1st Deployment of Non-Metallic High-Density Polyethylene (HDPE) Liner at Khurais Field

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Abstract

This paper cover non-metallic initiative High Density Polyethylene (HDPE) Liner initiative for 700 m undertaken and implemented by Khurais Producing along with Consulting Services Department. The objective of this trial is to evaluate the performance and cost-effectiveness of the nonmetallic High-Density Poly Ethylene (HDPE)/Polyethylene Raised-Temperature (PE-RT) liner in sour crude service.This HDPE liner rehabilitate 8” corroded CS flow line of Oil Well Flowline at Khurais field for sour crude service. The original carbon steel line was experienced high severe corrosion. The line was hydrotested and scraped before HDPPE installation. The HDPE- PE-RT liner was installed from well site location by compress the liner with special compressed machine which will reduce the HDPE liner diameter so it can be pull by pulling machine from other manifold side. The pulling machine used special scraper pushed by air through the carbon steel flowline until reach well site so it will be connected to the liner in order to pull it after been compressed. Moreover, a passive injection system was installed from both end to remove any possible gasses accumulate between HDPE liner and carbon steel. The carbon steel flowline was experienced sever internal corrosion and by applying such nonmetallic initiative, it will help in reducing the severe internal corrosion in oil well flowline. This pilot test will helped to achieve zero sour hydrocarbon leak in flowline. The projected cost saving of this deployment is more than 50% compared to RTP installation. This is part of Khurais Engineering continuous effort in deploying new non-metallic initiatives at Khurais field where this HDPE- PE-RT liner is the first installation in the company for hydrocarbon applications and if successful, it has a potential of up to 70% cost saving in comparison with RTP.

The HDPE-PE-RT does not require inspection and maintenance job which will result in saving more than $120 M/ year. One more benefit for HDPE liner is that there is no limit for pipeline length where this give it flexibility to all process media application. Pressure also is not a concern and it will fit in flangeless spool connection which increase operation continuity and efficiency.