

SMART CORROSION SYSTEM

(SCS)

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Smart Corrosion System (SCS)

Overview

Corrosion can severely compromise the safety of production facilities. Corrosion mitigation is one of the largest expenses for maintaining the integrity of production facilities today. Inadequate corrosion control can cause production downtime, expensive replacement costs, harmful environmental and health expenses, and potential catastrophes. Continuously monitoring the corrosiveness of fluids is critical to maintaining optimal corrosion protection.

A good corrosion monitoring system should provide: 1.) Reliable and timely corrosion data. 2.) Greater confidence in integrity of piping under extremely corrosive conditions. 3.) Operators/Engineers with quick, easy to interpret, up-to-date, decision-making information.

Technology Brief

The SCS measures the instantaneous corrosion rate of a metal in an aqueous solution. It uses the Electrochemical Current Noise technique (ECN) for measurement. The advanced data acquisition subsystem acquires the field data and processes it before making the real time corrosion data available to a user. The data can be read digitally or by means of a high accuracy 4-20 mA output port. The SCS utilizes a commonly available and commonly used Linear Polarization Resistance (LPR) probe to measure corrosion.

The SCS monitors corrosion continuously on-line using an Electrochemical Current Noise (ECN) technique and a correlation algorithm developed by BP Amoco's High Pressure Corrosion Lab formerly located in Naperville IL. The SCS provides the predicted maximum corrosion rate in Mils Per Year (MPY). This probe is able to measure both general corrosion and pitting corrosion.

The SCS have been undergoing field testing since 1998. It has successfully passed all tests. Currently, there are over 300 units installed in various field locations. The following is a partial list of locations where the SCS is being field tested: Whiting Refinery Crude Unit Atmospheric Tower Overhead Systems, Tuscaloosa, Anschutz Ranch and Whitney Canyon assets in Wyoming, and Kaybob Field (Canada).

Benefits

The SCS is capable of controlling chemical injection which results in optimizing the amount of chemical inhibitors injected. Real time monitoring of the rate of corrosion. Low maintenance. Low cost per installation.

Specifications

Power: Input Supply, +24 VDC Nominal @ 220 mA. The input range is +18 to +32 VDC.

Communication: RS485, Half Duplex, 9600 Baud, ModBus Binary. Maximum of 16 devices.

Other Outputs: 4-20 mA High accuracy, isolated output correlates to the MPY readings.

Console Interface: RS232 console interface is used for system configuration. Terminal Emulator (VT100) is required.

Operating Temperature Range: -20C to +75C

Operation: Automatic Probe / System Calibration. LPR probe fouling check. One status output (optically isolated) for system failure alarm. Internal battery backed 1500 entry log. User defined sample rate. Uses the BP Amoco patented MPY Calculation algorithm.

Availability

The SCS is currently available only to BP Amoco and its subsidiaries.

Applications

The SCS probe requires electrolyte continuity between its' two elements. The probe will function when exposed to flowing fluids that contain a minimum of 10% water. This implies that the probe can be used on any refinery system where at least 10% of the fluid stream consists of liquid water. One particular installation was near ideal in that respect, and there were no problems with probe fouling. Fouling that electrically bridges the two probe elements, or forms an electrical bridge between a probe element and the vessel wall, adversely affects probe performance.

Other refinery applications that could be considered for corrosion monitoring using a SCS probe include: other Whiting Refinery Crude Unit Atmospheric Tower Overhead Systems, Hydrotreater Reactor Effluent Gas Systems after water has condensed, Hydro Former Gas Separation Overhead Knockout Systems, Vapor Recovery Unit Overhead Knockout Systems, and Cooling Water Systems.

Contact / Ordering / Technical Information

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