



PRE-SHUTDOWN CONTROL PERFORMANCE SERVICES

Maximize Control Performance During Scheduled Plant Shutdowns

Prioritize and focus your resources

In today's competitive environment, plants are being run harder and longer. It is vital that scheduled plant shutdowns or turnarounds are used to address the most critical automation issues. Key to this is proper definition and planning of focused process control maintenance work lists and work packages.

- Review of maintenance procedures and records
- Interviews with operators, technicians and engineers
- Walkdown of the equipment
- Gathering of additional information (tag numbers, data sheets, trim types, manufacturer's specifications, serial cards, etc)
- Collection of actual data, such as historian downloads and trend printouts
- Hook-up of the Entech Toolkit™ for real-time data acquisition (steady-state, set point changes and manual mode steps, if feasible)

Data analysis

- Time series evaluations
- Frequency spectra, cross-correlation analysis
- Model identification and Lambda tuning for controllers

Written report

- Detailed technical discussion
- Recommendations for required hardware improvements
- Recommended optimal tuning of loop controllers based on operating objectives and process dynamics
- Corrections in control strategy

Automation expertise and technology

The Emerson blend of technology and expertise helps target improvements that increase plant profitability, enhance operating stability and provide detailed maintenance work package recommendations.

This investigation and analysis is performed by Emerson consulting engineers who are experts in the performance characteristics of control valves, dampers, drives, process sensors, transmitters, and control loop dynamics. Our experience is bolstered by evaluation of thousands of control loops and devices in a variety of plants. We measure loop performance, provide specific recommendations to optimize controller and instrumentation performance, and define actions for further improvements to instrumentation, process design, and control strategies to be performed during the shutdown.



Emerson Process Management offers Pre-Shutdown Control Performance Services that identify and prioritize the most significant opportunities for operational improvement including:

Plant Audit

- Study of piping and instrumentation diagrams (PID's) and isometric drawings
- Identification of critical control loops and operating objectives

Online performance analysis

It is important that key automation issues be addressed in terms of the installed online performance of control devices, not just the performance that can be measured offline. Recommendations for improvement are based in part on measurements and analysis of process dynamics using Emerson's EnTech™ Toolkit and EnTech™ Valve Tester. These tools allow evaluation of automation performance with the plant operating in normal online configuration prior to a turnaround.

Return on investment

Customers often realize a large economic payback from the Pre-Shutdown Control Performance report both from the facilitation of an effective shutdown and the significant operational improvements after startup.

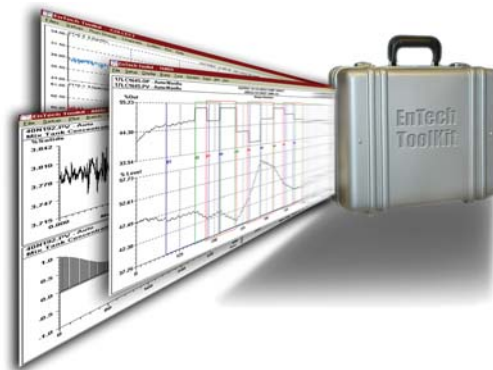
Many see immediate visible improvements such as startup with loops in normal modes (Automatic or Cascade) that were run in Manual prior to shutdown and past troublesome loops holding setpoints without regular intervention by operators.

Example engagement A refinery Pre-Shutdown Control Performance Report:

- Found the boiler would trip on low or high burner pressure so operators avoided adjusting the boilers and ran gas flow in Manual. This resulted in thousands of dollars per day in wasted fuel costs. Recommended replacing the sticking fuel control valve.

- Found O2 controls were run in Manual and could not be optimized for best regulatory compliance with minimal cost. Recommended repair or replacement of the inoperable main stack analyzer.

- Found air flow controls were run in Manual because the loop would cycle strongly in Automatic. This overloaded operators when the plant would try to optimize boiler loads. Recommended servicing the air damper to remove 2% dead band, and replacing the air flow sensor to get measurable flow change when the damper moves.



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