Incident Report

NO INJURIES "NEAR MISS"

Stainless Steel Tubing Accident

What Happened: A technician had just removed a fitting from a stainless-steel instrument line from an unpressurized vent connection and found it to be improperly done. He was then concerned about the state of the pressurized fitting next to it and wanted to check it.

PRESSURIZED
About 3,000 psig

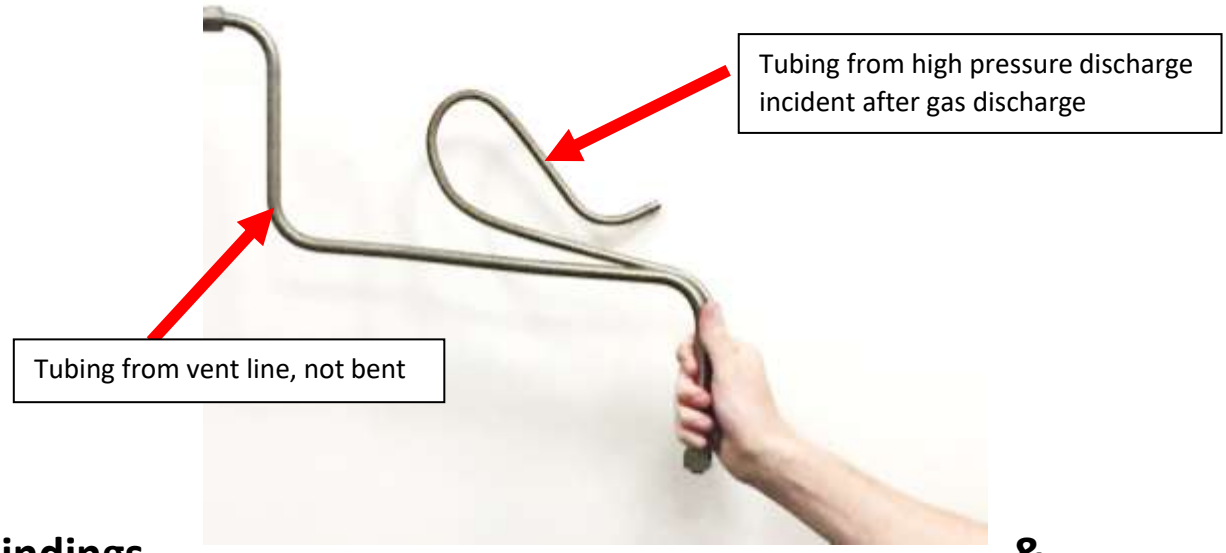
NOT Pressurized

FERRULE properly seated and swaged into place, space left on the end for proper installation.

WHAT IT SHOULD HAVE LOOKED LIKE

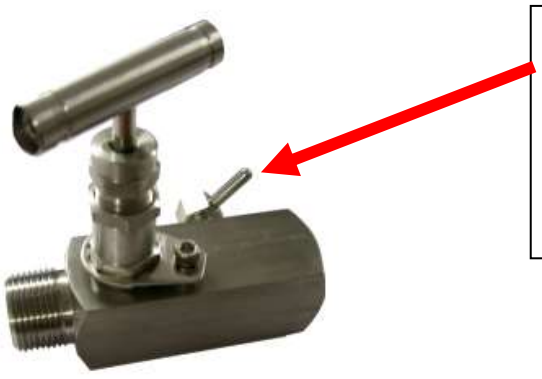
No space left on the end for the ferrule to seat and be locked on. IMPROPER INSTALLATION! VERY DANGEROUS!

What Happened (cont'd): The technician had just touched his wrench to the high-pressure fitting in an attempt to turn the nut and bleed down the small section of pressurized tubing so that he could completely remove the nut and check the ferrule and installation. As soon as he touched it, it came apart in a violent manner ejecting gas and immediately bending the tubing. It made a loud "Pop" sound followed by the distinct sound of gas pressure being relieved.



Findings & Corrective Actions

1. The instrument tubing on the high-pressure side had the correct length of tubing after the ferrule, however, it was never tightened properly and swaged onto the tubing.
2. A method to bleed the pressure off this line with a bleed valve was not immediately recognizable.



3. Make sure that all installers of tubing and fittings are properly trained in bending techniques, supporting the tubing, leaving space for flexibility, considerations for vibration, proper materials selections, pressure testing, and proper ferrule tightening and swaging. Swagelok and Parker have excellent training materials available. https://www.youtube.com/watch?v=FdthSQDH8qk
4. Consider a program to depressurize and validate high pressure fittings installed.
5. Implement a quality control process in the future for any tubing installations where all of the factors identified above will be checked in the field and proper ferrule seating witnessed.

What Could Have Happened:

The technician in this case could have been seriously injured as occurred in the incidents described below.

In 2011 an oil industry worker experienced an exactly parallel incident. He was not so lucky. The escaping pressure ripped a 4-1/2 gash into his esophagus. One of his lungs was deflated and the other partially deflated. (https://www.stepchangeinsafety.net/sites/default/files/incident/653.pdf)

In another incident a ¾" high pressure tube, discharging 3-4,000 psig from about 3' away tore the flesh and muscle from a man's forearm leaving a big divot and gas bubbles under his flesh.

FOR ADDITIONAL INFORMATION CONTACT:

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