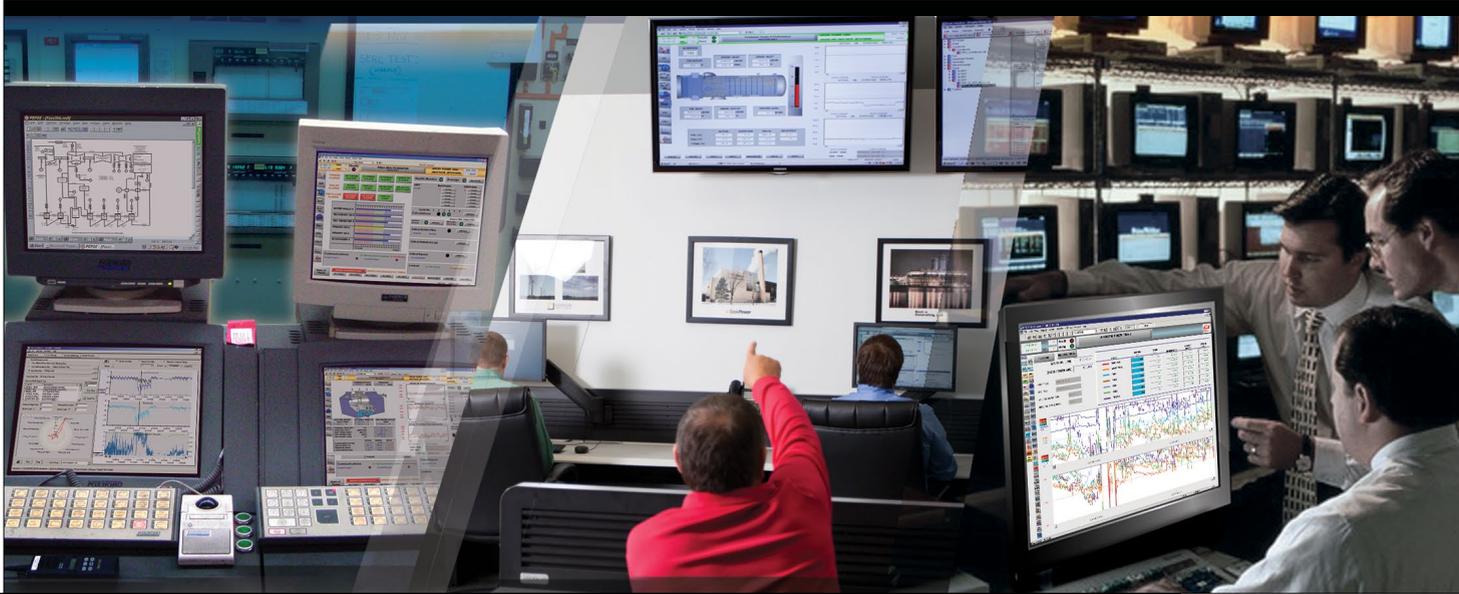




Integrated Plant Solutions for Smarter Power Generation



FAMOS™

Fleet Asset Management and
Optimization Solutions

The Power of Integrated Support



Your partner for performance and reliability improvement

Over 500 fossil, nuclear, combined-cycle and simple-cycle plants worldwide have partnered with Curtiss-Wright to increase the efficiency, safety and profitability of their operations.

Curtiss-Wright's FAMOS suite of products is built on more than 30 years of power industry experience. Combining domain expertise with advanced technology the suite is an integrated solution for analyzing and optimizing plant performance, improving equipment reliability and plant availability. It dependably monitors and detects problems and accesses vast amounts of plant data, anchoring a plant with operational excellence.

By changing the way information is assimilated, and by presenting it in a clear, visual manner, plant engineers and operators hold the key for avoiding performance malfunctions, improving plant safety and leveraging other condition monitoring investments.

Only the FAMOS suite of products can provide all of these benefits to users

1. Flexible, Integrated Performance Solutions

The FAMOS suite is a cost-effective solution and a way to avoid the complication of third party add-ons. At the same time individual components can be installed separately, with the option of adding other applications as your budget and needs dictate.

2. Critical Information Accessibility

Fleet profitability and performance are enhanced through unified applications that create more accessible and identifiable information for driving business decisions.

3. Robust Data Mining and Validation

Access to accurate and reliable metrics increases your overall plant efficiency and profitability.

