



Learning Event



DRILLING/COMPLETING A WELL

HAZARD
Physical
(pressurised system)

**Person in
Line of Fire**

CONSEQUENCES

Actual: No harm to persons
Potential: This could have caused a fatality

WHAT ARE YOU DOING TO ENSURE A FORMAL MANAGEMENT OF CHANGE (MoC) PROCESS IS COMPLETED TO EVALUATE RISKS WHEN MODIFYING EQUIPMENT?

What Happened?

During a hydraulic fracturing operation, while pumping the 11th stage of the frac at a rate of 86 BPM (Barrels Per Minute) at 11,300 PSI, an iron failure occurred on a 3-inch threaded 1502 connection that is part of a spring-loaded Pressure Relief Valve (PRV) on the frac manifold. Upon failure of the threads the valve and attached 4-foot long vent line disconnected from the manifold and were scattered across the surrounding area. Although the standard 35-foot buffer zone was in place at the time of the event, the valve body and internals came to rest outside of the buffer zone.



Why did it Happen?

- The PRV assembly experienced vibrations during pumping operations and transport of the skid. It weighed 125 kg and was only supported by the threads of the transition hub. The 45-degree angle of the PRV assembly created a moment arm acting on the transition hub threads.
- An inline ePRV was utilised for overpressure control for the traditional frac system.
- A Management of Change (MoC) process was not completed for the field installation of the PRV. An additional PRV was added (not part of the original design of the skid) for overpressure protection of an individual bank (for 3-bank design) and remained in situ on the skid during transport between locations.

What did they Learn?

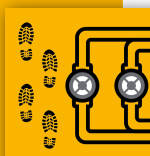
- Special consideration should be made for independent pump banks out of line as in the 3-bank setup, which are now no longer used.
- Remove the 4-foot section to reduce the weight of the PRV assembly on the threaded connection.
- Evaluate orientation of PRV assembly.
- Evaluate bracing, support or securing requirements during pumping operations and transportation.
- Assess vendor MoC processes to ensure risks are evaluated for field-driven retrofits.

Ask yourself or your Crew:

- In your workplace what types of tasks require a buffer zone? How do you determine what's a safe distance for these buffer zones? How do you ensure that buffer zones are clearly communicated and strictly enforced?
- Do you have a formal Management of Change (MoC) process in your workplace? How effective is it? What steps do you take to prevent equipment modifications from producing unforeseen and undesirable side effects? How do you prevent people using informal workarounds instead of following a formal MoC process?

IOGP Process Safety Fundamentals

- ✓ We improve our understanding of process safety hazards at our location and our roles in controlling them.
- ✓ We are vigilant about the potential impacts of uncontrolled process safety hazards.
- ✓ We discuss process safety hazards before starting a task.
- ✓ We bring forward process safety hazards to be included in activity risk assessments.
- ✓ We use operating and maintenance procedures, even if we are familiar with the task.
- ✓ We pause before key steps and check readiness to progress.
- ✓ We physically confirm the system is ready for the intended activity (e.g., valve positions, line up of relief devices, etc.).
- ✓ We look for and speak up about change.
- ✓ We discuss changes and involve others to identify the need for management of change (MoC).
- ✓ We review the MoC process for guidance on what triggers an MoC.
- ✓ We discuss and seek advice on change that occurs gradually over time.



Further Information:



SCAN ME

Safer Together
Line of Fire
Portal



SCAN ME

Safer Together
Process Safety
Awareness Video
"We All Have a
Part to Play"

Click here to send us your feedback



or scan the code

