Technical Diagnostic Services Training Institute

Infrared Inspection of Electrical Power Systems
16 Hours

Who Should Attend?

Technicians, Engineers or Supervisors responsible for preventative and scheduled maintenance.

Course Description:

Students will learn basic infrared theory as it applies to infrared inspection of electrical systems. This is a two-day theory and application course for the use of thermal imaging to locate and evaluate problems in electrical distribution systems.

This course covers infrared theory, heat transfer concepts, equipment operation and selection, standards compliance, image analysis and report generation. Students are trained to identify and document thermal patterns caused by improper design, workmanship or material failure.

Selection criteria, manufacturers, models, range and level settings of infrared imagers and accessory equipment are covered. Students have the opportunity to use imager in class. Detailed instruction on safety and indoor and outdoor inspection of transformers, buss, switchgear, fuses, circuit breakers, and cable trays is provided. Guidelines for report generation, presentation and end user/thermographer responsibilities are also addressed.

Outline:

1. **Basic Infrared Theory**
   a. Heat transfer
   b. Electromagnetic spectrum
   c. Emittance, reflectance, and transmittance
   d. Atmospheric transmission
   e. IR wavebands and lens materials

2. **Infrared Equipment**
   a. Selection criteria
   b. Range and level settings
   c. Class demonstrations
   d. Manufacturer equipment presentations (optional)
   e. Hands-on use in class

3. **Electrical System Inspections**
   a. Theory and thermal signatures of problems
   b. Ground-based inspection of distribution systems
   c. Substation inspections
   d. In-plant inspection of:
      i. transformers
      ii. bus
      iii. switchgear
      iv. fuses
      v. circuit breakers
      vi. cable trays
   e. Standards for inspection
      i. end user and thermographer responsibilities
      ii. safety practices
      iii. data gathering and report preparation

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