

Online Tank Services

Profiling - Desludging - Inspection



Multiple services, singular solutions

for the Oil, Gas & Petrochemical Industry



A.Hak Industrial Services – *Call us 'HIS'*

Protecting Your Investment

At A.Hak Industrial Services (better known as HIS) we provide a complete range of services to the oil, gas and petrochemical industries around the world. Through our Pipeline, Inspection, Storage Tank and Industrial service lines, we can assist you in every step of your plant operation – from design to end-of-life – to assure the best possible operation throughout your installation's work cycle.

As operation costs continue to rise – certainly in a challenging economic cycle – it's important to keep pipelines, storage facilities and every related aspect of your installation in top working order. By offering integrated services, we can assure maximum plant integrity and sustainable operation.

HIS is based in the Netherlands and maintains offices in Brazil, France, Germany, Italy, Malaysia, Romania, South Africa, Spain, the United Arab Emirates, the United Kingdom and the United States.

Reduced Storage – Reduced Profits

During storage or transportation, crude oil, slurry – in fact, every type of tank content – tends to separate into components of differing weights. The sludge that sinks to the tank bottom is a combination of hydrocarbons, gas, sediments, sands and water. When sludge builds up inside your tanks, it reduces your storage capacity and your installation's ability to function properly – and that reduces your profits. When it comes to crude oil storage, the sludge can consist of more than 95% recoverable hydrocarbons. These are valuable commodities and must not be lost!

Sludge reduces storage capacity, accelerates corrosion, disrupts maintenance operations, and causes damage when landing the tank roof.

We have a solution!

Always Online

We perform all our tank services while your tank remains in operation. You don't have to shut your tank down. So you don't lose production time or volume.

Online tank sludge profiling provides a clear image of the quantity, characteristics and distribution of the sludge. We gather information to design the best possible cleaning program for your installation and calculate the amount of hydrocarbons we can recover.

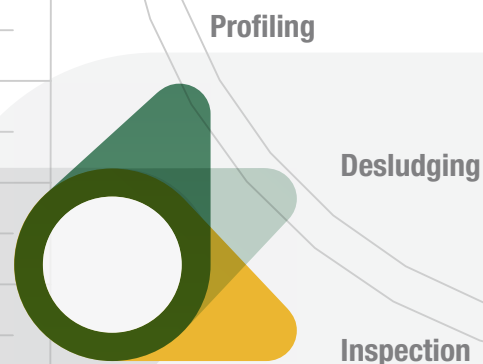
Online desludging breaks up the sedimentation and separates out the hydrocarbons, water and solids. This allows for hydrocarbon recovery and increased storage capacity. And your installation remains in service.

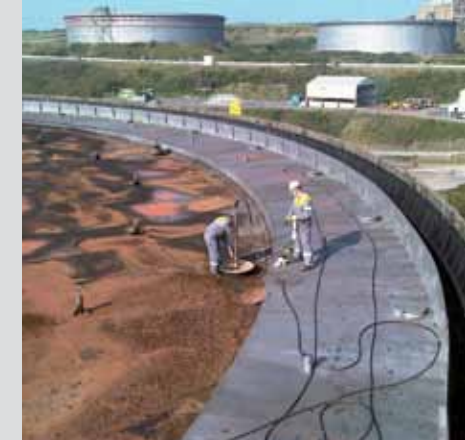
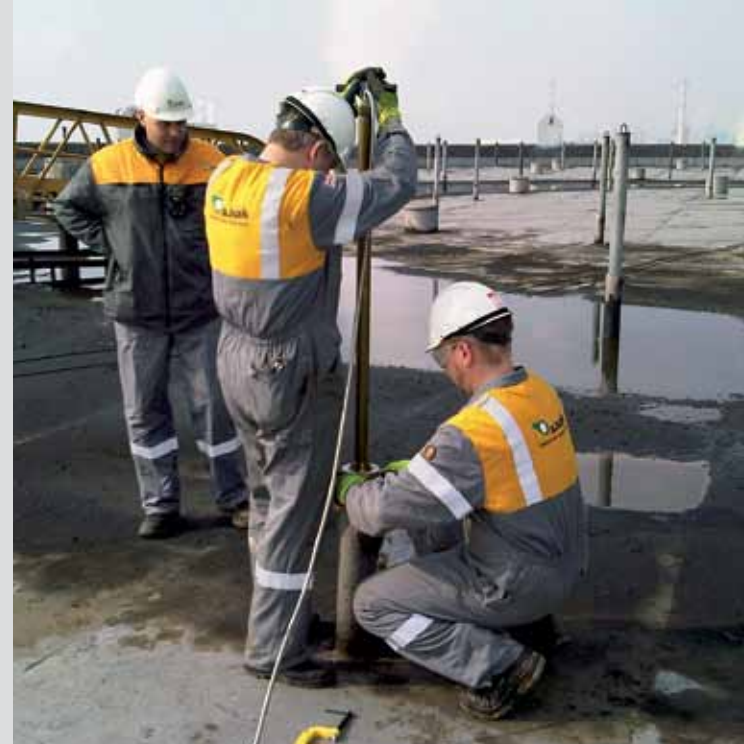
Online robotic tank inspection allows for ultrasonic tank bottom inspection while the tank is online, all according to API 653 standards.

