



Planning an Electrical Infrared Inspection?

If you're new to the idea of infrared inspection of your equipment, planning, finding a provider, and determining what the benefits are may seem like a daunting task. Whether or not the task is new to your facility or if you have had a program in place for years, it doesn't have to be another stressful project in your already hectic schedule. A quality infrared inspection can be performed with little or no interruption in your schedule and can save you time and money later on.

Why Infrared?

Infrared inspection of your facility can provide you with valuable information on the condition of your equipment that can save hundreds or thousands of dollars in costly repairs, downtime, and dangerous failures resulting in fires or explosions. An infrared inspection of an electrical distribution system is designed to identify potential equipment failures before they happen so the appropriate action can be taken. Resistance created by loose connections creates heat that can be imaged to show the exact location of the defect that will simplify repair and protect the adjacent components. This in turn will reduce cost of repair and potential down times. You may also ask your insurance provider if they offer discounts as a result of an infrared inspection.

Choosing a provider.

Choosing an infrared service provider is an important step in creating a valuable program for your facility. There are several points to consider when choosing the right provider to get the most for your dollar and a thorough inspection of your equipment.

1. Cost! Cost! Cost!

Of course cost is at the top of your list. You have a budget and you're expected to stick to it. As with anything you buy, cost can be an indicator of the product or service you're going to buy. Although cost is a driver you must also consider what you're getting for the dollars spent. Some providers charge by the day or half day while others charge by the hour. Many will give hard bids for job completion if asked to do so. Ask the provider if they have additional charges such as air fare, report charges, mileage, etc. Sometimes the cheapest bid can be more expensive if the provider tacks on additional charges at the end of the job. Get an estimate in writing before the job begins! This will reduce the

chance that either of you misinterpreted the job scope or total cost of inspection. Does the vendor provide electrical services with the inspection? Many infrared inspection providers do not provide their own electrical support or may have agreements with electrical contractors to sub-contract the prepping of electrical components for inspection. If your vendor does not, be sure and include the cost of panel removal and replacement in your total job cost.

2. Certifications.

Infrared testing technicians are rated by level of training and experience. Don't be afraid to ask how they are certified and for copies of documentation. Level certification comes in level 1, 2, and 3, with 3 being the highest certification. Being level 2 trained means a technician has had 80 hours of formal training from a certified provider. They provide the classroom training portion for certification under ASNT. The American Society for Non-destructive Testing (ASNT) certification also requires that a technician have verified application experience supervised by another level 2 or level 3 technician in addition to the classroom training hours. A level 1 technician is allowed to perform inspection duties under ASNT guidelines as long as he is under the supervision of, and a level 2 or 3 technician reviews his findings. A level 2 technician is authorized to perform the inspection and interpret results of the scan and assist and supervise the training of a level 2. A level 3 technician's duties also include the writing of procedures, training of personnel on his staff, and quality control.

3. Duties and experience.

Does your service provider perform infrared inspections full time or as part of his/her other duties? Many feel that proficiency is achieved through repetition. Most would not disagree that performing a single task daily would make you better and/or faster at performing the task than if you performed it one day a week or month. Infrared inspection is no different. Technicians who perform infrared inspections only will gain much more experience in a shorter time than ones who perform the task sporadically. Also, be sure and ask if your technician's experience and certification is in the appropriate application. For an electrical inspection the technician should have his/her training in electrical inspection rather than other applications.

4. 3rd party?

Do you wish to have repairs made while the inspection is performed? A first party inspection service can provide minor repairs during the inspection process. If utilizing in-house personnel for electrical support this is not an issue. If using an outside provider, be sure and determine if minor repairs can be suggested while the inspection is in process and if they perform the repairs themselves. The difference between a first party inspection and a 3rd party inspection is simple. A first party inspection will be done by the company that is responsible for repairs. A third party inspector has no benefit if the item being inspected passes or fails and can provide an unbiased opinion.

Pre-job Planning

There are several considerations to be made prior to the arrival of your infrared inspection technician.

1. Equipment utilization.

The first consideration is the load applied to your equipment. All equipment to be inspected must be energized and under normal load for best results. If this is not the case consider a different time or date for your inspection of that component. Convey the status to your inspector so he/she may adjust recommendations accordingly.

2. Streamlining.

If possible, have the equipment prepped for inspection prior to the arrival of your technician. This is not advisable in areas where other personnel or the public can access open energized electrical equipment. If you have dedicated electrical rooms that can be secured this is a way to reduce cost and increase the efficiency of an inspection. You may also consider more electrical support. One crew can open panels in front of the inspector while a second crew follows and closes the panels. This can reduce the impact on your facility and speed up the process.

Performing the inspection.

Once the inspection process begins it is important to keep several things in mind. Safety is the first of any inspection of this type. NFPA 70e addresses the concerns of performing an infrared inspection of energized electrical equipment. It is important that everyone with access to the equipment understand the dangers involved and how to mitigate them. Electrical personnel should be experienced on the type of equipment being inspected. For example, your electrical contractor who deals with low voltage may not be comfortable with high voltage transformers.

The second thing to keep in mind is the most thorough and complete inspection possible. Not all equipment can be correctly inspected. Interlocks and protection may be in place that reduces the thermographer's ability to see all the components. Make available a complete equipment list prior to inspection so that the inspector and electrical personnel can assure that each item was inspected and that each item was secured properly at completion.

Do's and Don'ts

1. **Do** make sure all equipment is properly prepped for inspection up to safe limits. ***No infrared technology can inspect electrical components while the covers are in place.*** It is a common misconception that “new” infrared cameras can see through the enclosures. While it is possible to see major defects due to heating inside the panel, it is much more likely to miss potential failures. **Don't let anyone convince you otherwise!** One equipment owner I spoke to recently told me “our provider does it with the covers on and has been 100% correct; everything he said was bad needed repair when we opened it!” Well of course if you're seeing a signature on the outside of the panel it means the component has risen to a temperature high enough to transmit heat to the enclosure. This can be a dangerous situation if the component is at failure point and leaving your facility with unidentified potential failures.
2. **Do** ask questions. Feel free to ask you technician to explain their findings and what they mean to you.
3. **Do** follow up on repairs with additional inspection to make sure the defect was corrected and no additional damage was done during the repair process.
4. **Do** make sure you have given all information to inspection personnel to ensure the best possible inspection. **Don't** hold back information on suspect equipment to “test” your thermographer to see if he finds it. Let them know if you have been having problems in a certain area or piece of equipment so it can be looked at with this in mind.

Final results

Once the test is completed the thermographer will insert the infrared images into a report format. Reports should contain the thermographic image, a digital image (when possible), and identification of the component where a defect is noted. Most providers will supply a “hotspot” report that will only include images of the potential failures noted during the inspection. You must request reporting of all the components prior to inspection if desired. Typically, hotspot reports are the best route as they offer complete inspection without the additional cost of the added report generation which can far exceed the cost of inspection, depending on the size of your facility. Review the report quickly and be sure and ask the thermographer any questions you may have. The National Electric Code (NEC) offers recommendations for repair based on temperature of the components and many providers offer similar recommendations as well. These recommendations are designed to make sure your equipment does not experience any unplanned downtime or damage. Of course the final decision lies with you. As the owner

you have to weigh the cost of equipment failure vs. safety, downtime for repair vs. downtime for failure, and the power requirements for your facility. An experienced thermographer can help you with information used for you to make your decision.

For more information please visit our website at www.itimaging.com or feel free to call us at 1-877-ITIMAGING (484-6244).