

Fireye InSight Scanner Installation Exceeds Expectations

APPLICATION: Sulfur Reaction Furnace

Imperial Oil Resources LTD recently updated a Sulfur Reaction Furnace at their Quirk Creek Plant located near Millarville, Alberta, Canada. Fireye® InSight 95DS Scanners were installed on an existing 130mm BTU/hr Sulfur Reaction Furnace that was supplied with both a new burner and new pilot burner system. Process Combustion of Calgary, Alberta, Canada, installed two scanners: 1-Pilot/Main and 1-Main Scanner. The scanners operate redundantly once the main flame is established.



The reaction furnace is warmed with natural gas to a suitable oxidizing temperature for the H₂S gas. This occurs over a stoichiometric fuel/air ratio. The H₂S gas is then introduced to the burner in sub-stoichiometric ratio to air and the natural gas stream is typically shut off. Steam is used to purge the system during hot re-ignition to prevent plugging to the catalyst bed. Special quartz isolation lenses were used as the chamber operates at a back pressure of up to 15 psig.

This was an ideal application for the InSight dual wavelength scanners. Since a number of fuels are utilized within the system and because the furnace chamber radiates a great deal of Infra-Red when hot, discrimination is important. The ability to use multiple files is also an important feature. Each file allows every fuel an individual, correct setup. The scanners were easily retrofitted to the plant's existing BMS control, only a flame ON/OFF contact was required. Online communication and flame trending was a bonus feature.



SETUP

The unit was started with high gain settings on both UV and IR to avoid nuisance shutdowns. Once the chamber was hot, a natural gas setup was completed and stored as one operating file. With the system hot and firing H₂S, the procedure was repeated to ensure good discrimination, and to verify that the steam purge did not affect the system in any way.

Discrimination with a hot furnace chamber was excellent. The operating levels of UV and IR almost reversed when burning natural gas. With H₂S natural gas was emitting primarily UV. Only a few pulses of IR were detected during a Hot Trip, but the chamber was well below the On Threshold Level.

Once the chamber was hot, the full setup was complete in approximately one-half hour. The ease of setup was better than anticipated.

These units replaced older IRIS 550 viewing heads and flame relays. Dave Scoropad, Process Combustion, reported that the Quirk Creek Plant was very satisfied with the new InSight scanners, noting its variety of features and the ease of setup. InSight Scanners are a definite consideration for future applications.



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