Benefits

- increase your tank capacity without emptying your tank or taking it offline
- recover more than 95% of the valuable hydrocarbons in sludge
- significantly reduces waste disposal and cost
- reduce operator entry into closed tanks by 90% compared to standard methods
- requires no buffer tank
- reduce risk as operators do not work in dangerous conditions and limits crane usage

One solution!





Online Tank Sludge Profiler

The HIS online tank sludge profiler uses an acoustic sensor capable of scanning tank contents with the greatest precision. After scanning the tank, we process the data we have gathered to calculate sludge volume and generate three-dimensional views of sludge distribution. Our survey system measures the tank sludge volume with an accuracy of up to 95%. Based on information

describing the sludge properties and distribution, we can determine the best strategy to desludge and inspect your tank. Accurate tank profiling leaves you with no doubt about whether to invest further in desludging, inspection or maintenance projects.

ATEX

The HIS profiler is an ATEX-certified tool which we insert into the product through the roof support or manhole. A small team can operate the profiler easily, and complete the survey quickly and inexpensively. All work takes place while the tank is online.

Reporting

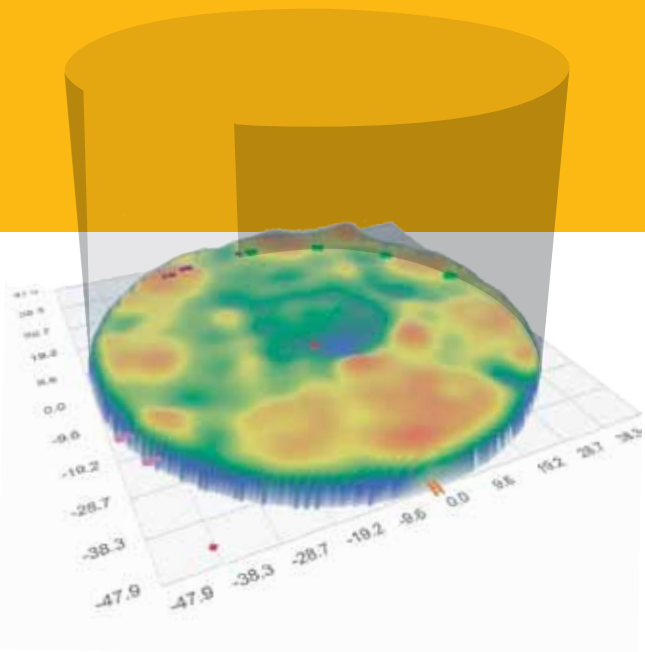
We provide, after data processing of the raw data, a report that is easy to understand for tank operators. Sludge distribution is represented as a 3-D contour map. We calculate sludge volume for the entire tank in cubic meters or cubic feet.

No Downtime!

We can perform our sludge survey with the tank online. We only need to have the roof raised to its maximum height and the mixers turned off. You experience a minimum of disruption to your plant operations.

