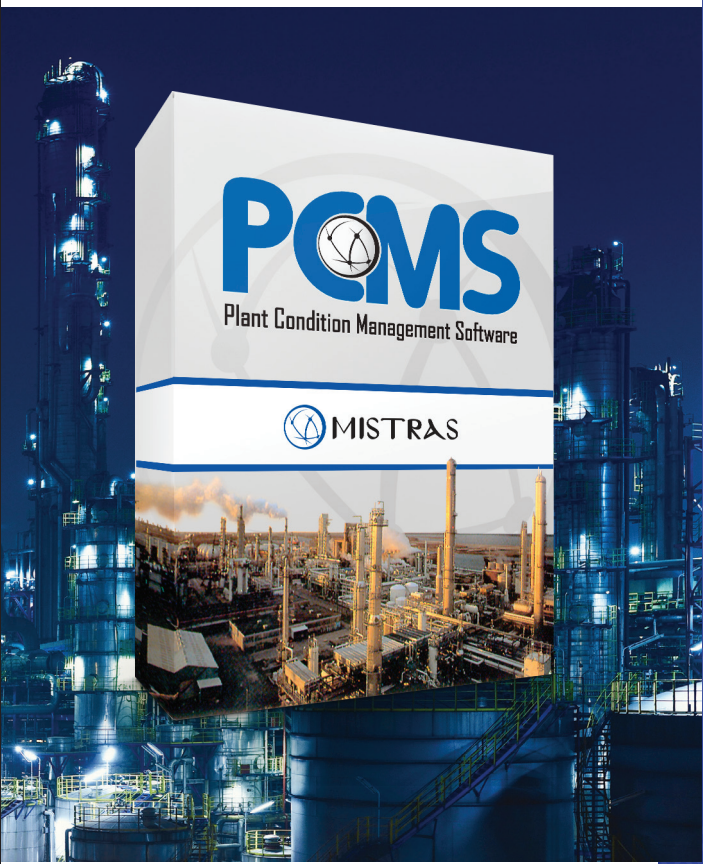
PCMS

PLANT CONDITION MANAGEMENT SOFTWARE



MOBILE DEPLOYMENT

PCMS is a ground-breaking leap forward in creating a mobile inspection foundation. Partnering with PK Technology, a leader in the oil & gas inspection industry, PCMS' mobile deployment capabilities satisfy the needs of a changing world, in which information must be accurate, timely, and omnipresent.

PK Technology's intelliSPEC™ was the first iPad-based data collection and inspection management system in the oil & gas industry. The MISTRAS-PK partnership merges the strengths of each company: MISTRAS' advanced, widely-used mechanical integrity software combined with PK's intelliSPEC software and years of experience in mobile technology development.

Reciprocal Data-Sharing Across Platforms

The use of mobile inspection technologies effectively standardizes, streamlines, and ensures the accuracy of collected inspection data. The mobile platform interconnects all field and database communications, creating a flow of information to and from technicians & operators.

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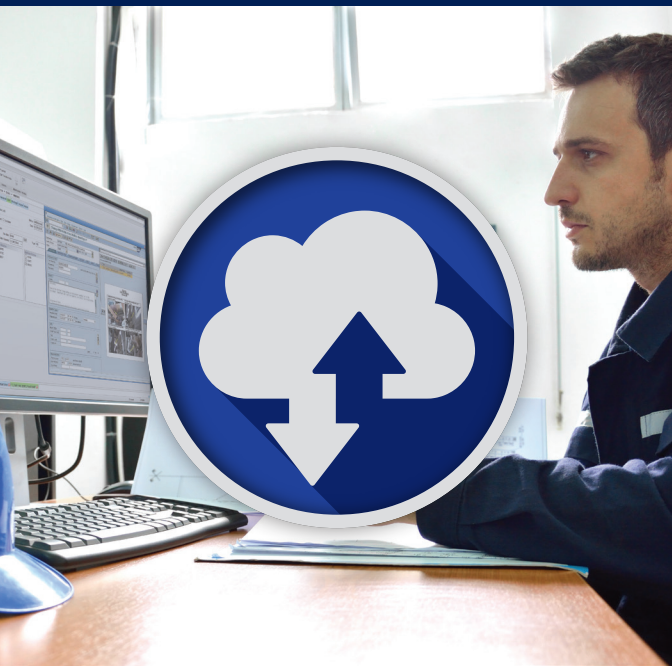
As an inspection need becomes apparent, PCMS operators send a file to technicians' intelliSPEC-enabled tablets, alerting them of the equipment's location and type of inspection required. Technicians complete the inspection and relay real-time data and images directly back to PCMS, using pre-populated question and answer forms which guarantee consistent reporting between inspectors.

