Infra-Red Scanning

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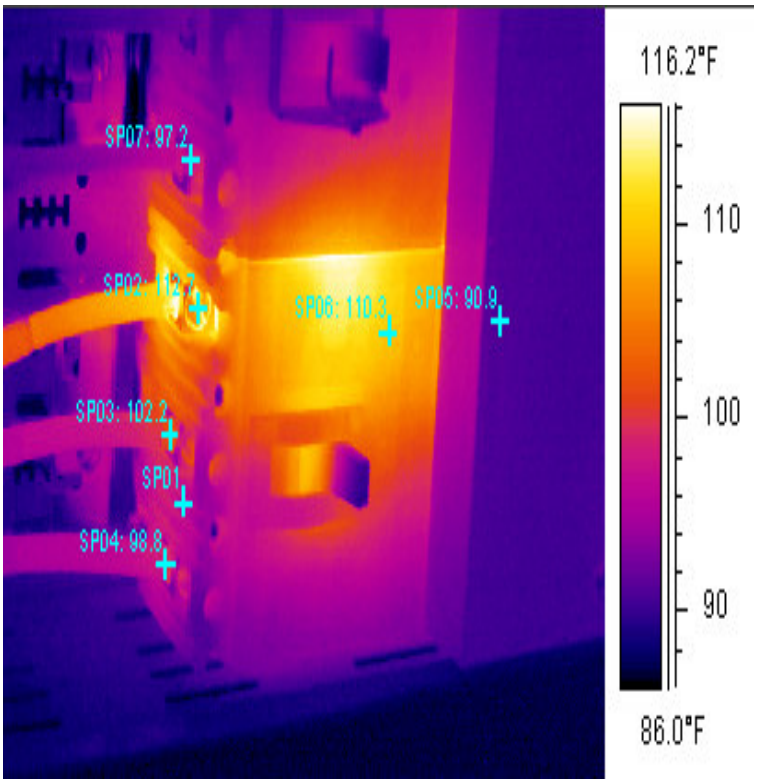
EXECUTIVE SUMMARY

Infra-Red (IR) scanning has become a useful tool in prevention of fires due to electrical origin and elimination of electrical waste. The question has arisen that the frequency of such scans varies depending on the authority having jurisdiction. The NFPA and FM standards will be compared and a recommendation made as to frequency.

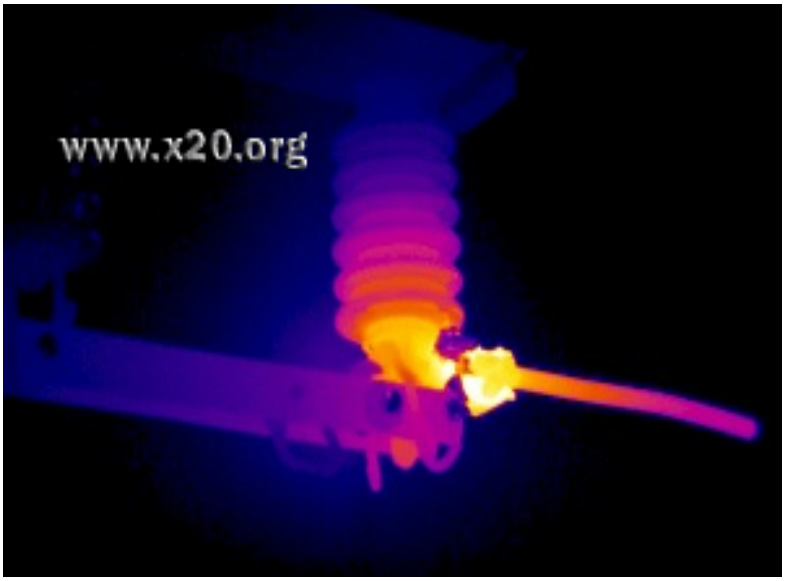


THE PROBLEM

Fires of electrical origin are a serious concern in <u>almost</u> all commercial occupancies. NFPA statistics show that between 1999 and 2002, electrical distribution equipment was the third overall most common fire cause, accounting for 10% of the fire ignitions in commercial buildings nationwide while causing over $400,000,000 in property damage. Faults occurring in electrically powered appliances and process equipment were the ninth leading cause of fire during the