Profiling is used to:

- quantify the sludge volume prior to cleaning
- quantify the sludge topography prior to manhole removal
- reduce unforeseen delays during maintenance and verify a successful desludging operation
- ensure safe roof landing
- allow better asset management over the plant's lifetime
- monitor sludge accumulation precisely

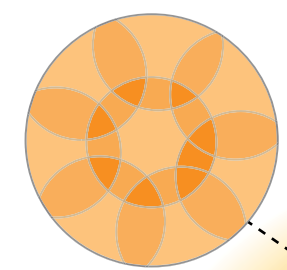


Online monitoring of acquired data during the profiling job

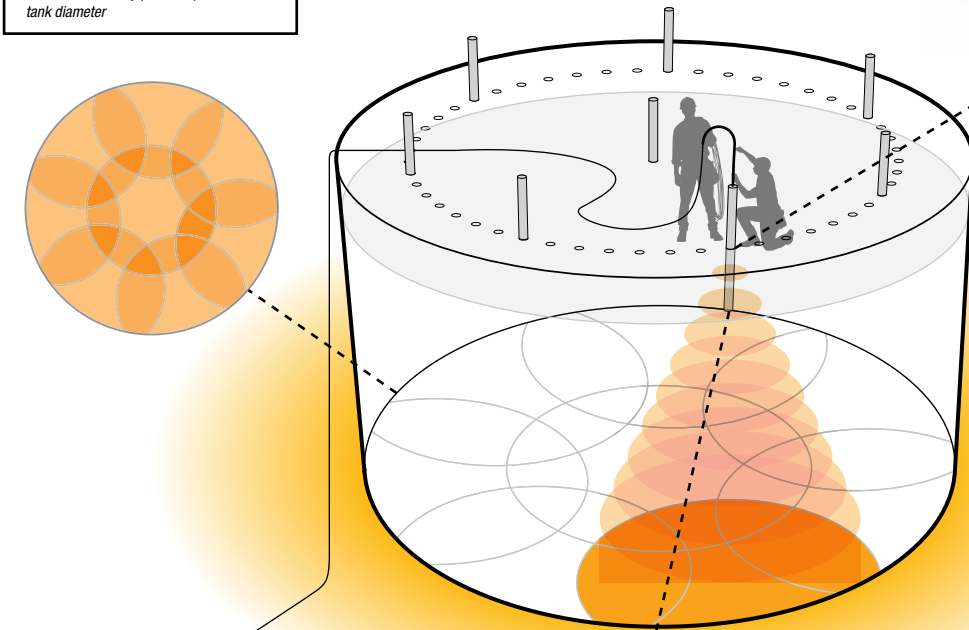
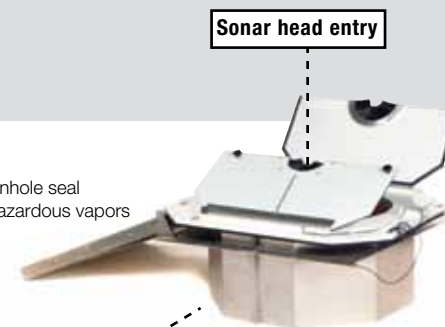
Acoustic Sludge Profiler

- 100% coverage of tank bottom depending on entry points*
- over 95% accuracy

* the amount of entry points depend on the tank diameter



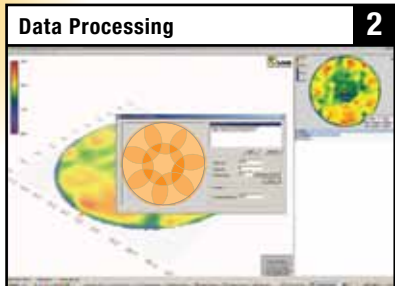
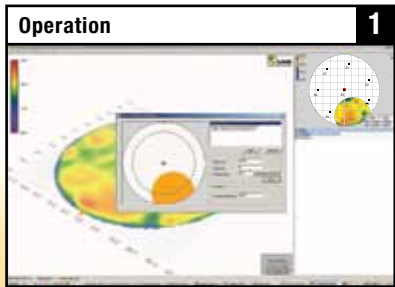
The special designed manhole seal prevents the release of hazardous vapors



Sonar head



The profiling equipment is fully ATEX certified



Data Analyses/Final Reporting



The final report includes a 3-D colored contour map of the sludge distribution present in the tank and the sludge volume in cubic meters or cubic feet.



