventative maintenance program.

### Resources

NFPA 70B – *Recommended Practice for Electrical Equipment and Maintenance*  
Infrared Training Center, <http://www.infraredtraining.com>

For further information on this topic, please contact your independent insurance broker.

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