Digital transformation through data-driven decision making

Welcome

Founded in 1992, Engineering Consultants Group, Inc. has grown with our customers to make a positive impact on industrial operations. We take a partnership approach to the development of monitoring and diagnostic software for process equipment. ECG is a group of experienced engineers focused on building effective solutions that aid in operational efficiency and equipment health monitoring.

As a company focused on our customers, we have a passion for developing software solutions that best suit our customers' unique needs. We do this by harnessing years of industry knowledge, leveraging advanced statistical technologies, and preserving ongoing dialogue between ECG and software users. Our commitment to product excellence and client success makes ECG a vanguard in the equipment monitoring and diagnostic field.

Too often, software companies sell a "one solution fits all" approach, leaving customers to adapt their operational processes to a software's capabilities. At ECG, customers lead our development roadmap and collaborate on new and upcoming features. No more "inside-the-box" thinking.

Our team of talented engineers and software developers work with you to build products that solve real-world issues found in process-heavy industries. Together, products are tailored to your company's character and operational needs. Agility is our strength, giving us the ability to implement new adaptive product features quickly and reliably.

Elite, collaborative, and proven, ECG is ready to support your company's digital transformation.

Michael Santucci
President & Founder

James Scavuzzo
Senior Vice President

Michael Santucci

James Scavuzzo

Bold goals call for strong partnerships

ECG has helped customers like DTE Energy for over 20 years with both custom and enterprise software solutions.

Forging a reliable partnership, DTE and ECG have come together to create numerous software solutions that DTE uses to support their daily operations.

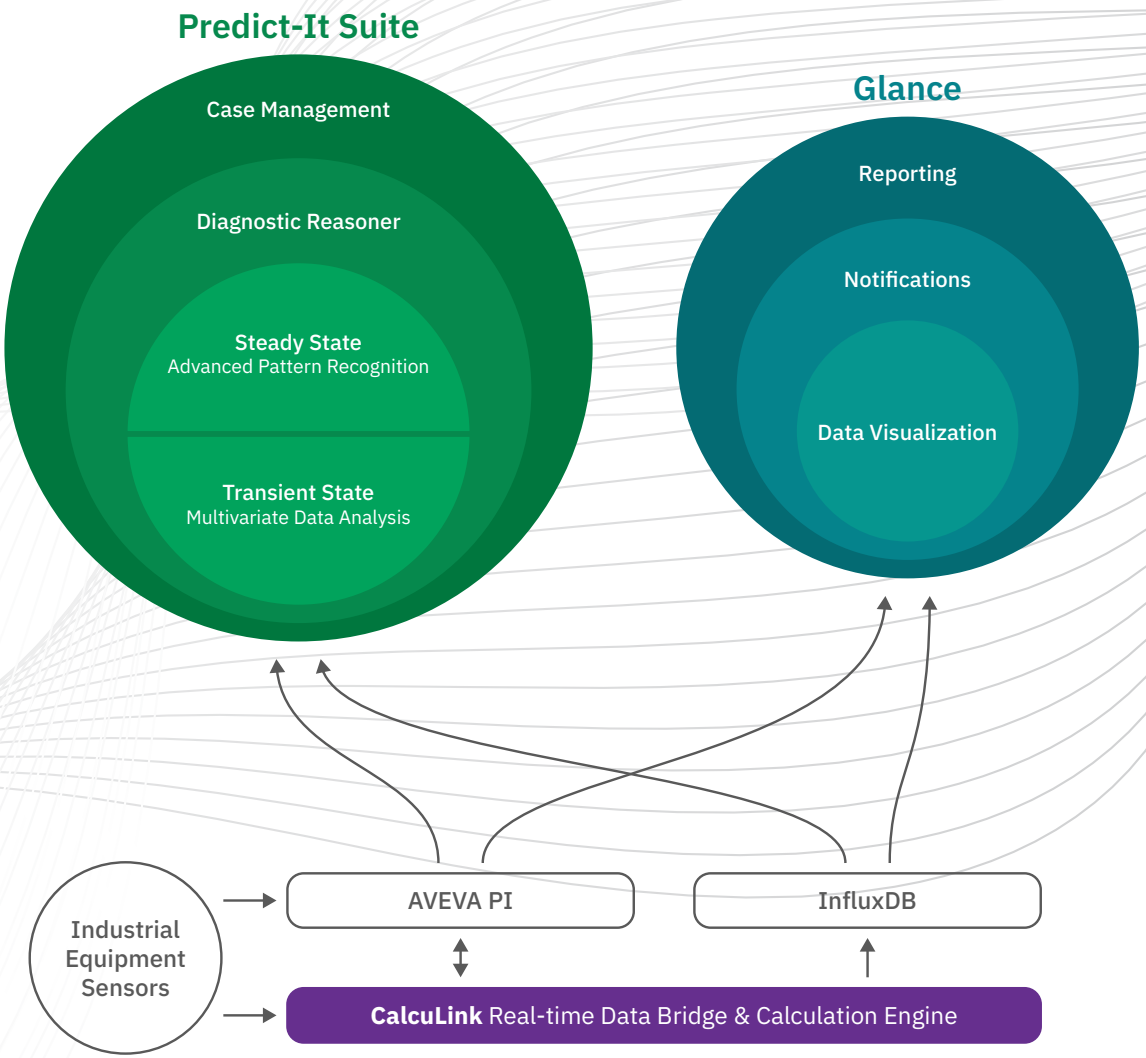
- E-Notification
- Protection Tagging System
- Unit Constraint Tracking System
- Coal/Material Tracking System
- Project/Plant Tracking System
- Tree Trimming Complaint Management
- Six Sigma 4-Block Reporting System
- NOx Reporting System
- BoilerCam™

