SO_2 and CO_2 Emission Control with CANSOLV SO_2 and CO_2 Capture Systems

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ABSTRACT

The 2009 recession resulted in a worldwide drop in crude demand and the disappearance of the traditional spread between sweet and sour crude prices. Environmental pressures continue to be exerted however, and refinery emission limits for both SO_2 and CO_2 are under continuous review. Product sulfur specifications also continue to tighten. In particular, the Maritime Convention on the control of Pollution in Ships (MARPOL) mandates initiatives that will reduce the allowable sulfur content of bunker in steps by 2015 and 2020, respectively.

If the sweet/sour spread in crude price returns, refiners will wish to be positioned to capitalize on it while also meeting more stringent product sulfur specifications. Strategies that upgrade the bottom of the barrel will be of great interest, but will be costly. Alternatives which involve the combustion of all or part of the bottom of the barrel, for internal energy consumption or cogeneration, should also be examined.

Combustion of resids, however, requires additional investment in NOx, SOx and possibly CO_2 capture systems downstream of the combustion source. The CANSOLV SO_2 Scrubbing System and the CANSOLV CO_2 Scrubbing System can help resolve pressures on SO_2 and CO_2. Much of the energy consumed in the SO_2 Scrubbing System can be captured and cycled to the CO_2 Capture System, to reduce overall energy penalties associated with the two capture systems.

This paper describes the CANSOLV SO_2 and CO_2 systems and explores the high level capital and operating costs that would apply to the use of these systems to treat flue gas generated from fuel containing 4.6 wt% sulfur, fired at a rate of 35 t/hr.

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