Repair of a Deformed and Leaking 36 Inch Crude Oil Pipeline Using

ID: 10151

Industry:	*Oil & Gas*	Customer Location:	*Al Khafji, Saudi Arabia*
Application:	*VPF-Valves, Pipes and Fittings*	Application Date:	*November 2025*
Substrate:	*Carbon steel*		
Products:	*Belzona 1161 (Super UW-Metal),Belzona 1221 (Super E-Metal),Belzona 5831 (ST-Barrier),Belzona 9611 (ES-Metal)*		

Problem

Severe external corrosion, combined with continuous loading from the support structure, caused structural deformation and the formation of a pinhole leak in a 36 inch crude oil pipeline operating at ambient temperature and 4 bar pressure. Approximately 5 meters of the pipeline experienced significant wall-thickness loss, posing a high risk to operational safety and continuity.

Pipeline damage caused by severe external corrosion

Pipeline condition after surface preparation by grit blasting

Pipeline condition following plate bonding using Belzona 1221 and wrapping with Belzona 1161 (Super UW-Metal) and Belzona 9341

Pipeline condition following application of Belzona 5831 (ST-Barrier) for external corrosion protection

Application Situation

Welding was not a viable option due to active leakage from the pipeline, and full replacement was not possible because the required pipeline material was not readily available. An immediate, safe, and reliable repair solution was therefore required to minimize downtime and avoid hot work.

Application Method

The pipeline was first shut down, and all oil residues were thoroughly cleaned from the external surface. The pinhole area was sealed using Belzona 9611 (ES-Metal) and Belzona 1221 (Super E-Metal) to prevent oil sludge flow under high ambient temperatures (35°C).

After inspection and confirmation that the Lower Explosive Limit (LEL) level was zero, abrasive blasting was carried out to achieve a minimum surface profile of 75 microns and Sa 2.5 cleanliness. A steel plate was then blasted and bonded to the 36” pipeline using Belzona 1221 to correct the deformation and restore structural integrity.

ISO 9001:2015
FS 695214
ISO 14001:2015
EMS 695213

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To provide long-term reinforcement, a two-wrap composite system using Belzona 1161 (Super UW-Metal) and Belzona 9341 (Lagseal Reinforcing Sheet) was applied along the affected section of the pipeline. Finally, Belzona 5831 (ST-Barrier) was applied as a topcoat to protect against future external corrosion.

Belzona Facts

The customer required a cost-effective, reliable, safe, and rapid repair solution. By utilizing Belzona plate bonding and conventional composite wrapping techniques, the full structural integrity of the pipeline was restored in less than one week.

This rapid repair enabled the customer to return the pipeline to service promptly, avoid significant production losses, and eliminate the risks associated with welding or full pipeline replacement.

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