



AUTOMATIC TANK CLEANING (ATC) LITE

'On-the-fly' automatic tank cleaning and recycling technology



ATC Lite: Permanent or mobile option for safe and continuous onshore, offshore tank cleaning applications

With ATC LITE, M-I SWACO, a Schlumberger company, builds on its field-proven AUTOMATIC TANK CLEANING (ATC) technology to provide the industry with a permanently installed mud tank cleaning system for offshore installations. The ATC LITE, which can also be truck mounted for land based operations, delivers the same waste reduction efficiencies by using only 6.5m³ (41bbls) of wash water to clean multiple tanks. The obvious QHSE benefit is that man entry into tanks is minimized or eliminated.

ATC LITE is uniquely engineered for a range of mud tank cleaning and recycling applications, including long-term or permanent installation aboard offshore rigs and supply vessels. The ATC LITE is the only technology of its kind adaptable as a trailer-mounted rental unit for cleaning oil and water-base mud tanks on onshore drilling rigs. In addition, ATC LITE is designed to enable fixed installation at liquid mud plants.

The ATC LITE unit is engineered to fill a cleaning, recycling void

Features

- Fully automatic tank cleaning technology
- Continuous, closed-loop cleaning, recycling process
- Requires only 41 bbl (6.5 m³) of water on average
- Operates multiple TCM simultaneously
- Enhanced solids separation, water cleaning technologies
- Applicable for oil and water-based fluids
- Employs proprietary cleaning chemicals when cleaning OBM/SBM tanks
- Compact and mobile configuration
- Suitable for permanent installation
- Simplified operation
- Optional UL, ATEX Zone 1, Class 1 Div 1 and non-hazardous area designations

Benefits

- Eliminates or significantly reduces need for confined space entry
- Minimizes waste volume by up to 90%
- Promotes recycling
- Decreases environmental footprint
- Greatly reduces cleaning time compared with traditional tank cleaning
- Facilitates barite recovery
- Reduces overall waste management costs
- Enhances QHSE profile
- Reduces comparative labor requirements
- Lowers non-productive time
- Improves overall project economics

Available for sale or long-term rental, the ATC LITE is installed on the rig where, it is connected to the Tank Cleaning Machines (TCM) which are installed in each tank. The ATC LITE slop recovery pump is connected to the suction or dump line of the tanks. The wash water and a small amount of surfactant are pumped through the TCMs at high volume and low pressure to provide "impingement cleaning". The slop generated by this process is returned to the wash water tank where the solids are separated from the wash water. The recycled wash water is immediately sent back to the TCM to enable continuous, uninterrupted cleaning.

The standard M-I SWACO ATC system more than meets the industry's need for a tank cleaning and recycling system designed specifically for the offshore rental market. Owing to its designated application, the standard ATC was engineered with mandated regulatory and operational redundancies, with respect to process capacity, automated electrical systems, dual voltage network and DNV-certified frames, among others.

While the original ATC effectively meets all its application-specific requirements, many clients asked for an ATC with the same capability but with a smaller footprint for permanent installation on rigs and boats. The ATC LITE was engineered for those applications, providing the industry a cost-effective, fully-automated and easily operated alternative that typically requires zero manual labor, minimal downtime and offers complete recycling capabilities. In addition M-I SWACO received requests from our offshore clients for a similar unit to serve their land rig operations market. The ATC LITE fulfills that need.

The ATC LITE is ideally suited for onshore and other areas where water consumption is a primary concern. As it continually recycles slop in the cleaning process, the ATC LITE uses only a fraction of the water required for comparative cleaning processes. Furthermore, unlike batch-type processes and systems that have separate cleaning and recycling capabilities, the all-inclusive ATC LITE is a continuous "on-the-fly" cleaning and reuse process.

In addition, when cleaning water based mud tanks the ATC LITE uses a proprietary hydro cyclone expansion pack that is a secondary separation system designed to remove very fine solids from the wash water. The expansion pack basically comprises a feed pump located adjacent to the TCM pump and is activated to send water stored in the buffer tank through the secondary separation system. Once the clean water exits the expansion pack, it is sent back to the buffer tank and is available for further cleaning.

Engineered process that promotes re-use

Throughout the cleaning process, the sediment pump installed at the bottom of the separator tank transfers the settled sediment slurry into a skip or cuttings box. The slurry which predominately comprises barite and water, is allowed to settle in the skip where the water is then recovered with a suction hose and weir bucket and returned to the ATC LITE. This completes the closed loop system.

Once full, the skip is either replaced or else the slurry is pumped into a separate tank. Regardless, the slurry eventually is either transported off site for approved waste disposal or whenever possible treated for reuse in building a new active drilling fluid system.

How the ATC LITE system works

At the heart of the patented ATC technology are the automatic TCM that are positioned optimally inside each mud tank. These cleaning machines employ powerful water jets that automatically clean the entire surface area, following a programmed cleaning pattern that is based on the geometric design of the tank.

