OVERVIEW OF GAS CONDITIONING - 1983

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The term "gas conditioning" has been given to those procedures and processes required to up-grade and purify natural gas until it meets the quality standards set forth in a sales contract. One who works in this segment of the industry will explain that it includes gas cleaning, dehydration, sweenening of sour gas and recovery of its sulfur content, and adjustment of its heat content and condensing characteristics by controlled removal of condensible hydrocarbons. Great strides have been made in all of these areas. But the high cost of fuel gas, declining field pressures, growing use of field compressors, new tertiary oil recovery technologies, unusual gas compositions and never-ending economic pressures combine to tell those of us who work in this area that our task is by no means done.

If one should conclude that gas conditioning technology has reached its peak and that there is little left to accomplish, he should give thought to a few problems whose solutions are, at best, temporary.

In physical phase separations, of which gas cleaning is a part, it should be noted that salt and lube oil remain in the feed gas stream after it has passed the inlet scrubber and both accumulate in the treating solutions to cause foaming, emulsions, fire tube burn-out, et cetera.

In gas dehydration, all gases are fuel-intensive because both absorbed and adsorbed water must be evaporated from the transfer agent before it can be removed from the system. With fuel gas costs the highest in history, operators have finally resorted to metering their fuel gas to learn how many standard cubic feet of 1000 Btu fuel gas are required to evaporate one pound of water whose latent heat is approximately 1000 Btu. When it is learned that this number may range as high as 15, stern measures are often in order. Why waste all of that heat? Unfortunately, all dehydration processes have a large excess

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of low level heat which either must be exchanged or wasted. This is a big challenge.

In sour gas treating, the liquid processes are fuel and power intensive. Progress has been made with high loading secondary amine solutions with acid gas to effect significant reductions in circulation, meaning less fuel gas and less pumping power required. Some selective solvents are being used with notable success to leave significant percentages of CO_2 in the residue gas. But with the down-turn due to recession, pipeline companies are invoking the CO_2 limits set forth in their purchase contracts and require adherence to the usual "one percent, or less, by volume" for carbon dioxide.

Countering this trend is the growing demand for CO_2 to be used in enhanced oil recovery (EOR) projects. In some localities, there is interest in purchasing H_2S free off-gas from existing sour gas treating plants. How is this separation done best?

Progress continues in sulfur recovery with refinements made to the numerous versions of the Claus Process, and also to tail-gas cleanup processes used with that process. Yet there is a real need for an effective, consistent sulfur recovery process that can handle small acid gas streams which represent from 0.5 to 10 tons of sulfur per 24-hour day.

In natural gas liquids recovery, installation of new cryogenic plants has slowed because of the recession and slack demand for ethane. But the search continues for a better method for separation of nitrogen associated with natural gas in some areas. And there are occasional signs of feed gas preparation using glycol absorption, glycol injection and methanol injection to replace mol sieve adsorption for economic reasons.

One of the big problems in gas conditioning is the lack of operator training. It is disheartening to see a well-designed, up-to-date plant operate well below its capabilities because its operators are not properly trained in basic principles or in the finer points of plant operation. Much too often, a man who comes to work regularly, keeps the pumps running and the fire lighted is considered a "good operator". And all too often there are no instruments available to measure the quality of the product to truly measure performance more frequently than 30-day intervals. In most cases where these practices occur, they are management deficiencies. Hands-on training under the supervision of an experienced instructor should be encouraged and provided wherever possible.

So bear in mind the fact that there are many problems that need better solutions. Some will be discussed at this meeting so you areurged to contribute by joining in these discussions.