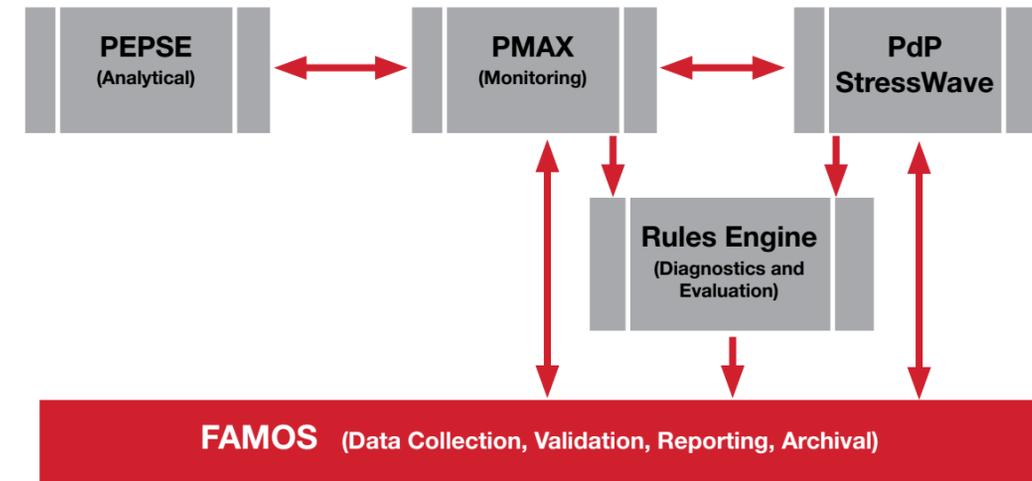
4. Quick Diagnosis and Corrective Action

Early detection, analysis and correction of problems with predictive pattern recognition and automated diagnostic rules that raise proactive alarms, while identifying the cause of problems and providing corrective actions.

5. Proactive Communications

Engineers, operators and management receive the early warning and necessary information they need to identify and respond to problems before degraded performance or equipment failure occurs.

The FAMOS Suite of Product Solutions



The link between plant efficiency and your carbon footprint

FAMOS Helps Reduce a Plant's Carbon Footprint

Increasing the efficiency of a power plant has a direct impact on lessening its CO₂ emissions. No doubt, the reduction of CO₂ and carbon footprint have become pressing issues. Using FAMOS, plants have a solution that decreases fuel cost per KW while addressing environmental concerns.

FAMOS Provides a Condition Monitoring Edge

FAMOS is the premier Performance Monitoring System (PMS) – delivering the calculated performance indicators a plant needs to drive efficient operation.

Other systems designed to optimize plant efficiency have been shown to decrease user confidence due to inaccurate or faulty inputs of pressures, temperatures and flows measured at the plant.

FAMOS ensures that the plant inputs feeding the PMS are accurate through its input validation module, which can include advanced pattern recognition expected conditions. This assures that operators are confident in making the required adjustments for optimizing plant performance.



FAMOS Guides Plant Operation With Consistent, Reliable Data Inputs

When a plant is operating at peak efficiency, guided by advanced pattern recognition, data validation and accurate performance indicators, the amount of fuel needed to produce a KW is reduced – and so is the carbon footprint. Payback is usually six to nine months.

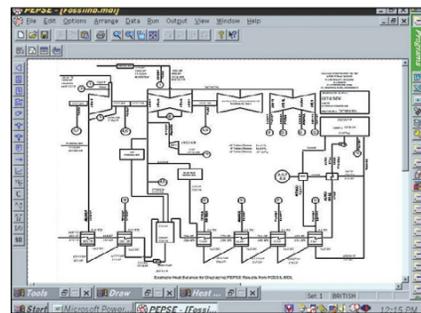
FAMOS applications are connected at the software development level

This ensures that beyond cost-effective application integration, users have the assurance of data continuity and accuracy across the system.

How the FAMOS applications work together to provide a total solution

PEPSE

PEPSE is the industry standard first principle, steady state, energy balance application to analyze an entire plant or individual equipment components. Users can conduct “what if” studies to evaluate potential efficiency improvements and perform many engineering analyses that will detect abnormal operating conditions and lower plant operating costs.



PEPSE is user-friendly with drop-and-drag icons for modeling, and easily understood visual data for driving improved performance.

PMAX

Installed on more nuclear generating stations than all other performance systems combined, PMAX is bringing efficiency to over 300 fossil, nuclear, combined-cycle and simple-cycle units throughout the world.

