



Technical Diagnostic Services Training Institute

Infrared Inspection of Electro/Mechanical Systems 24 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 Electro/Mechanical Systems. This is a three-day theory and application course for the use of thermal imaging to locate and evaluate problems in electrical distribution and mechanical systems. This is a non-certification course that focuses on these specific applications. 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. Attendees are encouraged to bring their own imager for individualized training or to learn how to use it more effectively.

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.

Prerequisite: All students must complete our Infrared Inspection of Electrical Power Systems Course

TDSTI

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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

4. Mechanical System Inspections

- a. Theory and thermal signatures of problems
- b. Rotating equipment
- c. Power transmission components
- d. High-temperature insulation
- e. Fluid flow including steam systems, heat exchangers, cryogenics, etc.
- f. Active thermographic inspection techniques
- g. Standards for inspection
 - i. end user and thermographer responsibilities
 - ii. safety practices
 - iii. data gathering and report preparation

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