

The Twister® Multi-Purpose Manway
featuring a Submerged Jet Mixer (patent pending)

Case Study - Twisters cleaning Large Crude Oil Tank

A major refiner used 7 Twisters to clean a crude oil tank when it was taken out for emergency repairs. The tank is 290' D and has a cone-bottom floor. The tank had varying solids depth, from 12"-36" (25,000-30,000 bbls), with ~10,500 bbls in the cone. They went from "oil down to gas free" in <2 weeks. When they opened the manway plates after initial cleaning using the Twisters, they could already see the floor plates out to the center of the tank. No shoveling or digging or manual removal was needed... just a water wash for detailed cleaning. The customer credited the Twisters with saving at least 2 weeks due to less manual cleaning time versus other circulating nozzles, which they viewed as huge dollar savings both in actual cleaning costs and in recovered margin due to shorter tank downtime. Demurrage on the tank was valued at \$60,000/day, so savings on this project (including manpower and rental costs) was in the range of a million dollars.



To clean this tank, they first stripped the crude from the tank and installed the 7 Twisters through existing manway openings. On the same day, they also installed two suction lines to a normal low point. They refloated the external floating roof with gasoil. Using a 1700 gpm/150 psi pump to recirculate through each Twister, they ran two Twisters at a time, approximately 180° across the tank from each other. They ran each Twister at a fixed nozzle position for 15 minutes at a time, then advanced to the next nozzle position. After all 8 nozzle positions were exhausted, they then rotated the pumps sequentially around the tank to the next set of Twisters, by opening and closing valves. The Twister setup could reach totally across the diameter of the tank, and completely side-to-side, leaving no blind spots. They continued turning the tank for 48 hours.

After pumping off the refluidized product (largely paraffins) to other tanks for downstream processing, they ran firewater through the tank for 1 day to remove LEL & H₂S, and when they opened up the tank, they could see the floor. The project – from pumping down the crude inventory, to completion of water washing and inspection - took a total of 12 days.



The client reported seeing major advantages versus other circulating nozzles they had used over the years: lower investment costs; no moving parts such as gearboxes or shafts to break; longer cleaning radius than other nozzles; the nozzle can be moved by cleaning personnel and directed to where it needs to be inside the tank; can handle any flow rate and varying pressures; can circulate the tank with cutter oil, and then water wash tank with Twisters without having to open the tank manways,

thus minimizing exposure to personnel; and takes a very short time to install versus other nozzles.

When the project was completed, they decided to leave 4 Twisters on the tank so that they could conduct a periodic “online tank cleaning”. They will simply bring a pump to the tank and hook up to the Twisters and begin recirculation and cleaning. They won’t have to open the tank or remove it from service, and plan to clean the tank every other year.

Please contact us at Triton Industries (a sister company of Waterline Tank Technologies) to discuss your specific application.

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