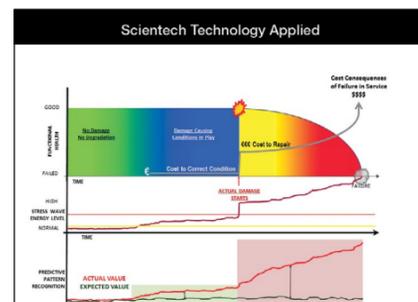


PMAX is saving users millions of dollars in operating and maintenance costs by arming operators with the tools they need to reduce heat rate and find “lost megawatts.” These efficiencies in turn improve plant performance and reduce a plant’s carbon footprint.

StressWave

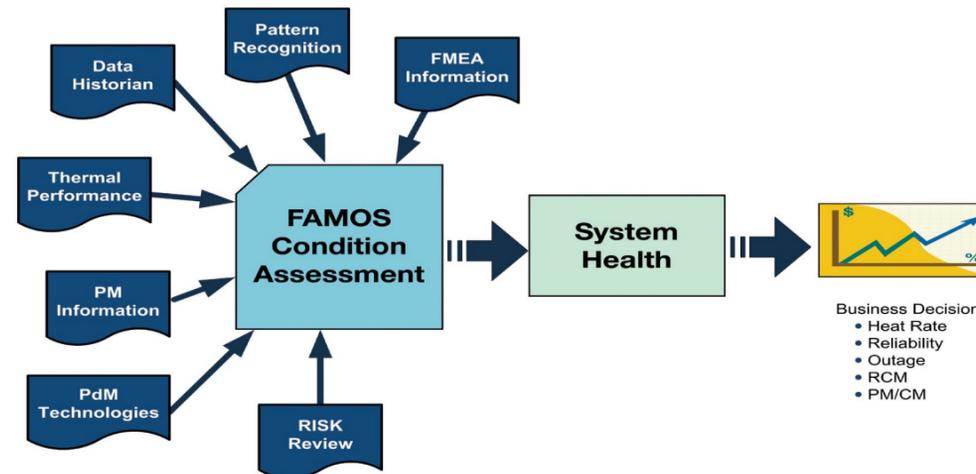
StressWave Energy analysis provides proactive “health” information on process equipment such that operating conditions are not allowed to progress to premature degradation, damage and failure by focusing on the ultimate root cause of all failures – friction and impacts.

StressWave energy analysis can be thought of as an advanced vibroacoustic method for monitoring structural energy. It differs from traditional vibration-based methods in that it does not require the external surfaces of the structure to be shaking for data to be acquired. Rather, it filters out and ignores the relatively low and audible frequency shaking and “listens” for the much higher frequency StressWave pulses inside the structure which are generated by friction and impact events.



PdP

This real-time, advanced pattern recognition monitoring application utilizes existing data signals available through installed DCS systems, historians, and other monitoring systems. The signals available from these systems feed the PdP application in order to detect abnormal operating conditions. PdP’s early identification of anomalies means potential catastrophic failures can be avoided by scheduling repairs and averting costly unplanned shutdowns.



R*TIME

R*TIME provides fast, reliable real-time data retrieval, processing, presentation, and reporting along with a powerful archival program. This nuclear and fossil power industry-proven system is scalable from a few tens of channels to tens of thousands of channels. Real-time and historical data are readily accessible through icon and pulldown menus. Interfaces to hundreds of industry protocols and hardware support simple and proven connections to virtually any system or software in the industry. Other easy-to-use features include point-and-click to select data points, and simple poke points to view displays and trends.

This powerful system software is complete with tools for creating color graphic displays with trends (time, x-y and bars), alarms, logs and message files.

Rules Engine

The robust Rules Engine works across the FAMOS suite. It is fully integrated with all of the applications and will provide automated and comprehensive evaluation of factors contributing to loss of efficiency and reliability at the component, system, plant, and fleet levels. This diagnostic and decision support software enables better business decisions using the real time condition of the plant and fleet assets. The Rules Engine works by transforming the domain expertise of subject matter experts into an actionable system of reasoning. Decision tree analysis is merged with a library of diagnostic expertise – including real-time DCS data, manually collected diagnostics and disparate business system information and FAMOS results – to provide a coherent assessment of component health and system performance.

The Rules Engine can also facilitate knowledge capture regarding manpower shortages and the aging workforce.

Curtiss-Wright's M&D Center's services can improve a plant's performance and bottom line



Curtiss-Wright's FAMOS products can directly address fleet monitoring requirements. All FAMOS products can be easily deployed on a central server facilitating further improved data processing. A centralized deployment approach can optimize resource utilization while still enabling and empowering local maintenance and operating practices, leading to realization of a fleet-wide strategy aimed at improved performance and proactive condition monitoring.