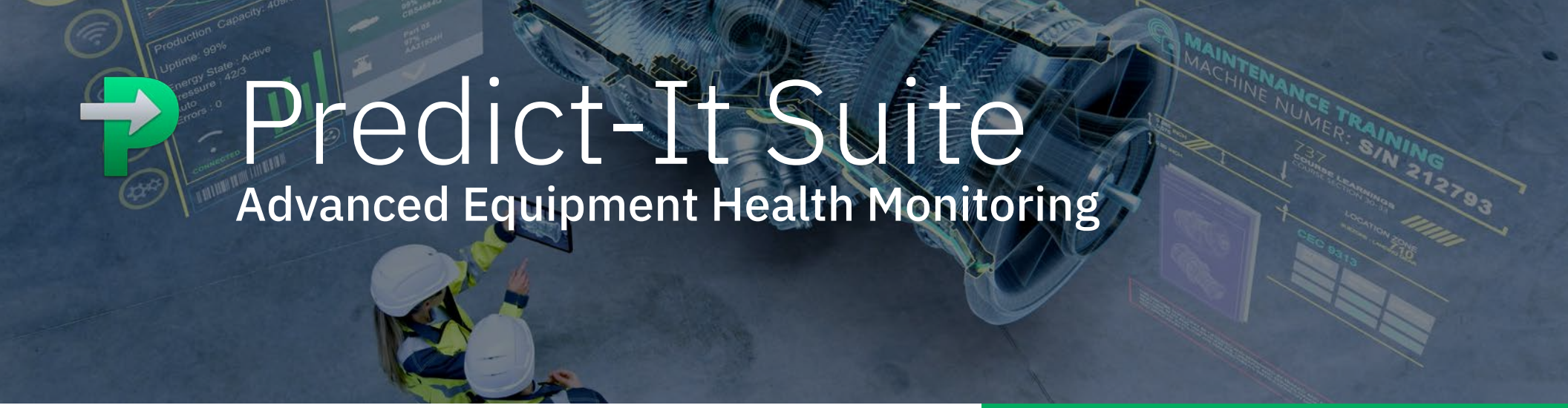
Put our solutions to work.

The Predict-It Suite helps organizations prevent failures by detecting anomalies early, monitoring steady state and transient processes, and diagnosing faults using advanced statistical models and Bayesian networks. It tracks process variables against historical trends, flags deviations before downtime, and ranks fault probabilities with consistent metrics. Case Management closes the gap between detection and corrective action, enabling collaboration from alarms to closure.

Glance delivers real-time data visualization and analysis from AVEVA PI or InfluxDB data sources. Users can monitor operations anywhere, analyze trends, manage alarms, and generate reports using an Excel add-in. With features like virtualized processes, calculated variables, and connectivity powered by CalcuLink, Glance bridges data sources for speed, scalability, and actionable insights.

Together, Predict-It and Glance form a unified Asset Monitoring Suite, seamlessly integrating visualization, predictive analytics, and case management to deliver a complete solution for smarter, data-driven asset management.

