



Sweet Solutions.™



MERICHEM COMPANY



LO-CAT[®] PROCESS

H₂S OXIDATION SYSTEM FOR OFFSHORE PLATFORMS

Chevron USA Production Company selected the LO-CAT[®] Hydrogen Sulfide Oxidation Process as part of the natural gas sweetening train for the Mobile Block 864 "B" Production Platform in the Gulf of Mexico. The entire sweetening train, consisting of both an amine unit and the LO-CAT unit, is located on the platform. The LO-CAT unit absorbs H₂S from the amine acid stream and then converts it to elemental sulfur.

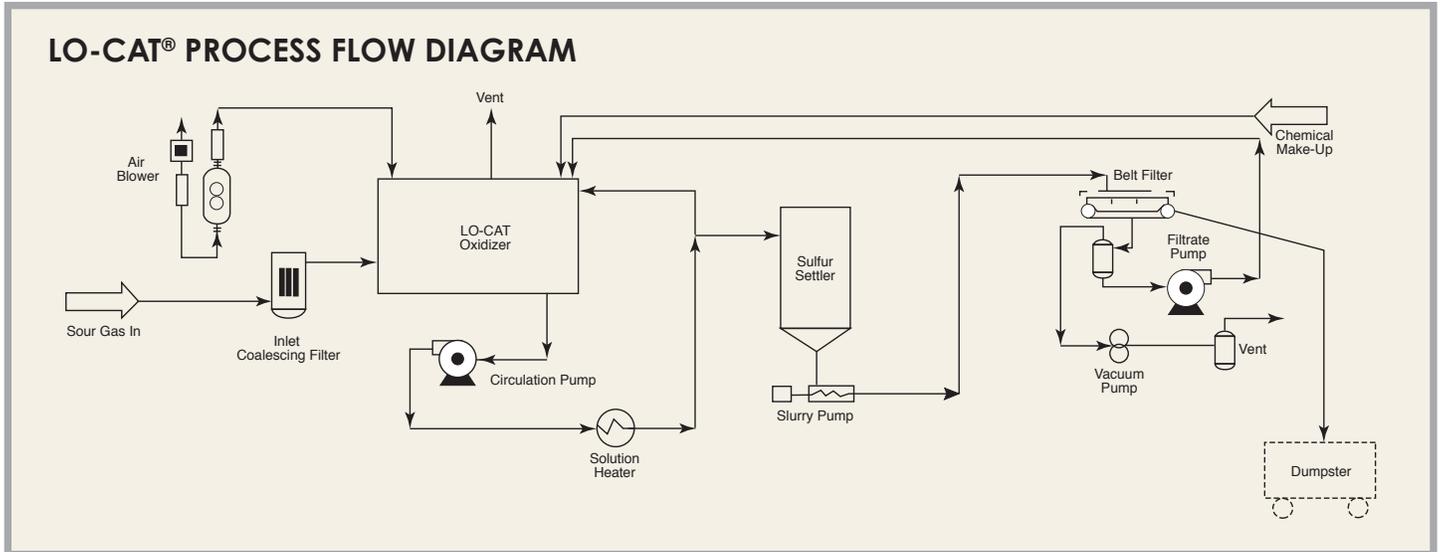
As this was the first LO-CAT unit on an offshore platform, Chevron and Merichem worked together to ensure the success of the unit. Several areas of the standard LO-CAT equipment package, including vessels, structural steel, and instrumentation, were redesigned so as to meet offshore requirements involving space, corrosion control, and on stream availability.

The existing platform had little space available for the LO-CAT unit. Therefore, space limitations required that the main processing vessel, the Autocirculation vessel, be split into two vessels connected by tunnels. This in turn resulted in modification of the Autocirculation vessel internals to allow for seal welding of the tunnels, eliminating any chance of leaks at the normally bolt up connections between the vessels and the tunnels. To save additional space 1) the oxidizer air blowers were mounted on top of, rather than beside, the Autocirculation vessel, 2) the platforms around the settler vessel and the vacuum belt filter were consolidated, and 3) the standard shell and tube heat exchanger was replaced with a stab in heater mounted on top of the Autocirculation vessel.

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Due to the corrosive, marine environment, the external design of the Autocirculation vessel was modified. Because Chevron corrosion control specifications required that all external vessel designs have 100% seal welding, Merichem installed poison plates between the carbon steel support beams and the stainless steel vessel skin. The poison plates were seal welded to both the supports and the vessel shell. Chevron also required that after seal welding all vessels to the deck plate, that the deck plate beneath the vessel be removed. The Autocirculation vessel, typically designed to be supported on a rigid foundation, was redesigned for this application so that the floor beams would both span the large open area and support the vessel.

Several instrument modifications including redundant level controls, modified level safety switches, and modified temperature safety switches were required to meet the offshore availability requirements.

The LO-CAT[®] unit was started up in September 1996. While the unit is operating at a reduced sulfur load, it is exceeding the H₂S removal

requirements. The unit requires approximately 25 hours per week of operator attention.

The modifications to the LO-CAT unit due to the offshore environment have not altered the expected performance of the unit. The LO-CAT unit at Chevron's Mobile Block 864 "B" Platform is performing successfully. The design changes made to the mechanical equipment, the structural equipment, and the instrumentation allow the LO-CAT unit to perform as intended in this first ever offshore application. In the LO-CAT process, the H₂S is converted to innocuous, elemental sulfur by and environmentally safe, chelated iron catalyst in accordance with the following equation:



The primary chemical consumptions are replacement of chelated iron lost in the sulfur removal process, replacement of chelating agents which oxidize over time, and a small caustic addition required to maintain the pH of the operating solution in the mildly alkaline range.