Bringing Old Non-integral Wells Back to Life - Latest Maintenance Techniques to Improve Asset Reliability, Sustainability And Reduce Carbon Footprint

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Abstract

Objectives/Scope: Tree valves and wellhead cavities provide HSE critical barriers that control flow of oil&gas from wellbore to production system. Conventional techniques may not always be effective in addressing complex challenges of maintaining and reviving integrity of these critical HSE barriers. Therefore, advance unconventional techniques are employed to restore and maintain optimal performance whilst ensuring safe and efficient operation of the well.

Methods, Procedures, Process: Some unconventional techniques which can be employed include: 1. On-site valve repair: Internally corroded Tree valves fail to provide barrier and may leave the well unsafe to operate until faulty valve or tree is replaced. Deployment of this advance unconventional maintenance technique which involves Lapping, grinding and polishing valve sealing surfaces on-site can restore optimal performance. 2. Lubricants: Selection criteria of tree valve lubricants with high resistance to concentrated acid and harmful fluids in wellbore, for non-routine activities, like acid and chemical bullheading, which could degrade valve functionality. 3. Sealant: Advance sealing technique to repair leaking metal-to-metal seals in wellhead cavities of to prevent fluid migration between annuli and hydrocarbon release to environment especially in Gas-lifted wells.

Results, Observations, Conclusions: The use of these unconventional techniques has opened new horizons in ways of maintaining optimal performance and safe operation of oil&gas wells. These techniques are cost-effective, increase lifespan of assets, help reduce downtime, improve safety, and avoid significant GHG emissions associated with reduction in mobilization of equipment, materials, and services. Here are some of the outcomes of implementing unconventional techniques. 1. The on-site valve repair technique to Lap, grind and polish failed Tree or wellhead valve sealing surfaces, clearing them from corrosion or deposits gives the equipment a new life. Through implementation of this technique, old unfit assets were reworked on-site saving asset replacement cost of Millions of dollars and reducing the carbon footprint. 2. Criterion was established to test and select Lubricants with High resistance during Non-routine PM activities. After reviewing its composition, penetrability, ability to retain its chemical properties when exposed to well fluids for use. It was observed that, through use of high resistant lubricant, the reliability of valves increased significantly and able to avoid Tree valve deterioration by 100%. 3. Many sealants are available to repair cavities but an ingenious methodology to repair Metal-To-Metal Hanger/Cavity seal on Gas-lift wells using any sealant helped save workover of wells resulting in significant savings and reducing Company’s carbon footprint.
**Novel/Additive Information:** These latest Maintenance Techniques will provide the audience with a new perspective on how to Revive and make best use of existing assets rather than drilling new wells to create a sustainable business. Each methodology mentioned herein are new Techniques trialed and successfully implemented in the UAE and at large, could benefit the Asset Reliability and Maintenance professionals in the global Oil&Gas community.