

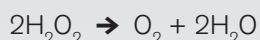


GULF COAST REFINERY - TURN-KEY REFINERY TREATMENT

Project Scope

A gulf coast refinery periodically used hydrogen peroxide (H₂O₂) at their WWTU Bio Unit. The H₂O₂ was used to supply supplemental dissolved oxygen DO to maintain a target DO level of 5 ppm in the aeration basins during high chemical oxygen demand (COD) loading periods.

Two parts of hydrogen peroxide yields one part of dissolved oxygen:



This reaction occurs rapidly in aeration basins, and thus provides an immediate source of DO for the biomass. Since H₂O₂ is a liquid, and infinitely soluble in water, the amount of DO provided to the aeration basin biomass is not limited by mass transfer of oxygen from air to liquid as is the case with mechanical aeration.

A local distributor supplied 35% H₂O₂ to the refinery in 55-gallon drums. The drums were stored on wood pallets, which violated industry safety standards. The drums of 35% H₂O₂ also required changing out the drums, which increased the risk of spills and exposure to operators. The Safety Department identified the violation and deemed the drums of 35% H₂O₂ as unsafe. They were subsequently removed from the plant.

During a turnaround of an upstream unit, higher COD loading depleted the dissolved oxygen level in the WWTU Aeration Basins, resulting in ineffective treatment. Despite the use of additional mechanical aeration (diesel driven air compressors), sufficient wastewater DO levels were not being maintained. An alternative H₂O₂ supply approach had to be implemented right away.



USP Technologies turn-key dosing system example

Solution

The refinery approached USP Technologies (USP) to engineer a H₂O₂ chemical dosing system sized to meet the plant's DO demand. The system was requested to include integral secondary containment and had to meet Class 1, Division 2 electrical standards. The plant also expressed concerns about 35% H₂O₂ being a Class 2 Oxidizer.

With consideration to the engineering requirements and the urgency to respond with a treatment plan, USP developed a two-phase response. The first step was to address the immediate H₂O₂ treatment requirement and the second step was to implement a long-term solution.

Program Benefits

The USP 27% H₂O₂ treatment program offered the refinery several benefits:

- It provided a simple and effective means to provide supplemental dissolved oxygen during periods of high BOD/COD loading to the WWTU Bio Unit.
- The use of a Class 1 Oxidizer (Refinery Grade 27% H₂O₂) and a turn-key storage and dosing system offered a safe solution during periodic increases in BOD/COD loading to the WWTU.
- The program has also enabled the plant to remove the diesel driven rental air compressors, which is an additional cost and emissions issue.

Rapid Response Treatment Program (Phase I)

USP responded to the refinery's immediate need by quickly mobilizing a four-person project team, which included a local account manager and experts in the areas of technical applications, equipment system design and equipment installation/maintenance. The full-service chemical management team installed a USP Rapid Response System consisting of a 5,000-gallon temporary storage trailer and a modular dosing control system. Additionally, with the plant's desire to minimize risk exposure, USP provided a Refinery Grade Hydrogen Peroxide (27%), which is a Class 1 Oxidizer.

Upon the addition of Refinery Grade 27% H₂O₂ to influent of the WWTU Bioreactor System, the mg/L DO target was maintained during the high COD loading period.

Permanent System Treatment Program (Phase II)

Once the temporary system was commissioned, the USP project team turned their attention to providing a permanent chemical storage and dosing system. USP worked with the plant's engineers to determine the optimum dose point as well as the proper location for the chemical storage tank. The USP project team designed a program solution that included the following:

Equipment

- USP-5000 system consisting of a 5,000-gallon, double-wall HDPE storage tank with 110% integral secondary containment and all required safety relief devices.
- A dual-pump chemical dosing module sized to meet chemical dose requirements and designed to specific Class 1, Division 2 electrical requirements.
- All system components are pre-plumbed, pre-wired and passivated to ensure ease of installation and to maintain operational safety and product quality.

Field Services

- USP field service installed, commissioned and maintained the entire system to ensure operational reliability.

Chemical Inventory Management

- USP's ChemWatch™ inventory management system provides remote monitoring capability and enables USP to respond quickly to sudden high usage requirements at the facility.

The changeover occurred following the plant turnaround and was completed by the USP Field Services Team without incident and without disruption to the treatment program.

About USP Technologies

USP Technologies is the leading supplier of peroxygen-based technologies and services for environmental applications. We have been serving the water, wastewater and remediation markets for over 20 years and have offices and field service locations throughout North America. Our consultative approach to problem solving includes application assessment, technology selection and development of a tailored treatment approach. Our full service programs successfully integrate storage and dosing equipment systems, chemical supply, inventory and logistics management, and ongoing field and technical support. This approach provides cost-effective, "hands-off" solutions to our customers. USP Technologies also can provide access to experienced application partners for a turn-key program encompassing engineering, site characterization and technology selection, program implementation, execution and report generation.

Getting Started

We look forward to supporting your treatment needs, whatever the scale of your requirements. To obtain a streamlined treatment solution tailored to your specific project, give us a call at (877) 346-4262.

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