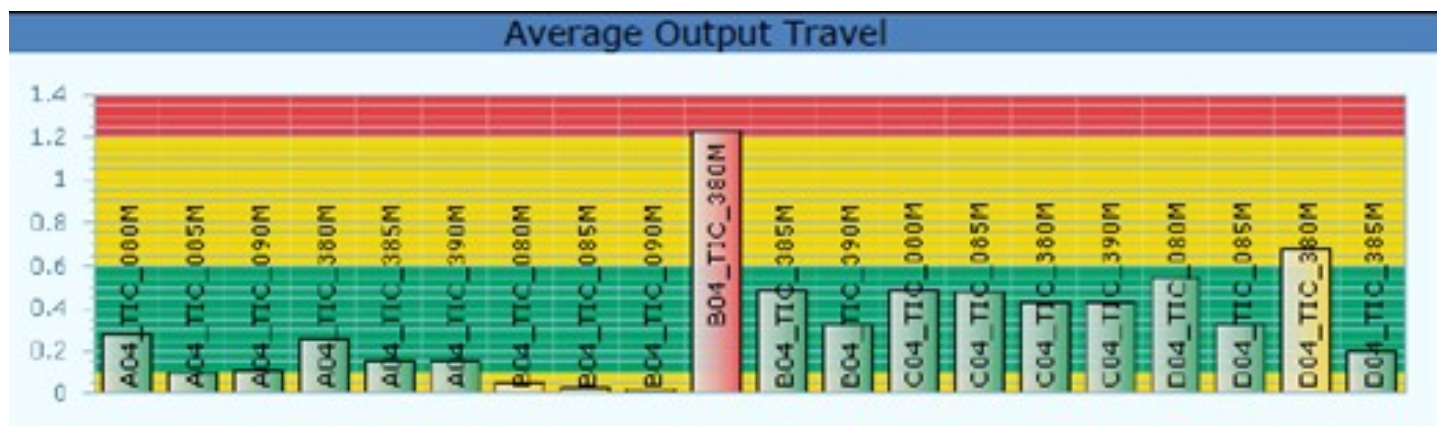


Basic Materials: Isolating Asset Inconsistencies

Consistency is a hallmark of world-class manufacturing. While engineers often focus on maintaining consistency within an individual line, most production supervisors and plant managers require a broader view. Knowing when the performance of one asset, process, or line stands apart from the others — *whether for good or for bad* — can be critical to the plant's long-term viability as it can put quality and consistency at risk. When management at a ceramic proppant mill learned of an outlier from a standard control loop report, they took immediate action. The PlantESP report they viewed depicted the Average Output Travel associated with a group of similar valves. Each valve served as the final control element that regulated temperature of identical production lines. While the mill's other monitoring systems indicated that processes were operating within their appropriate ranges, PlantESP identified an outlier in behavior that warranted investigation. Other loop KPIs linked the troubled valve's behavior to ineffective PID controller tunings. With further guidance from PlantESP and a simple adjustment to tuning values, the valve's performance fell in line with the others. No outliers were evident in the next management report. Consistency is truly a beautiful thing!



PlantESP reports include those that assess the performance of individual PID control loops or assets as well as those that compare the performance of multiple loops or assets. The image above showcases a section of one report that focuses on Output Travel. It revealed a valve that was working excessively compared to others, and it allowed engineering staff to proactively address the situation.

What was the cause?

Like most things valve performance typically degrades over time. The steady, subtle changes are amplified by the PID controllers that are responsible for regulating control loop performance. It's rare that tuning parameters implemented when a valve is initially installed are the same parameters that are needed after the same valve has been in operation for 1000s of hours. In this instance the valve was being forced to work excessively in order to maintain effective control. Compared to others used in identical applications this valve stood apart. The tuning values were overly aggressive, forcing the valve to exert excessive effort and putting it on a path towards premature failure.

How did PlantESP find it?

PlantESP is equipped with an array of reports to which users can subscribe and that detail important aspects of control loop performance. Whereas some reports focus on the health of individual final control elements such as valves and dampers, other reports compare the performance of multiple such assets. Seeing KPI values for similar assets allows users to better understand how those assets are regulating production. In this case the Average Output Travel KPI made clear to plant management that one particular asset was at risk. For a company that prided itself on consistency the report made the outlier obvious and facilitated both further investigation and corrective action.