



## CASE STUDY

### Monitoring Deposit Accumulation in a Horizontal Vessel

#### THE CHALLENGE

Many horizontal vessels will experience deposit build up along their bottom over time. Monitoring the accumulation of these deposits allows the operator to keep the vessel in operation longer, maximizing production run time and minimizing shutdown costs.

Monitoring deposits provides the operator with a real time snapshot of vessel deposit levels and takes any uncertainty out of the vessel's operating conditions. This can help provide operators the ability to schedule a cleaning shutdown at an opportune time.

In this case study, our customer opened a horizontal vessel on a regular schedule to perform cleaning. The rate of deposit accumulation for this vessel varied greatly depending on plant operation. Cleaning was not always required when the vessel was opened. ScanTech was asked to perform level measurements along the length of the vessel to verify the deposit profile. This allowed our client to appropriately schedule the next vessel opening only when required to save time, effort and expense.

#### OUR RESPONSE

ScanTech performed a Neutron Backscatter scan to identify the deposit profile in the horizontal vessel. While the vessel was still operating, the scanning crew utilized ScanTech's handheld NuScan technology along the circumference of the vessel at specific intervals over its length. Existing ladders and platforms granted access to the base of the vessel from one side, so no preparation was required from the operator.

#### THE SPECIFICS

The vessel was approximately 17 meters long and nearly 5 meters in diameter. The steel wall thickness was 38 mm covered with 90 mm of insulation and cladding. The vessel had no internals and was primarily liquid filled. The vessel had been shut down approximately every 2 years to clean out deposits as capacity was reduced.



#### GAMMA SCANNING RESULTS

A non-invasive NuScan was completed on the vessel under normal operating conditions. Scanning intervals were selected along the length based on external obstructions and access for the equipment. At each distance interval, measurements were taken at 50 mm increments around the



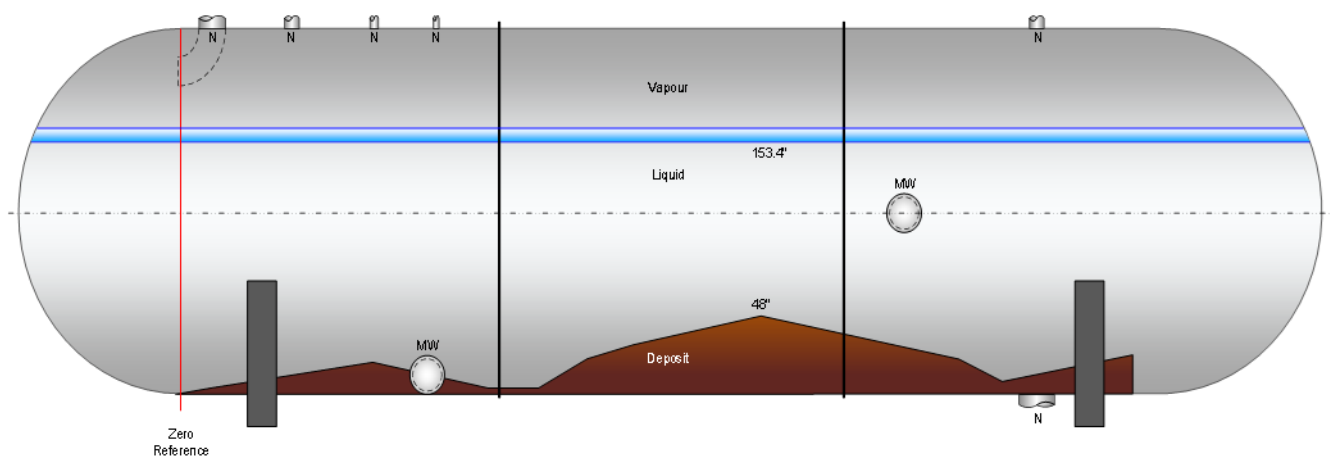
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circumference until a change indicated the deposit level. Periodic scanning was conducted up the side of the vessel to record the liquid vapour interface height.

The starting reference was selected on one end of the vessel at the tangent line. At each distance increment, the deposit height and vapour liquid interface were plotted along a scale recreation of the vessel.

The highest deposit was located approximately 10 m from the starting reference point and was approximately 1.2 m in height. The lowest deposit heights were positioned near the lower manway and outlet nozzle at the bottom of the vessel. Scanning was stopped before reaching the end tangent line due to restricted access.



After the report was submitted to the customer, a sketch of the deposit profile observed during the previous visual inspection was provided to ScanTech. The observed profile closely resembled the profile that was found with ScanTech's NuScan measurements. The sketch showed an increase in deposition from the inlet reference towards the middle of the vessel, then decreasing to the outlet nozzle at the bottom before once again increasing in height into the head of the vessel.

### CASE STUDY CONCLUSION

- NuScan level measurements allowed the customer to monitor the rate of deposits, reducing the frequency of scheduled shutdowns, minimizing production loss and saving lost dollars.
- Scanning at regular intervals of time would allow the customer to associate the deposit rate to known plant operations.

For more information on how neutron backscatter NuScan level measurements can assist your operation, contact us at [don@scanningtech.com](mailto:don@scanningtech.com) or call us at +1-780-410-0563.



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