Sour Water Treatment

Sour Water Tank, Sour Water Stripper, Sour Water Flash Drum

Facts about the Sour Water Treatment Process:

- Sour water treatment is an important process which removes ammonia (NH_3) and hydrogen sulfide (H_2S) and then sends them to the sulfur recovery unit.
- Water leaving the stripper tower is used as feed water to the desalters and cokers or it is sent to the water treatment plant.
- The sour water stripper helps reduce the overall corrosion potential when water is reused for various refinery processes.

Sensor: SE 554
Transmitter: Stratos Pro
Fitting: CSR 3600
Portable Meter: Portavo 907 Multi

Improve Corrosion Control with Smart Digital pH Sensors and HART/AMS Compatible Transmitters

Sour water is a byproduct from steam stripping of crude oil in a variety of refinery distillation processes. Sour water treatment removes ammonia and hydrogen sulfide from water, both are damaging to overhead condensers and other process piping and vessels. The process begins when the flash drum removes light hydrocarbons from the sour water before the water moves on to the sour water tank.

Sour water tanks separate trapped solids and oil which provide a uniform feed of water to the stripper tower. Because many stripper unit configurations are a single tower design, providing a constant feed of sour water around 8 pH to the tower is important. The stripping tower uses steam to strip ammonia and hydrogen sulfide from the water. The stripped vapor continues on to the sulfur recovery unit. Other areas of the refinery, like the desalter or delayed coker, reuse the water.

The stripping process is challenging for pH electrodes because the junction can be affected by solids & sulfides. This can cause sensors to drift or fail. The SE 554 Memosens pH sensor is ideal for use in this application. The sensor's open junction design is resistant to plugging media. In addition, the polymerized KCL electrolyte prevents poisoning of the Silamid® reference, which greatly extends sensor life.

A microprocessor in the head of the pH sensor allows for offline calibration and sensor health analysis. When using a Portavo portable analyzer, technicians can calibrate and troubleshoot in the shop or lab instead of inside the processing unit. Controlling the pH buffer solutions allows for more precise calibrations. After calibration, the technician simply carries it out to the installation, disconnects the Memosens inductive cable, and does a "hot-swap" with no additional calibration or configuration.

The Stratos Pro is a two-wire loop powered Class 1 Div 1 FM/CSA rated transmitter. It provides a 4…20 mA output, superimposed with HART process and diagnostic data. Plant operations can view the diagnostic data when using AMS software. Therefore, operators can now predict maintenance requirements, reducing the potential for unscheduled process interruptions.

Double block and bleed installations are a requirement in refineries. The CSR 3600 is a simple ball-valve retractable holder which allows the user to easily insert or remove the sensor through a ball valve.

What was this Customer's Return on Investment?

- ***Reduces Sensor Replacements & Maintenance Costs:***

  The M4 Knick SE 554 pH sensor lasted longer under difficult process conditions and required fewer calibrations, resulting in reduced maintenance costs.

- ***HART diagnostics for AMS:***

  HART with AMS compatibility clearly indicated required maintenance. The customer could now use a predictive, rather than a preventative maintenance schedule. Consequently, fewer trips to the pH sensor increased available maintenance man-hours for other tasks.

- ***Improved corrosion control:***

  Having a reliable pH measurement, the customer was able to reduce their capital equipment cost due to improved corrosion control.