Case Study on:
"The effects of Methane Gas on Lubricants"

Methane gas is becoming a major contributor to the oil and gas industry and we are in need of a solution to help extend oil change intervals without reinventing the wheel. We are viewing a lot of oil samples that come through the labs, and our lab technicians are amazed at what they are observing; low wear metals and clean running engines.

However, the amount of water that is mixing into the lubrication oil on the compressor side of the transformation process is alarming. This process is responsible for getting the gas down the pipeline to the plant or refinery for further refinement and processing.

Changing oil in one of these units can cost over a thousand dollars when factoring labor, oil costs, disposal of oil, as well as, wear and tear on the unit. The methane gas mixes in with the lubricating oil on the compression side and the result is emulsified oil.

This white, milky looking oil begins to lose its viscosity in a short period of time. It also loses its lubricating factors, allowing the components of the compressor to become exposed to higher temperatures and increased friction on all moving parts.

These engine/compression combinations are expensive units. Replacement components for these units are also very costly, and most of the units running in the United States and surrounding countries are not within a block or two of the office. Instead they are 40 to 100 miles from any operations center, and need to be monitored closely, as they must be self sufficient to continue processing.

So, with a little help from our technical department and from a leading bypass filtration company, we set out to find a solution for the Oil and Gas Industry by removing the water while at the same time, extending drain intervals, without sacrificing reliability.

This particular bypass filter is about the size of a regular full flow unit with a special element made from a cellulose fiber material to help absorb the water that is being introduced. The guys at our bypass filter company assured us of 100% water removal up to 440ml and fine filtration down to one micron. So with our objectives in mind, and a compression company to help us with the case study for a sixty-day period, we will determine if our ideas can help this particular application.

With the bypass filter installed, and an oil sample taken on two engines and two screw compression units, we will now begin to monitor each unit closely by using timely sample analysis, looking for increased water absorption, and decreased wear metals. We will track and trend this procedure on our website every two weeks for sixty days, updating our subscribers as necessary to determine the out come of the case study

on February 13, 2002 we discussed a case study we're performing on the effect of Methane Gas on engine and compression oils. The main focus was to pinpoint the water issue that mixes with the oil causing an emulsion of the oil and breaking down all the additives, viscosity and lubricating factors of the oil.

The units tested are units that usually run 24 hours a day 7 days a week with no time for break down. These units were tested in the Northern part of Wyoming where Methane Gas is being drilled for on a daily basis to satisfy our nations growing demands for a clean energy source.

As noted, we had a leading bypass filtration company donate their products and LubeTrak did the oil sampling on the units every 720 hours checking for the amount of additives depleted and the condition of the oils of each unit. We changed the replacement cartridge on the filter units for the first few times every 150 hours because of the water build up, in the existing oil. We did not drain the oil because we wanted to see if the bypass filter unit could remove the water and let the oil stay in the units longer.

Before the bypass filters were installed and here were the results:

Compression Unit: 1451 hours on oil
ISO Rating 22/18 (5318 ppm >5)
TAN: 0.67
Karl Fisher - PPM 323

Engine Unit: 1451 hours on oil
TAN 2.34
TBN 6.0
Oxidation .05
Viscosity 14.7
Karl Fisher - PPM 121

After running the bypass filters on the compression and engine units for an additional 1649 hours, the results were quite amazing:

Compression Unit: 3100 hours on oil
ISO Rating 19/15 (3127 ppm > 5)
TAN: 0.43
Karl Fisher - PPM 63.8

Engine Unit: 3100 hours on oil
TAN: 1.69
TBN: 5.89
Oxidation .01
Viscosity 14.1
Karl Fisher - PPM 41.2

With the test results coming back and the case study still running, we have determined that the oil may be extended in the units for some time, saving thousands each month in oil purchase and disposal costs.

We will continue to monitor these units trying to reach a goal of 10,000 hours on the oil if all properties will allow the oil to remain internally in each of the units.

Compression Unit: 4924 hours on oil
ISO Rating 18/16 (1678 ppm > 5)
TAN: 0.61
Karl Fisher - PPM 47.2

Engine Unit: 4924 hours on oil
TAN: 1.43
TBN: 5.12
Oxidation .01
Viscosity 13.9
Karl Fisher - PPM 22.2

We would like to say thanks to everybody involved in the case study and stay tuned for more updates.