



Performance Intelligence from GE Digital

Real-time thermal performance data, analysis and actionable recommendations

Actionable insights to operate at optimum efficiency levels

How much does 1% heat rate loss mean to your business? Having a clear picture of thermal performance at the plant level is essential so that you can course-correct underperforming assets.

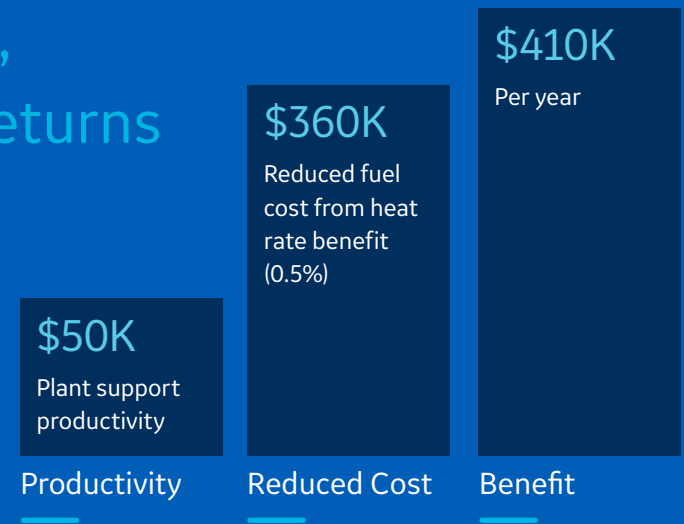
Performance Intelligence answers the question, “Do I have a problem?” If yes, how much is it costing me and where is the issue? Performance intelligence is a window into the plant with actionable insights to bring all the equipment data together to take the guess work out of the fixes the plant needs to run at its full operating potential.

Key features

- **New** Carbon Analytics and Sensor Health
- Real-time visibility to thermal performance
- Diagnostic analysis for actionable insights that expedite remediation
- Optimize plant economics with quantified performance and financial impacts
- Aligns to your CapEx or OpEx budget
- Available on-prem or in the cloud

Drive productivity, fuel savings and returns

600 MW Plant Potential Annual Benefit



Improve and maintain equipment performance and overall plant heat rate

- Monitor system-wide equipment performance across the operating range to reveal developing trends and efficiency losses
- Identify and diagnose performance shortfalls driving increased fuel costs
- Reveal hidden equipment issues with actionable data insights

Improve startup performance and fuel costs

- Visualize start performance vs. expected and normal
- Understand start variation and deviations from expected
- Improve startup performance through data-driven insights

Maintain capacity for peak seasons

- Monitor the full load range to reveal developing trends and potential derates
- Visualize performance trends throughout all seasons and operating conditions
- Analyze equipment performance trends that impact plant peak capacity

Manage minimum load performance

- Provides visibility to gas turbine turndown and combined cycle minimum load operations
- Visualize best and worst performers
- Understand drivers for minimum load variation

Performance Intelligence Technical Specifications

Performance Intelligence includes:

- Data integration tag mapping for application input data
- Thermal performance models deployed in cloud or other IT infrastructure
- Model validation analysis
- Analytic configuration
- Application software and UI configuration
- Application functional validation
- Implementation and Subscription/Acceleration Plan for a customer selected term
- Managed Services – Optional service offering depending on project.

Customer Supplied Materials:

- Collaborate with GE implementation team on the required data and information
- Access to plant personnel for plant and equipment data/information
- Plant and major equipment design information
- Process layout details
- Piping and instrumentation diagrams
- DCS master tag lists
- Historian master tag lists
- Sample data sets including historical data covering load range and seasonal variation, performance test data, historical upgrade events, major maintenance activities
- Technical support for data questions, sensor investigations and alternative data source discussions
- Recommendations on key data inputs for specific KPIs consistent with established business processes

This also includes the Performance Intelligence System hardware components, as substituted, updated, modified, omitted, or replaced from time to time and which constitute parts (not included in cost or price), but are required to be customer supplied.

Other Requirements:

- The required interconnection devices, such as short-haul modem pairs, cabling, switches, etc.
- Cyber security devices (e.g., firewall)

For Cloud Implementations:

- One On-Site Monitor (“OSM”) or other Edge option, acceptable to GE, including CPU, monitor and keyboard. If required, GE can provide a quotation for an OSM (additional cost/price). One network connection per computer system to provide remote access.
- Data system interface to OSM/Edge (DCS or Historian via OPC or other data exchange protocol)

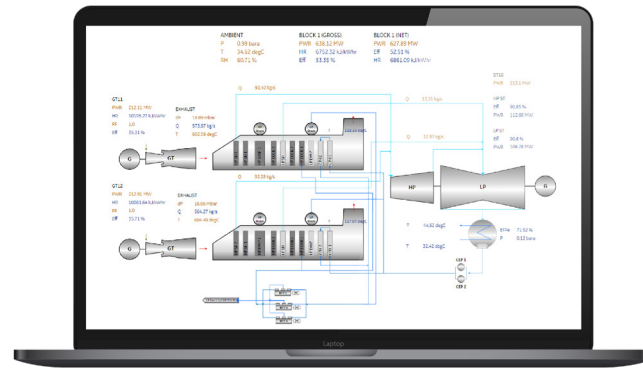
To view application the following are required:

- Laptop/Desktop
- Connectivity to cloud or web-interface to on-premise system network
- Chrome version 55.X or higher



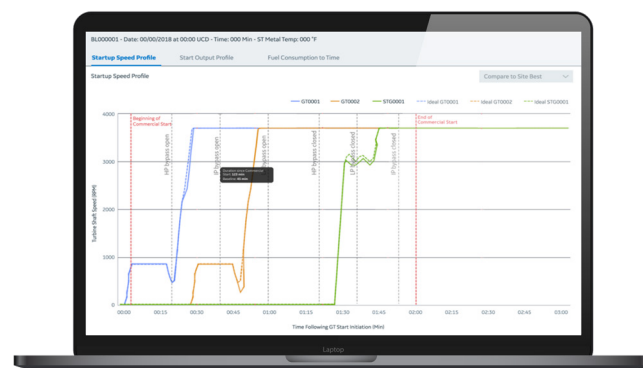
Safely explore your plant operating limits and simplify your processes

Performance Intelligence Modules



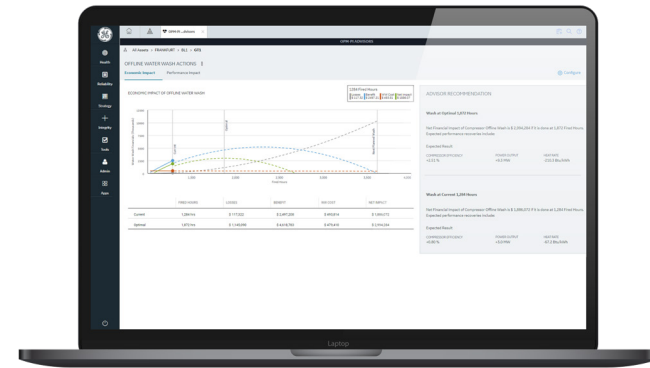
Thermal Performance

- Uses models deployed by GE that generate data reports that empower plant engineers and operators to improve plant performance
- Digital Twin Models Customized to plant and equipment designs and plant dispatch profile
- Performance analytics provides visibility, trends and insights
- Operating mode analytics provide performance data relative to the various plant operating configurations across the load range and operational conditions
- Software user interface provides easy access



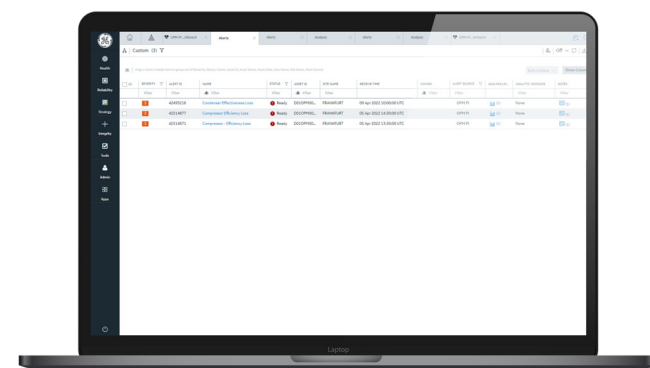
Flexibility Performance Monitoring

- Improves plant flexibility and operational performance
- Critical insights provided for start fuel, start time, ramp rate and minimum load
- Gas turbine turndown performance relative to expected min load fuel savings and operational benefits



What-If Tools and Economic Tradeoff Advisors

- Empower employees to make decisions that improve plant performance
- Improve waterwash operations, performance recoveries and decision making
- Evaluate inlet filter house performance and maintenance options
- Understand the impact of equipment derates on plant capacity and heat rate



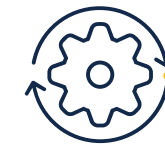
Diagnostic Alerts and Advisors

- Diagnostics provide automated alerts of performance shortfalls
- Real time alerts with diagnostic insights and impact on plant capability provides data-based decision support

How Performance Intelligence works



Digital Twin Models customized to your plant's equipment, system design and dispatch profile



Performance analytics are deployed, providing visibility to performance data, trends, and insights, across the entire range of operating modes and loads



Easy-to-access software user interface that provides operational data summaries and performance analysis



Reduced Fuel



Reduced Emissions



Improved Capacity



Reduced Risk

Performance insights from a simple dashboard

Collect and normalize operational data and run key performance and degradation calculations.

Real fuel savings

Manage your top operating cost and improve performance across the entire operational load range.



Benefit from GE Digital's domain expertise as you streamline processes for maximized performance and reduced fuel loss.

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