Online Tank Desludging

By using the HIS online desludging system, we can recover more than 95% of the hydrocarbons in the sludge! What is more, we work with the tank online so you lose no operation time and storage capacity.

Conventional sludge removal creates health and safety risks for the people performing the cleaning operations. But the greatest impact comes from losing storage capacity while taking your tank out of service during the cleaning operation. Ultimately, our desludging system saves you money because, 1) we recover up to 95% of the hydrocarbons trapped in the sludge and, 2) your tank stays in operation.

Sludge settled on the tank bottom is a combination of hydrocarbons, gas, sediments, sands and water. So, when reclaiming oil from sludge, we work to separate those components.

During the HIS online desludging process the tank is fully filled up having the floating roof in its highest position. The non-men-entry operation is executed without any activities on the roof.

The data retrieved from the HIS Tank Sludge Profiler will show us the amount, topo-graphy, and composition of the sludge in your tank. With this information we are ready to start the desludging process.

By mounting a manifold on the tank side manholes and using a cold tap, we create an opening in the blind flange of the

manhole. We then introduce a steerable jet cannon which circulates the product by applying high kinetic energy to break up paraffin and asphalt agglomerates. During the circulation process we inject a small amount of biodegradable demulsifier to separate hydrocarbons from water and sediments. When we stop the circulation, the pumps are switched off and the oil, water and solids separate. The water can be pumped into another process or to a wastewater system. The oil, which is unchanged by the demulsifier, is ready for use.

At completion, only a small amount of sediment consisting of sands and minerals will be left in the tank. These can remain until a total tank cleaning operation is performed.

When we complete the desludging process, the taps are in place. We can leave them there so they'll be ready and waiting the next time your tank requires desludging, or if the tank is open for maintenance.

Economics

The valuable oil recovered from the sludge, and the savings you gain by reducing waste and downtime, make the HIS Online Desludging system a profitable service for you.

Environment

The HIS system delivers the best possible results. Yet it uses fully biodegradable products which protect the operators and reduce contaminated waste.



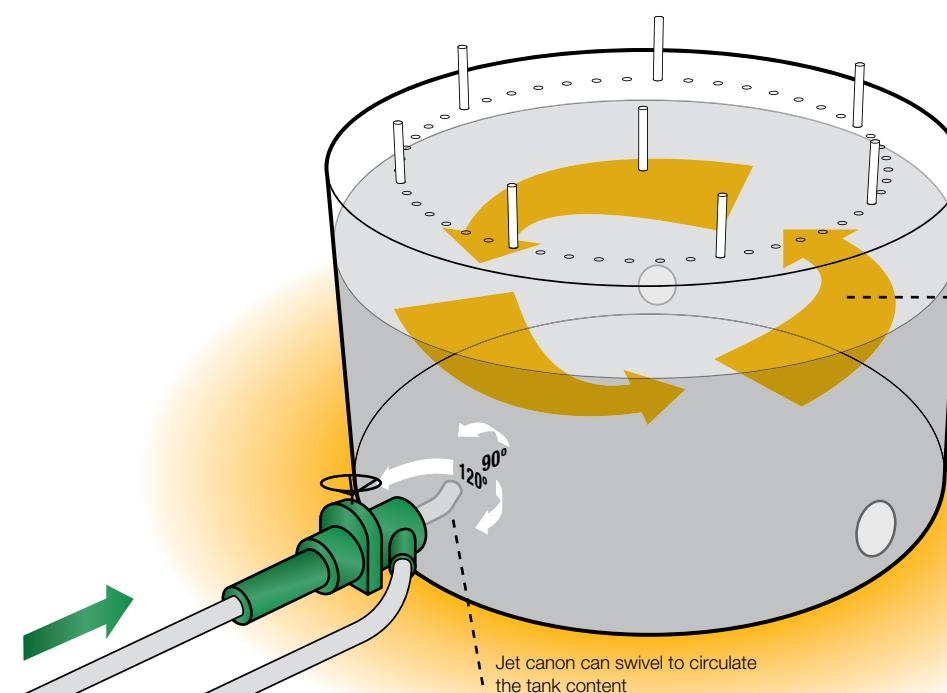
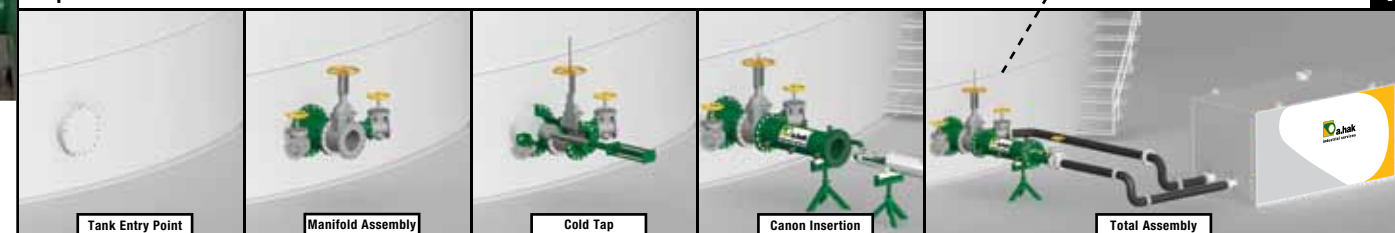
Atex Certified Circulation Pump
300 m³ p/hr at 13 bar



