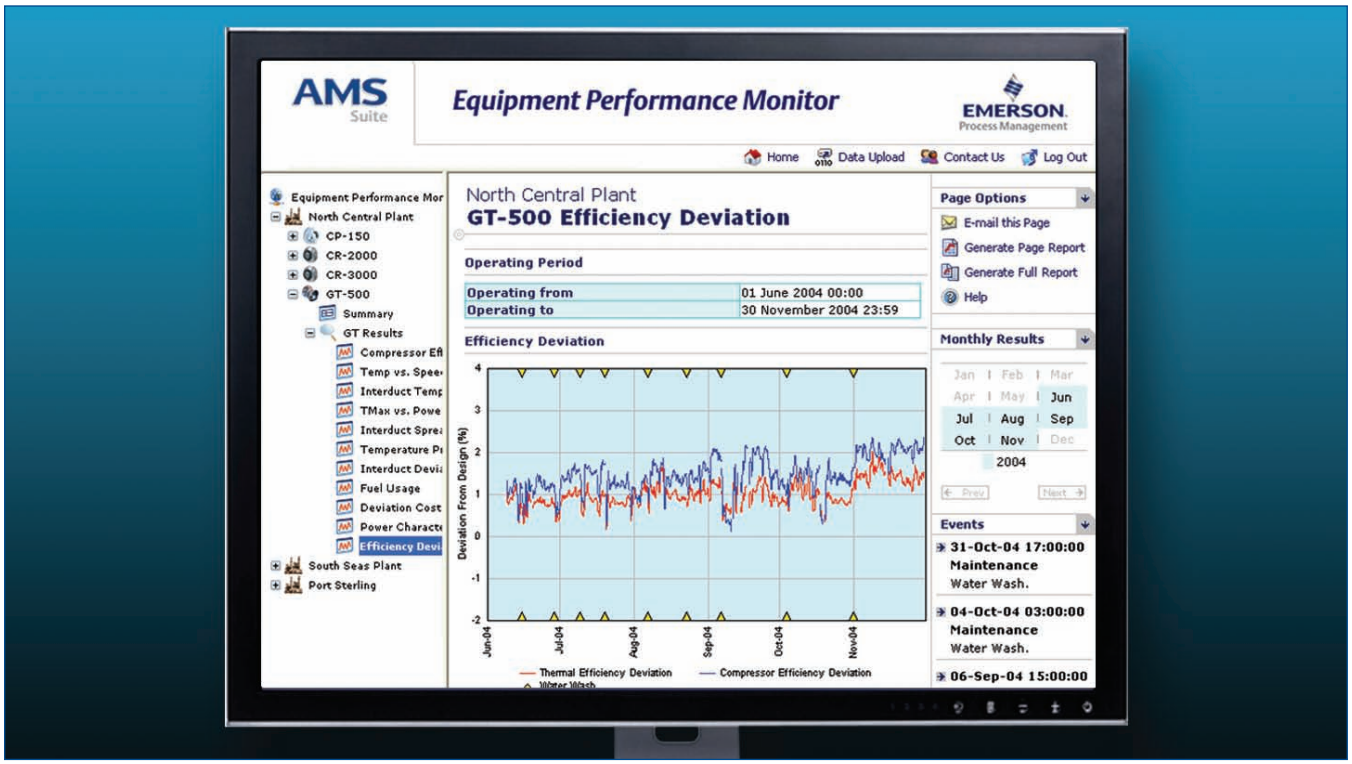
Performance Monitoring - Gas Turbines



Difference between actual and design gas turbine thermal efficiency and compressor efficiency.

- *Reduce operating costs and maximize production*
- *Increase availability and reliability*
- *Avoid unplanned downtime and costly shutdowns*
- *Maintain power demand to plant or grid*
- *Determine optimum load across variable ambient conditions*
- *Reduce fuel costs and energy losses*
- *Optimize gas turbine and plant heat rate*
- *Reduce unplanned maintenance expenditures*

Enable Predictive Maintenance

AMS Performance Monitor provides the tool to achieve peak performance of Gas Turbines. It facilitates the move to predictive and proactive maintenance programs, maximizing equipment performance.

Equipment Categories

- Aeroderivative
- Industrial (Heavy Duty)
- Mechanical Drive Application
- Power Generation
- Single and Twin Spool
- Twin Shaft

AMS Suite: Equipment Performance Monitor

Success Stories

- Changed water wash maintenance strategy reducing downtime from weekly to every six weeks, saving $150K/year.
- Eliminated unplanned equipment shutdown ($2.6M/year potential lost capacity), ensuring that the power demand was met.
- Determined relative performance of parallel operating margins to assist in optimizing load sharing and scheduling.
- Adopted a proactive maintenance strategy, increasing availability by 5%.

Capabilities

- Assess performance relative to design or baseline.
- Receive alerts for performance degradation beyond defined limits.
- Validate and reconcile data using rigorous mathematical models.
- Correct parameters to non-dimensional and ISO/ambient conditions.
- Track performance and associated heat rate degradation.
- Track performance for individual component sections and stages.
- Optimize gas turbine operation to meet production targets.
- Track the effects of water washes and maintenance activities on gas turbine performance.
- Benchmark and compare performance between similar units and/or multiple sites.

Key Performance Indicators (KPIs)

The following are typically presented using ASME PTC 22 thermodynamic custom-built modeling techniques:

- **Polytropic Compressor Efficiency** - Use to determine performance trends and effects of maintenance events.
- **Power Characteristics** - ISO power production and corresponding thermal efficiency overlaid on design and baseline performance.
- **Efficiency Deviation** - Load independent comparison of performance relative to design. Presented separately for both compressor and thermal efficiency.
- **Turbine Inlet Temperature (TIT) vs. Power** - Scatter plot identifying GTG degradation and optimum control regions.
- **Temperature Profiles** - Together with performance KPIs, identify operational conditions to recognize machine performance.
- **Fuel Usage** - Current fuel usage and corresponding fuel requirement at design performance. Shows the effect of degradation and fuel consumption rates.
- **Exhaust/Interduct Spread** - Radial profile of temperature probes relative to position.
- **Temperature Ratio (vs. Speed)** - Scatter plot indicates any deviation from expected performance.
- **KPI Synopsis** - Comprehensive user-defined statistical KPI values with reference to occurrence.
- **Operating Loss Cost** - Track current and historical 'lost opportunity', both instantaneous and cumulative.

Gas Turbine Demonstration available at www.AMSPerformanceMonitor.com/

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