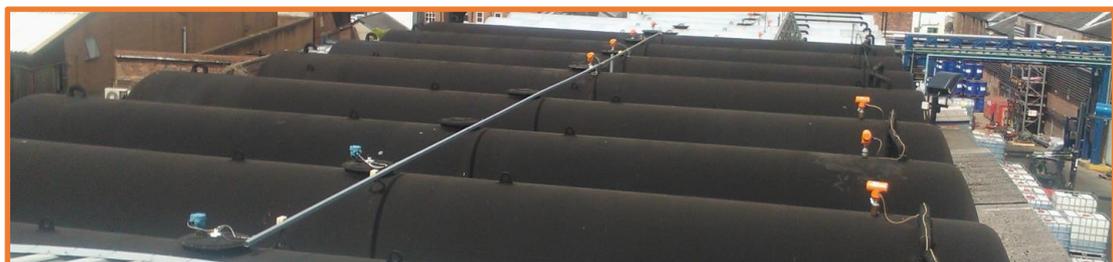


# **HYCONTROL**

LEVEL MEASUREMENT SOLUTIONS



## ***High-Accuracy TDR in Lubricant Manufacture Application***



## Hycontrol expands safety coverage at lubricant producer

Level measurement specialists **Hycontrol** have successfully completed a multi-point level measuring upgrade system for a UK-based lubricant producer. This has involved installing Hycontrol's high-accuracy TDR\* microwave level sensors and instrumentation to 27 existing tanks used for storing base oil products. The horizontally mounted vessels range in volume from 27,500 litres to 96,400 litres with overall depths between 2.6 m and 3.2 m.

A previous Hycontrol installation had involved the deployment of level measuring sensors on a total of 68 tanks, together with local contents displays at the fill points and remote monitoring data capabilities transmitted via the LAN. The displays at the fill points allow delivery drivers to monitor the tank levels as filling takes place and the pre-set high level alarms prevent over-filling. Technologies utilised in this original installation included ultrasonic, TDR and high-temperature TDR. The new 27-point system integrates directly with the existing Hycontrol system, providing a comprehensive and accurate real-time stock control system across the plant.

Effective level measuring in horizontal tanks presents a number of challenges, especially during the fill process when the surface of the liquid approaches the top of the tank. From a storage efficiency point of view it is important for operators to maximise the capacity of the tanks, but any unwanted over-filling is disruptive, costly and potentially environmentally hazardous. Adding to the complexity of this installation is that 26 of the tanks are mounted in pairs, one tank on top of the other. This significantly restricts access space to the lower tanks.



These tanks had originally been fitted with ultrasonic level sensors, but over time these had proved to be unreliable due to the relatively large blanking zone (or dead band) of the sensors. This had caused a number of unwanted over-fill spillage events. (Ultrasonic sensors can be considered to be 'far-sighted' devices, a feature which prevents them from accurately measuring levels when the product comes close to the sensor face. The effective way round this is to fit the sensors in standpipes, but this requires additional space above the tank which is not available in this application.)

Unlike ultrasonic sensors, TDR sensors have a relatively small dead zone, minimising stand pipe dimensions. For this application Hycontrol engineers proposed the installation of segmented coaxial VF2



TDR devices, which have a dead zone of just 150mm. This provides an ingenious solution to overcome the restricted headspace between the bottom and top tanks. Whilst a fixed sensor antenna or probe is designed to fit the overall depth of the tank in one piece, the coaxial rod sections can be assembled incrementally as the probe is inserted into the tank via the process connection. The sensor software converts measured depth to volume based on the tank profiles.

Hycontrol's UK Sales Manager **David Wadsworth** said of the installation: "The customer had encountered a number of spillages on the base oil tanks which still had their original ultrasonic sensors fitted. They therefore needed a reliable level measuring system, which could be installed without major plant disruption and structural changes to the tanks. To prove the effectiveness of the TDR technology, our engineers set up a trial on two tanks. The results were excellent and the customer had no hesitation in ordering sensors for the remaining 25 tanks. These tanks are now connected into the existing Hycontrol level instrumentation system which has eliminated overspill incidents in this area."

Hycontrol have extensive experience in supplying fit-for-purpose, fully engineered solutions for multi-point level measuring applications. Their expertise not only allows them to select exactly the right level technologies for specific applications, but also to design and build bespoke local and remote instrumentation and alarm panels that can integrate directly with customers' in-house electrical and data systems.

*Footnote:*

*\*TDR technology, originally used to detect breaks in subsea communication cables, uses pulses of low power microwaves sent along the conducting probes. At the point where the waves meet the air-product interface, they are reflected by the product back along the probe. The measured time between emission and reception back at the sensor head is proportional to the distance. This information is then converted to the level in the tank. The technology provides an effective level measuring solution to a wide range of applications involving liquids and solids. Unlike many other level measuring technologies, Hycontrol's TDR sensors are unaffected by product build-up on the probes. Performance is also not affected by changes in pressure, temperature, dielectric constant or viscosity.*

To read more of our applications in the chemical, food & beverage, nuclear, water & waste, recycling, quarrying and metals industries, please go online at [hycontrol.com](http://hycontrol.com)

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