



# Catch of the Month

## Power & Utilities

### Exposing Configuration Challenges

As an automation supervisor you trust each member of the team to do their job, but you also verify that the various tasks were done right. That's especially true in complex environments like power generation. In the case of a combined-cycle plant an important PID control loop had been configured improperly for single-element control. Indeed, failure to properly configure the loop for three-element control had been overlooked – possibly dating back to the plant's commissioning. While the plant had been recognized consistently as a top performer within the company's fleet, the oversight had put the plant's heat recovery steam generator (HRSG) at risk of excessive wear and tear. Fortunately the issue was uncovered nearly immediately by PlantESP upon completion of the application's deployment. A combination of excessive valve action and process oscillations were flagged by PlantESP, signaling to the plant's engineering team that something was amiss. Following routine investigative procedures the team uncovered the issue and reconfigured the loop for the appropriate three-element control. When there's so much at stake in the operation of a power generation facility supervisors need to trust their staff. That's knowing they can rely on PlantESP to verify that tasks are done right!



# Key Performance Indices



In addition to trending key performance indices (KPIs) PlantESP can trend the process data from a given PID control loop as another valuable reference point. Shown above is a trend of the HRSG unit's drum level controller. While the Process Variable (green line) showcases limited oscillatory behavior the Controller Output (yellow line) exhibits significant oscillations as soon as start-up procedures are initiated.

## What was the cause?

A typical power plant employs 100s of individual PID control loops to regulate steam generation. Whereas most loops are used to control simple processes involving a single element others loops are configured using more complex structures. Such a configuration had been intended for the HRSG unit in support of routine start-ups. Indeed, the three-element design allows for safer, more efficient start-up operation by combining the benefits of cascade and feedforward control. Interactions between each of the HRSG's drum level, feedwater flow, and steam flow are highly coordinated. However, with so many PIDs it's not uncommon for configuration mishaps to occur. The highly robust nature of PID control is such that performance can remain strong and mishaps can be easily overlooked.

## How did PlantESP find it?

In addition to mechanical and controller tuning issues PlantESP's KPIs uncover problems associated with ineffective process architecture. Shortly after its deployment at the power plant the software flagged loops associated with the HRSG unit for exhibiting oscillatory behavior during start-up. The oscillations resulted in similarly high Output Travel measurements. The Oscillation Likelihood metric was found at 81% with a corresponding Output Travel value of 2.3 strokes/hour. The readings led plant staff to examine the process data which confirmed PlantESP's findings and resulted in an adjustment to the loop's configuration. With three-element control in place the KPI for Oscillation Likelihood dropped by 79% and Output Travel was reduced to less than 0.3 strokes/hour.

**Uncover today's performance issues before they become tomorrow's production problem.**

Learn how PlantESP makes it easy to identify issues and isolate root-causes.  
Contact us today at +1 (860) 872-2920 or [sales@controlstation.com](mailto:sales@controlstation.com).

