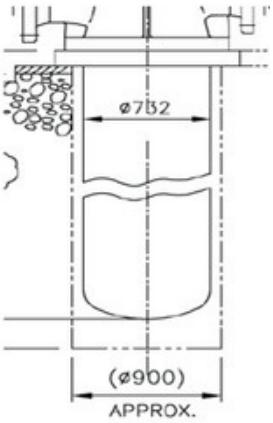
Octobotics Tech

CASE STUDY /

Robotic Pump Barrel Inspection

A global oil and gas leader utilized Octobotics Tech robust inspection data to save more than $100k and reduced man hours in maintenance.

Inspected Asset: Pump Barel / **Industry:** Oil & Gas



Challenges

- Daunting task that involved breaking concrete to extract the barrel for external ultrasonic testing (UT).
- Safety risk for rope access personnel due to confined spaces.
- Internal weld-seam inspection and crack detection

Solutions

- Full-coverage UT inspection using OCRV (2-Wheel) robotic inspection platform.
- Octobotics VR based software.

Results

- Full-coverage inspection completed in **a single day instead of 10 days** for traditional approach
- Significant cost savings for inspection.
- 100+ **UT data readings** obtained
- Eddy current test for crack detection.

$50k
approximate savings

100+
UT data readings

1Day
instead of 10 days

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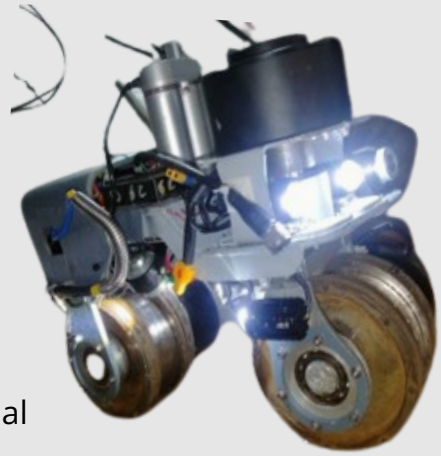
Challenges

A major international oil and gas corporation, among the largest globally, identified pump barrel exhibiting surface cracks and reduced wall thickness. Despite the design's intent to safeguard against cracks, the continual wear and tear, particularly under prolonged exposure to oil and operational temperatures, led to a diminishing thickness of the barrel walls. If left unattended, this deterioration could result in oil leaks, compromised structural integrity, safety concerns for employees, and an elevated risk of failures.

In the conventional approach, addressing this issue would involve removing the entire barrel from the ground by breaking the surrounding concrete. However, this method is labor-intensive, incurring high costs and requiring extended man-hours. Common problems such as oil leaks and reduced structural integrity often occur within the interior of barrels occurs due to unability in precisely identifying damaged areas through manual or spot Ultrasonic Testing (UT) inspections at corrosion monitoring locations (CML). These traditional methods leave substantial portions of the asset uninspected, relying on chance to detect potential issues.

Solutions



The site anticipated that they would need to completely replace the Barrel, which is equating to over $100k for complete reconstruction. Before taking the next steps to reconstruct, they first wanted to get a more complete understanding of the asset condition.

The refinery explored options for full-coverage inspections of the pump barrel to properly locate the internal corrosion and understand the overall health of the assets. Initially, the refinery explored traditional full-coverage manual scanning options which needs to take out the whole pump barrel by removing surrounding concrete and then do the job. It was estimated to take a minimum of 10 days to complete the inspection using this method.

Alternatively, Octobotics Tech was able to perform the full-coverage inspection without digging in and taking out the barrel in a matter of single day–drastically reducing the turnaround time and outage time frame. Using OCRV (Two wheeled magnetic crawler), that is capable of doing surface preparation with the help of inbuild technology, It rapidly scanned the depth, collecting more than 100 UT readings for the pump barrel that 10x faster than any other traditional method. And complete the job remarkably.

Results

Not only was Octobotics Tech able to complete the inspection in significantly less time than the traditional method, but it also didn't require to take out the pump barrel for inspection and was half the quoted cost of the traditional inspection. Octobotics Tech's industry-leading technicians deployed the robot safely from the ground level for efficient scanning without tying up internal resources at the plant.

The high-quality, precise readings collected by the robots populated the Octobotics Tech's VR based software platform to create reports of thickness measurements, cracks on the surface (if any) to illustrate the damage. The platform made it easy to visualize patterns of generalized cracks and welding failures. The captured data and expert-level analysis determined that targeted repairs could be made instead of completely rebuilding the pump barrel – ultimately saving thousands of dollars.

Due to the time efficiency, accuracy, cost savings, and repeatability of the robotic solution, this refinery continues to partner with Octobotics Tech to perform subsequent inspections. In addition to the Pump Barrel, Octobotics Tech has also performed inspections on their boilers, flare lines, and acid settlers, providing full coverage and thorough insights that help inform, protect, and maintain their critical assets.