Whether the FAMOS products are deployed at the utility, or a customer takes advantage of Curtiss-Wright's remote monitoring services, applying a centralized approach to the applications' usage can provide additional value for return on investment in applying these technologies.

Features that further enhance a plant's investment in FAMOS

A common software development model ensures reliability of the system and integrity of information as well as producing fast processing and response times.

Condition monitoring – FAMOS addresses the utilization of enhanced condition monitoring technologies to improve asset optimization at power generating facilities and report on the health of the power plant. Key performance indicators, fuel and maintenance costs are reduced to achieve economic dispatch of fleet resources.

Flexible installation options – Curtiss-Wright supports deployment of the whole FAMOS suite, as well as incremental installations designed to address current needs or budgets.

Fleetwide installation – Enables broad strategic planning and management oversight, while local operators and engineers drive plant performance.

Technical support excellence – All FAMOS products are supported by a technical staff that assumes ownership for helping you manage the chosen solution.

Expertise for addressing obsolescence – The experts behind FAMOS products have an understanding of legacy systems and can support the need to address potential challenges posed by maintaining older hardware and securing spare parts. Our ability to help you meld the old with the new provides a cost-effective way to optimize plant performance.

Graphical tools – Includes consistent interfaces and iconography across applications which serve to improve operator efficiency, decrease training time, encourage implementation and broaden the use of the system.

Central server or site utility deployment – Individual needs are served either through the use of Curtiss-Wright's centralized remote monitoring service, or by a site hosting its own.

Conferences and seminars – We invite FAMOS customers to attend an annual symposium, that includes technical papers, tutorials and “hot topic” workshops.

Curtiss-Wright's M&D Center for Full Support

We further enhance our customer support through a remote Monitoring and Diagnostic Center that can routinely and efficiently monitor performance and condition of clients' plants.

As plants are forced to reduce staff and/or limit on-site engineers, outsourcing becomes a viable alternative. Curtiss-Wright provides unparalleled outsourcing support, including trouble shooting and diagnostics using our FAMOS applications.

Consulting Services

Curtiss-Wright can provide full consulting services in all aspects of plant performance and implementation of the FAMOS applications, including thermal performance assessments, systems integration studies, system and equipment trouble shooting, reliability assessment and improvement analysis, and risk informed asset management. Our consulting can support your existing Key Performance Indicators (KPI) or we can help develop new KPIs for you. Curtiss-Wright can also build custom interfaces to your existing business software.

Other areas of Curtiss-Wright expertise

- Workforce planning
- Risk assessment
- Reactor and steam generator servicing equipment and services
- Chemistry quality control software and services
- Plant process computer replacements
- Thermal performance and safety monitoring software
- Procedures/electronic procedures
- Training services
- Work management systems
- Hardware solutions for obsolete instrumentation
- Access processing
- Supply chain solutions
- Licensing and regulatory compliance

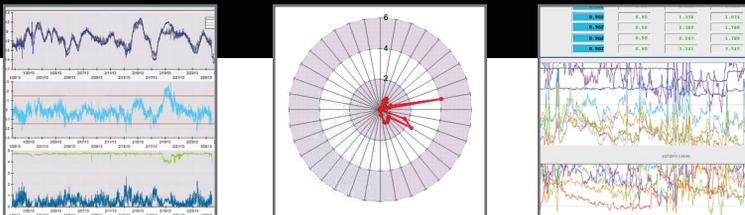


Training

Curtiss-Wright has extensive experience in all phases of training program development and implementation; from analysis and development to classroom and simulator presentations. We have developed and standardized thousands of procedures, each incorporating the best practices and technology currently available. In addition, training courses are regularly offered at our offices and can also be provided at client facilities upon request.

Delivering Solutions to the Worldwide Power Industry

Curtiss-Wright is a global engineering, manufacturing and service company. In addition to its other services, Curtiss-Wright provides plant process computer, digital control, and annunciator systems; thermal performance software; regulatory information databases and services; nozzle dams and installation services; reactor and steam generator specialized tooling; under-vessel BWR services and equipment; inventory database services (RAPID, OIRD) and supply chain analytics; probabilistic risk assessment (PRA) services; repair, refurbish and reverse engineered I&C services; power supplies; security and access authorization software; mobile technology applications; and equipment reliability solutions. We are committed to the safe operation and improved performance and reliability of power plants worldwide.



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