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## The Hartford Steam Boiler Inspection and Insurance Co.

# ELECTRICAL RISKS ASSOCIATED WITH THE PURCHASE OF ABANDONED BUILDINGS

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### Introduction

There are many potential risks when purchasing an abandoned building. These include both property and equipment breakdown risks. This paper discusses the potential risks associated with the electrical equipment in an abandoned building as well as the steps to take to address these risks.

### Risks and Mitigation Steps

Prior to a building being abandoned, the owner of the building is typically under severe financial hardship. In these types of situations, the maintenance staff, if existent, is significantly reduced and the equipment maintenance and repair budget is at a bare minimum. Therefore, the electrical equipment of an abandoned building may have been severely neglected in the months/years prior to the actual abandonment. During the abandonment, the equipment is typically exposed to extreme temperature swings, moisture from leaking roofs, dirt and other contaminants through broken windows, vandalism and theft.



Specific electrical components of concern are: the equipment, cables, and bus of the electrical distribution system; and abandoned installed electrical equipment such as sump pumps, cranes, and ventilation fans to name a few. The environment that electrical equipment is exposed to in an abandoned building may lead to corroded or loose connections, arcing, grounds faults and overheating of electrical equipment. All of these conditions may lead to equipment breakdown, significantly reduced equipment life spans and electrical related fires.

The following steps should be taken prior to energization:

- 1) A licensed electrical contractor experienced with abandoned buildings should be hired to evaluate the condition of the equipment.
- 2) An extensive visual inspection should be conducted. This inspection should include all power distribution equipment, including cable and bus, and the installed electrical equipment. This inspection should identify any dirt buildup, moisture or contamination issues; corrosion; broken or missing components; and improperly labeled equipment. All issues should be documented.
- 3) A preventive maintenance program should be initiated. In addition to the standard preventive maintenance activities, the issues documented above should be addressed.
- 4) Non-energized electrical testing should be performed on the electrical distribution equipment and other critical equipment. This testing should include but not be limited to electrical insulation tests, resistance tests, relay calibration, breaker trip testing and transformer testing.
- 5) Any equipment using oil for lubrication, cooling or insulation purposes should have the oil sampled to verify it does not contain PCBs and it is in sufficient condition to adequately perform its function.
- 6) An inspection of the electrical grounding system should be performed.

When the system is determined to be safe to energize, additional testing and monitoring should occur. This should include but not be limited to:

- 1) Electrical system voltage and current monitoring.
- 2) Vibration monitoring on rotating equipment.
- 3) Infrared surveys. Infrared surveys are critical to perform. Surveys should be completed initially when the system is at no or low load. This will help identify any significant or overlooked issue. Surveys should be completed again at rated load conditions.

All of the above will help establish the present condition of the equipment, its suitability for service, and serve as a baseline for future testing. In addition to assessing the condition of the equipment, an additional concern is the suitability of the existing electrical infrastructure to support the new loads that will be installed. To address this concern the following actions should occur:

- 1) A professional engineer (PE) should develop one line drawings of the electrical system and conduct electrical system studies. To develop one line drawings, electrical equipment must be identified, the sources of power for the electrical equipment must be identified and the cable and bus must be identified. Electrical system studies such as load flow, short circuit, and protection coordination will assist in the layout of the new equipment, verify the existing infrastructure can support the voltage and current requirements of the new equipment, and ensure the new equipment will be adequately protected during an electrical fault.
- 2) Meet with the utility that is responsible for supplying power and determine their rate structure, reliability statistics, emergency procedures, and the ownership of the electrical service entrance equipment. Document the ownership agreement.

- 3) Evaluate the need for power quality devices and surge protection devices and install as appropriate.
- 4) Development of a contingency plan. Local electric service firms should be included in this plan.

### **Conclusion**

Purchasing an abandoned building can expose the insured to many risks. By taking a proactive approach, these risks can be understood and minimized early on in the process. This proactive approach may help reduce the occurrences of equipment breakdown, unscheduled down time, and equipment related operational issues.