Richmond Refinery LPS Communication

Pilot Drill breaks while drilling hot tap

Impact : #22343

Location: D&R Flare Relief Header

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Reference:
Investigation
Information

The first picture is the snapped pilot drill in the LaBet bridge & pipe.

The second picture is broken pilot drill cutter blades.

The third picture is a side view of the drill penetrating the bridge.

Always remember to do your LPSA – because we care about you!

Incident Description:
While drilling a 36" hot tap on the D&R relief header, the hot tap machine briefly shuddered and acted abnormally. The technician contacted their factory advisor by phone. Advice was given to continue drilling and break through the resistance. The pilot drill bound while cutting through the LaBet Bridge, a u-shaped channel welded externally on the coupon. The bridge helps ensure coupon removal after cutting (typically used in high flow scenarios). The pilot drill jammed and then snapped off at the drive hub, which joins the drive shaft, the pilot drill and the 36" hole cutter. This was at the very top of the cutter head assembly, above the isolation valve, which could no longer close. The drill was bent due to downward hydraulic pressure.

Incident Response:
Drilling was stopped. The hot tap assembly was hydro-tested, which verified the drill had not penetrated the pipe wall. Inspection after the hot tap machine was removed showed the relief line was depressed. The drill had broken cutter blades and was bound in the bridge just engaging the 36" header. A review determined the safe course of action was to remove the bridge and broken pilot drill, install a new pilot drill with brazed welded cutters, and cut the coupon without the bridge, due to lack of turbulent flow rates in the line.
An investigation is in progress to determine root causes.

Potential Lessons learned:

- The pilot drill's weak point is located above the isolation valve seat, leaving the valve unusable if the pilot drill breaks.
- Chevron & Contractor collaboration is required on Risk Mitigation planning. Plans should include the possibility of the hot tap machine remaining in place until the system can be safely isolated.
- When a problem occurs during drilling operations, Chevron operations and project personnel should be notified to review recommended options.
- Drilling procedures/equipment should be reviewed by Chevron prior to use.

LOSS PREVENTION SELF-ASSESSMENT

BEFORE BEGINNING ANY ACTIVITY/TASK/JOB, AFTER A LOSS OR NEAR LOSS, ANY UNUSUAL CIRCUMSTANCES:

ASSESS the risk!
What could go wrong?
What is the worst thing that could happen if something does go wrong?

ANALYZE how to reduce the risk!
Do I have all the necessary Training and Knowledge to do this job properly?
Do I have all the proper Tools and Personal Protective Equipment?

ACT to ensure loss-free operations!
Take necessary Action to ensure the job is done properly!
Follow written procedures! Ask for assistance, if needed!

DO NOT PROCEED UNLESS ALL RISKS HAVE BEEN ADDRESSED!

For Everyone • Every Day • All the Time