INDUSTRIAL AUTOMATION SERVICE

ABB Ability™ Performance Optimization for control loops - Fingerprint

Diagnose and improve control loop performance

Benchmark control loop performance and develop a plan for reducing variability and improving process performance.

ABB Ability™ Performance Optimization for control loops is completed one of the following ways:

1. Secure connection via ABB Remote Access Link (RAL). RAL provides a secure connection to the site, configured to meet all IT and regulatory security requirements, for data collection coordinated with the customer.
2. An ABB Field Service Engineer (FSE) will come to site to collect the necessary data for analysis.
3. An ABB Process Optimization Engineer will come to site to complete the data collection and discuss details process with key team members.

ABB Ability™ Performance Optimization for control loops service follows a three-step methodology—Diagnose, Implement and Sustain—to audit, tune and maintain control loop performance. The Diagnose step is an industry proven service that provides a performance benchmark and improvement plan with associated ROI.

Typically, processes that have taken advantage of an ABB performance optimization implementation plan have benefited with a 6-month or better payback

Diagnose

The diagnostic service compares existing controls to industry standards, and compares actual operating data to expected capability. It is a platform independent, noninvasive service that can be applied to any automated process.

Utilizing comprehensive data mining techniques, it measures performance and provides insight into improvement potential. These data mining techniques are based on ABB's proven loop performance indicators, standard service methodology, and the experience and training of our people. Areas examined include:

- Control, process and signal conditioning assessments (Figure 1)
- Tuning parameter evaluation (Figure 2)

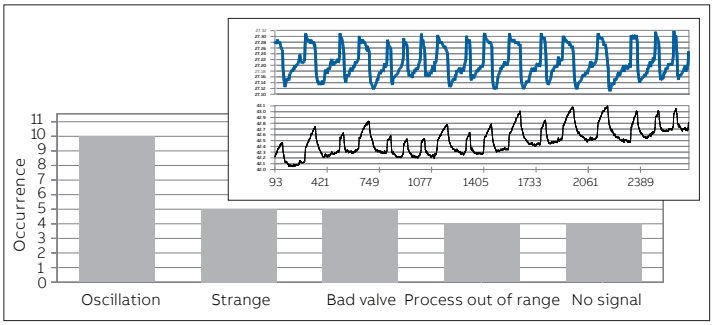
Typical control loop issues
Overtuning loops leads to oscillations and poor product quality
Instrumentation requiring calibration or displaying noisy measurements
Valve stiction limiting performance and causing process oscillations
Improperly sized valves restricting control performance
Large disturbances overwhelming control loops that are tuned too slowly or need feedforward action

The diagnosis step uses a bottom-up approach to performance improvement. Data is collected to verify that basic instrumentation is working as needed, for optimized operation and control.

Process evaluation

Each performance index is a function of specifically designed ABB indicators. The resulting indices are used to evaluate performance levels as well as provide the following insights:

- Ensure solutions are applied to the source of process disturbances rather than band aids added to process symptoms
- Distinguish between tuning problems and physical hardware issues such as stuck or broken actuators



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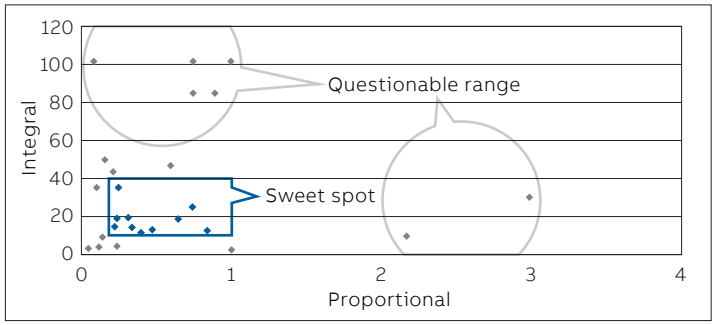

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Figure 01. Control loop performance (Loops in manual or saturation, Questionable regulation, Oscillating outputs); Process issues (Non controllable disturbances, Questionable valves); and Signal conditioning (Quantization, Filtering and outlier issues).

Figure 02. Data collections and current loop tuning parameters are compared with tuning standards, based on process type. Provides a benchmark of control performance, and gives insight to tuning practices, default tuning, tuning cluster targets, and frequent loop tuning changes.

- Quantify signal conditioning setup problems as opposed to actual instrumentation short comings

Delivery scope
Data collection, analysis and presentation of the final report can be completed within a few weeks. Communication between ABB and the plant precedes scheduled activities to ensure the agenda is clearly communicated and coordinates with ongoing plant activities.

Improvement plan
The results of the loop performance analysis are described in a comprehensive report that also includes recommendations and an improvement plan.

The report summarizes the current control loop performance relative to best practices. Specific types of control loop problems related to control, process, and signal conditioning issues are identified for loops diagnosed. The report includes data trends to support the diagnostic results.

The improvement plan provides recommendations for resolving identified performance bottlenecks and the steps required to move towards optimal performance. In addition, the estimated financial benefits are provided.

Based upon the findings, recommendations may include:

- Valve replacement
- Correct sources of cyclic process problems
- Clean up signal conditioning problems
- Optimize or add control logic
- Tuning techniques
- Update standard operating procedures
- Re-tune controls for optimal performance

Implement
Once improvement recommendations have been defined, steps to improve performance, while creating a foundation for continuous improvement, can begin.

Services to Implement improvement recommendations are in addition to the Diagnose step and priced separately.

Approved improvement recommendations can be implemented all at one time, or scheduled to be completed incrementally over time; beginning with improvements that provide the greatest financial return. ABB is available to implement the improvements, work with site engineers, or work along with site personnel to achieve the desired boiler optimization level.

Sustain
To sustain benefits achieved from the improvements made, loop monitoring service offers automatic, non-invasive data gathering for continuous analysis of control loop performance.

Loop performance monitoring provides your personnel and ABB service experts with a real-time view of KPIs and diagnostic and system data. Data collected from the monitoring service is highly secure as it remains on-site and requires user identification to view.

Why ABB
ABB Ability™ Performance Optimization for control loops transforms raw data into actionable information, leading to reduced process variability, increased availability and improved product quality. A unique service, it utilizes proprietary software tools and industry proven data mining techniques. The diagnostic methodology is based on ABB's proven loop performance indicators and standard service methodology.

References
ABB Ability™ Performance Optimization for control loops has successfully improved the performance of control systems across the globe. Many customers have scheduled this service as part of their ongoing annual service agreements, while others have implemented the Loop Performance Monitoring to daily diagnose, monitor and resolve system and process performance issues.

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