

CASE STUDY

Carbontech Case study 009
12" Flange Wrap on GRP fire water line



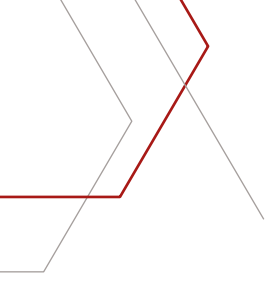


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PROJECT DETAILS

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|--|--------------------------------------|-------------------------------|---|
|  | Case Study Number CTCS:009 | Design Pressure 15 Bar |  |
|  | Repair Summary Firewater Line | Operating Pressure 8 Bar |  |
|  | Client Refinery in Caspian Region | Design Temperature 75°C |  |
|  | Service Type Fire water line | Operating Temperature 20°C |  |
|  | Line Size 4"x2" Inch Line | Base Material GRP |  |
|  | Line Class 150# | | |



ANOMALY DESCRIPTION

Through wall defects and mechanical damage of piping and flanges

Figure 1:



Figure 2:



Figure 3:



INTEGRITY CONCERNS

Through wall defects created the leaks in pipeline and it was further discovered that the integrity of the gasket between the flanges was questionable, since another leak was present at the flange connection. The line was used for firefighting water, and therefore played an integral role in the safety systems of the plant. The option to remove the bolts and change the gasket was rejected due to concerns of causing further damage to the glass reinforced epoxy system. The criticality of the line was high due to it being a safety system, therefore, an urgent sealing solution was required.



THE CARBONTECH SOLUTION

The installation was done in four stages to ensure adequate curing of each repair:

1). The line was isolated and surface preparation was performed using sand paper and acetone - stronger surface preparation methods cannot be used on glass reinforced epoxy. The bolts and nuts were cleaned using MBX bristle blaster. The defects were then covered with Revoprep and smoothed. The Revoprep was also applied to crevices between the flange and pipe to ensure a good seal. the second option was then selected as the most efficient sealing solution. The efforts of the Carbontech Engineering team, lead to the development of an installation procedure to ensure a qualified repair for 5 years

Surface Preparation achieved: N/A

Product used: Revowrap 110

Engineering calculations: ISO TS 24817

Layers used: 4 layers

Post cured: Not Required

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



Figure 4: Installed wrap



Figure 5: Bolted flange clamp prior wrap



CONCLUSION

The composite repair was successful and was completed in a period of four days. The upstream valve was removed to ensure that the line was completely isolated, and a Tioga heating system was used to ensure that the pipeline and its components were completely dry during all stages of the repair. The line was put back into service successfully.



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

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