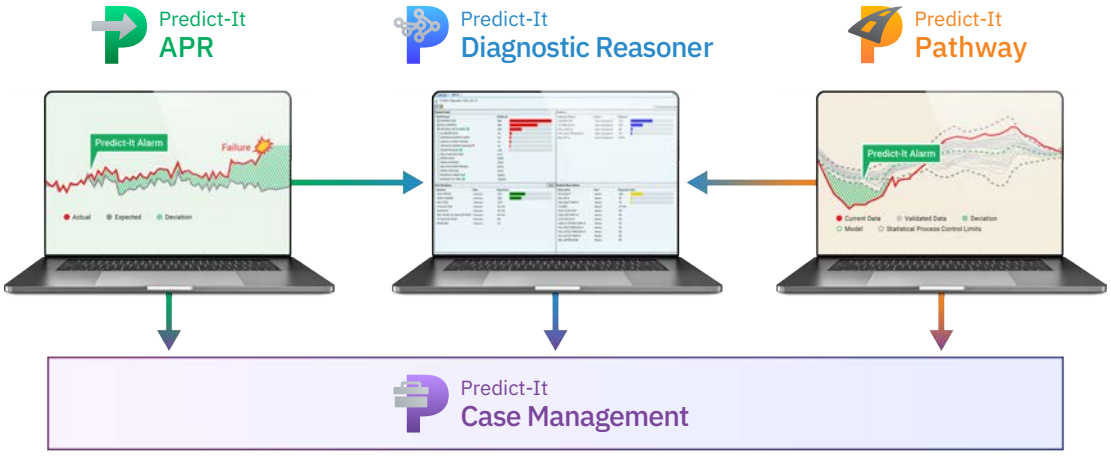




Predict-It Suite

Advanced Equipment Health Monitoring

Your Trusted Partner in Real-Time Equipment Health Monitoring



Predict-It is a powerful analytic solution for the AVEVA PI System that monitors the health of critical process equipment. Predict-It's enhanced Advanced Pattern Recognition (APR) facilitates early anomaly detection during normal operation that triggers fewer false alarms.

Predict-It is a powerful analytic solution for the AVEVA PI System that monitors the health of critical process equipment. Predict-It's enhanced Advanced Pattern Recognition (APR) facilitates early anomaly detection during normal operation that triggers fewer false alarms. The Pathway module enables detection of anomalies during asset start-up, shut-down, and in batch processes.

Predict-It Advantages

- Easy Deployment and Low Life Cycle Cost
- Superior Diagnostic Engine — X-Ray vision for equipment health
- AVEVA Asset Framework Compatible — Leverage your current infrastructure
- Proven and scalable technology utilized by industry leaders across the world

Predict-It In Action

Deploy, Detect, and Diagnose

Deploy

- Easy self-deployment aided by automated processes and templates, or via ECG services where computer scripts transfer information for model creation.
- Mature technology permits M&D Center engineers to apply unique Predict-It features for reduced manpower.
- AVEVA PI Asset Framework-enabled model building.
- Build models and go from zero to full predictive health monitoring and diagnostics within weeks.

Detect

- Two detection methods for complete asset coverage in all equipment operating states and conditions.
- Accurate anomaly detection ensures less model maintenance.
- Advanced model maintenance automation for reduced required manpower.
- Expert peer analysis provides asset condition review across similar assets to ascertain operating differences in an efficient manner.
- Open and manage cases in Predict-It Case Management for a streamlined equipment recovery response process.

Diagnose

- Asset make/model-specific diagnostics ensure advanced troubleshooting and determination of anomaly causes.
- Smart system captures expert intuition and enables knowledge transfers from senior staff to less-experienced personnel.
- Allows for user-specific asset diagnostics and use of community or PEER networks for an advanced digital “second opinion”.
- Equipment Fault Diagnostic Library available for purchase.

