Maintenance Tips
Boiler Logging & Efficacy

Boiler maintenance and troubleshooting best practices starts with applicable readings and daily logging of operational parameters such as steam and other pressures, water temperatures, and flue gas temperatures. These pressure and temperature readings serve as a base line reference for system operation and troubleshooting.

The following are a few key areas impacting boiler operation and efficacy:

- **Water treatment** - One of the most important elements in a boiler program. Untreated or poor water treatment contains contaminants that include dissolved minerals, gases and partials causing scaling on boiler heat transfer surfaces, which increase energy use and, if left unchecked, desecration of the equipment and system.
- **Turndown ratio** - Boiler turndown is the ratio between full boiler output and the boiler output when operating at low fire. Traditionally, burners on fire tube boilers operate within a 5.1 turndown ratio range depending on fuel and size. High turndown burners are considered those with a ratio of 10:1, or greater. The turndown ratio between full boiler output when the boiler is operating on low fire. The ability of a burner to turn down reduces the frequency of on-off cycling.
- **Combustion efficiency** – Combustion efficiency is the measure of how effectively the heat content of the fuel is transferred into usable heat. Stack temperatures and flue gas oxygen (or carbon dioxide) concentrations are primary indicators of combustion efficiency
- **Boiler Sequencing** - Most facilities operate more than one boiler at a time, depending on load. This can result in more boiler capacity then required. Boilers deliver maximum efficiency at or near full load of their firing capacity. This can lead to inefficient boiler operation and waste of energy. Automatic sequencing controls monitor the load conditions and sequence the boiler of a combination of boilers that would best meet the load's most efficient operating efficiency
- **Prevent Dry Cycling** – Dry cycling can waste a great amount of energy even with BMS optimization in use. Utilizing load optimization as a control can assist with reliable and efficient boiler performance
- **Temperature set points** - Ensure temperature and set points are correct and calibrated. If sensors are out of calibration, the measured value from the sensor to the control system operating the boiler will not respond correctly; this negatively impacts boiler efficacy and system performance
- **Safeties** – All safeties, interlocks and alarms function correctly for both automatic and manual, as recommended by governing code compliance, and the manufacturer. Training ensures that Operating staff possess sufficient knowledge for optimization of boiler system performance and safe operation.

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