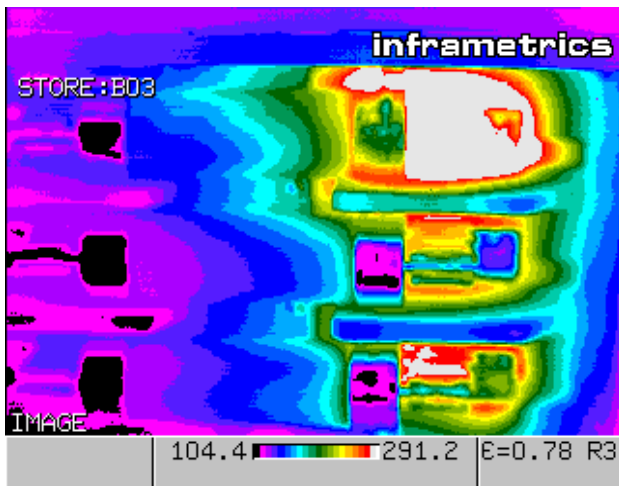


Infrared thermography is an ideal predictive maintenance technique for scanning electrical equipment for defective components. Normal wear, chemical contamination, corrosion, fatigue and faulty installation may raise the resistance level of the component. Such a rise in component resistance will increase the amount of power dissipated in the form of heat. This in turn will cause an increase in the temperature of the component.

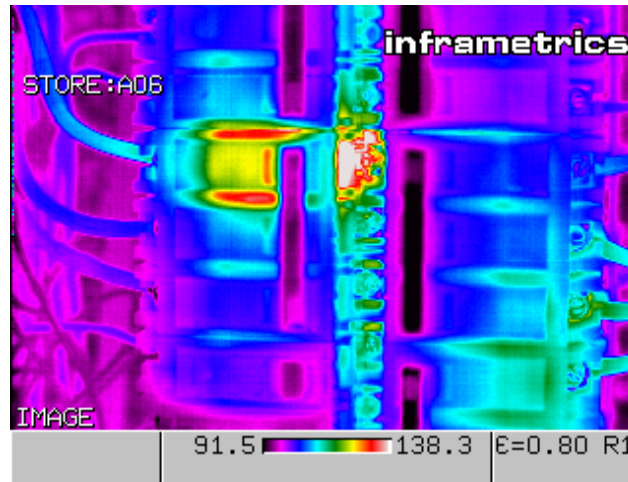
This excessive heat, evidenced by the increased surface temperature of the component, can be readily noted and the temperature rise measured by an infrared imaging system. The increased temperature indicates, a potential trouble spot and possible future failure of the component.

The infrared inspection is carried out while the electrical system is under load. However, there is no physical contact with the system, thus making it an excellent preventive maintenance tool, which causes no disruption to the normal operating routine of a facility.

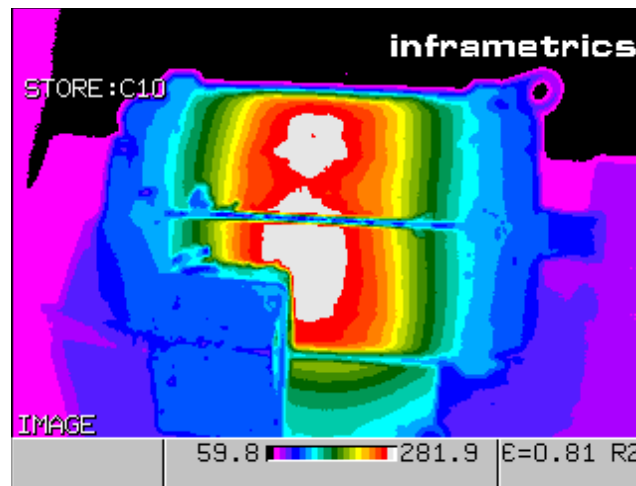
At the plant/building level, all the major electrical equipment, such as substations, motor control centers, switch gear, circuit breaker panels, electric motors, etc., can be readily checked for component parts which are at excessive temperatures, thus indicating potential problems.



The main switchgear supplying power throughout your facility should be inspected. The thermogram above shows a hot fuse connection in a main distribution panel.



