



# Learning Event



## OPERATING A WELL

### HAZARD

Chemical  
(explosive)

**Loss of  
Containment**

### CONSEQUENCES

**Actual:** No harm to persons

**Potential:** This could have caused a fatality

## WHAT ARE YOU DOING TO PREVENT VIBRATION INDUCED FATIGUE FAILURE IN PROCESS PIPEWORK?

### What Happened?

A wellsite operator heard an audible leak of methane gas while at a wellsite to complete a separator dump. The source of the leak was from a snapped nipple (½ inch - DN15) at the base of an instrument on the non-productive side of the wellhead.



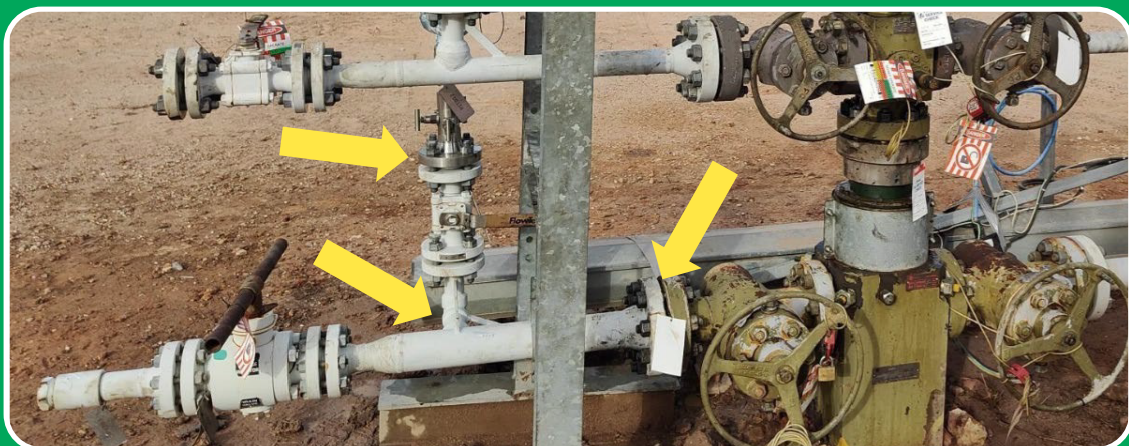
### Why did it Happen?

When originally commissioned the Case 3 wellhead had threaded fittings. It was later converted to a STS / flanged wellhead. The spool with the DN15 threaded nipple was used because it was a wellsite PoP (plug). Threaded fittings are prone to vibration induced which caused the DN15 threaded nipple to snap.



### What did they Learn?

- The threads on threaded fittings are stress raisers and prone to vibration-induced fatigue failures. Similar failures have occurred on Fuel Gas inlet lines on compressor engines.
- The wellhead is the primary source of vibration. Wellhead vibration may not be high during normal operation but may increase during unstable process events such as water slugging.
- Legacy piping specification to be made obsolete to prevent future use. Current piping specifications prohibit the use of threaded fittings in gas service and require the use of flanged connects with adequately braced small bore branches.



### What good looks like:

- Spool with flanged connections instead of threaded fittings (higher tolerance to vibration).
- Small bore branches are welded.
- Branches are braced back to the main line with bracing in two planes.
- Compliant with Energy Institute Guidelines to minimise vibration induced fatigue.

### Ask yourself or your Crew:

- Do you have threaded fittings on the gas lines connected to wellheads?
- Have you assessed the risk of threaded fittings in vibrating service?
- If you saw a threaded fitting on the gas lines at a well site, how would you report it?

### IOGP Process Safety Fundamentals

- ✓ 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.
- ✓ We pause and ask questions when signals and conditions are not as expected.
- ✓ We stop and alert supervision if the activity is not proceeding as expected.
- ✓ We proactively look for indicators or signals that suggest future problems.
- ✓ We speak up about potential issues even if we are not sure they are important.



### Further Information:

Energy Institute - EI 3160:  
Guidelines for the avoidance  
of vibration induced fatigue  
failure in process pipework



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