WHY & HOW HOTSPOT DETECTORS CAN HELP IN ELECTRICAL RISK CONTROL?

Temperature Detection and electrical accident Control

Many safety conscious organizations are using non-contact type, laser guided thermometers to detect temperature rise in electrical panels, equipment, etc. This hotspot detection tool if used effectively can increase reliability by identifying potential problem areas in advance without initiating a shutdown. The concept of the use of thermometer is based on the principle *that 'generally, electrical failures are preceded by abnormal heat build-up'*. Thermometers can be used for diagnostic and preventive inspection of electrical equipment.

US study showed that 26% total electrical failures are due to loose connections and poor terminations. Indian scenario as per an expert cannot be less than 50%. Immediate effect will be overheating of joints and terminations due to increased contact resistance. The temperature detection at electrical connections, etc. becomes very crucial considering the fact that the effect of temperature on insulation life will reduce by 50% if the maximum temperature is exceeded by 10 degree centigrade.

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Hotspots can form due to:

- Use of improper lugs / incomplete crimp
- Poor contact
- Bolts carrying current
- Dirty contact surface
- Extra Joints
- Cut wire strands to accommodate smaller lug
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High temperatures (or hotspots) could indicate:

- High contact resistance
- Loose/ tight connections
- Unequal loading
- Over loading

Although this versatile temperature-measuring instrument is used in many plants, it is observed that the proper interpretation and action taken on temperatures exceeding normal values requires

improvement. A few tips for temperature value interpretation, extracted from a manufacturer's application guide are given below for guidance.

1. 30 degree centigrade + ambient indicates a serious fault condition and needs investigation.
2. Temperature difference between phases – 5 degree centigrade or more- a potential problem.

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