

ARC FLASH AND SHORT CIRCUIT STUDIES

Companies are increasingly concerned with the safety of their employees and contractors who may work on hazardous electrical equipment. The most common electrical injuries come from electric shock and from arc flash.

- Electric shock occurs when contact with live parts causes current to pass through the body to ground or to another phase.
- The most damage occurs when current passes through the lungs, heart or brain.
- Arc flash occurs when an electrical current passes through the air from one point to another.
- The resulting arc can reach temperatures up to 35,000 degrees F, igniting clothing and causing severe burns.

ThermoTest offers Arc Flash and Short Circuit Analysis studies which help clients comply with changing safety regulations.

- This study details the hazards that workers encounter when working on electrical equipment and methods necessary to reduce the risk of injury.
- Each study involves an inspection of the electrical distribution system.
- This study includes up-to-date single line drawings of the electrical system for each type of analysis.
- A report and safety labels indicating hazard levels.
- The report also details required personal protection equipment (PPE) for working on specific electrical equipment.

WARNING

Arc Flash and Shock Hazard
Appropriate PPE Required

| | |
|---------------------------------------|---|
| 15' - 10" 133.7 Extreme Danger | Flash Hazard Boundary cal/cm ² Flash Hazard at 18 Inches PPE Level Dangerous work hazard; Energized work prohibited. |
| 13.8 5' - 0" 2' - 2" 0' - 7" | kV Shock Hazard when cover is removed Limited Approach Restricted Approach - Class 2 Voltage Gloves Prohibited Approach - Class 2 Voltage Gloves |

Equipment Name: MAIN SWG (Fed by: R-4)

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PROVIDING INDEPENDENT INFRARED CONSULTING TO THE COMMERCIAL, INDUSTRIAL, GOVERNMENTAL, AND RESIDENTIAL MARKETS FOR OVER 30 YEARS!

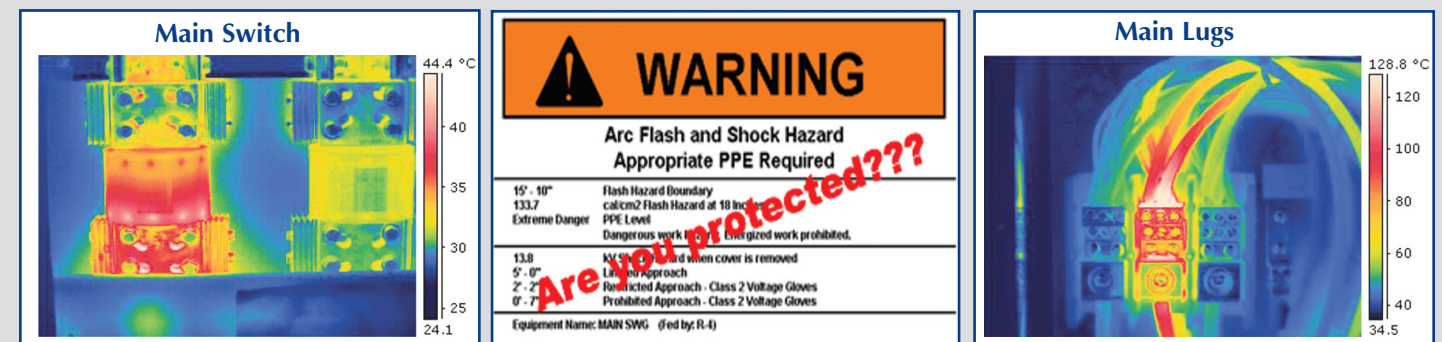
OUR MISSION:

Our goal at ThermoTest is to become the premier inspection company specializing in infrared thermography and other non-destructive testing procedures, enabling the modern office or industrial plant to optimize operating performance of the facility infrastructure.

INTRODUCTION:

ThermoTest provides testing and inspection services utilizing state-of-the-art technology to find and resolve potential problems in electromechanical and industrial settings. ThermoTest offers a quick, accurate and affordable solution to assist in reliable preventative maintenance. ThermoTest's qualified technical staff utilize current, state-of-the-art imaging and analysis equipment. Most testing and analysis procedures are conducted without interruption of power, production or business. Together with your staff, ThermoTest can develop an effective preventive maintenance program.

