BOILER & FURNACE COMBUSTION IMAGING


The Opportunity

The continued rise of worldwide electricity consumption has put an ever increasing demand on power generation facilities. With coal fired power plants, this demand results in challenges to increase production while minimizing environmental impact.

Optimizing the performance of the coal boiler can provide immediate benefits and maximize the Rankine cycle efficiency. One common problem is the buildup of fly ash and soot on the boiler tube surfaces which reduces the heat exchange efficiency. These deposits (Slag) can be removed with lances, and similar systems, but identifying when to implement this action can be difficult to estimate and routine periodic lance operation can cause thermal stress to boiler tubes, leading to failure and unscheduled downtime. In addition, lance systems typically operate blindly; attempting to uniformly target all boiler tubes for cleaning. It is possible to reduce the furnace power to obtain a visual inspection of some tubes, but the efficiency loss during this process is significant. Properly tuning the combustion process can help reduce the buildup of tube deposits, and can minimize emissions. However, switching coal composition can further complicate the tuning process, and lead to varying fouling of the boiler tubes.

Our Solution

Advanced Energy leverages more than 25 years of infrared thermal imaging experience to developing the BoilerSpection™ SD solutions specifically designed to address the monitoring of heat exchange tubes in coal fired boilers and furnaces. Using a custom narrowband 3.9µm filter and precision boroscope optics, we view through boiler flames and provide the clearest image of boiler tubes available. BoilerSpection™ systems provides a unique view into the boiler, allowing operators to have more precise control of their boiler.
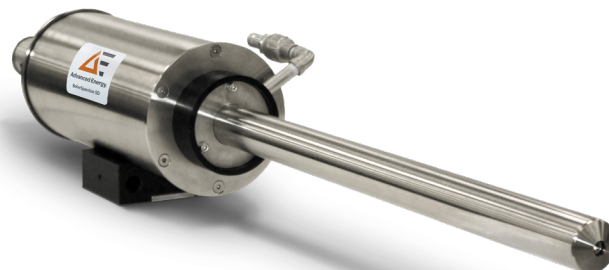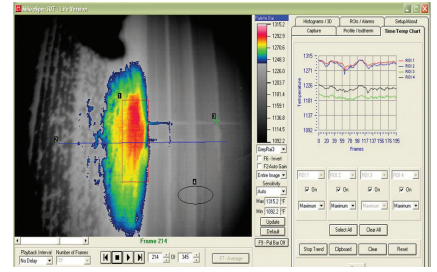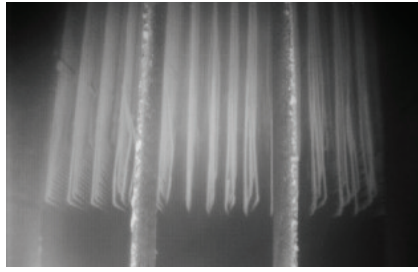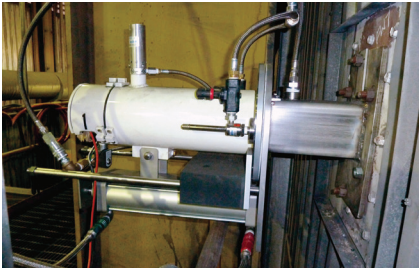
- **Real time continuous monitoring.** Crisp, live images of boiler tubes allowing continuous monitoring of deposits, and identification of thermal gradients.

- **Complete turn-key system** designed for industrial power plant operation. Integrated housing with vortex cooling, air purge and IP66 rating. Full auto-retraction system and all mounting hardware for waterwall or through-hole installations.

- **World class** uncooled VOx thermal imager with water cooled precision boroscope optics for superior image performance. 320 x 240um pixels for excellent spatial resolution. Wide angle 46° H x 38° V field of view. Wide 400 to 1600°C (752 to 2912°F) temperature range for accurate measurements throughout the operation envelope.

- **Professional thermal imaging software** for historical trending and statistical analysis. Region of interest definitions, and full alarm generation capability. Ability to tie into system controls for automation of tube cleaning solutions. Remote monitoring and Imaging archiving facilities.

- **Full-service** field installation, training and maintenance available.

OUR EXPERIENCE:

Worldwide installation of over 80 units in coal boilers furnace systems.

Return on Investment of less than one year in most cases.

Ease of installation allows system to be integrated during operation of boiler.

Your benefits

✓ Capture lost boiler capacity by reducing unnecessary cleaning.

✓ Increase efficiency by improving heat transfer with precise knowledge of slag and ash buildup

✓ Manage combustion by tracking uniformity of ash deposits

✓ Optimize fuel-switching by directly and accurately measuring ash rate and uniformity as fuel changes

✓ Lower maintenance costs by optimizing cleaning and identifying large deposits before they cause damage to boiler tubes.

Advanced Energy®

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PRECISION | POWER | PERFORMANCE