

## CASE STUDY NUMBER 3

Failed gasket on Heat exchanger

CLIENT:	Oil Field Kazakhstan
DATE:	20 January 2011
DESCRIPTION:	Leaking Heat Exchanger
Service:	Sour Service
Line Diameter:	Heat exchanger
Design Pressure:	87 BAR
Operating Pressure:	75 BAR
Design Temperature:	350°C
Operating Temperature:	420°C
Material:	SA-358
Line Class:	

Anomaly Description:

H2S gas leaking from Heat exchanger shell flange, Bolts were unsuccessfully re-tensioned in attempt to eliminate leakage

Root causes:

Probable cause of the defects severe Thermal cycling

Integrity and safety concerns:

Leaking H2S was a major safety concern and a deteriorating leak was imminent.

**BERUSEAL SOLUTION:**

Clamp Design:

An analysis of a clamp for a sour gas line was made for the Heat Exchanger. The clamp design was merely a contingency should the brass wire wrap method not have adequate support.

Picture 1



Picture 2



**Brass wire wrapping:**

Multiple adaptor ports was strategically placed on the flange to ensure best compound flow and curing during injection, the placing of the adaptor ports was also significant to reduce additional stresses that was added to the studs during injection.

Picture 3



Picture 4



Seal:

Brass wire wrap was peened into the flange gap using intrinsically safe equipment, Beruseal High Temperature Hydrocarbon resistant compound was injected strategically into the flange gap & Bolt pockets until a full circumferential seal was achieved. (See attached pictures 5 below). The entire job was performed under fresh air and had no re-injections until unit was replaced during the next scheduled Turnaround.

Picture 5

