ABB provides fast 1:1 replacement of legacy flame scanners on Domtar power boiler

The low-impact retrofit from ABB, with like-for-like acceptance by the local safety authority, meant no recertification was needed as the boiler was rapidly upgraded to the latest flame scanning hardware and software.

When Domtar’s Espanola pulp & paper mill in Ontario, Canada, was considering replacing their old flame scanners that monitor power boiler #9, Automation Specialist David Bench knew that he didn’t want to go through a new safety recertification process, if possible.

After surveying the market for alternatives that could meet their technical and safety requirements, he and his team decided that ABB’s flame scanners and its Flame Explorer software were the best choice. And they are happy they did.

“I am pleased to say that boiler #9 started up without incident, and that the ABB flame scanners have worked flawlessly since start-up,” Bench said. “The boiler is fully online and at a full load of steam. We have been impressed with the plug-and-play ease of this solution.”
Fit right in without modifying anything
The replacement ABB flame scanners give Domtar a solution which enables new flame scanners to be retrofit safely into old mounting locations, without needing to modify the installation inside the burner. It is a very simple switch from 1980s vintage analog flame scanners to a modern microprocessor-based flame scanner, with no additional need to modify any major mechanical mounting or field wiring.

The 2021 contract included four model SF810I-FOC-UVIR flame scanners with 1250 mm rigid extension fiber optic assemblies, as well as Flame Explorer v6.0 software. ABB Field Service site commissioning was also included. The scanners were installed in 2022 on the mill’s Babcock & Wilcox Power Boiler #9, rated at 400,000 lbs/h and capable of firing pulverized wood, #6 oil and natural gas as fuel.

What to know about flame scanners
Flame scanners serve a specific purpose in combustion safety, so it is easy to assume that anyone working with them such as maintenance managers and electrical and instrumentation technicians know all about them. However, that is not always the case; a few details may be valuable for those who wish to know more.

A flame scanner uses a UV, IR or UVIR dual sensor designed to detect the absence of a burner flame. It is installed on the burner and provides a relay contact output signal to a Burner Management System (BMS), to initiate a burner trip when necessary. A burner trip is a fail-safe mode that removes power from the safety shut-off valves, which immediately stops the fuel flow to the burner. ABB’s modern flame scanners can be retrofit to any ABB or third-party legacy flame scanners that use DCS, PLC or hardwired safety relays.
Flame quality trend monitoring helpful
The ABB Flame Explorer software manages the scanner operation and provides new functionalities such as enhanced ability to program the equipment, identify flame trends and save flame scanner configurations. Specific operational benefits include functions that allow operators to select different pre-programmed tuning parameters based on various fuels and operating loads for the most efficient operation.

Trends regarding the condition of the flame can also provide crucial insight to operators. The quality of the flame is thus continuously monitored by the ABB flame scanner, meaning it can sense trends and send alerts if the flame quality appears to be deteriorating. This is very helpful to avoid an unplanned shutdown of the burner or boiler, allowing corrections to be planned and executed before a failure occurs.

Repeat order is coming, based on high satisfaction
Bench has been impressed with the ease with which the plug-and-play solution for the new ABB flame scanners were able to replace the legacy scanners. He is especially pleased that the one-to-one replacement reduced installation time and cost, and eliminated the need for recertification from the Technical Standards & Safety Authority in Ontario.

“We are so happy with the first scanners that we are soon ready to place the next order for four more new ABB flame scanners to retrofit boiler #8,” he concluded.