Power plants increasingly face the risks of significant loss of availability due to aging assets such as gas turbine control systems. As these control systems become obsolete, they become less and less reliable and begin losing functionality. Your original turbine control system might even be a closed architecture, inhibiting plant operators to diagnose and correct system issues quickly and efficiently.

For several decades, ABB has been one of the world’s leading providers of cost efficient open architecture gas turbine control systems. ABB’s S+ Turbine solution provides unmatched functionality and performance for turbine control, turbine protection, valve positioning, generator synchronization, condition monitoring and mechanical/hydraulic upgrading. ABB gives your power plants full ownership of your operations, which reduces the risk of unscheduled downtime and increases equipment life span.

Benefits:
– Maximum reliability and availability
– Reduced maintenance costs
– Significant reduction of unplanned outages
– Improved unit responsiveness and performance
– Seamless integration and unified interface
– Lower NOx and CO emissions
– Increased fuel efficiency
– Prolonged equipment life span

ABB gas turbine control systems are designed to provide the operator with optimum information enabling precision control of the unit via integrated turbine modules and control expertise that perform beyond industry standards.

Proven products and integrated solutions
ABB gives you a common platform for turbine functions which minimizes the need for back-up hardware, reduces training requirements and eliminates the need for serial interfaces. Additionally, the open architecture allows operators to seamlessly interface ABB equipment to any other existing DCS platform at your plant.

High-end turbine protection
S+ Turbine offers a fully integrated turbine protection system that provides over speed trip protection, acceleration protection, and anti-surge protection functionality. This system is triple redundant and can be automatically tested with the unit on-line. The on-board processing capabilities allow the protection system to operate independently from the main DCS controller, resulting in faster and more reliable protection.

Integrated generator auto-synchronization
S+ Turbine provide a fully integrated synchronization module that automatically closes the generator breaker through precise matching of frequency, voltage, and phase. This provides reliable, efficient, and cost-effective solutions for generator to grid synchronization as well as bus-to-bus (switchyard) synchronization.
Industry's most capable valve positioner
The ABB solution includes a fast-acting valve positioner capable of interfacing with all major types of servo valves, I/H converters and position feedback devices. This operates separately from the main DCS controller in order to provide response times under 3 milliseconds, and is complemented by advanced features such as automatic calibration, built-in valve testing, I/O redundancy, module redundancy, built-in valve curves and cascaded loop control.

Advanced mechanical and electro-hydraulic applications
ABB supplies gas turbine mechanical and electro-hydraulic solutions that are reliably integrated into our DCS system. Our offering includes fuel valves, actuators, position feedback devices, speed probes and speed wheels.

Continuous condition monitoring and assessment
ABB provides continuous equipment condition monitoring that collects and analyzes historical data for evaluation. This allows you to maintain continuous surveillance of critical assets and support proactive maintenance programs.

Comprehensive DLN services
Combustion dynamics and emissions tuning
For DLN combustion systems, combustion dynamics tuning is required during initial unit start-up and periodically anytime combustion or hot gas path hardware is changed out. In addition, combustion dynamics tuning may be required to help meet your goals for operational flexibility. Combustion dynamics tuning involves the acquisition and analysis of real-time dynamics data using locally installed equipment and adjustment of a gas turbine's operating configuration. Tuning minimizes emissions and combustion hardware stress levels.

Monitoring services allow real-time analysis of combustion dynamics, identification of changes to a unit’s operating profile and recommendations for corrective tuning. Customers benefit from improved reliability, availability and regulatory emissions compliance as a result of combustion dynamics tuning.

DLN tuning
ABB allows you to optimize the DLN system operation to maintain emissions compliance over the widest possible ambient temperature range, while also ensuring sufficient margin from both Lean Blow Out and unsafe dynamic levels over the entire low-NOx load range.
**Auto Tuning**
The DLN Auto-Tuning system integrates continuous dynamic and emissions monitoring to automatically feed tuning adjustments back to the turbine controller. Auto-Tuning maintains the DLN system within operator defined emissions and dynamics limits, and prevents Lean Blow Out as the combustor responds to changes in ambient conditions, changes in fuel conditions, and degradation of combustion hardware and control valve calibrations.

**Operational troubleshooting**
Lean Blow Out and regulatory NOx emissions limits are common operational problems for improperly tuned DLN systems. ABB analyzes the pre- and post-outage turbine performance data to diagnose the causes of any problems, and provides short and long term solutions to maintain operations within compliance.

**eMaximize Load Turndown**
Many DLN turbines are commissioned with only 60% load turndown. Our offering maximizes turndown while also maintaining emissions compliance. Besides increasing operational flexibility, combined cycle plants can avoid overnight shutdowns, reducing start/stop cycles and extending hardware life.

**Proven experience**
For more than 40 years, ABB has provided control systems for turbine applications. We have provided control systems for all types of rotating machinery including a variety of applications for more than 3,200 turbines worldwide, representing over 30 different OEMs. ABB’s S+ Turbine for the power and water industry optimizes performance, improves reliability, enhances efficiency and minimizes environmental impact. S+ Turbine represents the new generation of the field-proven Symphony family of control systems with over 6,000 systems installed worldwide. Through ABB’s “Evolution Without Obsolescence” life cycle approach, we continue to economically provide technology enhancements and upgrades to existing ABB equipment without the need to rip and replace existing equipment.
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