



# Deepak Engineering Works

Govt. Approved 'A Class' Electrical Contractor up to EHT,132KV

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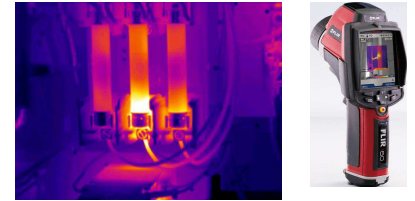
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## INFRARED THERMOGRAPHY SERVICES FOR ELECTRICAL PREDICTIVE MAINTENANCE & SAFETY

DEW provides infrared (IR) thermographic imaging services to clients. Infrared thermography as a predictive maintenance inspection technique is widely-recognized and effective non-destructive testing tool used often to check electrical and mechanical systems, buildings, roofs and facilities.



### INTRODUCTION TO INFRARED THERMOGRAPHY

Infrared thermography is an effective means to identify hot spots in systems or materials. Infrared allows us to see what our eyes cannot. Nearly everything gets hot before it fails, making infrared scanning extremely cost effective, valuable diagnostic tool in many diverse applications by analyzing the temperature signatures of equipment, problem areas are quickly identified and recorded along with all of the related temperature information. An Infrared camera is designed to detect this overheating and interpret it as early warning signs of imminent failure.

### SAFETY

Fire avoidance. Overheated electrical connections can start fires. You may have heard of a fire in your area that it was caused by "faulty wiring". This means many things including bad design and overloaded circuits. It also commonly means a bad electrical connection that was **overheating and was not found in time**.

An industrial process that runs reliably and without surprises produces a **safer work environment**. Many industrial processes are complex and run at high speed. A sudden failure on one machine can have a cascading effect of failures that may include flying debris.

### ELECTRICAL APPLICATIONS

The most popular and widely used application of infrared thermography is electrical switchgear, Motors, Transformers, Generators, Bus bars & Cables. No other commercial application has achieved the level of interest than that of electrical infrared thermography. Electrical Infrared is now an integral part of any Utility/facility manager's predictive maintenance and Safety program.

Why such an interest in electrical thermography? Simple. All electrical maintenance personnel know that as soon as new electrical components are installed they begin to deteriorate. With fluctuating and continual loads, vibration, fatigue, age, and other things like operating environment, all of these will increase the probability of faults in electrical components. These faults, if not found and taken care of, will lead to catastrophic failures, unplanned shutdowns and losses of production.

Approximately 25% of electrical equipment failures are caused by overloaded circuits, faulty electrical connections, whether they are loose, dirty, corroded or over tightened. These faults are not found during regular maintenance because one cannot see the problem until real damage to the component is done or the fault causes an outage or fire.



## THE MYTH OF CONNECTION TIGHTENING (Conventional Maintenance Procedure)

As has been seen in conventional maintenance technique, a strong emphasis is laid on tightening of all connections whether or not they are loose. A connection that needs periodic retightening is a connection having some problem. Better way is to check for signs of overheating. If such signs are found the answer is to find out what is causing them and correct it. Retightening it over and over again may aggravate the problem.

Once set, a termination should be left alone unless and until any indication of malfunction is detected – such as overheating which is detected by thermo graphic inspection. Infrared inspections however provides advanced warning to an eventual costly failure by finding the 'hot spots' or temperature differential that may indicate problems such as a loose or corroded connection, conductor or component overloaded or overheating apparatus.

## BENEFITS OF INFRARED ELECTRICAL INSPECTIONS

### ≈ Safety

- ~ failure of electrical components could be catastrophic, injuring or even killing employees, maintenance personnel or the public.

### ≈ Greater system security

- ~ locating the problems prior to failure greatly reduces unscheduled outages, associated equipment damage and downtime.

### ≈ Increased revenue

- ~ with more uptime, revenue is maximized. With less maintenance on good components and faster repairs of faulty components, maintenance costs are reduced leading, to a better bottom line.

### ≈ Reduced outage costs

- ~ the cost of an emergency outage is ten times greater than planned maintenance.

### ≈ More efficient inspections

- ~ since all common electrical problems announce themselves as an increase in temperature, they are easily detected in a minimum amount of time. No service interruption is required for infrared inspections.

### ≈ Improved and less expensive maintenance -

- ~ Precise pinpointing of problems minimizes time required for predictive and preventive maintenance
- ~ Maintenance efforts are directed to corrective measures rather than looking for the problem
- ~ Repair only what requires repairing, reducing repair time and unnecessary replacement of good components.

### ≈ Reduce spare parts inventory

- ~ with improved inspection techniques giving advanced warning of failure, fewer spare parts are required in inventory. What would it mean to the bottom line if your spare parts inventory could be reduced by 10 per cent?

### ≈ Reduced operational costs

- ~ with the system up and running for longer periods of time, the reduction and improvement of inspections, maintenance, spare parts inventory and outages will reduce the overall cost of operations.