Value of Mobility

PCMS' mobile inspection capabilities optimize inspection efficiency and maximize information accuracy. Eliminating the need for manual data entry provides realized value in the form of:

- Reduced data entry errors and duplicates
- Real-time inspection results for timely, well-informed decisions
- Standardized reporting to foster company-wide consistency
- Real-time identified problems with key performance indicator (KPI) dashboards
- Immediate notifications of identified safety issues

SOFTWARE AS A SERVICE (SaaS)



PCMS offers a commercial hosting solution of the PCMS suite through an online cloud environment, or Software as a Service (SaaS).

For clients with limited on-site IT infrastructure or personnel, a software subscription offers PCMS' full benefits, with no need to purchase hardware or software, or dedicate resources to manage the platform. For larger facilities, a PCMS SaaS model supports various areas of an MI program, including inspection management, Risk-Based Inspection (RBI), and Key Performance Indicator (KPI) development through the PCMS Business Intelligence (BI) platform.

The platform is scalable to fit a growing operation's needs. MISTRAS personnel implement and manage the platform, providing technical support & keeping systems up-to-date with new PCMS updates.

SaaS offers access to file sharing and real-time collaboration. The platform is compatible with any mobile device, allowing operators to manage their facilities no matter where they are.

TRAINING & IMPLEMENTATION SERVICES

A proper software implementation is the centerpiece to a sound mechanical integrity program. The MISTRAS Implementation Team provides a variety of services to support specific program initiatives.

Our staff understands the challenges that companies face in executing a proper implementation strategy, and we provide knowledgeable resources and the tools to help achieve program milestones and goals in an efficient and timely manner.

Training and Consultation

- Implementation Consultation
- Program Instruction
- Data Analysis
- Reporting
- Business Intelligence Tool Implementation & Consultation
- Administrative Training
- Risk-Based Inspection (workshop-class format)

Data Services

- Data Conversions
- Database Optimizations
- Report Writing
- Data Entry

FIXED EQUIPMENT

As PCMS has grown over time, it has extended its reach to more and more applications, assets, and facilities. But the software has built its unmatched industry reputation through proven successes in fixed equipment MI data tracking.

PCMS offers data management applications for piping, vessels, safety relief devices, valves, tanks, and more. The program tracks inspection information, including when recent inspections were completed, and generates schedules for future dates.

Automated monitoring solutions can be integrated into the software for real-time trending graphics, simplifying asset integrity and corrosion management and keeping operators informed.

Our embedded RBI calculators analyze the inherent risk in fixed asset operations in terms of probability of failure and consequence of failure. Having all of this information centralized through a single interface allows operators to more effectively plan maintenance strategies.

PCMS OVERVIEW

MISTRAS Group Inc.'s Plant Condition Management Software, or PCMS, is the industry's most experienced integrated database management system (IDMS), specializing in asset integrity, corrosion, and inspection data management.

PCMS has gone through decades of development with industry giants. Originally designed by BP to track piping wall thickness measurements, MISTRAS has expanded PCMS by working directly with its users to tailor it specifically for the industrial process industries. With the substantial weight of MISTRAS' resources and industry experience behind it, PCMS has grown into an integrated, central database for all of a company's mechanical integrity (MI) data.

