

CASE STUDY NUMBER:	Case Study 18
DESCRIPTION:	PRE-HEATER FLANGE CLAMP
CLIENT:	TENGIZCHEVROIL

SERVICE:	
Line size	3410 x 320mm
Design Pressure	4
Operating Pressure	0,48
Design Temperature	260
Operating Temperature	166
Material	ASTM A350 LF2 CL.1
Line Class	SPECIAL-TUBESHEET/CHANNEL

ANOMALY DESCRIPTION:

A small leak was detected on the body flange of vessel. The gasket and studs are over 20 years old. The existing studs was corroded and could not be re-tightened. The existing sheet gasket is completely confined and can withstand a higher compression gasket load.

A bolt changeout procedure was completed by the client yet the leak of H2S was still present

ROOT CAUSES

Deterioration of the Gasket and studs that have been in service for 20 years without replacement.

INTEGRITY CONCERNS (INCLUDING PICTURES)

Further degradation of gasket and bolting leading to increased exposure of H2S into the environment. H2S exposure to human health is hazardous and large amounts of exposure could be fatal.

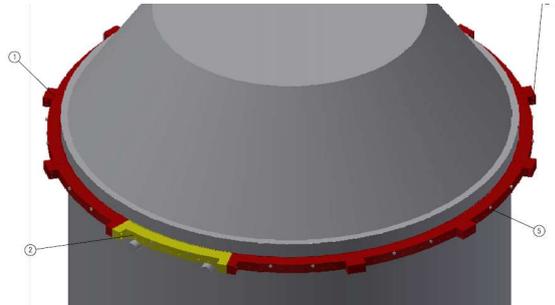
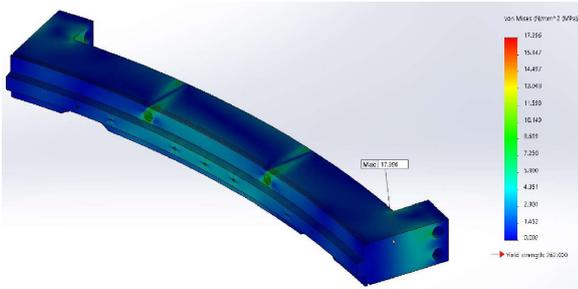
There was also a risk of Stress Corrosion Cracking due to bolting being exposed to sour service.



THE BERUSEAL SOLUTION (WITH PICTURES)

Beruseal designed and manufactured a 8 Part flange insert lip clamp that would clamp around the vessel flange. Due to the shear size of the ring clamp, The design underwent an FEA analysis to accurately determine the stresses the clamp would be exposed to.

Due to the clamp design having a seating area on top of the vessel flange precise measurements had to be made to ensure the clamp sits flush on the 3400mm vessel flange and create a effective seal. The enclosure was also CNC machined from the 3D model to have the dimensions exactly accurate as per the design.



INSTALLATION PICTURES



CONCLUSION

A PTFE based sealant was injected into the cavity of the flanges, with high precision measuring and machining a succesfull seal was obtained.