CASE HISTORY – REFINERY DECONTAMINTION WITH PARATENE® D740/D742

The decontamination of process equipment using steam is a long used, standard practice. Steam is pushed into towers and vessels to essentially bake off the hydrocarbon residues still found in the equipment after shutdown. The steam reduces the amount of hydrocarbons first by heating lower the viscosity of the residues and allowing them to flow and second by steam distillation of light ends transferring the hydrocarbon the vapour phase where it typically burned off.

In the past decade processes have been created to improve both the speed and effectiveness of the steam out process. Two products have evolved to give a significant improvement to just steam. **Paratene® D740** is a powerful wetting agent and mild oxidizing agent that acts to aid in the removal of light hydrocarbons, the rapid control of sulfides and mercaptans as well as the conversion of pyrophoric iron into non pyrophoric forms. The second product, **Paratene® D742**, is a powerful degreaser intended to aid in the removal of heavy hydrocarbons that are only made to flow by heating with steam. The two products combine to make a process that both effectively cleans and rapidly decontaminates the refinery systems.

SYSTEM DESCRIPTION

The systems to be cleaned included

- Crude Distillate Unit & Vacuum Distillate Unit CDU&VDU
- Delayed Coking Unit DCU
- Deep Catalytic Cracking DCC
- Fluid Catalytic Cracking FCC
- Sour Water Striping & Amine Regeneration Unit

While the systems all have slightly different profiles for the types of deposit present each of them has a combination of:

- Iron sulfides
- Pyrophoric sulfides
- Hydrogen sulfide
- Light Hydrocarbons
- BTEX
- Heavy Hydrocarbons
- Coke

In each system Paratene® D740 was added to the steam followed by D742.

RESULTS OF CLEANING

The results from using the combination of Paratene® D740 and D742 have been spectacularly successful. The pictures below show the set up and progress of one of the first applications in a refinery in China

Cleaning a distillation tower.

Chemical Injection

Interior view after cleaning

No Hydrocarbon vapour could be detected from the tower after cleaning.

Previous cleaning had severe problems with pyrophoric iron sulfides.

Turn arounds were performed using Paratene® D740 and D742 in 2014 at:

- **CNCP, Tianjin Dagang Refinery**
  Crude unit including Vacuum Tower
  Cat Cracking Unit

- **Chem China, Shandong Changyi Petrochemical**
  Crude unit including Vacuum Tower