Conductivity Monitoring in Propane Dehydrogenation

Success in this application can be applied to a variety of other applications with similar challenges

Facts about Propane Dehydrogenation:

Propane dehydrogenation is a method of implementing propane as a feedstock to produce in-demand propylene and hydrogen gas.

The process maximizes energy production with reusable hydrogen.

Midstream Gas-Processing for Heat Exchangers

Production of synthetic materials, resins, and plastics are steadily rising as the world reimagines fossil fuel usage. Propane derivative chemicals are key to the production of these products, and despite cuts in fracking and ethylene plants, these chemicals have continued to increase in production. This is mainly due to the implementation of propane dehydrogenation across many plants and refineries. Properly functional heat exchangers are critical to achieving dehydrogenation.

Heat exchangers are universally found in gas-processing plants where they are used to heat or cool the process fluid. Condensate contamination is very costly and affects the operation efficiency of the plant. Furthermore, contamination can potentially cause environmental pollution if left unchecked. Monitoring the conductivity of the condensate passing through the heat exchanger is a reliable method to ensure the heat exchanger is functioning properly. This ensures that no breakthrough of the process has occurred in the heat exchanger.

Most static conductivity sensors will have users in close contact with the process line. Because these methods involve extracting sensors directly from the process, this can potentially expose the user to hazardous conditions. As a result, the frequency of preventative maintenance and calibrations will likely suffer. Without consistent PMs, process buildup can occur. This can cause tube damage in a heat exchanger which may need to be taken offline to replace the tube system, leading to unplanned downtime and costs.

By using a pre-calibrated Memosens® sensor, maintenance costs and time spent in the process units are significantly reduced. The accuracy, availability and reliability of the measurements helped reduce the unplanned downtime and overall cost of maintaining the heat exchangers.

The SE 680x toroidal conductivity sensor is designed with chemically resistant thermo-plastics to resist buildup and extreme temperatures. When used with the ARF 210 flow cell and a Stratos Pro A201X transmitter, the measurement loops can now be relocated to a sample line, allowing for easy isolation without taking the heat exchanger offline. The intuitive menu navigation and easy-to-understand sensor diagnostics make the Stratos Pro A201X simple to implement in any plant or process. The high-contrast, glass display is immune to UV damage in direct sunlight. The color-coded user interface allows the user to quickly understand the sensor's condition. In addition, the sensor monitoring system on the Stratos Pro indicates the sensor's maintenance needs. As a result, PMs and calibrations can be completed in a safer environment at regular intervals.

What was this Customer's Return on Investment?

- ***Reduction in Maintenance:***
  By using the Knick SE 680X ARF 210 and a Stratos Pro A201X, the customer has greatly reduced the effort needed to do calibrations. They now do calibrations in the analyzer shop which reduces time spent in the process unit.
- ***Extended Transmitter Lifespan:***
  The glass display on the Stratos Pro A201X is immune to UV degradation from direct sunlight, providing the operator with a consistently clear view of the process variables.
- ***Eliminate Unexpected Shutdowns:***
  The reliability of the SE 680X has lowered the potential of an unscheduled shutdown due to corrosion in the heat exchangers.