

Tüpraş Refinery improves reliability with Smart Wireless

RESULTS

- Improved tank gauging system for critical oil movement tanks
- Minimized cost for cabling, conduits, and cable trays. Quick installation and commissioning
- No risk of operational disturbances due to excavation work
- Future proof – easy to add instrumentation
- Data from other instrumentation can also be sent via the wireless network

APPLICATION

Wireless tank gauging system including a batch calculation function for product transfers.

CUSTOMER

Tüpraş Izmir, a leading petroleum refinery company in Turkey.

CHALLENGE

Tüpraş sometimes experienced communication problems and incorrect readings from some of their storage tanks, equipped with non-Emerson instrumentation, because of damage to cables during excavation in the field. It was not always easy to get support personnel coming to the site in reasonable time. A decision was made to initiate an upgrade project.

The cable infrastructure and junction box situation were old and not up to standard, so Tüpraş considered laying new cables.

However, excavation work can be problematic and risky. If a cable is cut, it may result in an operation disruption for several tanks. In addition it is hard to dig in the area. The tank farm infrastructure, with piping and roads, is complex and the geological conditions are tough.

SOLUTION

Tüpraş tested the wireless tank gauging system on 21 tanks. After the evaluation period, the refinery decided to go for an extended Smart Wireless tank gauging system from Emerson to minimize installation costs, including cabling, cable trenches, conduits, cable trays and man hours. This order comprised 85 more tanks, including radar gauges to be used for level measurements in the critical oil movement tanks.

Within the refinery there is also a lubeoil facility. All 44 tanks have wired TankRadar Rex parabolic antenna gauges in successful operation since 2007. This wired tank gauging system from Emerson was a strong reference when the decision was made to upgrade the other tanks in the plant, since the system has proven to be very reliable, and accurate.



“By using the Emerson Smart Wireless solution we can minimize costs for cabling, cable trenches, conduits, and cable trays.”

Ali Erener, Project Chief Engineer



More than 100 tanks at the Tüpraş refinery will be equipped with Smart Wireless devices from Emerson. Each radar level gauge is connected with a wireless THUM Adapter, which transmits wireless data within the network.

The refinery first considered using the emulation feature within the TankRadar Rex level gauge, but when taking practical and installation considerations into the upgrade budget, Tüpraş decided to try a wireless alternative.

The wireless solution has the same benefits as a wired system, but has practical advantages, and is easy to set up.

Going wireless also gives the flexibility to add more devices in the future – not only for level and temperature measurements, but also for tank water control and nitrogen pressure control at tanks which are far from the control room, as well as other applications. Flow, and valve position data can also be distributed within the wireless system.

In the wireless field network each tank is a node. At Tüpraş, it includes a TankRadar Rex radar level gauge installed together with an antenna unit, the THUM Adapter, and a multiple spot temperature sensor.

Temperature and level data is sent via the wireless network to the Smart Wireless Gateway, which is the network manager. The gateway provides an interface between field devices and the TankMaster inventory management software or host / DCS systems.

TankMaster is used for net volume calculations, reporting, alarm handling etc. During the test period, the TankMaster software was upgraded to include batch calculation for product transfers.

Emerson Smart Wireless Solution

Emerson's Smart Wireless solution is based on IEC 62591 (*WirelessHART*), the industry standard for wireless field networks.

A *WirelessHART* device can transmit its own data as well as relay information from other devices in the network. The self-organizing mesh network automatically finds the best way around any fixed or temporary obstacle. Nodes can identify a network, join it, and self-organize into dynamic communication paths. Reliability actually increases when the network expands – the more devices, the more communication paths!

RESOURCES

Rosemount TankRadar Rex Technical Description, 703010En
Smart Wireless Tank Gauging from Emerson Brochure, 201026En

www.rosemount-tg.com

Technical details are subject to change without prior notice.

Emerson Process Management

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Mr. Mustafa Atalay, Operations Superintendent at Tüpraş, demonstrates the TankRadar Rex radar level gauge.



Mr. İlker Karadağ, operation chief of oil movement learns about the batch functionality within the TankMaster inventory management software.


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