

ProDecon® Case Study

UK REFINERY

Alkylation Unit Turnaround Chemical Cleaning



PROJECT HIGHLIGHTS

- ▶ HFA UNIT ACID CLEANING
- ▶ WORK COMPLETED SAFELY - ZERO INCIDENTS
- ▶ FLUORIDE & RESIDUAL HF REMOVED
- ▶ ALL EFFLUENT NEUTRALIZED & DISPOSED ONSITE

THE CHALLENGE

The Refinery operations team engaged with ProDecon® for the acid cleaning of various items of plant on the Alky Unit during the 2022 Turnaround. Alkylation Units are known to be one of the most hazardous environments on a refinery and require the highest level of planning and operational expertise to work in.

The ProDecon® Operations/Technical team proposed the inhibited HCL acid cleaning solution which has previously worked well on HF units across the world and has previously been used on this site. Our proposal was based upon the cleaning programme being condensed as short as possible to give the operations team the optimum time for maintenance work during the turnaround event.

THE SOLUTION

ProDecon® Engineers worked closely with the client technologists, checking connection points on each item of equipment to formulate circulation paths. Consideration had to be taken on how to reduce the mechanical scope of work for the client, with the equipment being contaminated with toxic Hydrofluoric Acid.

Plot plans were created of where the ProDecon® equipment would be sited and pipe runs marked up showing proposed routes of pipework and hoses. This would assist the client in planning other work in the area.

To ensure all the Iron Fluoride and residual Hydrofluoric Acid was removed, a liquid phase circulation was agreed for the equipment.

Detailed step by step procedures along with schematics of the different cleaning circuits were prepared for the client along with

Risk and CoSHH Assessments. The majority of the equipment was liquid filled with 1 vessel cleaned using a rotary cleaning head (where filling was impractical) to ensure full surface contact with the acid.

Our on-site chemists developed a rigorous sampling and analysis programme. Testing was conducted on site throughout the process to monitor the quality of the cleaning process whilst monitoring the protection of the client systems. Through this testing programme we were also able to maximise the chemical efficiency, minimising the waste generation and lowering the environmental impact of our activities.

The chemistry was re-used where possible to reduce the amount of waste generated for disposal on site, lowering the environmental impact of our activities. The chemistry was checked before re-using to ensure it was of a good quality to use (low iron levels and suitable acid concentration). Contingencies were in place (additional pipework, chemicals, spare pumps) to ensure a proactive approach was in place for the criticality of the turnaround event.

THE RESULTS

The chemical cleaning was completed successfully with all residual HF and Iron Fluorides removed, ensuring a safe working environment for the engineering works during the turnaround. Initial inspection of the assets reported a good level of cleanliness with no scaling present.

The programme of works was adjusted dynamically to the client's required needs during a busy turnaround.

The ProDecon® team worked with the site turnaround team to help manage the sequence of handover of each item of plant in the most efficient way possible. All effluent generated was neutralised and safely disposed to site drains.



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