A steerable jet cannon recirculates the product by applying high kinetic energy to break up paraffin and asphalt agglomerates.

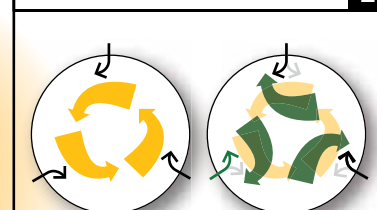


Preparations



During circulation a biodegradable demulsifier is injected to separate hydrocarbons from water and sediment

Circulation



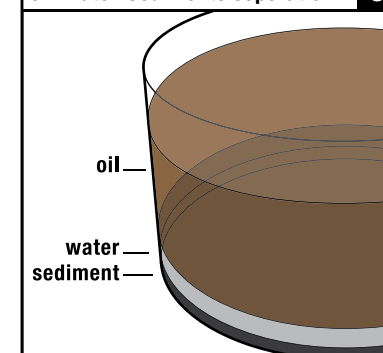
* the amount of entry points depend on the tank diameter

The water can be pumped into another process or to a wastewater system. The recovered oil, which is unchanged by the demulsifier, is ready for use!



Jet Canon Head

Oil-Water-Sediments separation





Online Robotic Tank Inspection

The OTIS robotic tank bottom inspector series allows for inspection according to the API 653 standards while your tank remains online. This independent tank bottom inspection device uses UT sensors to detect any variations in tank bottom thickness. The scan provides you with an API certified inspection of your tank bottom.

The HIS InTank approach to tank inspection has become an accepted option in the industry today. Tank owners can significantly reduce costs by performing API 653 inspections without removing their tanks from service.

- The HIS InTANK robotic system will save you money by:
- eliminating the high cost of tank downtime
 - eliminating the cost of temporary storage
 - eliminating cleaning costs
 - minimizing waste disposal costs
 - completing inspections in days instead of weeks
 - avoiding disruptions in plant operations, keeping revenue constant
 - reducing environmental risks such as spills and VOC release
 - improving safety by eliminating confined space entry and personnel exposure to hazardous chemicals

HIS robotic equipment ensures constant, controlled and proven conditions for the tank bottom inspection. In comparison with manual inspection the robotic equipment is tireless and unaffected by working conditions. Its advanced, computer-based ultrasonics makes data collection more accurate.

The patented HIS acoustic navigation system – equipped with two navigation pingers on the robot and 6 navigation transducers on the tank shell – is used to pinpoint the robot's location. Using onboard UT transducers, the robot follows a predetermined digital inspection grid and collects up to a million ultrasonic scans of the tank bottom to perform computerized data analysis. When operating in clear fluids, we can equip the robot with a HD camera. Thanks to the precise navigation, we can reproduce our inspections in the future to determine corrosion rates with great accuracy.

Our robots can maneuver in tanks containing heavy sludge of up to half a meter (20 inches) in thickness. What is more, we can equip our robot with cleaning systems using spray nozzles and brushes. So it can clean and inspect the tank bottom simultaneously, thereby enhancing safety and reducing costs.