The thermogram above shows a hot breaker connection in a breaker panel. The hot spot is at the breaker to panel connection.



Infrared inspection can also be performed on mechanical equipment to locate overheating components. Electric motors, bearings and couplings can be checked quickly to locate and identify hot rotating equipment. The electric motor in the thermogram above is operating at 286 degrees F.

In power generating, transmission and distribution systems, electrical energy is transferred from one facility to the next through a series of mechanical interfaces associated with connectors, insulators, switches, bushings buss, etc. Each such interface represents a point where conductivity may be reduced with a resultant temperature increase, again pointing to a potential problem.



Shown above are two hot “pothead” connections in an electrical substation. The entire electrical transmission and distribution system from the generating plant to the secondary service can be inspected. We inspect substations, transmission lines, generating plants, distribution lines, pole and padmounted transformers, pole and padmounted switchgear and electric manholes.

OTHER APPLICATIONS FOR THERMAL IMAGING INCLUDE:


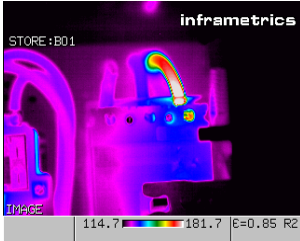
- Building energy audits
- Infrared roof moisture surveys
- Product testing and promotion
- Pollution monitoring

The results of a “standard”

thermographic survey consists of:

- 1) A “Summary of Anomalies Found” which list all thermal anomalies detected according to severity - used for prioritizing maintenance repairs.
- 2) A color image of the infrared view of the problem area.
- 3) A standard visible light image of the “normal” view of the problem area for field identification.
- 4) A written summary for each “hot spot” found. Target temperature, reference temperature, ambient temperature, temperature rise above reference and rise above ambient is included as a guide for determining the severity of the problem.

A sample report page is shown below.

INFRARED TECHNOLOGY SERVICES		
Anomaly Number : 1		
Severity Rating: 15		
Date: 08/06/2006	Time: 1112	
Location: Forge Shop, Middle Motor Control Center, Furnace Blower control panel, main breaker		
Description: Top right connection		
 		
Target Temp: 198	Rise above ambient: 104	
Reference Temp: 118	Rise above reference: 80	
Ambient Temp: 94		
Recommendation: Corrective measures should be taken IMMEDIATELY.		
Corrective Action Taken	Date	Signature

ADVANTAGES GAINED THROUGH THE USE OF INFRARED INSPECTIONS

- Prior to a new plant/system start-up an infrared inspection can locate potential problems and help to “shake down” the electrical system.
- With effective preventive maintenance, equipment life will be extended, delaying capital expenditures for equipment replacement.
- The plant maintenance manager will know exactly what problems exist and the specifics of the problems, hence maintenance manpower utilization may be increased, correcting known problems rather than checking equipment that is in satisfactory condition, not requiring maintenance.
- Costs of emergency repairs, in terms of overtime labor, higher priced replacement parts and emergency parts shipping are reduced.
- Scheduled shutdown time can be reduced for electrical maintenance since problems are pinpointed prior to shutdown. Replacement parts, if required, can be ordered, ready and waiting.
- Infrared inspections can evaluate the quality of repair work being done.
- Reliability of the plant power distribution system will be increased.
- Production loss due to unplanned outages can be minimized.
- Potential to lower plant insurance premiums. Economic gains result for both the plant and the insurance company since in cases of:

Fire: Conscientious maintenance carried out as directed by the result of an infrared inspection of electrical distribution systems will lower the chance of fires due to electrical failures which can lead to a lower percentage of paid claims or lower claim/premium ratio.

Casualty Loss: Regular infrared inspections locate specific equipment problems, hence preventive maintenance may be performed on equipment prior to failure and can result in a lower percentage of paid claims or claim/premium ratio on major equipment loss.

Liability: Prevention of accidents by locating failures before they occur can prevent damage to property and personal injuries.

INFRARED TECHNOLOGY SERVICES



- * Electric Utility
- * Industrial
- * Commercial
- * Roofs

**7586 U.S. Hwy. 79 East
Henderson, Texas 75652**

O: (979) 820-1248

F: (903) 889-2941