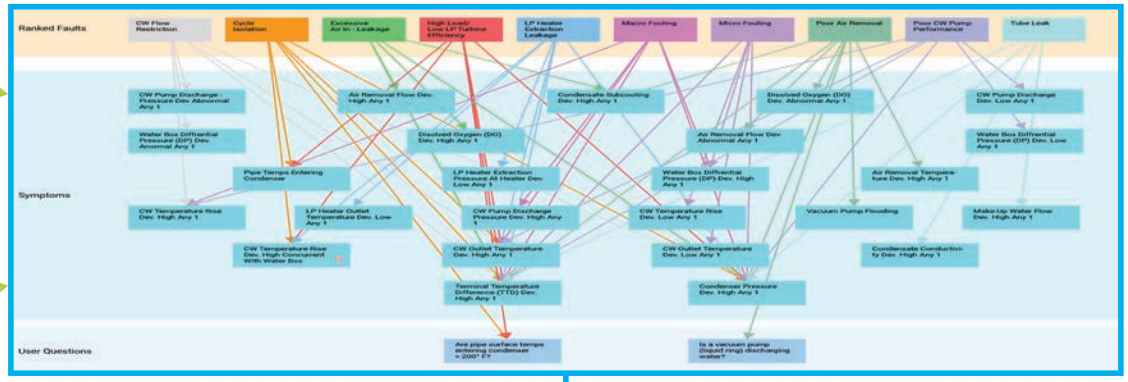
From Insight to Action

The Predict-It Workflow for Equipment Health Program Excellence

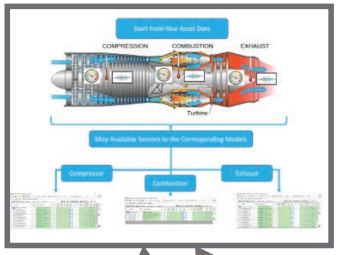
Equipment CANs

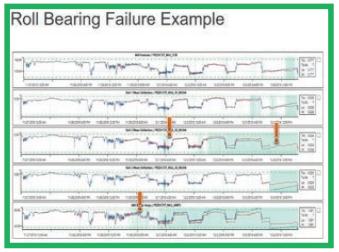
Equipment Specific RCM Data

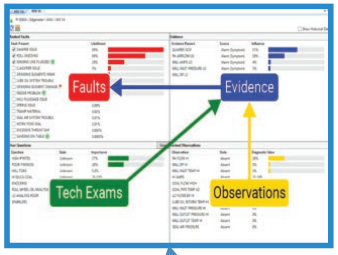
Subjet Matter Expert Experience

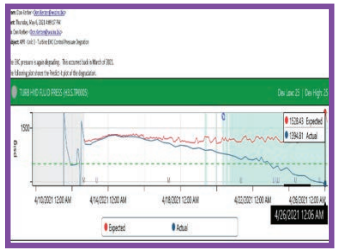


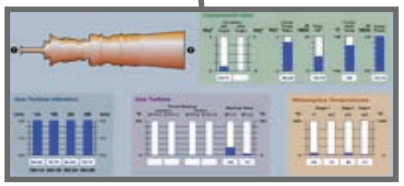
Deploy | **Detect** | **Diagnose** | **Manage** | **Take Action!**











Data Historian

Thermal Metrics

Equipment Specific CBM Tech Exams

Predict-It Anomaly Detection

Dual detection capability for complete asset coverage

Predict-It detects equipment issues in all modes of operation, providing coverage from start-up, through normal operation, and when shutting down. Detection of developing equipment issues are flagged weeks to months ahead of traditional monitoring techniques, providing time to plan corrective actions on your schedule.

Predict-It's Advanced Pattern Recognition (APR) module uses robust algorithms that track trends in process variables on a continuous basis and compare them to historical operation. This allows for real-time monitoring that gives O&M teams a look at the operation of machines during continuous processes.

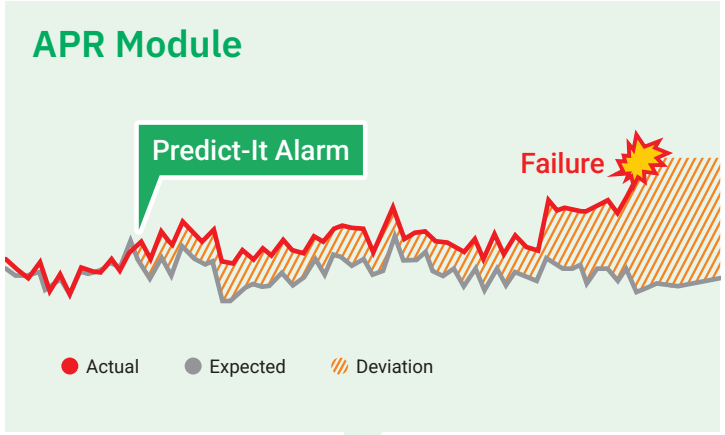
Start-ups and shut-downs account for much of the wear and tear that a machine will undergo in its lifecycle. **Predict-It's Pathway** module introduces a new way to monitor your equipment during the most vulnerable stages of operation using multivariable analysis techniques. Awareness of changes in key variables can make all the difference in optimizing operations and getting more productive hours out of your assets.

