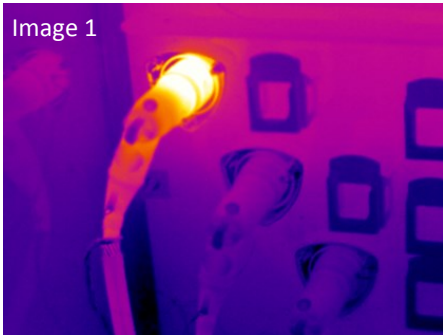


## Global Risk Communication: A Closer Look at Infrared Thermography

Infrared Thermography (IR) has been used in industrial and commercial facilities for a few decades and the practice has been well documented and proven. Global Risk Consultants (GRC) utilizes Infrared Thermography technology to uncover and identify “invisible” threats. Our technology can spot these threats and provide recommendations to prevent future failure.

Detecting, reporting, and acting on these invisible threats can go a long way in preventing outages, equipment damage, fire, and those losses that occur under the deductible, which takes in a fair percentage of a locations potential equipment loss exposure. Add in the possibility of a major Business Interruption due to a power failure, or the potential injury or loss of life, should the consequences of small occurrences quickly trend to the negative side, and it is easy to see why insurers and NFPA recommend IR inspections at some set frequency.

One of the first indications that an object is trending to failure is a change in a readily observable physical condition - *temperature*.



Electrical connections become loose and the increase of the flow of electrons to that point manifests in a change in resistance with a resultant temperature increase that can be observed with an infrared imager. Likewise, an increase in friction on a bearing, belt, or conveyor can quickly be noted and scheduled for repair.



Some examples of Infrared scans are seen here. The bushing on the main transformer for a data center is seen with an elevated temperature on the H-1 main bushing which presents potential business interruption (Image 1).

Image 2 shows an overheated motor thermal signature which could be a bearing or internal motor problem.

Not to be forgotten in the modern property loss prevention arsenal, ultrasonic technology is used to detect arcing, tracking, and partial discharge in electrical equipment. This is most often done adjunctive to an IR property loss control inspection of the medium to higher voltage equipment found in substations, transformers, switchgear, and HV cables. Since this type of equipment is often positioned in the system to feed other equipment, it is normally designated as critical path equipment whose failure would disrupt production, protection, and/or life safety.



### Summary Points:

- Infrared Thermography, Ultrasonic, and Visual Inspection are used to detect and prevent failures.
- IR technology identifies “invisible threats” by detecting temperature increases.
- Ultrasonic technology is used to detect arcing, tracking, and partial discharge.
- Visual inspection should be implemented consistently and professionally.
- Utilizing all methods provides you with data to make informed loss control decisions.

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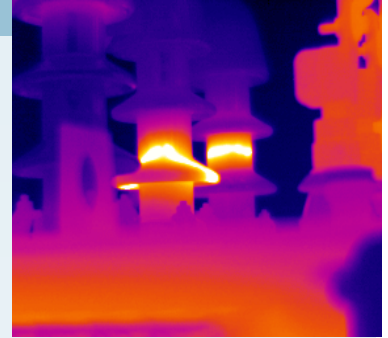
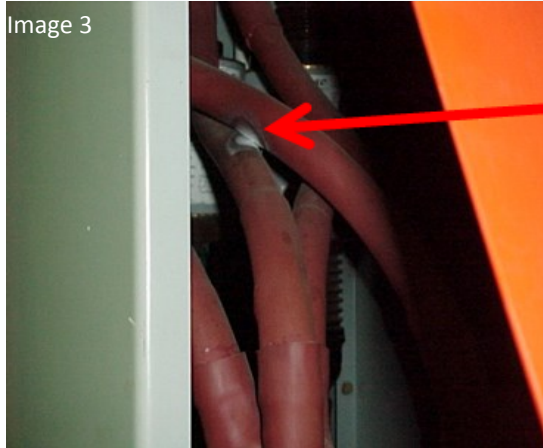
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A TÜV SÜD Company



The visual in Image 3 shows 6.6kV cabling on verge of catastrophic failure due to a conductor breakdown that was detected ultrasonically. Net loss potential was \$800,000 minus the potential of injury at time of phase to phase arc flash. Action was to replace the damaged conductors and reroute as to not overlap and touch adjoining cabling.



*“Another tried and true weapon in the loss control arsenal is neither new nor expensive, and that is visual or physical inspection, which if implemented on a consistent and professional level can be the most productive of the three techniques described”*

Another tried and true weapon in the loss control arsenal is neither new nor expensive, and that is visual or physical inspection, which if implemented on a consistent and professional level can be the most productive of the three techniques described. In this case (Image 4), Tripping batteries and UPS batteries are critical components in any electrical system and should have a documented visual inspection program. Image 5 shows the high side of a power company transformer that requires cleaning.



*“Those facilities that engage in a planned program of visual inspection and repair of critical path equipment put themselves in a position of strength in the contest of man over machine.”*

Those facilities that engage in a planned program of visual inspection and repair of critical path equipment put themselves in a position of strength in the contest of man over machine. Utilizing Infrared thermography, ultrasonics, and visual inspections, the Property Loss Control Professionals at GRC can provide you with the data to make informed loss control decisions.

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