



Sulfur Recovery Engineering 403-226-5951

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SRU Reliability, Performance and Protection

No Sulfur Fires, No Soot: The Best Start-up Technique

With all shutdowns comes the eventual start-up. There are two things that we want to avoid during a start-up: the production of soot and free oxygen. Operating a start-up with slightly deficient oxygen avoids both.

Soot can coat the waste heat boiler tubes, the first condenser and the top of the first converter catalyst. Soot in the waste heat boiler tubes and the first condenser lowers the heat transfer in these vessels; soot on the catalyst creates a high pressure drop which reduces acid gas load capability.

Free oxygen that is in the catalyst makes it difficult to control the $H_2S:SO_2$ ratio to 2:1. Good control of the $H_2S:SO_2$ ratio prevents emission violations while starting up.

To prevent the production of soot and free oxygen, a start-up can be operated slightly oxygen deficient by analyzing the combustion products from the waste heat boiler. This will indicate the changes that need to be made to the fuel and combustion air flow rates to ensure oxygen deficiency. Quench steam also affects the combustion and also needs to be considered.