

Belzona Repairs Staircase of 79-Meter-Diameter Crude Oil Storage Tank

ID: 10087

Industry: Oil & Gas
 Application: TCC-Tanks and Chemical Containment Areas
 Substrate: Carbon steel
 Products: Belzona 1161 (Super UW-Metal), Belzona 9111 (Cleaner Degreaser)

Customer Location: Paradip, India
 Application Date: April 2015

Problem

The staircases and steel gratings had sustained significant structural damage due to atmospheric and localized corrosion. Sections of the stairs were visibly detaching from the tank shell, posing serious safety and operational risks.

A shutdown for hot work (welding or mechanical anchoring) was not feasible due to operational and logistical constraints. The client urgently required a cold-applied, durable solution that could be deployed in situ without compromising safety or the integrity of the tank.



The staircase of the 79-meter-diameter crude oil storage tank was damaged.



The stair fixing arrangement was carefully designed to ensure safety and structural stability.



The grating stair was securely fixed to the tank shell.



The stairs were fixed and tested with a human trial.

Application Situation

A shutdown for hot work (welding or mechanical anchoring) was not feasible due to operational and logistical constraints, which posed serious safety and operational risks. Hot work on a tank of this size would require at least 30 days, potentially resulting in a loss of \$15 million.

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 FS 695214
 ISO 14001:2015
 EMS 695213

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A solution was proposed using Belzona 1161 (Super Metal) and Belzona 9111 Cleaner / Degreaser. The chosen methodology prioritized in-situ application, minimal surface preparation, and maximum structural adhesion under active site conditions. The Belzona repair was also planned to be completed within 72 hours, addressing 200 stairs.

Application Method

Given the site's hazardous zone classification and the potential for ignition, non-sparking tools were employed. Surface preparation followed the prescribed minimal surface preparation protocol, essential for safe execution in volatile environments.

The procedure included:

1. Mechanical cleaning using non-sparking tools to remove loose corrosion and contaminants.
2. Degreasing the application surface with Belzona 9111 Cleaner/Degreaser.
3. Repairing the damaged gratings and repositioning the dislodged stairs, which were structurally bonded to the tank shell using Belzona 1161 Super UW Metal.
4. Allowing the repair to cure for 24 hours.

Belzona Facts

The customer had no alternative but to use Belzona to return the tank to service.

This solution saved approximately \$15 million and 27 days of downtime.

The repair was continuously monitored until November 2025, and the stairs have been performing flawlessly for over 10 years.

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