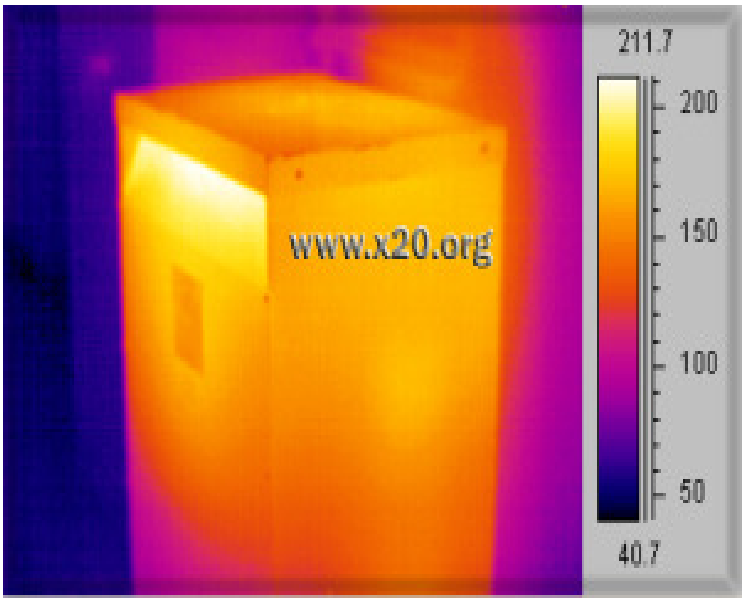
same period, accounting for almost $80,000,000 in property damage.

As with most fire causes, fires of electrical origin are almost entirely preventable. As property loss control professionals, we owe it to our clients to ensure our reporting reflects sound recommendations regarding the development of electrical preventive maintenance programs.



WHAT THE STANDARDS SAY

FM Data Sheet 5-20, paragraph 2.2.2.2 recommends that infra-red (IR) scanning be done at least once for any facility that has electrical equipment considered critical process equipment or a significant fire hazard, and all electrical equipment under normal load that may be scanned. Follow-up IR scanning is contingent upon the number of problems found in the initial scan. Large facilities with a harsh environment should be evaluated again every 6 months for 2-3 years. After that time, the interval between IR scans may be increased to every 3-5 years. The FM Data Sheet recognizes that small facilities may find it economically impractical to conduct IR scanning, but still recommends scanning of critical process equipment when fire exposure is unusually high. The IR scanning should be conducted with the equipment operating at a minimum of 40% of its maximum load.



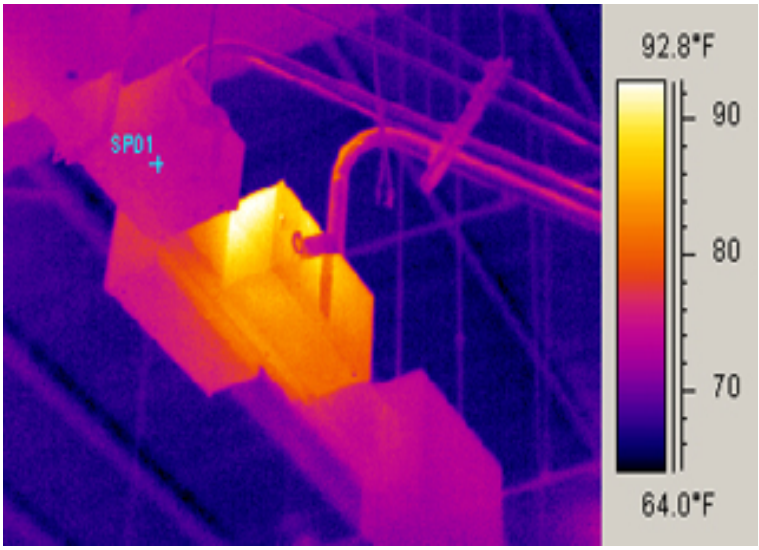
NFPA 70B indicates that routine IR scanning should be conducted annually for all critical process equipment. The applicable sections are as follows:

20.17.5 Inspection Frequency and Procedures. Routine infrared inspections of energized electrical systems should be performed annually prior to shutdown. More frequent infrared inspections, for example, quarterly or semiannually, should be performed where warranted by loss experience, installation of new electrical equipment, or changes in environmental, operational, or load conditions.

20.17.5.1 All critical electrical equipment as determined by Section 6.3 should be included in the infrared inspection.

20.17.5.2 Infrared surveys should be performed during periods of maximum possible loading but not less than 40 percent of rated load of the electrical equipment being inspected. The circuit loading characteristics should be included as part of the documentation provided in 20.17.5.4.

Some public utilities will perform an IR scan for free as a customer service. For multiple location facilities, the cost of a quality IR scanner can be split among all locations and the unit shipped to each facility as needed.



ESTABLISHING BASELINE DATA

The ongoing IR assessment of the Insured's critical process equipment is of greatest value when comparatively analyzed against previous scan data reflecting optimal conditions. As such, the initial scan conducted upon the installation of the equipment should be considered as the baseline by which subsequent scans are judged. Should the initial scan reveal an abnormality requiring mitigation, a second scan should be conducted upon the correction of the problem to adequately establish clean baseline data.

CONCLUSION

The two standards diverge on the issue of frequency of the IR scanning. Both rightfully make the frequency of IR scanning contingent upon the criticality of the electrical equipment to the production process.

However neither address the presence of aluminum wiring or pig-tails, nor the issue of non-process electrical equipment such as that which would be found in high rise buildings, computer systems, hotels, truck terminals, offices, and warehouses, just to name a few. Clearly these types of environments are not "harsh" and consequently do not impose the same vibration, impact and environmental conditions as would be present in a manufacturing plant. In these "stable" electrical environments, the probability of a

dynamic electrical condition is remote and the IR scanning frequency can be modified with good engineering judgment.