Projects involving human presence increase safety and environmental risks. Traditional tank bottom inspection technologies require tanks to be offline during inspection. They must be drained, cleaned, degassed and ventilated – all of which cost owners considerable revenues. By using the OTIS robot, the tank bottom inspection takes significantly less time. It is also safer and cheaper.

Your tank remains online throughout the operation. Cleaning times may vary depending on sludge levels.

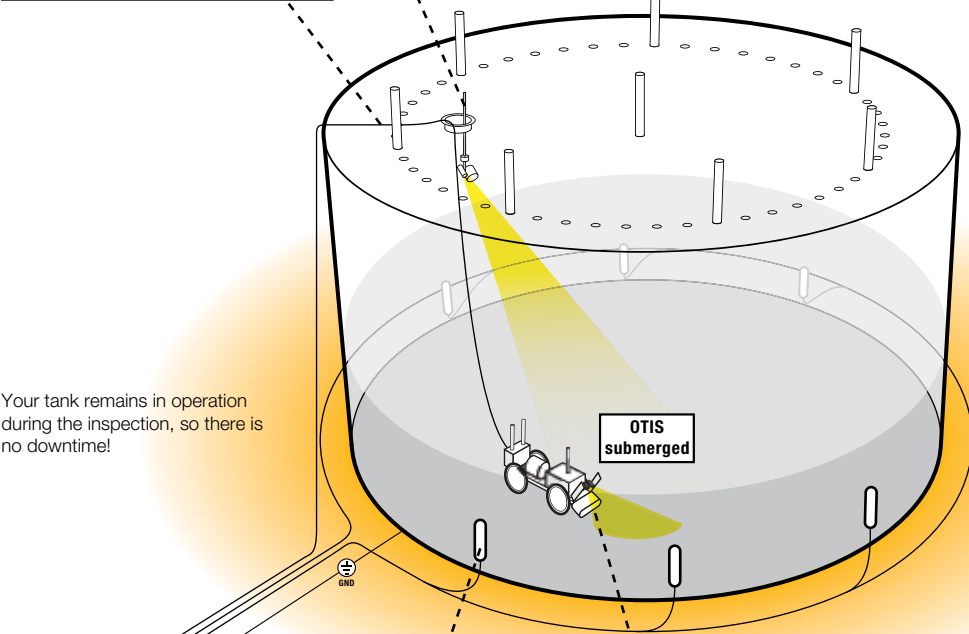
- When you use HIS Tank Inspection Robots**
- **your tank remains in production, so there is no downtime!**
 - **all work is according to API 653 standards**
 - **inspection generates no waste**
 - **you are ensured of safer operations**



Quick Look®

The quicklook system allows you to inspect the internal mechanical roof construction and observes the robot progress where possible

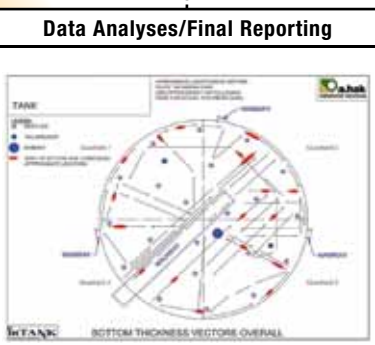
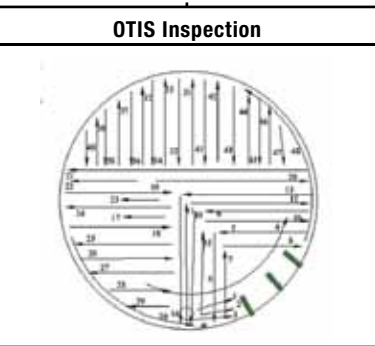
Robot umbilical



Your tank remains in operation during the inspection, so there is no downtime!

