Article on Infrared Thermography

INTRODUCTION

Even a few years back, maintenance and operation people did quite queer things in the factory. It was a common sight that a productive machine broke down and none had any idea as to why and when such breakdowns would happen. As and when such a breakdown took place, people ran all over the place fighting to put things back in order and as quickly as possible. The bosses would stand around the affected machine and literally breathe down the neck of the repairmen urging them to speed up as if they were driving a car. Sooner or later the machine would be up and running and the repairmen had a broad smile on their faces and a pride in their hearts thinking that their jobs will stay as long as the company stays. Such smiles were however short-lived since within some time the same type of scene would follow.

But such type of thinking and action has started to change. Managers now understand that proper management of equipment is the heart of Productivity. When equipment breaks down frequently it is not possible to produce. When equipment functions abnormally, quality of product is affected. And safety is also compromised. Under such circumstances operational costs increase leading to loss of profitability.

In order to prevent such loss of profitability it is important to enhance the reliability of operation and equipment. How does one do that? We may then start by understanding the basic reasons as to why any equipment would fail. One of the most important reasons is Temperature. For example, an electrical connection fails due to temperature. So does a bearing. And a furnace or boiler becomes inefficient due to temperature changes taking place within it. But the question that may come to your mind is "Are we not measuring temperature at different places in different ways?" Yes, but most often that does not give the indication of a failure. Why? Simply because a spot temperature measurement may not give us proper or sufficient information as to why and when a machine or component of a machine is going to fail. In most cases we would need to know the temperature distribution of a particular place. This in technical parlance is known as the temperature profile something like a CAT scan, which many of us are familiar with.

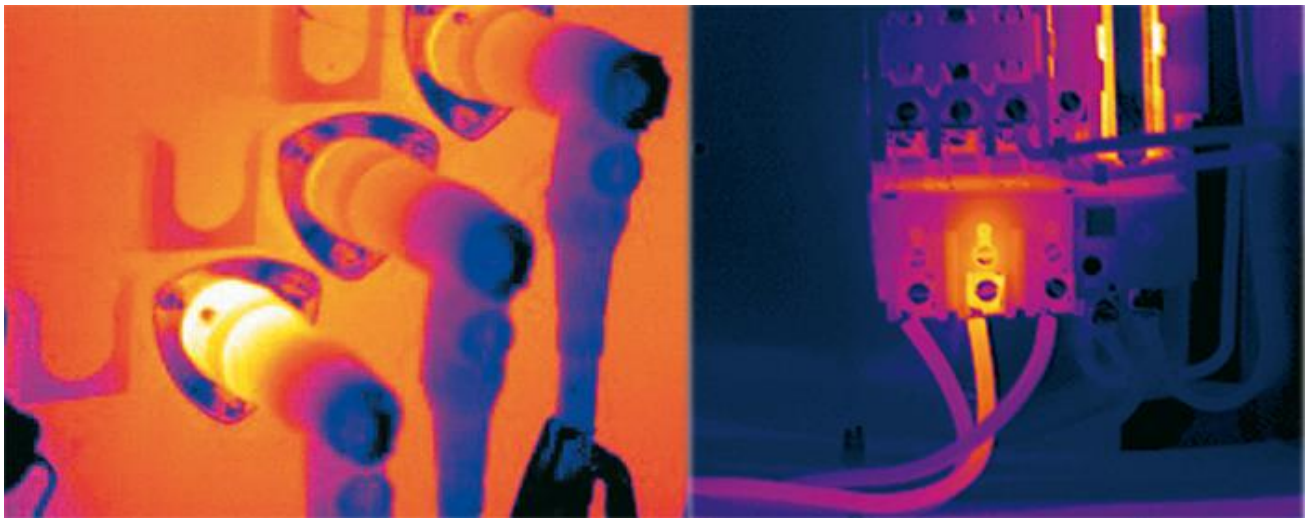
However, by simply knowing when a failure would take place we would not be in a position to improve reliability of the equipment. If there were some imperfection then that component or machine would again fail even after being repaired thoroughly. Improving reliability would mean improving the life of the component or machine. That may only be done if the root imperfection is understood properly.

Therefore, Infra-red Thermal imaging (non-contact measurement of temperature) is the only temperature tool that can not only predict a failure effectively but also understand the root imperfections properly. Once the root imperfection is understood and eliminated reliability is improved. We need to do it once to gain ongoing benefit. In this manner, we would be able to improve productivity, quality and reduce operating cost to obtain higher profitability.

A NOTE ABOUT TAKING GOOD THERMAL IMAGES

Unlike other temperature measurement techniques, infrared imaging provides the means to scan the infrared emission of complete machines, processes or equipment in a very short time. The user can view the thermal emission profile of a wide area simply by looking through the instrument's optics.

However, there are **three golden rules** to take effective Thermal Images. These are the following:



1. What am I looking at?
2. Why am I looking at this, what I expect from this images?
3. What additional data I need to analyze the thermogram and find the root imperfection?