

Control system performance audit

Achieve power plant operational excellence



Drive power plant performance and optimization

For electric utilities, improving generation unit efficiency and maximizing plant asset utilization are core activities. Today's challenges for power plants to meet changing load demands, to maintain high unit availability, and to comply with emission requirements are unparalleled.

Imagine that with just a few changes to your existing instrumentation and control systems, your power plant can achieve:

- Reduction of unit trips
- Reduction of NOx emissions
- Reduction of start-up times
- Heat rate improvement
- Unit turndown improvement
- Increased ramp rate
- Reduction of operator errors
- Reduction of nuisance alarms

We can help! ABB power plant audit experts provide you with assessment and overall performance improvement recommendations based on your plant's unique requirements and objective.

ABB's audit services provide value to your plant operation with the following benefits.

- Cost savings with increased unit efficiency, reduced fuel and O&M costs
- Increased revenues with higher unit availability, capacity and inter-utility power transaction support
- Environmental regulation compliance with reduction of NOx, SO2 and mercury emissions
- Equipment protection with proper safety interlocks design and boiler/turbine stress monitoring to avoid excessive stress and costly repairs
- Operational flexibility
- Consistent and ergonomically design HMI to reduce human operational errors

Solutions to optimize performance



Best-in-class services

With the industries' deepest power plant process application knowledge and most extensive control system experience; ABB offers complete instrumentation, control and electrical systems for literally every type of power plant. Our engineers have the know how to automate and optimize the power plant and understand the processes that are important to you. Integration of ABB's innovative products into economical and reliable solutions is what ABB automation experts do, while supporting the products over the entire lifetime of your plant.

The ABB audit team makes recommendations for upgrading control systems, actuators and instrumentation in order to improve power plant reliability, availability and efficiency. Our on-site audit team collects information through discussions with plant operating and maintenance personnel, inspection of existing control systems and plant field equipment, collection of process data, business data, and report logs, and through a review of the existing control systems documentation.

Based on the audit scope and process area, one or more engineers make up the audit team. A typical audit team may consist of the following controls experts:

- Boiler control application engineer
- Burner management application engineer
- Turbine control application engineer
- ILS / BOP application engineer
- Data acquisition/system integration engineer
- Plant automation application engineer
- Installation engineering supervisor
- Instrumentation engineer

Solutions to optimize performance

By identifying the bottlenecks of the existing system, ABB provides short-term and long-term performance improvement recommendations. The step-by-step implementation plan gives the customer flexibility to prioritize upgrade activities. Customers can schedule improvement projects in phases over a period of years based on scheduled outages and maintenance budgets while minimizing operational downtime.

For example, a power plant can choose to upgrade its feedwater pump turbine from mechanical-hydraulic controls to electrohydraulic controls first to improve operational uptime and efficiency. Later, it may modify unit operation mode from boiler follow to coordinated control, add a turbine condition monitoring and analysis package or purchase additional operator console and engineering work stations at later stages.

In addition, many reliability, maintenance and safety improvements can be identified including:

- Decreased possibility of pulverizer fire, resulting in savings by avoiding burner equipment replacement and prevention of production losses
- Fewer hardware interconnections
- Improved Mean Time Between Failures (MTBF)
- Reduced Mean Time To Repair (MTTR)
- Enhanced alarming capabilities
- Reduced spare parts and training

Improve overall equipment effectiveness and return on investment



Return on investment

Facing a highly competitive deregulated market and continuous deterioration of unit performance, a Mississippi power plant selected ABB to audit its existing instrumentation and control system. By adopting ABB's suggested implementation plan, this 750MW oil and gas fired supercritical once-through unit reported savings of more than \$3 million a year including:

- Over \$200,000 in reduction of spurious trips, based on reducing 4 trips per year
- Over \$500,000 in reduction of start-up times, based on reducing downtime by 48 hours per year
- Over \$600,000 in combustion efficiency, based on 0.94% heat rate improvement
- Over \$100,000 in ramp rate improvement
- Reduction of emission levels
- Over \$200,000 in unit turndown based on lowering minimum stable automatic load level by 35MW
- Over \$7,000 in control system calibration
- Over \$800,000 in reduction of forced outages due to superheat, reheat or water wall tube leaks based on elimination of one outage per year
- Over \$100,000 in boiler feed pump turbine controls improvement
- Over \$100,000 in main steam turbine availability improvement
- Over \$300,000 in reduction of synchronization time without placing any undue stress on the main steam turbine

Innovation leader and pioneering spirit

ABB understands the importance of building a partnership with our customers. Contact your ABB account manager and identify the scope and purpose of your audit needs. ABB will prepare a proposal with an experienced audit team.

The on-site audit schedule ranges from one to five days depending on the audit scope. After the audit, an audit report is delivered in two to four weeks. The audit report outline includes;

- Executive summary of findings
- System status and recommendations based on technical and business criteria
- Solicitation of the proposed improvement plan and migration strategy
- Appendix of reference

Based on the audit scope, the audit report may include;

- ABB's benchmark results (charts, tables, etc)
- Economic justification calculation
- I/O database listing
- Field equipment database listing
- Key performance indicators

After the report, ABB will support follow-up questions. Let ABB offer our experience and expertise to achieve your enterprise-wide improvement.

Contact us

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