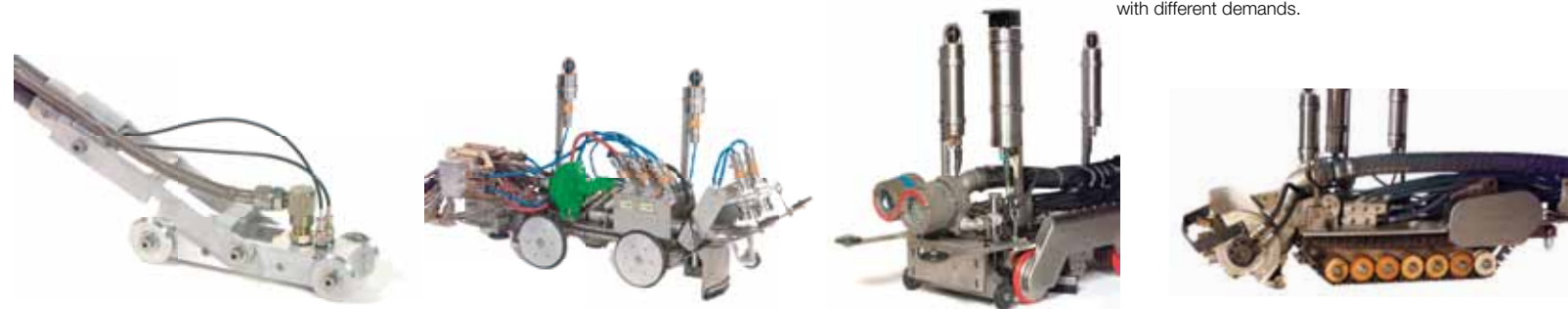
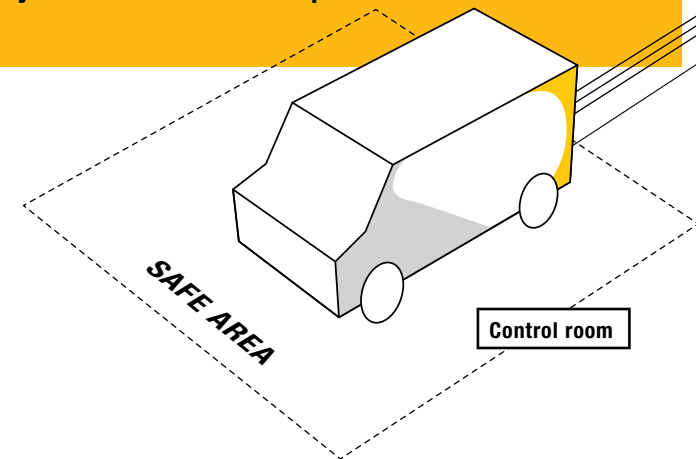
OTIS System results

A-Scans, x, y Coordinates
B-Scans, x, y Coordinates
Floor Elevation, x, y Coordinates
Sludge Removal (optional)



OTIS TYPES

Different types of robots are available. Each designed according to specific specifications enabling them to cope with different demands.





- Headquarters/Technology & Research Center
- Subsidiary

Worldwide Service



Services A-Z

Markets

		Abandonment	Airblowing	Bolt tensioning & torquing	Chemical cleaning	Cleaning pigging	Commissioning	De-Commissioning	Decontamination	Desludging	Displacement pigging	Drying (air, vacuum, nitrogen)	Furnace inspection	Hak decoking technology	Helium leak testing	Hot stripping	Hydrostatic testing	Pipeline inspection (ILI)	In situ coating	Leak detection	Mechanical construction	Mini Sandjet cleaning® (heat exchangers)	Nitrogen purging - (foam) inerting	Pipe freezing	Pipeline Integrity Management System	Pressure testing with nitrogen	Reactor cooldown (Accelerated)	Sandjet cleaning® (pipelines/furnaces)	Sludge profiling	Tank inspection (robotic, API 653)	
<div></div>	Pipelines	●	●	●	●	●	●	●	●	○	●	○	○	●	○	●	●	●	●	●	○	●	●	●	●	●	○	●	○	○	
	Refineries	●	●	●	●	●	●	●	○	○	○	●	●	●	●	○	●	●	●	●	●	●	○	●	●	●	●	○	●	●	
	Offshore	●	○	○	●	●	●	●	○	○	●	○	○	●	●	●	●	●	●	●	○	○	●	●	●	●	○	○	○	○	
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	Tank Storage	○	○	○	○	○	○	○	○	●	●	○	○	○	●	○	○	○	○	○	○	○	○	○	●	○	○	○	●	●	

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