CASE STUDY NUMBER 7

THROUGH WALL LEAK ON 36” SULPHUR DEGASSING UNIT

CLIENT:	KAZAKHSTAN
DATE:	21 OCTOBER 2014
DESCRIPTION:	THROUGH WALL LEAK ON 36” SULPHUR DEGASSING UNIT
Service:	TECHNICAL AIR H2S
Line Diameter:	36” to 6”
Design Pressure:	14.5 BAR
Operating Pressure:	1 BAR
Design Temperature:	100°C
Operating Temperature:	90°C
Material:	A671 - CC60
Line Class:	

Anomaly Description:

Visual inspection found through wall damage on the section of the line, Process Air line from pumps GB-401(refer to photo 1 & 2). Damage is located near tie-in 6” nozzle attachment weld of exhaust gases line from Sulfur Degasing Unit. UT scanning was performed to determine the condition of the area of damage and 6” nozzle. In accordance with inspection results, wall residual thickness in the area of damage is ≈4.7mm, in the adjacent areas T-min is 5.0mm, nominal thickness is 7.9 mm. Wall residual thickness of 6” nozzle is 5.8mm, nominal thickness is 7.11 mm.

Root causes:

The probable cause of this damage appearance is occurrence of wet acid corrosion mechanism due to missing of heat tracing on 6” nozzle tie-in of exhaust gases line from Sulfur Degasing Unit.

Integrity concerns:

The length of through wall damage is ≈200mm and consists approximately ⅓ of nozzle attachment weld length, and may result in catastrophic failure of the nozzle.

Picture 1

Picture 2

BERUSEAL SOLUTION:

A T-clamp was designed according to the ASME PCC2 specifications with a strong back system to hold the 6” Nozzle in place in the case of catastrophic failure. In the process of the clamp design a lead patch was installed over the hole in the pipe and set down with BELZONA1111 to stop the H2S leak while the clamp is being manufactured.

Picture 3

Picture 4

Seal:

The clamp was a multi medium system where the use of PTFE based compound was inject into a pre-cut groove around the clamp and bores of the large diameter pipe to create an outer seal.