

CASE STUDY NUMBER:	Case Study 35
DESCRIPTION:	14" Crude line support wraps
CLIENT:	SAPREF

SERVICE:	Crude oil
Line size	14"
Design Pressure	31,5 Bar
Operating Pressure	2,59 Bar
Design Temperature	60Deg C
Operating Temperature	26 Deg C
Material	Sa 106 GrB
Line Class	

ANOMALY DESCRIPTION:

The 14" Crude line that supplies to the refinery was inspected and noted that severe external pitting corrosion was found on the contact areas where the pipe meets the concrete sleepers. 178 support sections were identified with 27 that had major wall thinning. Major findings had wall losses of approximately 70percent.

2 7mm wall left from an original 9 52mm

ROOT CAUSES

improper design of sleeper support without any sacrificial wear material, for example a metal wear pad. The pipe sits directly on a 20mm diameter round bar and with vibration and movement of the pipeline over the years it has started eating away at the localised spots where the pipe meets the roundbar.

INTEGRITY CONCERNS (INCLUDING PICTURES)

Further deterioration could lead to possible leaks on the pipeline. The pipeline is the crude oil supply to the refinery which could result in major downtime, fire and environmental hazards. Major findings it is reported that the line is operating at below the design minimum thickness due to design pressure.



THE BERUSEAL SOLUTION (WITH PICTURES)

Beruseal engineered a diamond wrap composite repair according to ASME PCC2 to restore the pipeline wall thickness back to its original specification and enable it to operate at full design conditions. Out of the 178 supports Beruseal wrapped a total of 27 sections that were below the pipeline's T-min.

The remaining supports were fitted with a sacrificial steel wearpad and bonded with a steel epoxy putty. In either the repairs the focus was on removing the possibility of further external corrosion. In order for the repair to be implemented Beruseal worked in conjunction with a jacking company that specialises in the simultaneous jacking of a pipeline on multiple supports. The line was lifted 50mm off the support which allowed Beruseal to do surface preparation to a bare metal finish to get a good bond of epoxy to the pipe material.



INSTALLATION PICTURES



CONCLUSION

A successful repair on all the supports were implemented and a guarantee of 20 years is given to the wrapped areas for external corrosion and this will allow the piping to run according to its original design criteria of temperature and pressures. The wraps were all coated with a UV protection as they are continually exposed to the elements