For this reason, WFPS consultants will use the following decision tree for making recommendations for IR scanning:

MANUFACTURING RISKS:

1. An initial IR scan to be completed within one year to establish a baseline (if one has not already been done).

2. Subsequent frequency of IR scanning to use sound engineering judgment depending on the "harsh" or stable conditions at the location that would impact the electrical equipment and associated connections. Electrical preventative maintenance programs should be established or modified to address this trend.

3. Recommended frequencies less than once per year will require an explanatory comment after the recommendation.

4. Recommended frequencies greater than annual will also require an explanatory comment after the recommendation.

NON-MANUFACTURING RISKS:

A. An initial IR scan to be completed within one year with deficiencies immediately corrected. Subsequent IR scanning is to be done following all new electrical installations.

ALL RISKS WITH ALUMINUM WIRING OR PIGTAILS:

B. A minimum of semi-annual IR scanning will be recommended where aluminum wiring or aluminum pig-tails are present.

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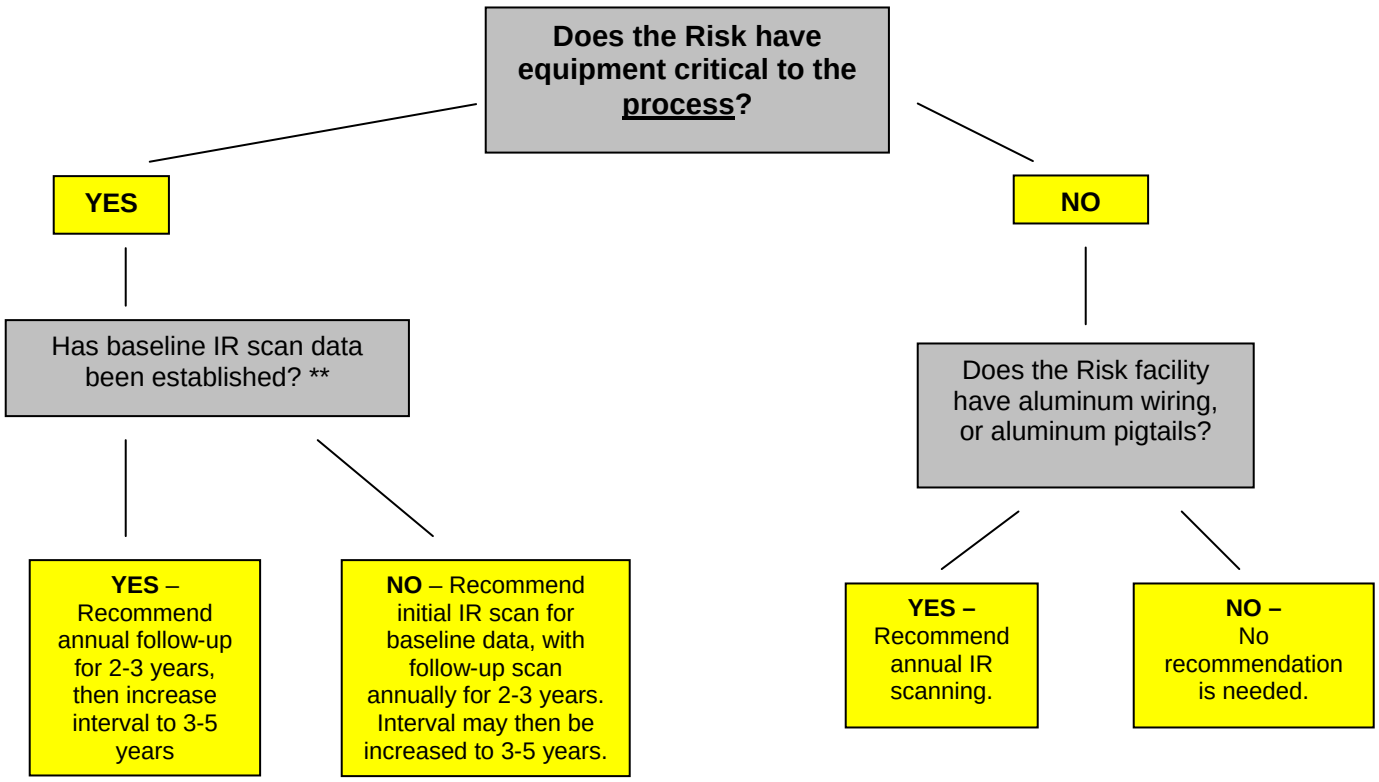

** Baseline data is the original data received from an IR scan of the critical process equipment reflecting optimal operation of the equipment. If the initial scan has revealed abnormalities requiring mitigation, a timely follow-up scan must be conducted once the repairs are completed. Data from future scans is then analyzed in comparison to the baseline data to reveal potentially hazardous changes.