

Temporary Equipment Bridges the Gap for Refinery Clarifier Rental Saves Production During Replacement Downtime



CASE STUDY

Location: Midwest United States
Owner: Anonymous

Problem

A Midwest refinery with a significant-sized operation of both crude oil and gasoline production needed to enhance its equipment. The old secondary clarifiers were near the end of their lives and suffered from corrosion, wear, and out-of-date technology that needed to be upgraded to improve efficiency.

The present clarifier mechanisms could not be fixed without taking the plant offline, subsequently reducing capacity for a significant period. The plant needed a solution that reduced downtime while the decades-old clarifiers were replaced with new WesTech clarifiers.

The planning for replacement clarifiers had been in progress for four years, and the challenge was in determining when the old equipment could be taken offline to install the new. The plant did not want to lose production time to replace the clarifiers. Meanwhile,

the old clarifiers were experiencing frequent break downs and were in immediate need of a solution.

Analysis of Alternatives

The customer turned to the sales agent, David Field from Salt Creek Technologies, to explore options to bridge the transition. Three options were suggested:

- Use temporary clarifier equipment for the few weeks the clarifiers would be down
- Install a dissolved air flotation (DAF) unit to fill in for the clarifiers
- Introduce inclined plate technology as a substitute for the clarifier

The customer evaluated the cost and complexity of all the options and chose the temporary equipment. Because WesTech was working with the plant on the main clarifier upgrade and the customer felt comfortable with the relationship, WesTech was chosen to provide the temporary rental equipment the site needed.

Implementation

WesTech had only a nine-week lead time to build and install the rental equipment. This short timeline required WesTech to divert extra manpower to the project, including a project manager who took on many hours of overtime. The system included a mobile clarifier and a SuperDisc™ filter.



The mobile clarifier unit can handle a total suspended solids (TSS) load of up to 6,000 mg/L with integral sludge pumps that are already piped, wired, and ready for service.

Solids were collected in the bottom trough of the tank in a sludge collection header and recycled back to the aeration basin. Clarified

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water was collected via weirs located along the long side of the tank, and discharge of the clarified water was collected in a manifold and sent to the outfall system via gravity.

Instruments for measuring pH and TSS were provided by WesTech and mounted inline for operator monitoring. The clarifier incorporated a tube settling design for higher removal rates.

The second piece of equipment, the SuperDisc, is a small-scale, high-rate filtration unit that fits into a compact footprint and needs less backwash than other filtration systems. It is a fully integral unit that requires minimal site assembly. The SuperDisc was used as a polishing step to ensure the TSS target was met if one of the clarifiers was down for maintenance.

The SuperDisc utilizes discs constructed of a compression-molded polyester frame. This frame houses a polyester filter mesh that is available in different pore sizes (10, 20, 30, 40, 50, and 60-micron screens) and used for liquid-solids separation in many different applications. It featured

a large amount of filtration area in a small footprint, low backwash volumes, automated operation, and a discharge pump for solids up to 200 gpm.



The plant operators required a short learning curve to modify their expectations for operating a rental unit vs. a full-scale installation. A WesTech employee came alongside the operators and helped with retraining so they were comfortable running the rental clarifier.

Once the underflow return activated sludge (RAS) and influent flow was set, only one operator was needed. One or two tanks were cleaned per day, taking approximately 45 minutes to an hour to clean one tank. Outside

of cleaning, maintenance was not frequently needed. For redundancy, one more unit than necessary was added to allow for full treatment capacity while cleaning took place. In this case, four units were required, but five units were at the site.

Results

The mobile system reached its target goal for the plant's effluent release during the entire three months that the equipment was onsite.

In addition, the customer was pleased with the responsiveness of WesTech. There was a significant risk of production loss, so the success of the project was vital, and the deadline was non-negotiable. With those challenges, the mobile installation met the deadline and was a huge success.

"Our team pulled together and came through for this important customer who praised us for having a robust equipment installation, helpful process expertise, and a continuing commitment to service," said Steve Goldsmith, WesTech Rental Systems Group Leader.

