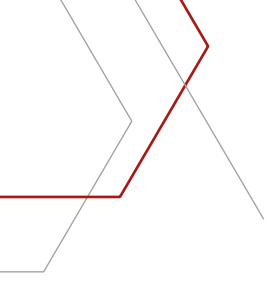


# CASE STUDY

Carbontech Case study 008  
6"x 4" Hydrocarbon drain line





# TABLE OF CONTENT

PAGE	CONTENT
1	Cover Page
2	Table of content
3	Project Details
4	Anomaly description Integrity concerns
5	The Carbontech Solution Conclusion
6	Contact Details

## PROJECT DETAILS



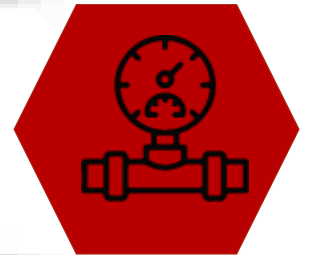
Case Study Number  
CTCS:008

Design Pressure  
6 Bar



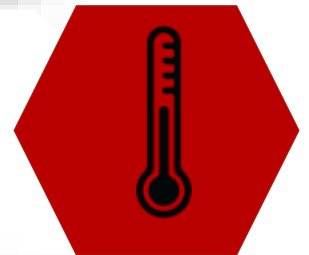
Repair Summary  
4"x 2" Tee with Flange

Operating Pressure  
4 Bar



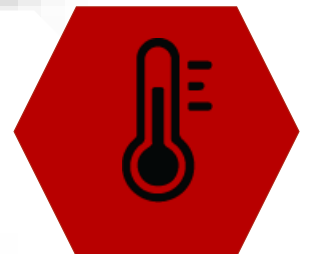
Client  
Refinery in Caspian Region

Design Temperature  
120°C



Service Type  
Hydrocarbon Drain line

Operating Temperature  
80°C



Line Size  
4"x2" Inch Line

Base Material  
SA-333 Gr-6



Line Class  
150#



## ANOMALY DESCRIPTION

Severe external corrosion detected on a hydrocarbon drain line.

Figure 1: Active leak caused submersion of the pipe and flange.



Figure 2: Severe external corrosion of the pipe and flange.



## INTEGRITY CONCERNS

Further deterioration to piping could lead to loss of primary containment resulting in high risk of fire or injury from Hydrocarbons. Flange bolts have deteriorated to an extent of nuts fusing to the flanges and adding further concerns to the piping integrity over and above the line operating with pipe thicknesses below the designed T-min.



## THE CARBONTECH SOLUTION

Simultaneous operations were required to keep the channel dry at all times as it would fill up within 2 hours, technicians did a surface preparation under SCBA in the case of creating any through holes in the pipe due to the thin wall thickness. Once prepared according to SSPC.SP3 the pipe was wrapped but external heating was required to get a sufficient cure on the resin. This required a habitat be built, the use of a Tioga heater to keep the temperature to a sufficient heat for cure as well as the water continually being drained. fuses to the profiled flanges.

It is the refinery policy not to wrap over flanges and once the pipe was wrapped the flange would be the next problematic area, Beruseal designed a strongback system to keep the system in place in the event of bolt failure of the flange, a surface prep was done on the entire flange and the area between the flange was profiled with Revofill.

Surface Preparation achieved: SSPC.SP3  
Product used: Revowrap 185  
Engineering calculations: ISO TS 24817  
Layers used: 4 layers  
Post cured: Habit with external heaters

Figure 3: SSPC SP3 surface preparation of the elbow tee with flange.



Figure 4: Installed wrap



Figure 5: Bolted flange clamp prior wrap



## CONCLUSION

A successful repair resulted in the line being able to operate at normal capacity until the next planned turnaround when the line will be replaced. Further sections on the same line were also identified with lower than allowable wall thicknesses and were also wrapped with Carbon fiber composites.



## CARBONTECH

The place chemistry, engineering and global expertise are brought together to drive progressive innovation in advanced composite technologies for the emergency repair of critical assets "There is nothing generic about us" we don't just sell pipe wraps; we provide accurate engineering backing to deliver tailored solutions

Sound and responsible engineering is the basis on which we build our company, products and services. It is the core to our success and it is the foundation on which we have engineered and manufactured our innovative and bespoke products

We strive by a zero-failure philosophy and warrant our engineered composite solutions are tested, proven and validated. We vow to provide dependable, responsible and accurate information regarding the capabilities of our systems

[www.revowrap.com](http://www.revowrap.com)

### CONTACT DETAILS

Office: +27 (0) 10 446 6866

Email: [info@revowrap.com](mailto:info@revowrap.com)

### PHYSICAL ADDRESS:

Unit A5 • Growthpoint Industrial Estate • Bell Street • Meadowdale Germiston • 1614 • South Africa

PROGRESSIVE COMPOSITE ENGINEERING

