

# FIRST CHEMICAL DECONTAMINATION OF AN RFCC UNIT WITH PYROPHORIC HISTORY

## Project

A major refinery in Taiwan turned to ZymeFlow for their first Chemical Decontamination for the turnaround of their RFCC unit. The refinery had previously only used a steam out to decontaminate the system, and they had a significant pyrophoric fire in the main column packing beds. As this was an unexpected event, the site did not have the material to replace the damaged packing beds and decided to continue operation of the RFCC unit until the next shutdown opportunity.

## Challenges

Due to the history of pyrophoric issues and poor conditions of the tower, there was an increased risk of pyrophoric fire in the unit as well as the potential for extending the critical path shutdown duration. Therefore, decontaminating the unit per the given timeframe and eliminating pyrophoric contaminants was a top priority. Furthermore, the site was facing difficulties with mechanical cleaning of the slurry circuit, as it was very time consuming and labor intensive.

Since this was the refinery's first full chemical decontamination, they relied on ZymeFlow's global decontamination experience and best practices to develop a decontamination strategy that was both safe and fast, through a close integration with their existing turnaround procedures.

## Engineered Solution

Due to the versatility of ZymeFlow chemistry, ZymeFlow's planners were able to integrate the chemical decontamination applications into the site's existing shutdown procedures. ZymeFlow was able to utilize existing site utilities during the execution, resulting in a minimal number of injections points. This significantly reduces the amount of mechanical preparation required from Operations.

ZymeFlow suggested a couple of targeted approaches to decontaminate the tower. First, ZymeFlow recommended using Rezyd-HP during the site shutdown slurry circuit thinning procedure to target the asphaltene as per site operating parameter. After which, ZymeFlow UN657 was to be utilized in a Vapour-Phase® application by injecting the chemistry through the steam-out line. This is then followed by a post decontamination tower flush to target any remnant pyrophoric material in the column as well as cooling down the system post steaming.

## Results

The overall unit was decontaminated in 11 hours of Vapour-Phase® application. The column was verified to be free of H2S and LEL, which mitigated the risk of a pyrophoric event during vessel opening. Overall, the decontamination of the RFCC was successful. During previous shutdowns, the steam out had taken five days. With ZymeFlow, that timeline was reduced to two days, without compromising safety of equipment or personnel. Reducing the overall timeline was critical to the client in order to get the important RFCC unit back online and operational.

Additionally, with the application of Rezyd-HP, heavy sludge in the slurry circuit was significantly reduced to the great satisfaction of the client.



● PULLED SLURRY HEAT EXCHANGER AFTER REZYD-HP® TREATMENT



● DAMAGED PACKING BED FREE OF PYROPHORIC MATERIALS POST DECONTAMINATION