

Application: Manual valve positioning during maintenance

Intro:

A typical chemical or oil & gas company has various use cases for manual valve positioning that can be made economical viable nowadays through IoT. In general, the IT and OT systems remain clearly separated and the valve position information generated is strictly used for IT.

Why:

In a typical chemical or oil & gas plant, you find thousands of manual valves that are often only operated during maintenance or turnarounds. Due to the large number of manual valves, it can be challenging to keep a good oversight of their position during the different stages of maintenance.

Leaving a valve accidentally in the wrong position has proven to be dangerous and has led to incidents and catastrophic accidents in the past all across the industry.

In today's industry, written procedures are used to guide operators through these valve operations, often supported by digitalized systems and the availability of handhelds to visualize the appropriate steps. Different companies use different means to identify the critical valves in the field and label or lock (LOTO – Lock Out Tag Out) them as part of these procedures. However, this still leaves significant room for mistakes. Different reports still report human error to be the main cause in 70-80% of the incidents.

What:

To further improve safety and increase visibility around valve operation during maintenance, Aloxy's valve positioning solution is introduced. A LPWAN network (DASH7 or LoRaWAN) is installed and a selection of valves on the system have been equipped with the Aloxy pulse valve position sensor.

The Aloxy sensor can be installed during production without any modifications to the valve. During installation, the sensor is calibrated in the current position of the valve and once the valve is fully operated for the first time, the opposite position is calibrated automatically. The actual valve position is now real-time available in the control room or on the operator handheld.



How:

Based on the different maintenance stages, all correct valve positions are configured upfront in line with correct safety procedures and visualized in the Aloxy dashboard. The operation team involved in performing the maintenance activity will use the dashboard as an additional safety layer to confirm all monitored manual valves are in the right position during the different stages. They can check the real-time position of every valve and immediately identify when the required position and current position do not align.

Before proceeding with signing off on a procedure or work permit, an additional check is done from the control room to verify all valves have been operated to the correct position. Additionally, a log is created of every valve operation which can be used for additional learnings or analysis afterwards.

Benefits:

It is always difficult to put an exact number on Safety, however a famous expression says: “if you feel safety is expensive, why don’t you try an accident”.

An accident has multiple negative aspects associated, first and most important the injury or loss of people. Secondly the economic costs are tremendous. The cost of plant downtime is often estimated around €500K a day and damaged assets add up quickly. Finally, accidents get a lot of media coverage which damages the company’s image.

Increasing safety has enormous benefits, but most importantly, this is not about limiting the impact, this is about getting it right all the time. When you have more data available and better oversight of your manual valves, there is less risk in performing these maintenance activities.