

Corrosion Protection of an Out-of-Service Crude Oil Tank on Sand Foundation by Underside Injection IDS

Project Specifics

Installation Dates
December 31, 2019

Location
Angola, Africa

Asset Details (Old & New Floor)
ORIGINAL (OLD) FLOOR FOUNDATION & CHIME AREA

Diameter: 300-ft
Vessel Construction: Single-Bottom with Concrete Ring Wall, 42 Ports (1" Threaded PVC) placed 0.5-ft to 1-ft from ring wall, No Active CP System.
Foundation Media: ~24 inches of sand.
IDS System: Underside Injection IDS with ER Probes

0.5-ft concrete foundation media between double-bottom (new) and original (old) floors.

DOUBLE-BOTTOM (NEW FLOOR) FOUNDATION

Diameter: 300-ft.
Vessel Construction: Double-Bottom with Concrete Ring Wall, 32 Ports (1" Threaded PVC) placed 3-4" from ring wall, No Active CP System.
Foundation Media: ~24 inches of sand.
IDS System: Underside Injection IDS and ER Probes.

Zerust Product(s) Used

Zerion® FVS Corrosion Inhibiting Powder
Zerion® FAN-5 Corrosion Inhibitor Powder

Project Specifics

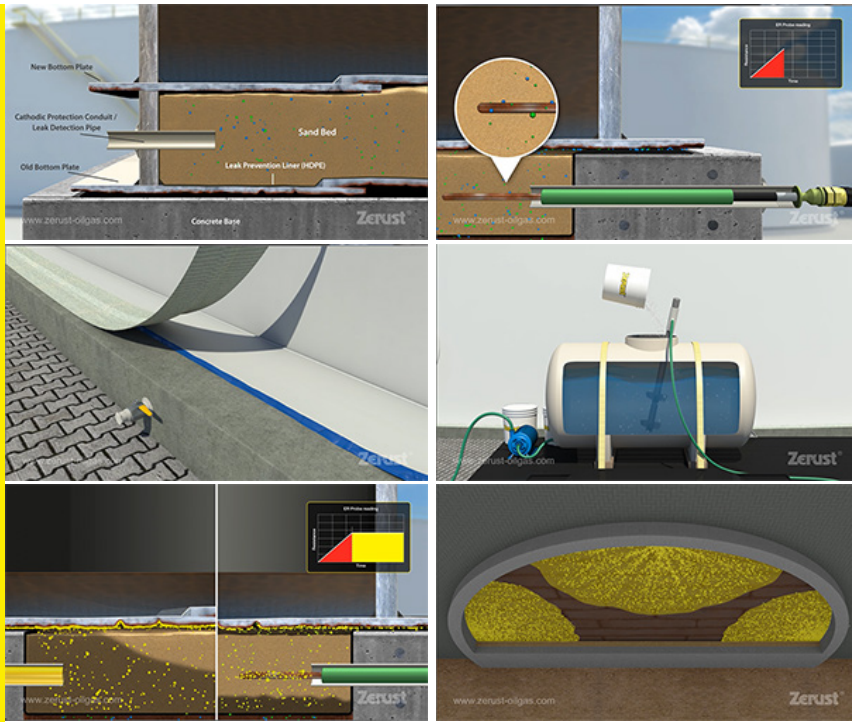
The client wanted corrosion protection for single-bottom, aboveground storage tank holding crude oil on sand foundation.

Zerust Solution

The engineers at Zerust® Oil & Gas developed a custom solution for this client using their Underside Injection IDS. Zerion® FVS and Zerion® FAN-5 Corrosion Inhibitor Slurry was injected between the new and old tank floors and ER Probes and Box were set up.

Vessel Assessment

This vessel was out-of-service. During the vessel assessment,



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forty-two (42) leak detection ports) had been drilled beneath the original bottom and were previously fit with Electrical Resistance (ER) probes for baseline corrosion monitoring. The leak detection ports were installed with fittings for injection of a corrosion inhibitor slurry. Additionally, four (4) ports (in addition to the thirty-two (32) leak detection ports) had been drilled through the dead shell (beneath the new bottom) and were also fit with ER probes for baseline corrosion monitoring, with the leak detection ports installed with fittings for injection of a corrosion inhibitor slurry.

IDS Installation Process

Corrosion inhibitor slurry was injected beneath the double-bottom and old floor. During the corrosion inhibitor slurry injections, various ports were opened around the tank circumference and water was noted to drain out. This drainage occurred even on the opposite side of the tank, indicating that the slurry had fully saturated the tank foundation. A Viscotaq sealant system was applied to the chime area of the original floor and adhesion tests were done approximately every 1-meter and were successful for the original bottom. The double-bottom was well welded. Following corrosion inhibitor slurry injection and installation of an IDS sealant system, ER probe readings were taken by the client.

Conclusions and Recommendations

All of the corrosion inhibitor compound was successfully applied/injected with few issues between the new and old floors. It is recommended that data continue to be collected from installed ER probes (and sent to Zerust Oil & Gas for analysis) for the recommended period of time given to the client following the corrosion inhibitor slurry injection.