

# On the net

**AUTOMATION** By converting to a wireless measurement system, SIOT improved custody transfer efficiency for its critical oil movement business, realised significant cost savings in its communication infrastructure and increased flexibility for future modifications

Società Italiana per l'Oleodotto Transalpino SpA (SIOT) last year faced a problem with its ageing tank gauging system. Replacement parts were no longer easily available for the old system and given the crucial strategic role of its operations it could not afford any potential shutdowns or delays.

SIOT is part of the TAL Group, which operates the Transalpine Pipeline connecting the port of Trieste with several central European countries to help meet their energy needs. The TAL pipeline system plays a strategic economic role, covering all of

Bavaria's oil supply needs, more than 50 per cent for Baden-Württemberg, 90 per cent for Austria, and more than 30 per cent for Germany as a whole and the Czech Republic.

Strategically located close to the Adriatic harbour of Trieste and several mid-European countries, SIOT handles custody transfer of crude oil through the pipeline, using level and temperature measurements for volume calculations. These readings are used to calculate official values for fiscal transfers. Online blending operations are facilitated via level rate measurements from the same system.

Every year more than 400 vessels bring an average of 35m tonnes of crude oil worth approximately €13-14bn to the SIOT marine terminal, mostly from Africa, the Middle East, Russia and Venezuela.

The marine terminal is located in the bay of Muggia and can receive tankers of up to 280,000 dwt. Each of the four moorings is connected to storage tanks 5 km away by both a 36-inch and a 42-inch pipe.

The 100 different grades of crude oil are stored in 32 floating-roof tanks and then pumped pure or in-line blended to be transported through a 753-km pipeline to any of eight refineries in Germany, Austria, and the Czech Republic.

### Stick with the trusted

SIOT had a good experience with its existing Saab (now Emerson) radar-based tank

gauging system installed in 1993. The system's components, however, were reaching the end of their lifetime, necessitating a new, upgraded system.

The existing cabling to the tanks dated back to the 1960s, when there were no regulations regarding installation within cable trays. The cabling was in a location with a high risk of communication crosstalk, and its shielding had worn out. The cost of new signal cabling, however, was estimated at about €1m, so the customer looked to Emerson for a reliable, cost-effective alternative.

Since SIOT was satisfied with the reliability of its old radar system over the past two decades, Emerson suggested the company stay with the technology, but with a modern upgrade - wireless capabilities.

The high cost for investing in new signal cabling made Emerson's Smart Wireless technology economically attractive and, thanks to the robust, simple and elegant one-layer network architecture that surpassed other options on the market, SIOT eventually selected this technology.

For each tank, the existing level gauge was replaced by a wireless Rosemount TankRadar Rex gauge equipped with a 12-inch still-pipe array antenna positioned using the same nozzle.

The new level gauge was then connected to the existing temperature sensor through a Data Acquisition Unit. This nine-spot temperature sensor was installed diagonally

in a pipe in order to move together with the floating roof.

The new gauge uses a Smart Wireless THUM Adapter to send tank level and temperature data over the wireless network to a pair of redundant Smart Wireless Gateways located indoors in the control centre. The gateway antennas were installed at the control centre roof via a 15-metre cable. Communication between each gateway and the DCS system is handled by the Modbus protocol. Each individual wireless device communicates with the host system through the Smart Wireless Gateway.

### Successful pilot

Four tanks were included in a pilot test network installed in October 2011. Before putting the system into full operation, the company wanted to make sure the new wireless system would be as accurate, fast and reliable as the old wired system. SIOT also wanted to analyse the network with the following considerations.

The region is prone to extreme weather conditions, including heavy rain and strong Bora winds that create cold, dangerous conditions. In February 2012, Bora wind speeds reached 150 km/h and dropped temperatures to -14°C.

Tank sizes range between 20 m and 80 m in diameter, and distances between tanks can reach up to 300 m.

"Installation was quick and easy," says Massimo Diminich, technical assets manager at SIOT. "The test turned out as fantastic as expected despite the worst Bora in years stressing the system during commissioning."

Diminich stresses the importance of being able to rely on the vendor, having day-to-day-communication with a dedicated representative, and an open dialogue when difficulties arose. Emerson, he said, met all of these criteria.

SIOT is now confident about Emerson's wireless capabilities and will expand the network to the other 28 tanks.

