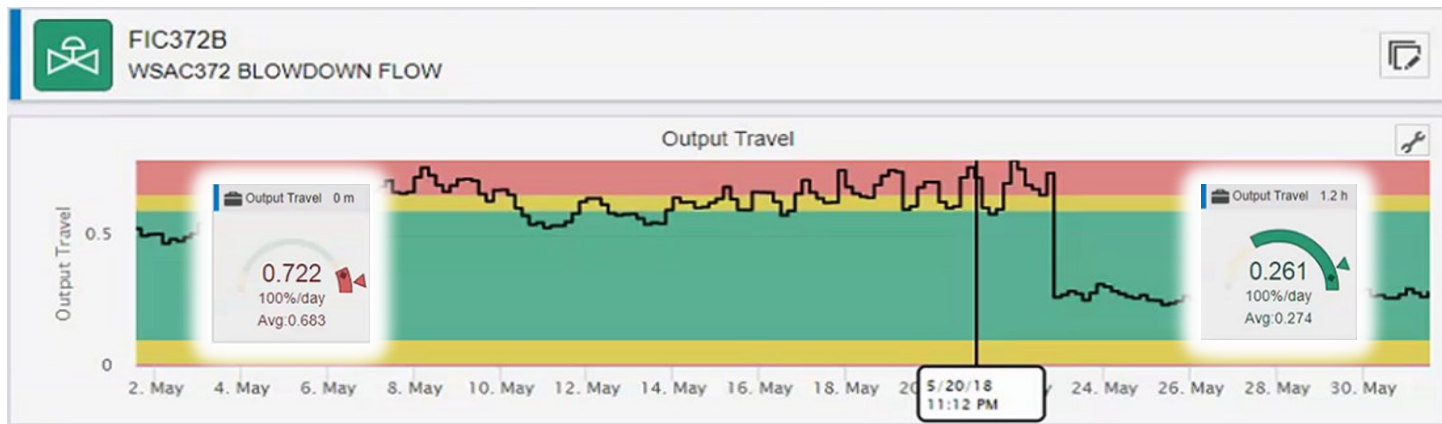


Oil & Gas: Uncovering Hidden Reliability Issues

So you don't know which of your plant's 100s of valves are racing toward failure? No worries – PlantESP does. With the expansive environment of a midstream processing plant it can seem impossible to know precisely which assets are at risk of premature failure. Luckily PlantESP continuously and proactively monitors performance on a plant-wide basis. It not only identifies issues that could affect the plant's process performance, it also evaluates the health of final control elements (FCEs) like valves and dampers. In the case of one particular blowdown flow valve engineers were surprised to learn that it was working overtime to regulate the blowdown flow from the condenser. The valve regulated the level of mineral concentration within the condenser, adjusting to variation in the rate of water evaporation and preventing mineral scaling. PlantESP spotted the problem, seeing the control loop's Output Travel value steadily rise. In a nutshell the valve was working increasingly hard and moving towards its mean time to failure at an accelerated pace. When equipment failure and the associated downtime are not options for a plant's engineering staff, it can be helpful to have PlantESP on constant watch.



Output Travel is one of several Key Performance Indices (KPIs) used by PlantESP to assess asset health. It measures the amount of effort applied by an FCE to maintain control. The trend shows a steady increase in Output Travel with it approaching a constraint at 72.2% of its daily limit. Once addressed by engineers the KPI dropped to 26.1%, extending the valve's mean time to failure by nearly 3x.

What was the cause?

A process' dynamics change over time due to a variety of factors such as surface fouling, variable feedstocks, and even shifting environmental conditions. Those changes can cause oscillations as the associated process model and PID tuning parameters originally used to control the loop are no longer in synch. Engineers at the plant were unaware of changes to the blowdown flow loop's dynamics. The oscillatory behavior driving increased valve effort was invisible to the naked eye, and the need for tuning was only made clear with the help of PlantESP. Alternative tuning parameters were recommended based on PlantESP's automated analysis of everyday output changes. The new tuning parameters eliminated the oscillatory behavior and restored the valve to its normal level of effort.

How did PlantESP find it?

Important details related to FCE health are hidden in a plant's process data. KPIs like Output Travel leverage that data to measure the amount of effort applied by valves and dampers on a daily basis. In this instance the KPI for the condenser blowdown flow rate loop exceeded an important performance threshold, reaching a value of 72.2% and triggering an alert from PlantESP. Clicking on the alert engineers quickly saw the gradual increase in Output Travel as it increased from acceptable levels in early May to unacceptable levels later in the month. Further investigation using PlantESP's KPIs indicated that the valve issue was linked to an increase in oscillatory behavior. PlantESP recommended tuning as a corrective action and equipped the plant's engineers with alternative tuning parameters.