Casing Vent Challenges Into An Opportunity: Thermal Production Wells Safe Venting Solution

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Abstract

**Objectives/Scope:** In oil production process, trapped pressure in the annulus of an oil production well can negatively impact the performance and efficiency of the well. This pressure buildup needs to be safely and effectively released to ensure optimal production levels. However, finding an appropriate method to release this pressure without causing high flaring or disturbances has proven to be a challenge. This trapped pressure can lead to several negative impacts:• **Reduced Production Efficiency:** The trapped pressure can restrict the flow of oil from the reservoir into the wellbore and to the surface, decreasing the overall production rate of the well. • **Equipment Damage:** The trapped pressure may cause stress on well components, including the casing itself, the pump, and the seals. • **Gas Locking:** Gas that accumulates in the pump can impede the flow of oil, causing what is referred to as a gas lock. This scenario can temporarily halt production until the lock is resolved. • **Safety Risks:** Sustained casing pressure can lead to safety hazards such as a blowout. This is an uncontrolled release of oil and/or gas from the well, which can lead to catastrophic outcomes including fires, loss of well control, and even human injuries or fatalities. • **Reservoir Damage:** If the pressure differential between the casing and the reservoir is too high, it can potentially damage the reservoir and negatively impact its long-term productivity.

**Methods, Procedures, Process:** In this project, lean practice was used to define the opportunities including A SIPOC (suppliers, inputs, process, outputs, customers) diagram, Process Mapping, Cause & Effect Diagram, Root causes analysis. Practical Problem Solving (PPS) approach was used and several countermeasures had been completed.

**Results, Observations, Conclusions:** This project developed a robust and balanced solution for safe and efficient release of trapped pressure in the annulus in “A” field. The key finding resulted in providing a casing vent skid that can smooth the operation and increase the flexibility to bleed the gas into a safe location. This skid also has the full mobility around the wells and ease of access. The result of this project is quantified and resulted in around 10% of total “A” field production saving and cost saving of around 30%. The solution is preventing disruptions to the oil production process at the “A” Production Station, mitigate environmental impact through minimized flaring (more than 40% saving), and uphold the integrity and performance of the well.

**Novel/Additive Information:** This Solution has been achieved while ensuring adherence to safety standards and industry best practices. The end goal is to optimize oil production, reduce potential equipment damage and safety hazards, and enhance the overall operational efficiency at the “A” Production Station.