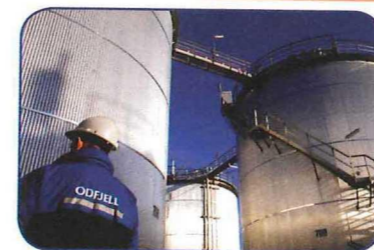
Diminich says SIOT appreciates the flexibility of the open system, which is based

on the IEC 62591 (*WirelessHART*) standard. The network can easily be expanded to other tanks by adding new equipment. Additionally, the wireless system enabled each tank to be connected to a fire alarm system that uses the same wireless network.

With Smart Wireless, data from nearby equipment - such as gas detectors and switches, which are powered but have no signal lines - can be seamlessly integrated into the network, opening up numerous possibilities for future modifications.

A *WirelessHART* device can transmit its own data as well as relay information from other devices in the network. The self-organising mesh network automatically finds the best way around fixed or temporary obstacles. Nodes can identify a network, join it, and self-organise into dynamic communication paths. Reliability actually increases when the network expands - the more devices, the more communication paths nodes will have access to.

[www.EmersonProcess.com/SmartWireless](http://www.EmersonProcess.com/SmartWireless)



## Sea & Shore

## Ship & Store



# ODFJELL

[www.odfjell.com](http://www.odfjell.com)

The Odfjell Group is a leading participant in the global market of seaborne transportation and storage of chemicals and other specialty bulk liquids. The Odfjell Tankers fleet of about 90 ships, trades globally and regionally. The Odfjell tank terminal division of 12 partially owned tank terminals is in a network with 12 other tank terminals partly owned by related parties. The terminals are all strategically located around the world, and with Odfjell Group headquarters in Bergen, Norway, the Company has more than 20 offices world wide. Odfjell has about 3,500 employees and annual gross revenue of about \$1.2 billion.

### Equipment for all

Some of the regular exhibitors are returning once more to the TSA show, offering products to help terminal operators improve efficiency and safety. For instance, **Fort Vale Engineering** will be showcasing its Safeload petroleum bottom loading coupler and its range of Drytyt disconnect couplings, for use with a variety of liquid cargoes including chemicals and foodstuffs. **Dantec** manufactures a range of high quality composite hoses including Firesafe and PA hoses. Dantec has a range of composite hoses for use with biofuels and other products. It also offers a hose inspection, repair and certification service, more information on which is available on its new website, [www.dantec.com](http://www.dantec.com).

Other exhibitors involved in product transfer include **Elaflex**, which produces a range of hoses, expansion joints, dry-disconnect couplings, reels and flame arrestors. It will also have the **Mann-Tek** dry disconnect couplings on show.

**Loadtec** provides solutions to companies that have issues with bulk liquid transfer and fall prevention, with a range of products including

tanker loading and unloading arms and access platforms. This year Loadtec has introduced a range of high-integrity loading arms for fuel and chemical use. **IFC Inflow** supplies loading equipment and safe access systems for road tankers, including petroleum bottom loading and chemical loading racks, loading skids, safe tanker access and folding stairs.

Looking for floating roofs or tank seals? Check out **Baillie Tank Equipment**, **HMT Rubbaglas** and **Atreus**, which says it has the first silicon-free aluminium dome roof on the market. Coatings and linings are on offer from **PPG** and **International Paint**.

**MRC Transmark** is the largest distributor of valves and actuators for the oil and gas market in Europe. It offers a wide range of both manual and automated valve types, and can provide a range of bespoke solutions for all applications. **Protego** will be showing its tank valves, flame arresters and a range of tank equipment. It will be demonstrating its sizing programme at the exhibition, which allows the user to calculate venting requirements for storage tanks, and is

also introducing a range of lighting and static protection solutions.

**Flare Industries** specialises in combustion and pollution control technology, providing quality flare systems, thermal oxidisers, incinerators, burners and ignition systems. **Knowlsey SK** designs and supplies specialist firefighting equipment and systems for oil, gas and petrochemical industries for use in offshore and onshore locations. It also offers tank protection services, remote-controlled monitors and jetty protection systems.

The 2013 TSA conference and exhibition is shaping up to be another success for the UK's bulk liquid storage trade association. All exhibitor spaces have now been sold out, so companies looking to get in on the act should get their names down soon for the 2014 event. Prospective delegates should be aware that, although the increased capacity in the E.On Lounge at the Ricoh will accommodate 330 people, the news is that spaces are selling quickly, so get your name down. This is the event not to miss!

[www.tankstorage.co.uk](http://www.tankstorage.co.uk)

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