iNPIPE Case Study: Plugging System for National Grid LNG Tank

Image 1-

National Grid LNG Tank - Partington

iNPIPE Products has been a global leader in the supply of pipeline maintenance equipment to the petro-chemical, oil, gas and water industries for 25 years. The company's vision is to be proactive and technovative in leading the way in high quality design & products.

iNPIPE places major emphasis on providing clients with solution led management, which allows the client to take advantage of the engineering expertise that is available within the company, from an advisory capacity through to technical feasibility and conceptual studies. The capabilities within the company also allow for customised products to meet the individual specifications of the client.

INTRODUCTION

When iNPIPE were approached by National Grid they were challenged to find the safest and most time efficient manner to change a valve on a LNG storage tank situated at Partington. Safety was stressed as being of paramount importance as the LNG tanks held temperatures of minus 160˚C.

Image 2

The valve in question was covered in ice due to leakage

APPLICATION

iNPIPE responded to National Grid's request by designing a Plugging System (patent pending) consisting of an MP Pipe Plug and Stuffing Box. The concept meant that the MP Plug would be inserted through the valve to isolate the line and provide a safe working environment so that the old valve could be replaced safely.

Following a site survey by iNPIPE a Plugging System for this particular application was manufactured, pre-tested and under went a Factory Approval Test at our headquarters in Yorkshire

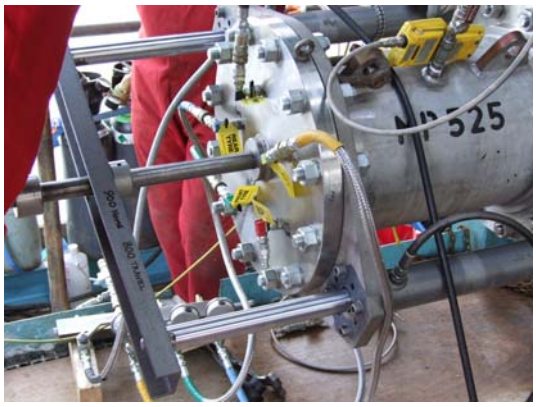

Image 2

New iNPIPE Plugging System for V2001

On the 16th June 2009 the valve change out took place. The Plugging System was connected to the existing valve and the gas pressure and pipeline temperature continually monitored. Heaters were installed to keep the pipeline at ambient temperature. Once National Grid were satisfied that the gas pressure and temperature were stable iNPIPE were able to open the valve and insert the plug to a pre-determined position located beyond the valve.

Image 3

Installation of iNPIPE's Plugging System

The plug was then inflated and an inter-cavity pressure applied using Nitrogen gas to prove that the MP Pipe Plug had sealed. With the plug now in place the stuffing box was removed leaving the plug inside the pipe.

Image 4

iNPIPE's MP Plug installed through valve

National Grid and their contractors were then able to remove the leaking valve. iNPIPE contractors then machined the gasket face onto the pipe before National Grid replaced their new valve.

Image 5

Contractors installing new valve

Once the valve had been replaced the stuffing box was reconnected to the valve and then the plug. With the introduction of gas pressurised to 1.7 bar the new gasket and valve under went a low pressure test.

Before the inter cavity was depressurised safety checks were made and the tyres deflated. One tyre had frozen due to the pipe centre's temperature dropping to below zero. To resolve this matter iNPIPE and the heating contractors advised National Grid to increase the heaters positioned around the pipe to thaw the plug. After a few hours the tyre thawed and iNPIPE were able to deflate. The MP plug was then retraced through the new valve and back into the stuffing box.

Image 6

Induction heaters can be seen wrapped around the pipe behind the valve

After the stuffing box was removed, National Grid and their contractors were able to connect a blind flange to the new valve and carry out an initial pressure test.

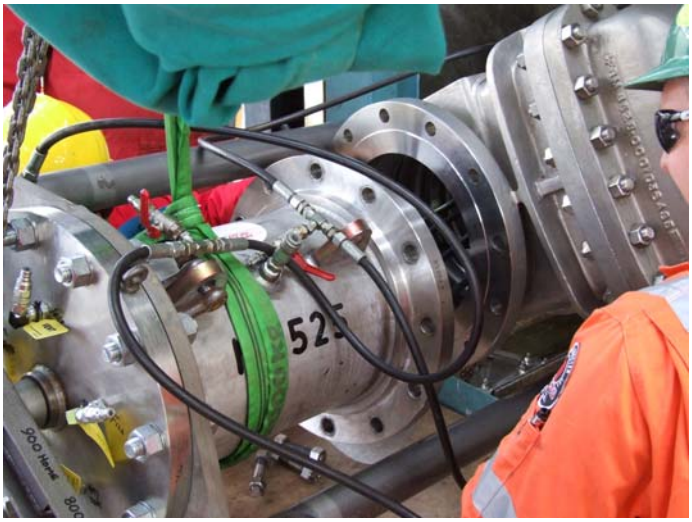

Image 7

iNPIPE Plugging System being removed

SUMMARY

iNPIPE's Plugging System fulfilled National Grid's objective to replace the LNG tanks leaking valve safely and in a time efficient manner. Despite the unexpected freezing from inside the pipe the job was executed to plan and to the complete satisfaction of all parties. This is another example of iNPIPE's expertise which has meant that we have been an industry leader for the last 25 years

Ian Briggs, Operation Engineer stated "the operation was a great success, with the whole team having full confidence in iNPIPE's equipment"