



SENSORNET DTS PROVIDES PROCESS MONITORING TO VESSELS AT EUROPEAN AMMONIA PLANT

Sensornet recently installed and commissioned two Halo DTS systems and sensing cables at the largest Ammonia plant in Europe to provide continuous process monitoring of two reactor vessels.

CLIENT REQUIREMENTS

The two ammonia vessels at Yara Sluiskil operate at high temperatures. The vessels are internally insulated to prevent the shell from overheating. Constant monitoring of the skin temperature (approximately 110 to 150°C) is required to detect the location of any cracks in the internal insulation, allowing any hotspots to be identified and managed from an early stage. Monitoring was previously achieved by using an electrical resistivity system. This system became outdated and was no longer supported by the original supplier. The temperature of the vessel can rise up to 350°C when a hotspot occurs. These hotspots create great stress on the vessel and repairs are needed to be completed during a turn-around.

THE MONITORING GAP

The existing electrical resistivity monitoring solution became outdated and was not supported anymore by the original supplier. Temperature readings were presented as percentile figures based on maximum and minimum values which was not ideal. Temperature readings were also taken with infra red thermometers. Although these provided valuable data they could not be deployed on a permanent basis and would not provide a fully distributed temperature profile of the vessel.

APPLICATION

Two ammonia vessels were installed with monitoring cables in 2008 and 2009. The initial installation on Vessel 1 was conducted during a scheduled maintenance shutdown. The Sensornet team worked around the clock along with other service companies to ensure the installation was completed within schedule. The sensing cable on Vessel 2 was installed at the manufacturer's facility in The Netherlands before the vessel was relocated to the Yara site. Final connection and commissioning was then conducted in a matter of days. Both projects utilized the Halo DTS complete with the integrated multiplexer for bi-directional testing. These were deployed in local control rooms and communicated with the site SCADA system via OPC tags.

THE SENSORNET SOLUTION

The Sensornet solution uses high temperature fibre deployed in a mesh topology to provide complete coverage of the vessel. This ensures that hotspots as small as 20cm in diameter can be detected. The vessel is divided into a series of zones, each containing a minimum of 10m of sensing cable. The Sensornet DTS is positioned within the local control rooms meaning that no active hardware is required in the field. The DTS communicates directly with the site's SCADA system via OPC tags. This illustrates the average and maximum temperatures of each zone on a vessel schematic and refreshes the temperature every 10 seconds. In this instance automated alarms are activated by the SCADA system. If required this can be achieved directly from the DTS via contact relays.



Sensornet engineer installing high temperature fibre in a mesh topology to provide complete coverage of Vessel 2

SUBSTANTIAL BENEFITS

The Sensornet vessel monitoring solution provides a complete temperature profile of the reactor vessel with near real-time refresh rates. Monitoring the entire vessel online enables the process to be managed to ensure that the vessel performs within its operational tolerances. This results in longer runs times between cleaning and maintenance periods. Moreover the operator can be safe in the knowledge that the vessel is operating safely.

MEASURABLE PERFORMANCE

The Sensornet range of DTS offers the most advanced performance available today. Measurement times of down to 10 seconds and temperature changes of better than 0.01°C can be detected by the sensing cable. For each of these vessels a total of 1km of sensing cable was deployed directly onto the skin. This gives a total of 1000 measurement points and provides the client with comprehensive thermal modeling of the reactor vessel.



Reactor Vessel 1 prior to fibre installation



Yara Sluiskil ammonia plant, The Netherlands

To close your monitoring gap, call +44 20 8236 2550 or visit www.sensornet.co.uk

