

# DECONTAMINATION OF A LARGE VACUUM DISTILLATION UNIT

## Project

ZymeFlow returned for the eighth time to a refinery in Greece to decontaminate several units during the turnaround. The equipment ZymeFlow was preparing for entry included; crude unit, two vacuum distillation units, visbreaker, and Tertiary Amyl Methyl Ether (TAME) unit. The first Vacuum Distillation Unit (VDU) was the largest vessel in the project at 31 feet (9.5 meters) in diameter. ZymeFlow Decon's objective was to eliminate contaminants within the unit and minimize the risk of pyrophoric iron sulfide.

## Challenges

The likely presence of pyrophorics was the main concern. The VDU was large in size and contained three sections of packed beds. Additionally, there was a history of pyrophoric activity upon opening this particular vessel.

## Past Procedure

Before using ZymeFlow, the company had relied on a combination of steam and potassium permanganate to clean the VDU. The previous multi step process was time consuming and effluent disposal was difficult. Exchangers was performed via a Vapour-Phase procedure for this bank using saturated steam (125 psi) enriched with Zyme-Flow UN657 for an 11-hour period.

## Engineered Solution

Due to the large size of the VDU and the high risk of pyrophorics, the decon planning team included additional treatments with the ZymeFlow process. Refinery personnel first performed an oil wash in the bottom circuit with Z66 chemistry to enhance its effectiveness. ZymeFlow's team of experts then injected Zyme-Flow® UN657 and Z66 into each header to best reach contaminants trapped in the packed bed sections. Steam was added to the tower, quickly followed by the injection of Zyme-Flow UN657 for Vapour-Phase® treatment.

A series of tests for chemistry concentration, benzene, LEL, and hydrogen sulfide were conducted throughout the treatment. After nine hours, the contaminants had reached zero ppm and Vapour-Phase was complete. The decontamination process ended with a post rinse of water and UN657 to remove any remaining scale and to cool the tower for faster entry.

## Results

At the end of the decontamination process the contaminant levels had reached zero inside the vessel. Upon entry, there were no pyrophoric issues and tower bottoms were completely de-oiled. The refinery was very pleased with ZymeFlow's work. The vessel was not only safe for entry in a shortened time-frame, but was also much cleaner than the refinery personnel had anticipated, with no residual sludge or scale. A refinery engineer commented that it was the best decontamination job they had ever seen done on their system. Shortened time-frame, but was also much cleaner than the refinery personnel had anticipated, with no residual sludge or scale. A refinery engineer commented that it was the best decontamination job they had ever seen done on their system.



◆ VDU PACKED BED SECTIONS CONTAINED NO SCALE OR PYROPHORICS AFTER ZYMEFLOW'S PROCESS