Written by MT Staff
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Being proactive is what predictive maintenance is all about.

With coal-fired plants generating a substantial percentage of the electricity produced in the United States, it's vital to ensure their reliability. Keeping such a plant up and running calls for continual monitoring of equipment and maintenance planning. Even the smallest of components have the potential to shut down operations. That's why infrared thermography (IR) can be such a powerful tool around these facilities.

Mirant Mid-Atlantic's Morgantown power gen operations

IR technology

Thermal or infrared energy is light that is not visible because its wavelength is too long to be detected by the human eye. It is the part of the electromagnetic spectrum that we perceive as heat. Unlike visible light, in the infrared world, everything with a temperature above absolute zero emits heat. Even very cold objects, including ice cubes, emit infrared. The higher the object's temperature, the greater the infrared radiation emitted. IR allows technicians to see what their natural eye cannot.

Infrared cameras produce images of invisible infrared or "heat" radiation and provide precise non-contact temperature measurement capabilities. Nearly everything gets hot before it fails, making infrared cameras extremely cost-effective and valuable diagnostic tools in many diverse applications. And, as businesses strive to improve manufacturing efficiencies, manage energy consumption, improve product quality and enhance worker safety, new infrared thermographic applications continually emerge.

Situation

Mirant Mid-Atlantic, LLC is one organization that has recognized the value of IR in its business.

The company generates electricity for various localities in the mid- Atlantic region of the U.S. It owns four power plants in the Washington D.C. area and the coal-fired Chalk Point station in Maryland handles a large portion of the electricity generation for the mid-Atlantic assets.

The Chalk Point facility's maintenance organization is responsible for ensuring that processing equipment performs as required. Infrared cameras now play a big role in condition monitoring and overall predictive maintenance. Before IR, point measurement was the only type of temperature gauge used. There was no way to look at a whole area or piece of equipment and anomalies were not easily identified.

Mirant Mid-Atlantic currently uses FLIR's ThermaCAM® T400 infrared cameras as part of its PdM efforts. The information obtained with the T400 is furnished to schedulers and planners so they know what equipment to schedule for repair and when. Having this information gives them the necessary lead-time to order parts and schedule maintenance. The camera also helps identify equipment that does not need maintenance. Eliminating properly functioning equipment from the maintenance list saves time and money.

In these power gen operations, coal is transported from storage to the generating facility by conveyor belt. The FLIR cameras are used to identify problems with pulleys, gearbox drives and roller bearings along the conveyor belts. They also are used to find leaking valves, identify blockages of coal going into the boiler and in boiler tubes. The infrared technology and resulting data lets technicians locate and determine the severity of faults and plan their maintenance activities accordingly.

Maintenance technicians cover a lot of ground in surveying equipment in these operations. The T400 is small and lightweight, making it easy for them to get the job done. The large viewing window and lenses that rotate make it possible to capture images when equipment is in difficult-to-reach places.

Real results

Results of thermographic inspections vary from equipment to equipment, but understanding the impact of even one piece of equipment or component helps illustrate the benefits of this powerful technology in a PdM program.

A study done by Mirant Mid-Atlantic found that by fixing a typical leaking valve, it saved an average of $5700 annually. In 2007, the company identified 187 valves. The cost of an infrared camera and other diagnostic tools is clearly a solid investment when fixing leaking valves. While the problem may have seemed to be a small one, solving it delivered savings of more than a million dollars.

Catastrophic failure of a conveyor belt also could have an enormous impact on production and costs. Although reserve coal for such situations is available, without new coal entering production, these reserves would quickly diminish and cause electric generation downtime. The ability to see problems before they become catastrophic allows Mirant Mid-Atlantic's maintenance team to plan and schedule repairs as needed, helping save in terms of maintenance expenditures, downtime and lost production. **MT**

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About FLIR

FLIR Systems, Inc. designs, manufactures and markets infrared imaging systems worldwide for a variety of thermographic and imaging applications. FLIR's thermography products are being used in diverse applications, including predictive maintenance, condition monitoring, non-destructive testing, and research and development and manufacturing process control. To learn more, go to www.goinfrared.com

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