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Enabling remote control using an Automatic Processing Unit

Date: October 2021

Client: Major North Sea operator

Location: UKCS

Client challenge

Our client, a major North Sea operator, had a specific requirement for an Automatic Processing Unit (APU) to remotely adjust injection rates. The unit needed to meet the following specifications:

- A stainless steel 316 box frame for attachment to a H_2S Scavenger rental unit.
- Single vs stroke speed (at 100 stroke length).

What we did

Our team provided an APU that enabled remote adjustment of chemical injection rates from a site control room. The APU received a 4-20mA signal from the control room, and based on this signal, adjusted the stroking speed of the pump proportionally. To control the pump's stroking speed, the APU utilized a solenoid valve, which was installed locally to the pump in place of the normal Williams Controller. This solenoid valve effectively fulfilled the role of the Controller.

The APU unit offers several advantages, including:

- Remote adjustment of the pump flow rate allowing for quick and easy changeover, especially in a duty/standby setup.
- Remote starting and stopping of pumps enabling remote control of pump operations, enhancing convenience and flexibility.
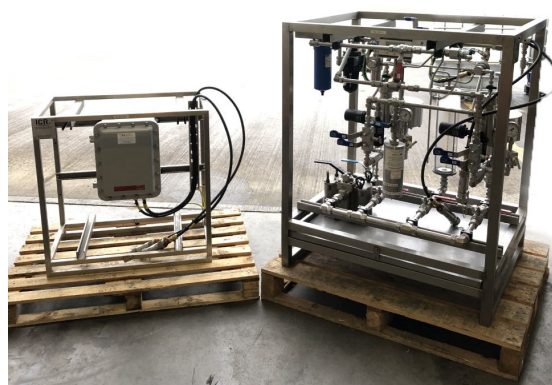
APU ready to be shipped to client

- Reduction in chemical usage by remotely adjusting the chemical flow rates, the APU assists in reducing chemical consumption.
- Compatibility with site instrumentation as the APU can receive an analog signal from the site DCS or feedback from site or package instrumentation such as flowmeters. This facilitates precise adjustment of chemical injection rates.
- Proportional adjustment of stroke speed as the APU receives a 4-20mA signal and adjusts the pump's stroke speed accordingly, ensuring accurate control.

The APU controls the stroke speed of the pump by opening and closing a solenoid valve installed locally to the pump, replacing the normal Williams Controller. The solenoid valve effectively performs the role of the Controller, enabling the increase or decrease of the pump's stroke speed.

The table below provides an example that demonstrates the relationship between the analog signal sent to the APU and the resulting stroke speed or pump volume. It's important to note that stroke speeds and volumes may vary depending on the specific pump models used.

Signal	Strokes per Minute	Litres per Hour
4mA	0	0
6mA	Pump A - 8.75	84
8mA	Pump A - 17.5	168
10mA	Pump A - 26.25	252
12mA	Pump A - 325	336
14mA	Pump A 35 & Pump B 8.75	420
16mA	Pump A 35 & Pump B 17.5	504
18mA	Pump A 35 & Pump B 26.25	588
20mA	Pump A - 35 & Pump B 35	672

Results

By successfully implementing the APU, our solution allowed our client to remotely adjust injection rates, control pump operations, and optimise chemical usage. The APU's flexibility and compatibility with various instrumentation make it a valuable tool in enhancing operational efficiency and ensuring accurate control in critical processes.

Controlled from remote locations