CLS
Industrial Purification

CASE STUDY

Net Gas Cl Treaters within a UOP CCR, New Jersey Refinery
CLS Custom Systems Solve Chloride based Corrosion

This is a Refinery located in New Jersey with a UOP designed CCR. The focus of this study will be the Net Gas Chloride Treaters, of which this refinery has two. The following is based on conditions within the reformer during 2008 when the pitting corrosion and leaks were discovered. This was all traced back to Reformer Chlorides.

Background

This refinery has a lead/lag arrangement for its Net Gas Cl Treaters. In 2008, operations personnel discovered H2 release at corroded valves. Further inspections revealed pitting corrosion within piping, malfunctioning valves, and severe salt deposition. All of these afflictions were serious safety hazards.

When CLS arrived at this refinery, it was determined that they were using Unicat Alumina as their Cl removal material. Hot onsite Cl testing revealed 100% Cl breakthrough as well as excessive Green Oil formation.

Problem

The refinery in question had been using Activated Alumina based on the recommendation of UOP, the reformer designers. After years of using the alumina based products, the refinery started experiencing severe corrosion issues. These Cl based corrosion issues lead to H2 releases, a serious health and safety hazard. Once it had been determined that the leaks were corrosion based, the investigation began. All corrosion was traced back to the Cl's within the reformer, Cl's which should have been removed by the Net Gas Chloride Treaters.

These Cl Treaters were sending 100% of all the reformer Cl's downstream to other units within the refinery.

Solution

CLS was able to approach this serious problem with a multi-faceted solution. The first step was to determine that the Cl's leaving the Cl Treaters were only visible when tested hot. These hot tests converted the RCl back into HCl, thus allowing HCl test tubes to create the necessary chemical reaction to make the Cl's visible. Once the chlorides were detectable, a solution could begin to be formed.

CLS then designed a Total Chloride Removal System which would protect the reformer and all downstream units from 100% of all chlorides.

In addition to creating a custom system, CLS was able to implement a Chloride Management Strategy within the refinery to continually monitor the Cl values at the inlet and outlet of each treater.

After the initial cycle length, it was determined that these treaters experience channeling due to a poorly designed inlet distributor. Spent sample analysis revealed much higher than possible inlet values. This was a clear sign of channeling occurring within the treater. Channeling can cause premature breakthrough resulting in Chlorides being sent downstream. To mitigate this channeling problem, CLS redesigned the materials used and were able to double the cycle length of the treaters.

Conclusion

Utilizing CLS' custom production process as well as the extensive technical experience of the company, we were able to quickly solve a client's issues with minimal down time and no continued risk of downstream corrosion. Had we not provided this unique solution, the refinery would have experienced further downstream corrosion which would have lead to exorbitant maintenance costs and possible explosions due to H2 leaks.

This refinery continues to utilize CLS' Total Chloride Removal Systems as well as our Chloride management Strategies.

The customer was thankful and greatly aware of the impact of the solution.

-Christian Ahrens