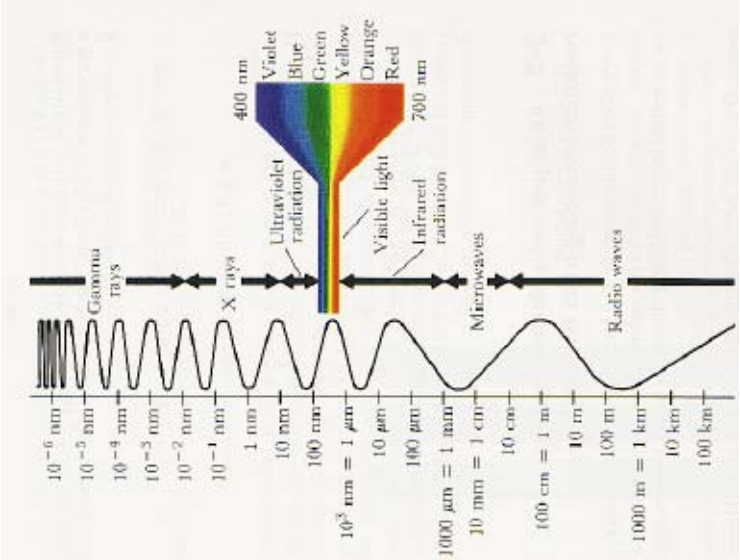
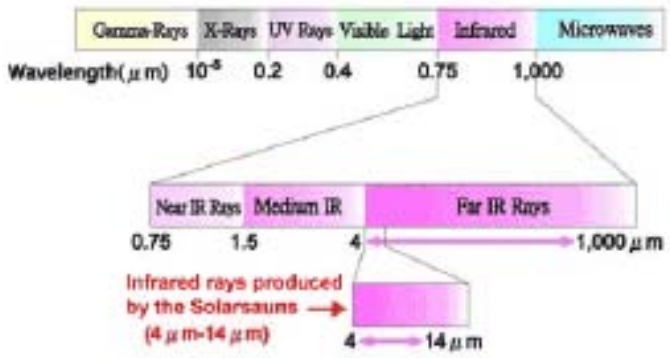
INFRARED
THERMOGRAPHY

Infrared imaging and radiometry in the commercial sector has been available since the mid 1960's. Infrared energy is part of the electromagnetic spectrum and behaves similarly to visible light energy. The difference between visible light and the infrared is its wavelength. Visible light has a wavelength from .4 micrometers to .75 micrometers. Infrared has a wavelength from between 2 micrometers and 1000 micrometers, which is longer then visible light. The camera used by WALCO ELECTRIC is a "long wave" which reads between 8 micrometers and 12 micrometers.



An infrared detector converts infrared energy into a usable signal. Generally the performance characteristics of the detector are enhanced the colder it is. This used to be most commonly accomplished by liquid nitrogen. In the past few years other cooling technologies have become efficient to replace liquid nitrogen. The Stirling cycle coolers are generally considered the most efficient and provide cooling to liquid nitrogen temperature (-196^{0}C) or below, and can maintain the -196^{0}C temperature over a wide range of external ambient temperature conditions.



One of the oldest applications of commercial infrared imaging involves the inspection of electrical distribution equipment. The underlying principle of IR inspection is that all conductors carrying current produce heat and the infrared camera measures the radiated heat. If an area of localized higher resistance is formed because of corrosion or a loose connection a hot spot is formed that can easily be found by the infrared camera.

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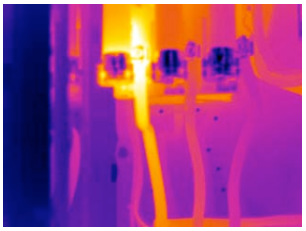
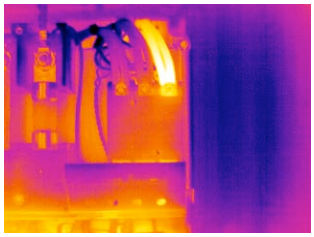
WALCO ELECTRIC provides a wide variety of inspection and maintenance services to aid the Plant or Facility Engineer, Property Owner in preventing and eliminating potential or existing problems. Most services involve the use of an **Infrared Camera** or other non-destructive equipment and processes.

Electrical Systems: *When current passes through a circuit all components will heat up. As the connections of these circuits deteriorate or when there is improper loading (overloading or unbalanced) circuits cause excess electrical energy to be converted to thermal energy. In these situations there is a waste of Electrical Power which translates into lost money and unsafe environments or cause fires if not attended to in a timely manner.*

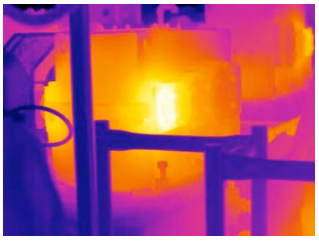


Fuse connection

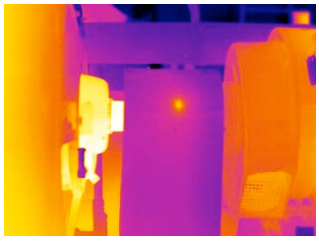


Loose wire connection

Mechanical Systems: *During normal operations most mechanical systems will heat up due mainly to mechanical energy dissipation. Friction creates heat in mechanical and electro-mechanical devices. If the interaction of these components becomes less efficient, Infrared Inspections can identify improper operational characteristics*

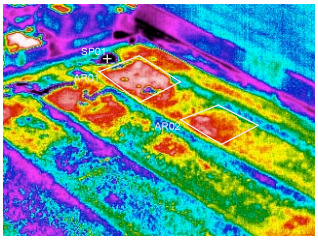


Gear Box overheating

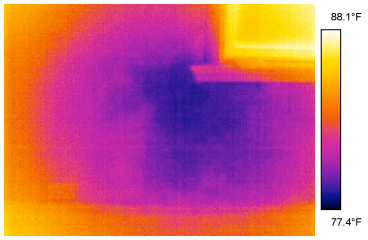


Motor Coupling misalignment

Building Science: *Infrared building science is the application of infrared (IR) thermographic inspection techniques as a powerful and noninvasive means of monitoring and diagnosing the condition of buildings. Find moisture sources and structural problems quickly without disassembly, air or liquid intrusion through window framing or other cutouts, roof inspections to pin point repair location and provide documentation of as-built or post-repair/restoration conditions*



Water Trapped Under Roof



Water Intrusion Inside wall near window