

MEDIA RELEASE

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Sulzer Acquires License for Total's Wash Tank Technology for Oil Processing

Sulzer's Chemtech division has been granted a license covering the Total-patented Wash Tank Technology for Oil Processing. The main purpose of this technology is to enhance the removal of water, salt, and contaminants from oil and emulsions, by a controlled distribution of the feed into the bottom of a hull tank of an FPSO/FSO/FPU which transforms the water-in-oil dispersion into an oil-in-water one where high efficiency phase separation takes place more easily. The technology also involves a significant simplification of the topsides crude oil process.

Sulzer will commercialize the licensed technology along with its static mixing technology as well as patented oil/water emulsion distributors which evenly distribute the feed across the full cross section of the hull tank and generate a constant droplet size (for a given flow) to maximize the system performance. Sulzer's testing capabilities and CFD services form an integral part of a properly designed solution for each specific facility.

The following benefits can be achieved and are maximized by an early concept selection of this technology:

- Reduced topsides weight, CAPEX and complexity through significant minimization of topsides processing equipment, including reduced number of separators and elimination of electrostatic coalescers (dehydrators & desalters) and associated heat exchangers
- Robust performance through more flexibility towards flow rate variations and potential future capacity increases, as well as mitigation of risks associated with naphthenate formation (emulsion stabilization, deposits accumulation)
- Improved Energy Efficiency and Lower OPEX through reduction of utility consumptions (heating, cooling and electrical loads)
- Improved Safety through a more aerated layout of the FPSO topsides

This technology has been in operation for multiple years on the USAN, PAZFLOR and CLOV FPSO's, as well as on the recently started MOHO Nord / LIKOUF FPU. MARTIN LINGE FSO and the EGINA FPSO are also equipped with this technology and will start up in the near future. While all these assets are operated by Total, Sulzer's license agreement will make the benefits associated with this technology available to oil field FPSOs around the world.

Further information is available on:

<https://www.sulzer.com/en/Newsroom/Sulzer-Technical-Review/STR-Library/STR-Issue-2-2016/Innovation-in-Offshore-Separation-Process>

<http://www.total.no/en/patented-oil-washing-martin-linge>

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August 14, 2017

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Sulzer, headquartered in Winterthur, Switzerland, since 1834, specializes in pumping solutions, services for rotating equipment, and separation, mixing, and application technology. The company creates reliable and sustainable solutions for its markets: oil and gas, power, water, and general industry. Sulzer serves customers around the world through a network of over 180 production and service sites, and it has a strong footprint in emerging markets. In 2016, the company achieved sales of roughly CHF 2.9 billion with around 14 000 employees. www.sulzer.com

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