PCMS stores, organizes, and analyzes MI information from all of an organization's facilities and equipment, and it links that information across any technology platform. From phone to tablet to computer, from plant to headquarters, PCMS acts as both the highway and the warehouse for MI data management.

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Most importantly, PCMS assists facility operators in budgeting and planning long-term maintenance strategies. It enables problems to be identified before critical failures occur, limits repair costs, and helps to reduce unplanned shutdowns.

PCMS is utilized in a variety of industries, in facilities located across the world. With its ever-expanding implementation and massive array of data management capabilities, PCMS has proven itself as an MI program cornerstone.

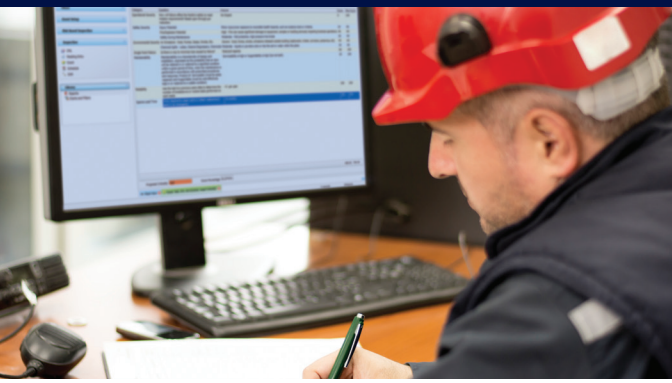
PCMS Applications

- Complete Asset Tracking & Analysis
- Corporate & Site-Level Business Analytics
- Integrated Risk-Based Inspection (RBI)
- Comprehensive Inspection Tracking & Analysis
- Inspection & Turnaround Planning
- Corrosion Analysis & Trending
- Safety Relief Valve Management

Industries that implement PCMS

- Downstream/Refining
- Midstream/Pipelines
- Upstream/Exploration & Production/Offshore
- Renewable Fuels
- Chemical
- Power

ROTATING EQUIPMENT MODULE



In tandem with Asset Performance Technologies (APT), PCMS offers a full library of rotating equipment failures that can be embedded into PCMS, making the Reliability-Centered Maintenance (RCM) process easier.

The Asset Strategy Library (ASL) contains over 700 equipment types, 49,000 failure mechanisms, and over 4,000 predictive maintenance tasks, so it helps find a solution for any equipment problem.

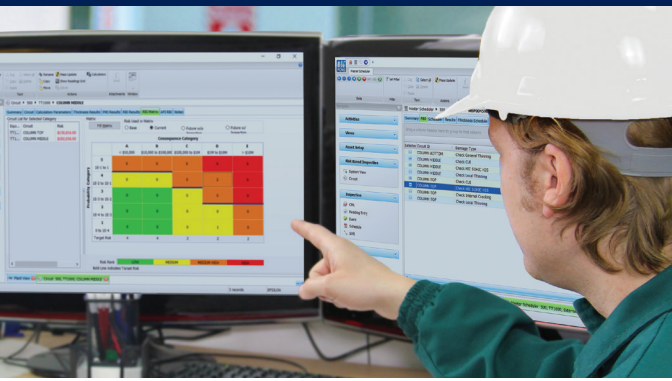
The key to the system is Failure Modes & Effects Analysis (FMEA), in which all equipment components are measured against similar products and processes elsewhere in the ASL.

The module provides FMEA tables to analyze thousands of potential problems, keeping facility operators informed about when maintenance is necessary, consequences of failure, and recommended actions to mitigate risks.

The "Event Group" function categorizes Event Types, streamlining maintenance scheduling by breaking events down into subcategories, including:

- Planned Maintenance, such as a reminder to change lubricant/grease bearings
- Predictive Maintenance (e.g. Oil Analysis)
- Condition Monitoring (e.g. corrosion monitoring)
- Time- and Risk-Based Inspections

RISK-BASED INSPECTION MODULE



MISTRAS and The Equity Engineering Group (E^2G) joined forces to enhance PCMS' Risk-Based Inspection (RBI) module. E^2G's Damage Plus software and API 581 RBI technology were integrated into PCMS, merging extensive RBI databases into a fully-integrated, one-stop RBI management system.