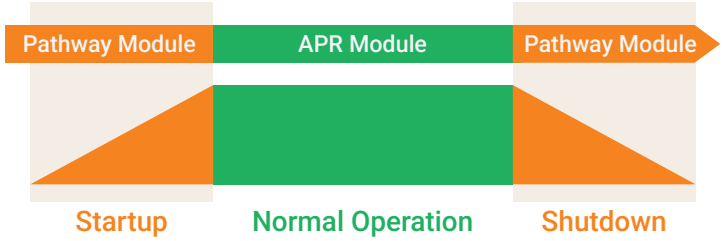
APR Module

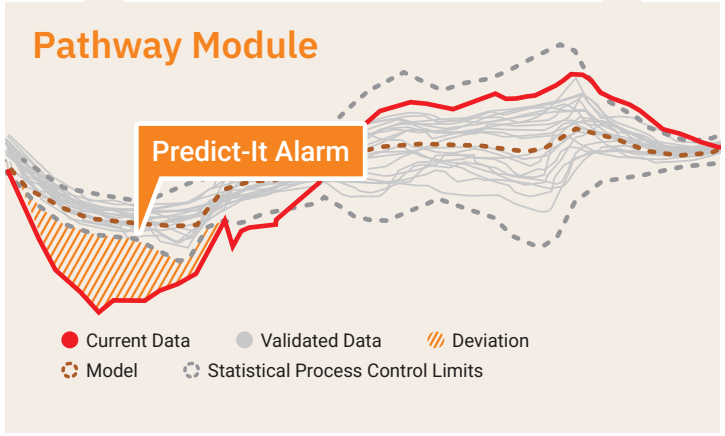
- Continual Operation – long runs
- Data snapshot every 5-15 min.
- Enhanced Similarity Based Modeling (SBM)
- Snapshot of expected vs. current value
- DBSCAN outlier filtering

Pathway Module (Batch Processes)

- Batch Processes – short runs
- Data snapshot every 1-10 sec.
- Univariate and Multivariate Models (MVDA)
- Overlay of process maturity events
- Batch model support
- Dynamic time warping