SERVICES PROVIDED:



INFRARED APPLICATIONS

Electrical Systems
Mechanical Systems
Moisture Surveys of Roofs
Heat Loss Inspection
Refractory Breakdown
Steam Analysis
Research and Development
Projects

ENGINEERING SERVICES

Arc Flash and Short Circuit Analysis
Harmonic Analysis
Power System Evaluation
EMF Studies
Power Factor Testing

FIELD SERVICES

Ground Fault Testing
Low, Medium and High Voltage
Switchgear Testing
Auto Transfer Switch Testing
Circuit Breaker Testing
Load Bank Testing
Transformer Testing
Ultrasonic Inspection
Vibration Analysis

We have performed over 35,000 site surveys worldwide. We have saved our clients millions of dollars in premature equipment failure, prevented costly down-time, and helped avoid safety hazards. All ThermoTest employees are level III-certified infrared thermographers, certified in harmonic evaluation, ultrasonic testing and vibration analysis. Starting a preventive maintenance program with ThermoTest will improve performance, increase operational lifetime and reduce repair costs for your facility for years to come.

INFRARED SERVICES

ThermoTest has built a reputation over 30 years specializing in the use of state-of-the-art infrared technologies to conduct surveys in a wide variety of applications.

KEY BENEFITS OF INFRARED SERVICES

- **Safety:** Surveys are conducted with a minimum of contact with equipment.
- **Reliability:** A properly conducted inspection will produce results not obtainable through conventional means.
- **Affordability:** Potential problems can be found before they become real issues, preventing unexpected shut-downs or replacement of expensive equipment.
- **ROI (Return On Investment):** Infrared testing has the highest return on investment. "When an infrared inspection program is coupled with timely maintenance repairs and equipment condition improvement, it is common for the return on investment to be on the order of ten times the cost of the program." www.mrgcorp.com

CAPABILITIES

Through the use of advanced infrared imaging systems, ThermoTest can diagnose many different types of applications. Most of these applications rely on the analysis of thermal patterns emitted by various surfaces and equipment. Below are some of the uses of infrared thermography.

Electrical Systems:

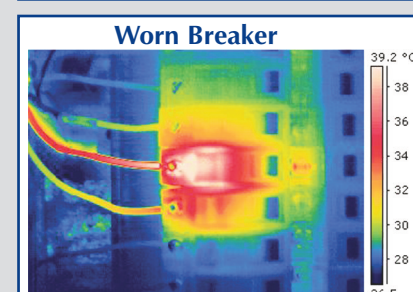
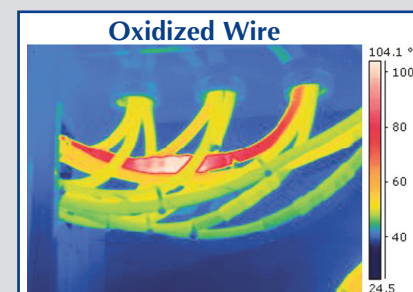
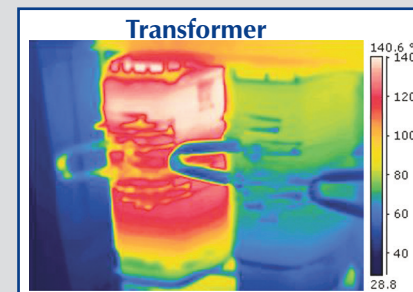
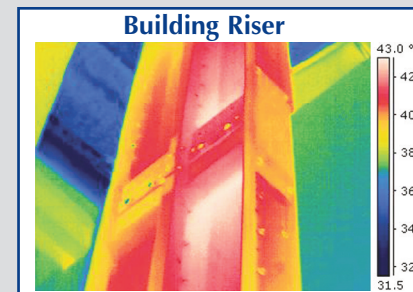
In electrical systems there are several causes of thermal anomalies. For example: increased resistance from poor connections/poor contact and improper loading resulting in overloaded or unbalanced circuits. Electrical resistance converts electrical energy to thermal energy. These situations and others lead to higher temperatures and wasted electrical power.

Mechanical Systems:

In mechanical systems such as motors and drives, friction is the primary source of heat build-up. Abnormal thermal patterns become visible in worn or inadequately lubricated bearings or misaligned drive components.