Design, operation, and inspection data from PCMS continually feed into the RBI calculator, providing a true evergreen approach to RBI management.

Semi-Quantitative and Quantitative RBI
The API 581 RBI calculator embeds directly into PCMS, allowing users to maintain inspection data and perform RBI analysis all within one software program. The calculator can also run in the background, with no need to interrupt typical user operations.

Qualitative RBI
In addition to developing inspection schedules based off damage mechanisms and risk ranking, this module incorporates E^2G's extensive background in the application of RBI principles to pressure relief valves (PRVs).

Imported RBI
PCMS can integrate RBI analysis results from 3rd-party RBI tools directly in the program. Users can also export any PCMS data needed to perform RBI outside of the program (design, operation, inspection grades, corrosion rates, etc.).

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Damage Plus Software
Based in API 571 and WRC 489, this E^2G tool sorts user-specified criteria to identify potential damage mechanisms that could be affecting equipment, and helps users decide on the most appropriate inspection methodology.

BUSINESS INTELLIGENCE ANALYTICS MODULE

PCMS Business Intelligence (BI) is a web-based analytical tool that is integrated within the PCMS product. With PCMS BI, all of an organization's data, from a single site to a corporate-wide deployment, report back to an integrated dashboard. This places advanced, comprehensive, user-friendly data in the hands of a variety of users, from unit inspectors to corporate executives.

PCMS experts implement the BI tool through either on-site or cloud deployment. The PCMS team will work with clients to tell them what data is most relevant to their facility, and can implement requested metrics or client-built metrics into the dashboard.

The tool is useful for both small and large organizations—even those companies with a smaller number of equipment assets still need the same kinds of information as larger plants, if not at the same scope. BI analytics are compatible with both PCMS and non-PCMS based facilities, so corporate leaders can view the data they need on any of their plant's equipment conditions.

Data Integration and Visualization

The PCMS BI tool transforms all of an organization's disparate raw data into interconnected, smart, interactive data illustrations. The tool offers rich visualizations of analytic

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metrics, all of which can be broken down and displayed at both individual site and corporate-wide levels. Examples of available metrics and predictive analytics include:

- Site and Corporate equipment implementation and compliance reporting
- Comparative analyses between facilities & sites
- Plotting of metrics on integrated maps
- Detailed corrosion analysis
- Risk-based analysis and trending
- Resource planning
- General data snapshotting and trending analysis

The BI tool's automated and self-service data-storytelling capabilities allow operators to share discoveries and insights with their peers as often as they wish.

MAINTENANCE MANAGEMENT LINK & SOFTWARE INTERFACING MODULES

PCMS is dedicated to centralizing data management, and that means integrating seamlessly with the programs that facilities already use.

PCMS interfaces with Maintenance Management Systems including SAP, MAXIMO, and EMPAC, and with many common software programs, like Microsoft Office and UT instrument and drawing interfaces. This allows users to reduce data entry, link inspection and maintenance processes & track all information from one application.

Through the Maintenance Management Link Module, PCMS sends and receives work order notifications, info, and confirmation data. Data changes propagate to PCMS as they occur in the user's maintenance system.

The Software Interfaces Module offers similar integration features, including:

- **Drawing Interface:** a live dynamic link to AutoCAD and Microstation applications
- **UT Instruments (Dataloggers):** links to a variety of inspection instruments, including Krautkramer, Panametrics, Olympus, and PAL (MISTRAS Group)
- **Data Transfer:** connects to Microsoft Word, Excel, and Access. Data can be imported and exported to/from these applications to streamline PCMS data population
- **Valve Shop Link:** The PCMS Valve Shop Link electronically imports Valve Test Repair data populated by a valve shop vendor directly into PCMS.

