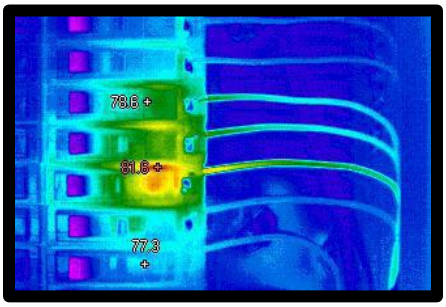
INFRARED TECHNOLOGY

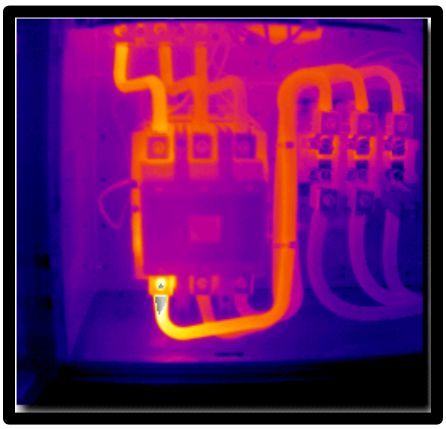
Thermal images of electrical systems can indicate the operating condition of the equipment in those systems. In fact, since the beginning of thermography more than four decades or more ago, the principal commercial application for thermal imaging has been electrical system inspections.



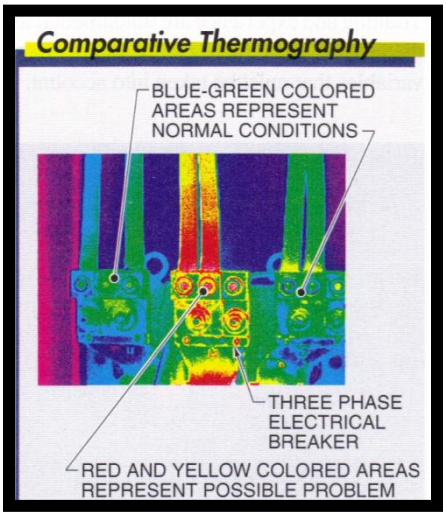
The reason thermography is so applicable to the monitoring of electrical systems is that new electrical components begin to deteriorate as soon as they are installed. Whatever the loading on a circuit, vibration, fatigue and age cause the loosening of electrical connections, while environmental conditions can hasten their corroding. Briefly stated, all electrical connections will, over time, follow a path toward failure. If not found and repaired, these failing connections lead to faults. Fortunately, a loose or corroded connection increases resistance at the connection and since increased electrical resistance results in an increase in heat, a thermal image will detect the developing fault before it fails.

Detecting and correcting failing connections before a fault occurs averts fires as well as impending shutdowns that can be critical to manufacturing, commercial and institutional operations. Such predictive actions are important because when a critical system does fail, it inevitably increases costs, requires the reallocation of workers and material, reduces productivity, threatens corporate profitability and impacts the safety of employees, customers and/or clients.

What represents a "red alert"? Equipment conditions that pose a safety risk should take the highest repair priority. Guidelines provided by the NETA (InterNational Electrical Testing Association) say that when the difference in temperature between similar components under similar loading exceeds 27° F immediate repairs should be undertaken. The same organization recommends the same action when the temperature for a component and ambient air exceeds 72° F.



What's the potential cost of failure? Left uncorrected, the overheating of a loose or corroded electrical connection could blow a five dollar fuse and bring down an entire production process. Then, it will probably take at least half an hour to shut off the power, get a spare fuse from the storeroom, and replace the blown fuse. The cost in production losses will vary depending upon the industry and the process, but in many industries a half hour of lost production can be very expensive. For example, in the steel casting industry, lost production costs from downtime have been estimated at about $1000 per minute.



Follow up actions. Overheating connections should be disassembled, cleaned, repaired and reassembled. If, after following this procedure, the anomaly persists, the problem may not have been the connection, although a faulty repair remains a possibility. Use a multimeter, clamp meter or a power quality analyzer to investigate other possible reasons for the overheating, such as overloading or unbalance.

Whenever you discover a problem using a thermal imager, use the associated software to document your findings in a report, including a thermal image and a digital image of the equipment. It's the best way to communicate the problems you found and the suggested repairs.