Moisture and Heat Loss Analysis:

Infrared technology is often used to determine the efficiency of insulation in buildings. Heat loss is clearly visible in poorly insulated structures. This also applies to insulation that has accumulated moisture due to leaks in the building envelope. Roof moisture surveys can locate saturated insulation and cut the costs of roof replacement.



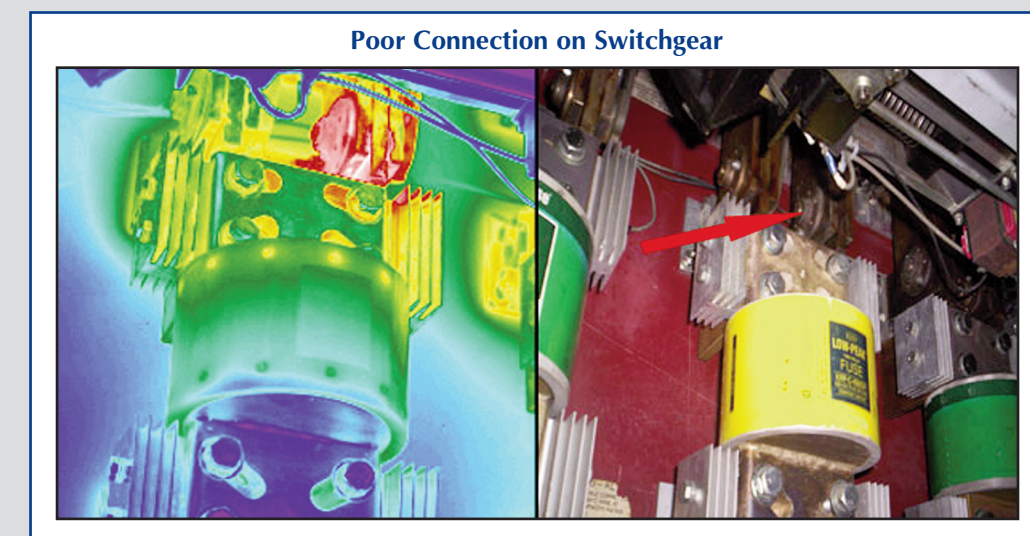
ENGINEERING AND MECHANICAL SERVICES

ThermoTest provides engineering services in the following areas: Vibration analysis, harmonic analysis, power quality monitoring, EMF studies, power factor testing and ultrasonic testing.

ThermoTest provides many other testing and maintenance services to help facility engineers keep their distribution systems running efficiently and reliably. Working with your staff, ThermoTest can help plan a maintenance schedule that includes testing and maintenance of switchgear, auto transfer switches, GFI and protective devices, transformers, UPS systems and generators. Keeping these critical operations running smoothly is our primary concern. We are committed to working from start to finish; from finding possible issues to resolving them. That is why ThermoTest strives to be your single point of contact for all your testing and maintenance needs.

Electrical maintenance services are provided to correct issues determined through the infrared inspection or by request of a client. We provide switchgear testing (low, medium and high voltage), ground fault testing, switchgear cleaning and torqueing, circuit breaker testing, retrofitting or replacement, transformer testing and maintenance, automatic transfer switch, load bank and generator testing.

Below is an example of a problem that can occur from a lack of switchgear maintenance.



Here are some of ThermoTest's satisfied clients:

| | | |
|--|-------------------------------------|------------------------------|
| UBS | Grubb and Ellis Management Services | Four Seasons Hotel |
| Memorial Sloan Kettering Cancer Center | Hilton Hotels | First Quality Maintenance |
| Pfizer | Metropolitan Museum of Art | Fisher Brothers Realty |
| Mt. Sinai Hospital | US Trust | First New York Management |
| Trump Organization | Time Equities | CRG Management |
| Rockefeller University | Sony | Cornell University |
| Paramount Group | Union Carbide | Liz Caliborne |
| Equity Office | New York Palace Hotel | Christie's |
| Verizon | New York Mercantile Exchange | The Brooklyn Hospital Center |
| Metropolitan Life | Marriott | Park Central Hotel |
| New York University Hospital | Mercedes Benz | Beth Israel Hospital |
| Anheuser-Busch Inc. | Gannett Newspapers | Antares Real Estate |