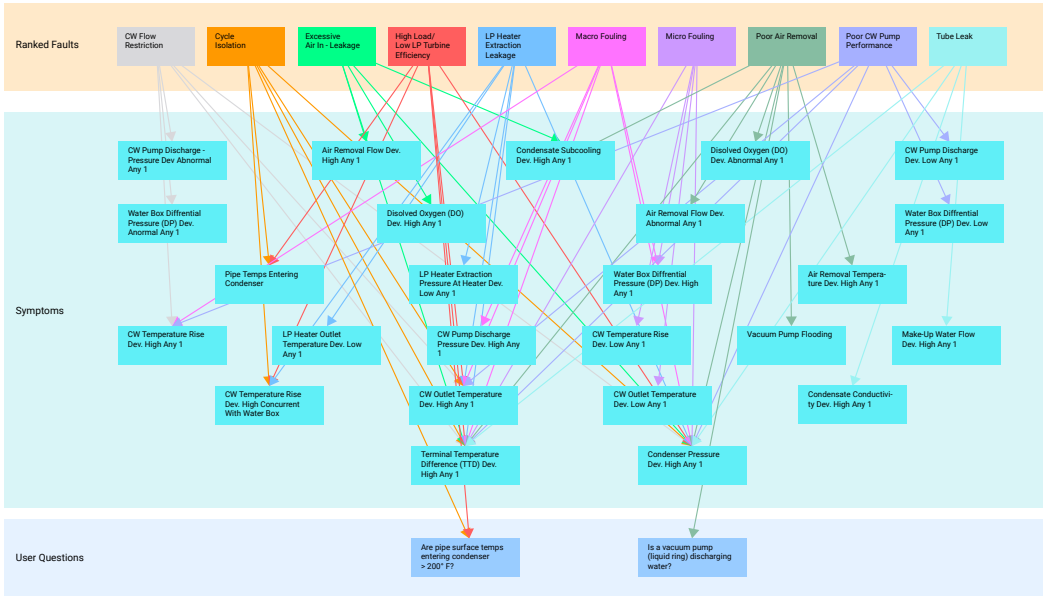


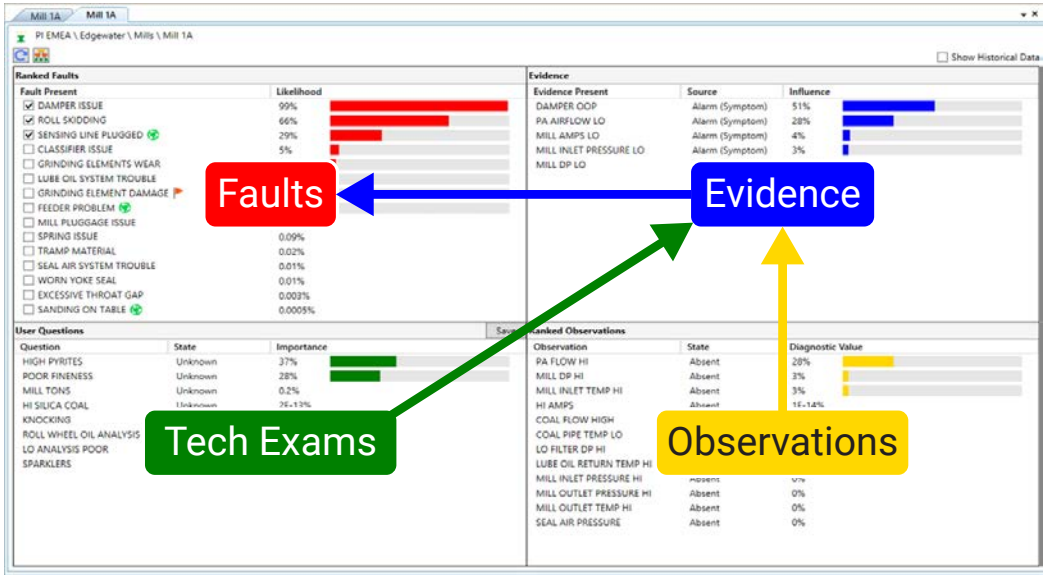
Predict-It Diagnostic Reasoner

A digital doctor for your process equipment

Predict-It's Diagnostic Reasoner is a dynamic diagnostic engine that capitalizes on Causal Asset Networks (CANs). These networks are designed for the specific make and model of the assets they evaluate — resulting in more precise and interactive diagnostic results. CANs power the Diagnostic Reasoner, suggesting multiple root causes for failures and assigning exact probabilities for each outcome.

Anomalies from both APR and Pathway feed into the Diagnostic Reasoner to provide evidence and start the analysis process. Subject Matter Experts (SME) can add knowledge of typical asset behavior, which is captured by Predict-It and applied across a fleet of assets. Real-time observed symptoms from tech exam reports can be added to the diagnostic engine to facilitate a higher level of certainty. Symptoms derived from multiple sources and probabilistic calculations allow pinpoint accuracy in Predict-It's diagnostics, taking the guesswork out of apparent cause fault identification.





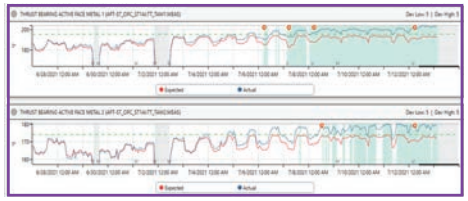
Diagnostic Reasoner Benefits

- Tailored Asset Diagnostics
- Intuitive Fault Troubleshooting Logic
- Backed by Bayesian Open Architecture
- Configured Diagnostics Available from ECG
- SME Input Support
- Fault Probabilistic Ranking

Predict-It Case Management

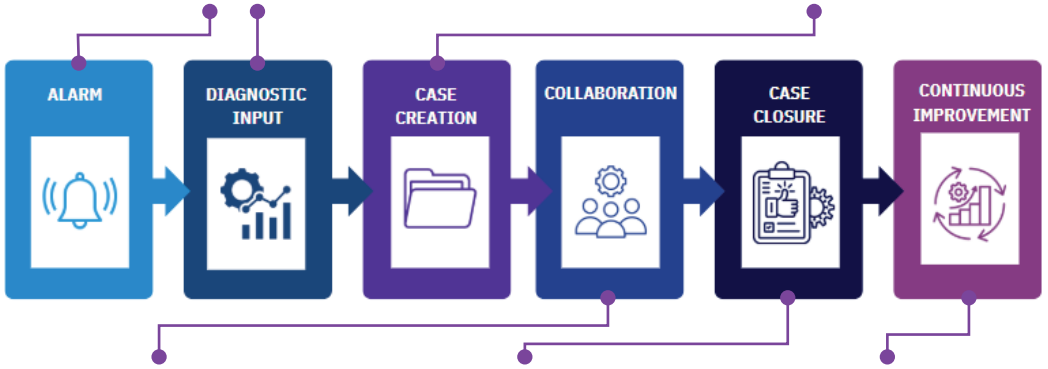
Bridging the gap between anomaly detection and asset recovery

Most monitoring systems only tell you when a problem occurs, leaving a dangerous operational gap between the alarm and the actual needed maintenance action. Predict-It Case Management is an integrated resolution framework designed to close the gap between detection and corrective action. By housing Case Management natively within the analytic environment, we ensure that anomaly and diagnostic insights are captured, tracked, and guided toward a documented recovery strategy. This integration allows for a seamless transition from data science to field engineering. **Predict-It Case Management ensures no critical reliability insight is missed, forgotten, or left undocumented.**

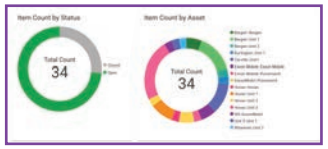


Real-time Monitoring & Analysis

Seamless Case Generation



Efficient Team Communication



Track Progress & Resolution

Historical Data & Optimization

From Analytics to Action

- **Issue Resolution:** Accelerates fault response using APR, Pathway, and diagnostic context in one workflow.
- **Trust & Adoption:** Builds confidence in Predict-It by clearly linking analytics to executed maintenance actions.
- **Cost Reduction:** Reduces unplanned maintenance by converting Predict-It anomalies into early, actionable engineering decisions.
- **Engineering Time Savings:** Eliminates duplicate analysis by focusing failure events on assets through one point of truth.
- **Knowledge Base:** Convert active cases into searchable historical databases to preserve diagnostic and troubleshooting expertise.
- **Traceable Audit Trail:** Timestamped records for compliance and performance tracking.

