

WirelessHART technology in the Danube Refinery

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The MOL Danube Refinery received the HART Plant of the Year Award in 2010 for its demonstrated creativity in the use of HART devices. The refinery had made the decision to install HART-enabled intelligent field instruments as part of a maintenance strategy to increase operational availability. In this article we would like to highlight how we started to utilize and what is the possible future of the wireless HART in the Danube Refinery.

The first wireless system in Danube Refinery, consisting of 4 wireless thermal transmitters in Crude Distillation Unit 3 (CDU3) and a gateway station to receive their signals, was installed in 2009. Our system has been dynamically expanding; currently 6 wireless gateways receive signals from a total of 32 devices throughout the refinery. The technology was tested in an arc-welding environment in the early phase, and both the wireless HART transmitter and the gateway were functioning faultlessly. Also, we tested several manufacturers' products on the same network and showed that they can cooperate without any problem. In 2015, the use of wireless technology was included in MOL standards as a new chapter, specifying the technical requirements for installation and use in the fields for different applications. According to that chapter, wireless technology at this time has been approved for diagnostic and measurement purposes at MOL. At this time, the standard excludes their application in control and in shutdown loops. At present, we typically use wireless technology for measuring temperature and corrosion rates. The system has the benefit of moderate installation cost, fast installation and flexible upgradability. We have not witnessed any limits to upgradability on any of our systems.

In addition, we are apt to apply wireless technology in the course of system integration. In several cases we have witnessed that the existing field instruments equipped with 4-20 mA and HART communication have advanced intelligence and diagnostic features but the available DCS I/O interface is not HART-enabled, which prevents communication from reaching the FIMS (Field Instrument Maintenance System). The replacement of I/O interfaces would be rather costly and can be only completed during planned unit shutdowns. That is when we use what are call wireless HART Upgrade Modules that, when connected to field instruments, transmit HART communication to a particular gateway. With the TCP/IP option, fitting gateways into the FIMS is also extremely flexible and simple and gives us access to this important information.

In 2016 or 2017, we plan to launch a FIMS Upgrade project at the Refinery level, when we will integrate an additional 100 control valve positioners of key importance into the maintenance system by using the above method, thus realising the on-line performance diagnostic of these critical control valves, further improving our preventive maintenance practices.

MOL is an integrated, independent, international oil and gas corporation, headquartered in Budapest, Hungary. MOL has operations in over 40 countries and employs almost 29,000 people worldwide. MOL exploration and production activities are supported by more than 75 years' experience in the hydrocarbon field. At the moment, there are production activities in 8 countries and exploration assets in 13 countries. The Group operates four refineries and two petrochemicals plants, under integrated supply chain management, in Hungary, Slovakia and Croatia. We also own a network of over 1,700 service stations across 11 countries in Central & South Eastern Europe.