

GenGard* with STP Helps Refinery Shorten Process Leak Recovery Time and Greatly Improve Corrosion Results

Challenge

A large refiner in the coastal California area of North America has periodic hydrocarbon leaks into their cooling system, not untypical for a refinery operation. These leaks cause severe fouling and can lead to accelerated corrosion if not immediately and effectively addressed.

When a process leak occurs, the first goal of the contingency plan is to reduce the impact of the oil contamination. To achieve this, extra dispersant (Spectrus* BD1501E) is added to the system to keep the oil in solution and all blowdown lines are opened. This flush process typically lasts about 30 days.

The resulting incremental load on the wastewater treatment plant is roughly 100gpm. The goal was to reduce this recovery time, saving water and chemical, while further improving the system protection.

The cooling tower make-up is well water mixed with RO make-up. Tower data and typical chemistry are shown below:

Recirculation Rate	39,000 gpm (57 m ³ /h)
System Volume	250,000 gallons (947 m ³)
Delta Temperature	21°F (6°C)
Magnesium	660 ppm
Calcium	900 to 1,200 ppm as CaCO ₃
Phosphate	10 to 12 ppm as PO ₄
Conductivity	3,200 umohs
pH	6.8 – 7.0

The previous treatment program consisted of the following products:

- Phosphate (10-12 ppm as orthophosphate)
- Dianodic* DN2763
- Dianodic DN2312 (maintenance program and batch fed during clean-ups)
- Spectrus BD1501E (batch fed during clean-ups)

Solution

To reduce the recovery time of a hydrocarbon leak, GE Water & Process Technologies recommended a change in the maintenance program and the hydrocarbon leak clean-up contingency plan. Both were modified to replace Dianodic DN2312 with the new GenGard* product, GN7004.

GenGard GN7004 is part of the GenGard platform of cooling products, featuring GE's newly patented Stress Tolerant Polymer (STP) and has a superior ability to handle foulants such as oil. This revolutionary product, effective in both neutral and alkaline pH scenarios, is a very forgiving chemistry with excellent inhibition of calcium phosphate, calcium pyrophosphate, zinc phosphate, and aluminum phosphate. It is also outstanding at dispersion of high iron and silt levels and handling high exchanger skin temperatures and high pH excursions.

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Results

During a recent hydrocarbon process leak, recovery was achieved in less than 5 days, down from 30. By shortening the recovery, 3.6MM fewer gallons of blowdown water were sent to the wastewater treatment plant and several drums less chemical were required. This alone saves the customer over US\$15,000 per event.

In addition, the corrosion results were outstanding. Figure 1 shows the mild steel corrosion coupons installed for 25 days, which looked almost new. The surfaces were free of visible corrosion and showed little to no oil accumulation. This ensures under-deposit corrosion is kept to a minimum, providing asset protection and a long asset service life.



Figure 1