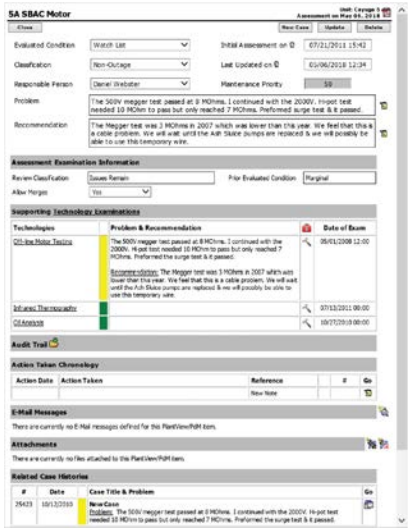
Case Management Capabilities

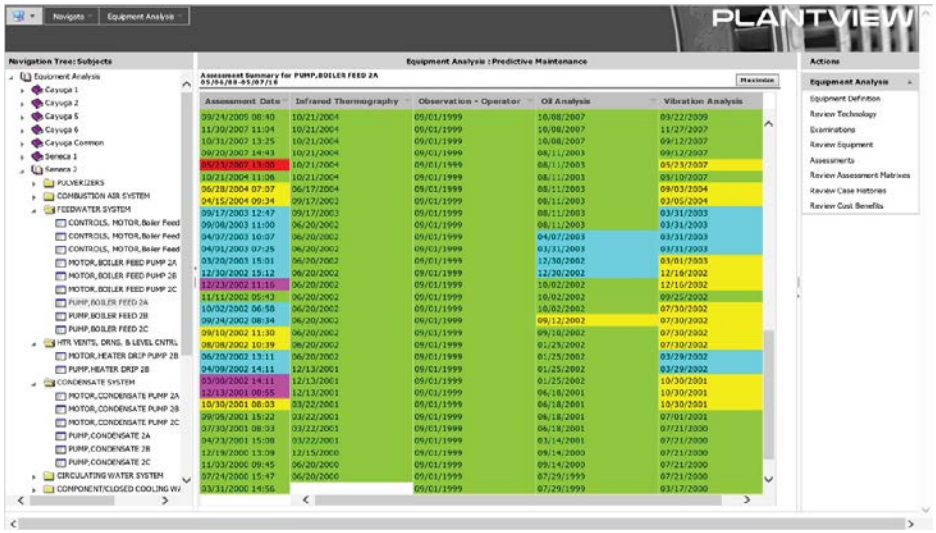
- **Native Predict-It Integration:** Creates cases directly from APR and Pathway validated anomalies without external systems.
- **Integrated Engineering Record:** Links Predict-It analytics, alarms, diagnostics, evidence, decisions, and actions within a single case record.
- **Lifecycle Case Tracking:** Tracks issues from initial detection through resolution or accepted operational risk.

Predict-It + Power Vision = Advanced Equipment Health Assessments

A powerful combination to streamline case management and provide periodic Equipment Health Assessment Report Cards

ECG integrated Power Vision's Predictive Maintenance Module (PdM) into the Predict-It ecosystem to provide time-tested case management capabilities and enable the ability to perform periodic equipment health assessments based on all of your available condition based maintenance information available.





Decisions Backed By Evidence

- Multi-technology verification improves real time equipment health assessment
- Cases created from Predict-It accelerate investigation at anomaly discovery
- Stakeholders contribute in PlantView to collaborate and compile one version of the truth
- Documented faults, emails, attachments centralize evidence for efficiency
- Interactive reporting enables parameters and drilldowns for analysis
- Fleet-scale adoption improves reliability across utilities and units

Case Workflow and Reporting

- PdM Tech Exams to be documented can include vibration, lube oil analysis, thermography, leak detection, and other CBM exams
- Standardized exam entries capture condition, analysis, recommendations consistently
- Easily add in new Predict-It information to update open equipment issues
- Email messages notify stakeholders with direct PlantView links
- SMEs review multi-technology evidence and finalize equipment assessments for consistent ranking of current equipment health

Glance

Trending and Process Visualization Made Easy

Your Mobile Visualization Tool for Operations

Glance is a real-time graphical visualization solution for the AVEVA PI System and InfluxDB users. With Glance, customers can access and analyze pivotal data on mobile devices using company networks. Glance runs on all modern devices that support HTML5 requiring no add-ons. This enables seamless collaboration across a fleet of industrial facilities. Follow your data wherever it takes you — from the office, to the factory floor, and beyond.

