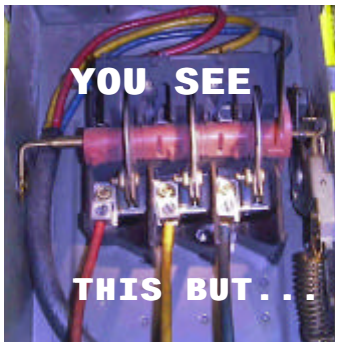
PREDICTIVE & PROACTIVE MAINTENANCE.
ELECTRICAL-FAULT SURVEYS.

*What are the benefits of combined **THERMOGRAPHIC & ULTRASOUND** surveys?*

When failures occur in a Facility's electrical system, they tend to happen when power is in most demand. This causes the maximum inconvenience due to downtime, lost production and person-hours. The Maintenance / Electrical Engineer's, job is made no easier by the ensuing high-pressure panic that he is likely to have to endure upon an emergency call out, possibly late at night, due the loss of a critical service or lighting etc. **Hospital Patients** may die! **Accidents** may occur due to lose of lights! **Equipment** may become damaged! **Perishable** stock & **Medicines** may be destroyed! **Telecommunications, Air Flights, & Commerce** disrupted! Even "Secured" Uninterruptible Power Supplies (UPS's) systems may fail to "cut-in" correctly!

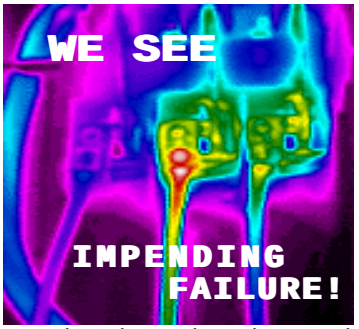
(Please see our flyer on UPS surveys.)

Power failures are generally caused by undetected underlying faults that also frequently present **Fire Hazards**, especially when volatile products such as lubricants, solvents and paint are being stored or are being used.
Such incipient faults cannot be detected by the Electrical Engineer's range of trouble shooting and/or test equipment. Only by INFRARED (IR) Imaging & Diagnosis, backed up with ULTRASOUND (US) Detection, can these insidious problems by caught in time to avert power outages, component failures, or consequences of even greater magnitude. Formidable disasters are often caused by small-unnoticed incipient faults!



Often, a common cause of such insidious faults can be due to hidden corrosion between the mating surfaces of electrical terminations. Other causes may include; Loose terminations caused by bad installation, vibration, and/or inductive and thermal changes, Faulty manufacture, Burnt contacts, Insulation break down, Occasional overloading, Neutral Harmonics, Partial cooling system failure, Weather exposure, etc.

A fully "Analytical THERMOGRAPHIC Imaging" camera is used for the INFRARED DIAGNOSTICS. This, together with the associated specialised software, has been developed to detect, quantify, and/or predict these problems due to the specific nature of their "Heat Signatures." This equipment is very costly, and requires experienced and qualified operatives to identify all of the probable faults. (This equipment is not a "hot spot camera" or "non-contact thermometer", these do not have the same sensitivity, precision or diagnostic capabilities.) Following a competent survey, the report should be prepared by the surveyor himself carrying out the result analysis and preparation of the remedial recommendations. This assures vertical integrity in the follow up Diagnostic Report. The Electrical Engineer can then pre-plan the prescribed remedial work therein, to minimize costly downtime, inconvenience, and/or loss of production or equipment, or risk to personnel. Many times, tightening a screw, cleaning terminal contacts, or cutting back and re-crimping a wire etc. can avert an impending catastrophe.



To take full advantage of this technology, and to obtain optimum equipment reliability, it is recommended that these Thermographic Surveys should be carried out cyclically. This is because all electrical systems in normal use are inevitably subject to degradation, particularly in an industrial environment. Re-surveys should be carried out as soon as possible following remedial action to insure the integrity and safety of the rectification work. Surveys should also be done whenever there has been an installation of any new equipment, or when equipment has been out of use for some time such as after "moth-balling," Holiday shut-downs, etc.; since hidden corrosion is very likely to have occurred.

With over thirty years experience in Infrared Spectrometry and Acoustic Industrial Fault Diagnostics, the author pioneered the use of Thermography during the eighties, and in the nineties, the synergistic coupling of ULTRASOUND to Thermographic surveys. US can detect a group of problems with inappropriate heat signatures for Thermographic detection, e.g. Air Ionisation, Micro-Arcing, other Discharge Sources, and dangerous connections hidden from Infrared view by panels and walls etc. **Ultrasound can hear what Infrared may not see and vice versa.**

Fault-temperature rises are proportional to the system load, and therefore loading conditions. These constantly change in accordance with the nature of the job being under taken (e.g. Lifting, Moving, Winching, Pumping, etc.). This should be an important consideration when deciding on how often, and when surveys ought best be done. The more frequently these surveys are scheduled into maintenance programs, the better these job task variations are covered, thus even capturing rogue problems. This fault focused approach will give a huge boost in the effectiveness of your preventative maintenance, a large saving in down-time, saving on the unnecessary condemning of good equipment, reduced risks, an elevation in equipment confidence and staff moral, increased production and, a much **greater retention in the value of your assets.**

Anthony R. CLOUDER, FELLOW OF THE INSTITUTION OF DIAGNOSTIC ENGINEERS.
United Kingdom Thermography Association (Founder member). International Thermographers Society.
Tel. +60 (0)13-8330093 or Email clouder@go.to - Website: http://go.to/clouder