

CASE STUDY

Flare Headers – What You Don't Know, Could Hurt You

THE CHALLENGE

One of our petrochemical customers experienced a unit depressurization resulting in vapour flowing at high pressure and velocity through the flare line. A 5 kg chunk of polypropylene deposit in the flare line was dislodged and exited the flare stack. The piece of plastic landed over 2 km away in a neighboring plant.

OUR RESPONSE

ScanTech was asked to perform Gamma Pipe Scans on the flare header piping system to determine the location and quantity of any further deposits prior to a planned turnaround. Sections of pipe with significant deposits could be prefabricated and quickly replaced during the shutdown.

THE SPECIFICS

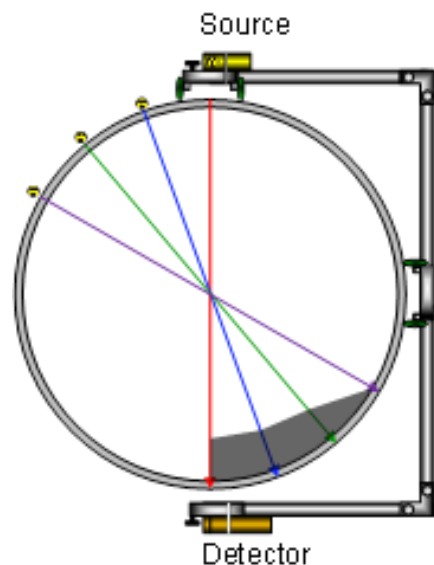
Flare headers are a vital link from the process units to the flare stack. In an upset or shutdown condition, large amounts of gas, vapour and even liquids can be pushed through this piping. The flare headers need to remain clean, so the flow capacity is available when needed and foreign objects are not ejected up the flare stack.

ScanTech's Pipe Scanning was performed approximately 1 month prior to the planned turnaround. As the flare header was elevated, scaffolding was erected at areas where blockages were most likely to form including at elbows and elevation changes. The flare header piping ranged from 20 inches to 36 inches in diameter.

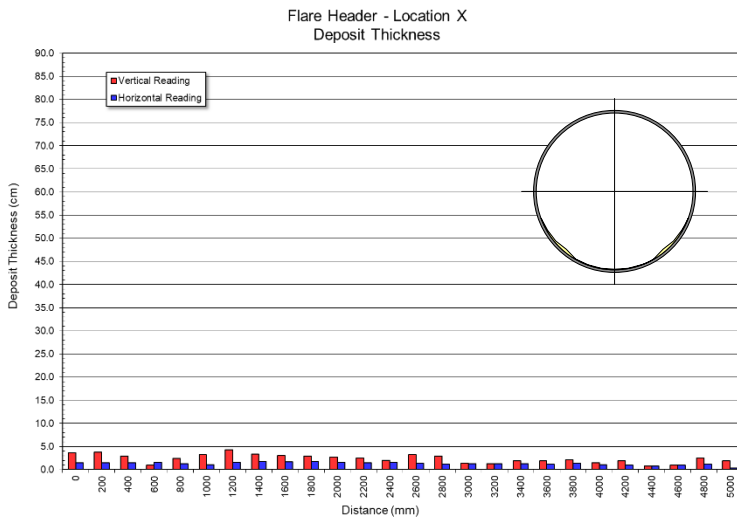
PIPE SCANNING RESULTS

The non-invasive Gamma Pipe Scan was completed at the predetermined locations along the flare header. The Pipe Scanning was performed while the plant was running with no interruption to normal operations.

As the inspection technique is a through pipe service, orientations are generally chosen in the vertical and horizontal planes. If significant deposits are detected, a rotational scan is performed in this area to provide a cross sectional profile of the deposit.



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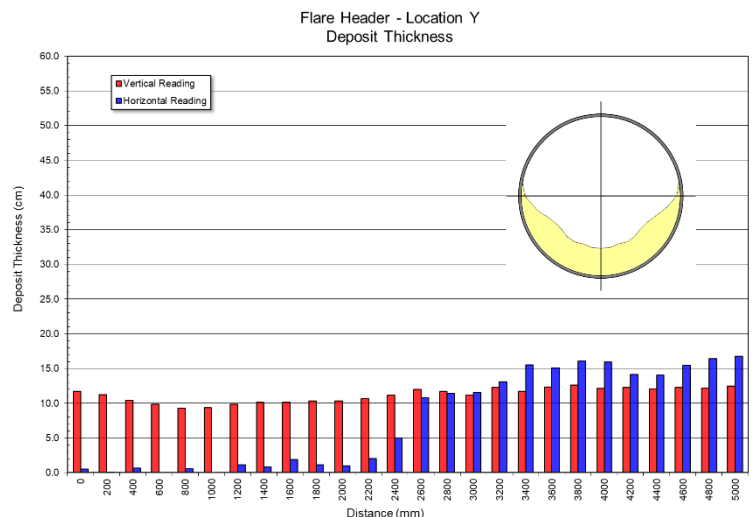


Most of the flare header piping appeared to be clear of debris with little deposited material identified. Measurements taken in both the vertical and horizontal axis are presented to scale with the pipe diameter for a rapid visual assessment by the customer. This 5-meter section of piping indicated less than 50 mm of debris in the bottom of the pipe.

Several sections of the flare header contained higher deposits of concern. A 5-meter length close to the process unit showed a consistent deposit in the bottom of the pipe (red data). This thickness was equivalent to 15% - 20% of the pipe diameter.

Horizontal readings (blue data) over this same interval indicated no deposits crossing the center of the piping until midway through the scanning distance. The horizontal thickness started to increase indicating that the deposit profile had climbed past the midpoint of the piping along the wall.

A rotational scan was performed at this location to verify the results by producing a profile of the deposit inside the pipe.



CASE STUDY CONCLUSION

- The customer received the information necessary to decide which sections of piping would be removed during the turnaround.
- Pipe sections could be fabricated prior to the shutdown with equipment, maintenance and safety crews scheduled appropriately.
- Replacement time was minimized, reducing the overall shutdown time and costs for the customer.

For more information on how Pipe Scanning can assist your operation, contact us at 780-410-0563 or email to don@scanningtech.com.