Glance Advantages

- Flexible licensing structure for large and small operations
- Easy implementation
- Adaptable to any industry task
- Multilingual — easily configure your preferred language
- Easy to use display building environment
- View detailed process data and trends on-the-go

Features & Benefits

- Mobile viewing of your process data utilizing your own custom-built displays and tables
- Easily build your displays with live data
- Intuitive drawing tools require minimal training and create an effective visual aid
- Robust interactive trending includes time period selection, multiple scales, data export, and streaming real-time data
- Advanced searching enables queries of metadata and integrated searches throughout PI Systems and InfluxDB historians
- Public folders can be customized by department, facility, region, and more

Glance Data Historian Solution

Monitor From Anywhere

Monitor your operations anytime, anywhere, on any device.

Analyze Data

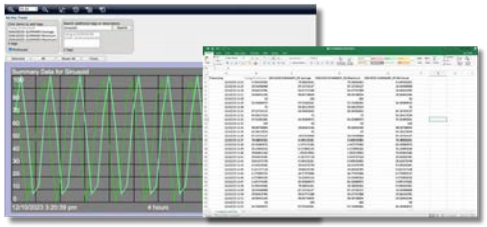
Develop in-depth charts, graphs, and zoom tools to analyze your data. Quickly find data with the redesigned Advanced Search interface.

Get Notified

Subscribe and receive notifications on PI System tags, InfluxDB tags, and PE/InfluxDB Equations.

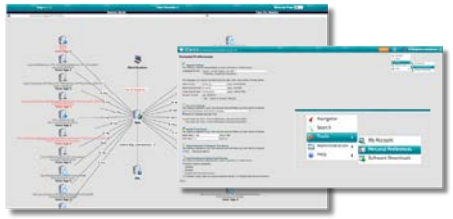
Visualize Process

Model your operations process and assets with the expanded symbol library, rotate/flip options, and overlay data.



Generate Reports

Generate scheduled reports using E-Display and InfluxDB MS Excel add-ins for professional reporting.



Self-Manage

Manage access privileges, server connectivity, service health, and leverage improved snap-to-grid interaction and expanded symbol library for easier display building.

InfluxDB

Speed and Scalability

High-performance historian enables rapid ingestion and querying of time series data with improved speed, reduced memory consumption, and enhanced security.

CalcuLink

Connect

Bridge connectivity across all your data sources, create tags, backfill data, set tag properties, and export/import displays with copy/paste functionality.

Calculate In Realtime

Create calculated variables and custom calculations as data is being captured.

CalcuLink

Real-time Data Bridge and Calculation Engine

Securely Write Plant Telemetry Data in Real-time

ECG's CalcuLink device is a powerful addition to the data infrastructure of any industrial organization seeking to use different data sources effectively. CalcuLink can read data from any number of source devices, including control systems, meters, or data historians. It performs additional custom calculations (aggregates, statistical results, engineering performance calculations including thermodynamics, etc.) and writes the results to any number of destination devices such as mirrored regional energy markets, data historians, open-source repositories, time series databases, and more.

CalcuLink acts as the bridge between numerous data sources, reading and writing data accurately, securely, and in the most relevant context in real-time. The software can be installed, configured, and provide calculations and connections between nearly any historians or data systems within days.

Remote Monitoring Service

Add our Experts to Your Team

Your Trusted Partner in Real-Time Equipment Health Monitoring

ECG now offers Remote Monitoring of critical process equipment by experts in the industry. We have partnered with several industry experts to provide this service at a reduced rate. ECG provides the Predict-It software, and our partners provide the experienced plant personnel who have the critical experience to provide Expert Level Remote Monitoring Service. Our solution is a cost-effective alternative to expensive and difficult to staff plant teams and Monitoring & Diagnostic Centers.

Remote monitoring can enable your operations to increase up-time and support Condition-Based Maintenance (CBM) strategies, which save resources and dollars. ECG can also customize the Remote Monitoring Service to specifically focus on the assets in your plants that you need to improve the reliability and control O&M costs.

ECG's Remote Monitoring Service will enable the transformation of your maintenance approach from reactive to predictive, thus protecting your assets and positively impacting your bottom line.

Equipment Health Monitoring Services

- Biweekly alarm and event reports issued to customer
- Diagnostic troubleshooting recommendations provided
- More diverse and comprehensive coverage compared to similar services
- Standard weekday coverage and 24/7 follow-the-sun coverage
- Ad-hoc Expert services available
- Unit startup and shutdown services included

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