

STORAGE TANK SURVEYOR pat. pend. HIGH RESOLUTION IMAGING TOOL



SONASEARCH

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The Storage Tank Surveyor employs the benefits of advanced, non-contact Acoustic Camera™ technology to the job of accurately & reliably measuring the remaining floor/wall thickness of above ground steel storage tanks and oil tanker inner hulls. The Storage Tank Surveyor answers the question ‘has corrosion reached the point requiring replacement of the tank floor/wall?’

Designed and manufactured by Sonasearch, this state-of-the-art sonar tool provides an extremely accurate image of features, anomalies and problem areas in fluid-filled storage tanks - without the need to remove the tank from service.

New advanced features only available in the Storage Tank Surveyor have been designed to solve some of the industry’s most common problems and make this tool rise above competing technology. For example:

- Automated, computer-controlled search pattern and anomaly recognition ensures complete search coverage & detection of all problem areas.

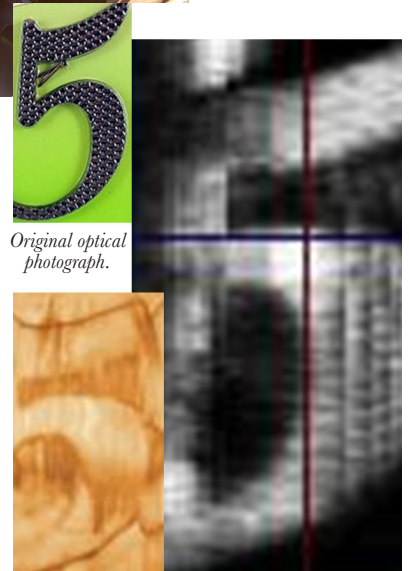
- Intrinsically safe for operation in the most hazardous environments: H₂S, gasoline, kerosene, diesel, fuel oil, crude oil, water, etc.
- Accurate, reliable steel thickness measurements despite the presence of

common tank sediments: rust, soil, water & small debris that escaped the filters.

- Inspection point spacing ≤ 1/4” to reliably detect corrosion areas measuring ≤ 1” in diameter.



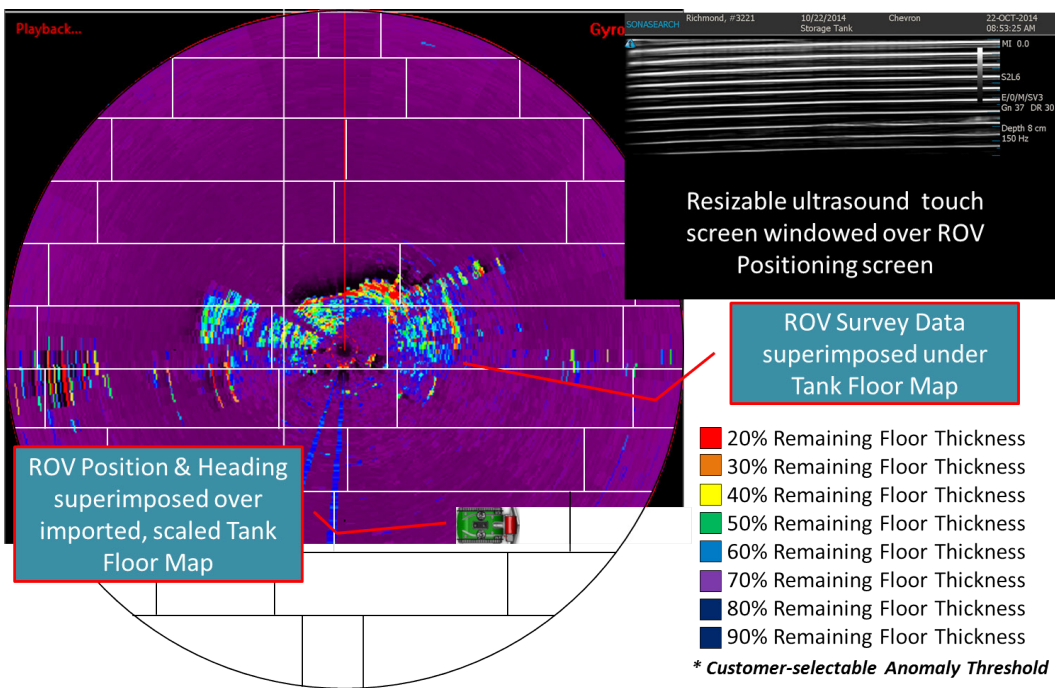
Storage Tank Surveyor being lowered thru tank manway.



Original optical photograph.

3D rendering of image to show target depth.

Acoustic Camera image taken in drilling fluid. Note visible texture of number.