Specifically, the ATC LITE is installed close to the dirty mud tank where the in-tank TCM are connected to its feed pump, which, in turn, sends a specially formulated mixture of surfactants and water to the single or multiple automatic cleaning machines. During the continual cleaning process, the feed pump constantly pumps the recycled water from the buffer tank inside the ATC LITE, directly to the TCM. The slop pump, which is connected to a bottom drain inside the mud tank, in turn continually removes the dirty water from the bottom of the mud tank being cleaned. The extricated slop is then routed to the Slant Plate Separator inside the ATC LITE

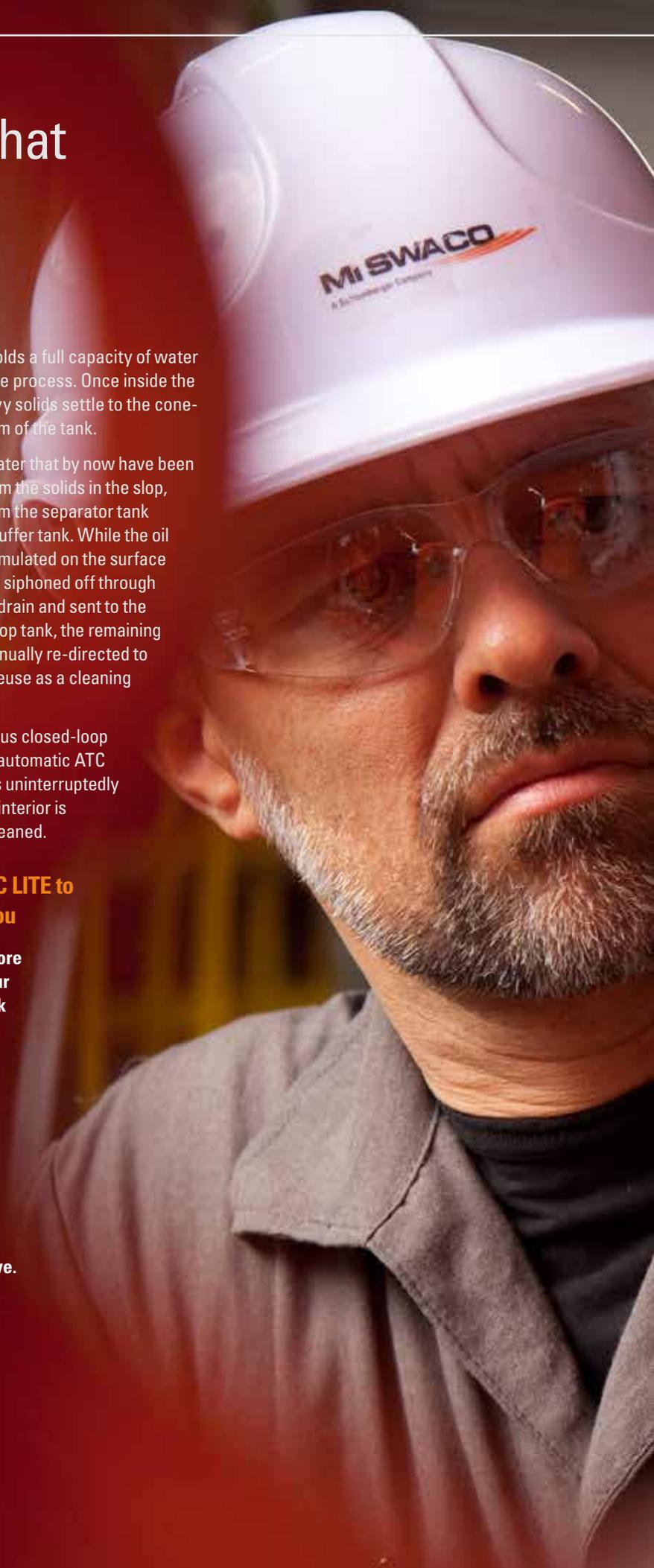
unit, which holds a full capacity of water throughout the process. Once inside the SPS, the heavy solids settle to the cone-shaped bottom of the tank.

The oil and water that by now have been separated from the solids in the slop, overflows from the separator tank and into the buffer tank. While the oil that has accumulated on the surface is periodically siphoned off through a specialized drain and sent to the mud skip or slop tank, the remaining water is continually re-directed to the TCM for reuse as a cleaning fluid.

As a continuous closed-loop process, this automatic ATC LITE operates uninterruptedly until the tank interior is completely cleaned.

Put our ATC LITE to work for you

To find out more about how our ATC LITE tank cleaning and recycling process and how it's performing for our other customers, contact your local M-I SWACO representative.





North Sea: ATC LITE system delivers complete tank cleaning on supply boat while at sea

The Situation

The vessel owner of a 240-ft (73 m) supply vessel that services platforms and rigs in the North Sea sought an alternative to traditional manual cleaning of the liquid mud, brine and slop water tanks while the boat is in the harbor. The key objectives were to clean the boat's tanks while travelling at sea using the M-I SWACO ACT LITE system, to minimize the waste generated, and do so with zero confined space entry (CSE) into the tanks.

The Solution

M-I SWACO recommended the vessel operator install its new-generation ATC LITE automatic tank cleaning and water recycling system. The uniquely engineered system is designed to clean tanks with zero or minimal confined space entry, while recycling the wash water for use in subsequent tank cleaning operations. Following an onboard survey, the ATC LITE system was installed in preparation for an at-sea field trial.

The ATC LITE system's wash water tank was filled with fresh water and 1% surfactant was added to create the wash solution. The ATC LITE system was connected to the existing Tank Cleaning Machines (TCMs) in the tanks and the cargo pump was used to return the spent wash water to the ATC LITE system for recycling.

The Results (Two Trials)

- After the vessel unloaded its cargo at the rig the crew started the ATC LITE system to clean the tanks while traveling back to port. This first trial at sea produced a reasonable result, with the tanks being cleaned 95% without manual entry. However, after analysis of the shadow areas left by the cleaning jets, the M-I SWACO specialist recommended a change of the existing model of TCM installation to a different configuration and the addition of one more TCM to the each tank.
- The second trial was carried out after the recommended modifications were completed and the tanks were cleaned 100% with zero manual entry required. This trial was conducted 180km offshore using the same 41 bbl (6,500ltr) of tank cleaning water that was used for the first trial. The total cleaning time was less than two hours per tank. The sea conditions ranged from slight to moderate and the boat speed was 10 knots.



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