CORROSION MANAGEMENT MODULE

The Corrosion Management Module has been the foundation of PCMS for decades. The module allows plant personnel to track wall thickness, corrosion rates, upcoming inspection dates, and retirement dates on any type of asset.

The patented risk and corrosion calculators analyze thickness data, which is subjected to 20 different test-case scenarios, to determine the critical dates for each Condition Monitoring Location (CML) and corrosion circuit.

The Corrosion Management Module also integrates with the Risk-Based Inspection (RBI) calculator in PCMS. All corrosion data is seamlessly fed into the RBI calculator providing the user a true evergreen RBI analysis. PCMS offers a variety of methods to set up inspection areas and capture corrosion data, including:

- CMLs
- Thickness Monitoring Locations (TMLs)
- Corrosion Probe Readings
- Corrosion Coupons

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Additional Corrosion Management features include:

- Calculates average rates of corrosion per circuit as well as adjusts rates per statistical scenarios
- Provides statistical adjusted rates based on inspection exposure and reliability of data
- Evaluates corrosion circuit data to determine proper circuitization
- Analyzes inspection frequencies to determine proper inspection intervals
- Calculates estimated thickness based on any user-supplied future date
- Takes safety factors into account and adjusts corrosion rates based on location, human hazard, flammability, and data confidence
- Flags data anomalies, alerts the user, and bypasses anomalies in corrosion calculations

ACTIVITY TRACKING MODULE

Typical activities tracked in PCMS include:

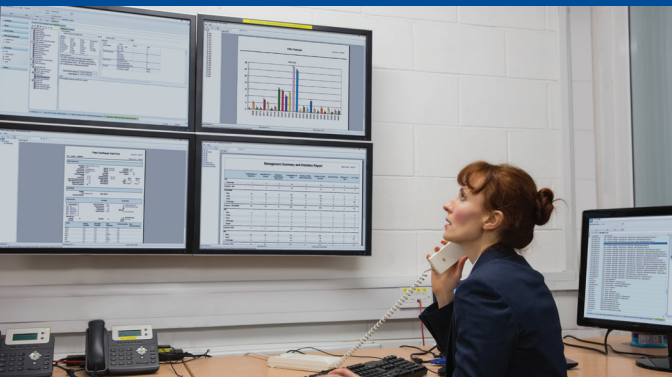
- Visual Inspections (Internals/Externals)
- On-Stream Inspections
- Management of Change
- Failures
- Valve Test Repairs
- Maintenance Requests

Document Manager
Allows any type of inspection record to be centrally-managed within PCMS, including pictures, Word documents, .PDFs, Flash, videos, and more.

Report Template Builder
Pre-defined inspection checklists can be configured per equipment type, asset, or specific inspection activity.

Maintenance Tracker
Inspectors can enter any pre- or post-inspection item along with info for maintenance personnel to review, including work priority, completion date, constraints, and narratives.

REPORTING MODULE



PCMS provides a high level of flexibility in reporting solutions. Users have the option of leveraging canned (pre-built) reports, internal PCMS report writers for ad-hoc reporting, or 3rd-party report writers such as Crystal Reports.

Reports in the program have flexible filter and search criteria, can be saved in a variety of file formats, and can be emailed directly out of the application.

No matter what tool is used, all reports can be loaded onto the PCMS Report Menu through the Report Organizer. The menu is customizable and security can be enabled to control who can view or edit reports within the menu. Users can also create a "My Reports" tab for reports specific to an individual.

ASSET MANAGEMENT MODULE

PCMS stores design, operating, and process parameters for all fixed and rotating equipment, eliminating the need to manage multiple data sources. The software incorporates a Graphical User Interface (GUI), providing a user-friendly method to quickly locate assets and navigate the system.

The program also offers features to support daily asset data management, including a full asset tracking mechanism, relief valve correlation to particular process equipment, and incorporation of the latest industry codes and standards.

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