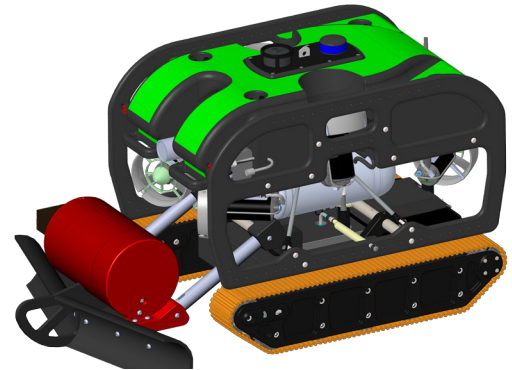


Operational Examples

Background: The goal is to ‘replace/repair the storage tank when needed but not before’. This requires accurate, granular wall/floor remaining thickness information that 1) shows even the smallest problem area, and 2) is repeatable with sufficient frequency to enable appropriate maintenance to be scheduled at the most appropriate, cost-effective time. If repairs are made prematurely, operational costs are unnecessarily increased; too late and the tank leaks, with the attendant complications. Guessing simply won’t do. It’s far too expensive.

The Storage Tank Surveyor eliminates the expense of removing above-ground storage tanks from service prior to inspection of the tank floor and mitigates the expense of manual inspection of the tank wall.

Based on the latest in advanced technology and innovative acoustics, the Storage Tank Surveyor is purpose built specifically for the most demanding Storage Tank Inspection applications.



Case #1:

In an ongoing effort to improve productivity, minimize costs, improve safety and maximize revenue, oil refinery management would greatly prefer to avoid the expense & disruption to production of removing their above-ground storage tanks from service during inspection of the tank floor. The ability to survey the tank walls concurrently with the floor is an added bonus. Automating the inspection process provides a significant safety enhancement, exposing far fewer personnel to risk of harm.



It’s time to deploy the Storage Tank Surveyor.

With the STS system, there is no need to take the tank out of service. No need to transfer its contents to another tank. No need to perform a sediment removal operation prior to measurement. No need for environmental concerns regarding disposal of the sediment removed. No concerns about tank ventilation, forced air working conditions or teams of workers subjected to hazardous working conditions.

In contrast, the STS system is designed to operate without the necessity of sediment removal, producing sharp, properly oriented measurements of tank wall & floor integrity with a minimum of lost time, lost patience and lost revenue.

Case #2:

To enhance safety, productivity & revenue while minimizing environmental concerns, safety issues and costs, tanker operators need to measure, monitor and maintain inner hull integrity. Where are the problem areas? What is the level of structural degradation? At what point will the anomaly need to be repaired? This is often an arduous, time-consuming, costly task.

It would be a great advantage if the inner hull walls could be meticulously inspected in an automated, reliable way. It would be even better if the location and extent of corrosion, fractures and other anomalies could be detected, measured and stored for comparison with previous surveys.

The Storage Tank Surveyor does just exactly that, with a level of detail that allows operators to characterize the rate of deterioration and make decisions regarding inner hull maintenance with the confidence they are doing so in an informed, cost-effective manner.



Software Display Capabilities	
Display Modes:	<ul style="list-style-type: none"> • 2D for ultra high-resolution display allowing easy, quick and accurate anomaly detection • Freeze Images mode provides capture up to 10 seconds in a Cine loop • Video Capture mode • Split Screen enables easy comparison of locations of interest • ROV in-tank position & orientation
Caliper Control:	Allows pan, zoom, measurement and annotation of anomalies

Surface Command Capabilities
Display Mode
Acoustic Transmit Frequency
Acoustic Receiver Gain
Dynamic Range
Acoustic Receiver TVG Slopes
Imaging Depth
Focus Zone(s) Number & Depth

Surface Control Console
Remotely located
Interface to computer via IEEE 1394a (FireWire)
Dimensions (W x H x D): 14.35" x 9.82" x 2.25"
Weight: 10.5lbs/4.8kg
Electrical Input: 100 to 240 VAC 50/60 HZ – 65 watts
Remote Sensor Interconnect: Single MMF Fiber Optic & CAT-5

Remote Probe (controlled via surface computer)	
Frequency:	2.5 – 6.2 MHz
Survey Speed:	10" per second / 2,500 ft ² per hour (max)
Sample Spacing:	≤ ¼" x ¼" for high probability detection of ≤ 1" diameter anomaly at full ROV speed
Environment:	Water, petroleum products
Positioning:	Acoustic Long Baseline and internal IMU
North Orientation:	Via internal heading reference system
Construction:	6061-T6, Acetal
Operating Temp:	-10° to +50° C
Operating Pressure:	0-450 psi
Input Power:	28 VDC—supplied by ROV

Certifications (pending)	
API 653 Class 1 Division 1 Group D Listings	ATEX Unit Verification Certification
• UL-1740	• IEC 60079-14
• NFPA 79	• IEC 60079-0
• EN 13463-1	• IEC 60079-11
• UL-913	• CENELEC EN60079-14
• CSA C22.2#60079-0	
• CSA C22.2#60079-11	

The Storage Tank Surveyor consists of a SeaBotix vLBC remotely operated vehicle with custom EX-listed umbilical, STS Remote Sensor Assembly, STS Surface Control Console preloaded with the Sonasearch Storage Tank Surveyor software suite together with 15.4" (diagonal) TFT LED backlit hi-res widescreen, anti-glare display and custom shipping cases.

**For more information
contact your Sonasearch representative
or visit www.sonasearch.com
425-883-1984 (USA)**

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