PVV Repair Plan Status

9/22/22

Bent nozzle/vent

This nozzle / PVV is tilted roughly 8 deg. A tilt in excess of 3 deg requires repair.







Coffman Engineering Structural Analysis

- Started with original design when considering repair solutions
- Proposed bracket/collar design reviewed and input provided
- Input incorporated into final design
- Final design of collar provides a 3x strength increase relative to original design



Collar components after forming





Collar flange brackets for securing to nozzles.

Holes are punched on the water jet, then tapped for a threaded fastener.





Final weld and coating completed by HCC after pieces tacked together.





Successful Straightening Test - Nozzle 4F

- Nozzle straighten test was within manufacturers' acceptable tolerances of the current PVVs (3 deg)
- No observed flange face damage
- No observed additional weld damage
- No detected vapor leaks





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Implementation of Repairs

- Hydraulic rams are used to push upwards.
- Specially machined nuts with shoulders are used to secure the brackets to the flanges from the bottom.
- An air tamper with a machined brass punch tool is used to tamp the roof plate while force is applied to the flange.





pipeline

Nozzle Straightening

The target is 0 deg, +/- 3 deg tilt



Alyeska pipeline

Application of Epoxy

Mixing the Belzona 1611 product (Belzona rep assisting).





Installed collar



