

CLEANLINESS SPECIFICATIONS SURPASSED IN ETHYLENE UNITS

CONTAMINATION AND RELIABILITY SOLUTIONS FOR CENTRIFUGAL COMPRESSORS

PROBLEM

In 2013, maintenance personnel from a chemical company in Brazil approached Colfax Fluid Handling Reliability Services personnel at a large industry trade show in Sao Paulo to discuss contamination problems in the lubrication systems of their centrifugal compressors in their plant ethylene units.

Being self-performers for their flushing process in turnarounds, it was typical procedure for them to utilize the compressor's lubrication system pumps and filters to perform these cleanings. Over the last few years, they started to notice repetitive contamination problems in at least two of their compressors and discovered the root cause to be poor flushing processes during the last turnaround.

SOLUTION

After discussing the issue with the chemical company, CFH Reliability Services offered to provide a training seminar at their plant that discussed best practices in flushing processes. As the discussion began, maintenance personnel expressed an interest in improving their current flushing procedures in seven critical centrifugal compressors for an upcoming turnaround scheduled for September 2014.

During the presentation, CFH Reliability Services representatives presented the main differences between the processes they were currently utilizing to perform their flushing services and the best practices CFH Reliability Services would recommend according to ASTM D-6439-05.

Four main points were highlighted for better flushing results:

- The recommended use of external pumps to increase the oil velocity to reach a turbulent flow, allowing dirt to be removed quickly
- The need for high efficiency filter elements to retain the dirt
- The recommended use of portable oil analysis equipment to determine the level of cleanliness on site
- The recommendation for four flushing teams, comprised of individual skids and personnel, performing the job simultaneously



Filter Change

Through the education and recommendations of the seminar, the customer realized that they could reach better cleaning results in less time and decided to include the information in their specification for bid for the next turnaround of seven critical compressors, all of which maintained an oil volume between 500 to 6,000 gallons.

The only company able to reach this specification was CFH Reliability Services due to the ability to staff and equip four working teams at once with flushing pumps of 2,200 GPM per recommendation. Once onsite, CFH Reliability Services began a weeklong engineering process, followed by equipment and staff preparation from May through September of 2014. The turnaround was completed with no issues.

CFH Reliability Services resources in place included:

- Four flushing skids with flow; two 500 GPM, one 1,100 GPM and one 2,200 GPM
- Four filtration housing units
- Two 75 Kw electrical heaters
- One portable oil analysis system
- Ten Flushing Supervisors, which included three from México, two from Venezuela and the remainder from Brazil

RESULTS

With the use of this new flushing procedure, the customer was very happy with the results. They realized that the entire job was completed three days before schedule and that the cleanliness levels reached in every lubrication system were actually better than what was recommended by ASTM standards. All flushed compressors started up well after turnaround, and their operational performance is exactly what the customer expected.

The customer was so pleased with increase in reliability and performance that they invited maintenance and engineering personnel from other company plants to learn about and implement these innovative procedures for their next turnarounds.



Flushing skid with positive displacement pump at 500 GPM flow and filter housing with four 34" filter elements.



Flushing Skid

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