



Energy Management Suite

The All-in-one Solution for Optimal Power Plant Operations

These days, the power generation industry finds itself torn between conflicting legal, social and economic challenges: deregulation and unbundling, tightened environmental rules and the necessity to reduce and manage emissions. Power plant operators are expected to deliver reliable power in spite of rising fuel, maintenance and labor costs. The complexity of IT landscapes continues to increase. A lack of integrated systems leads to manual information retrieval processes. These repetitive processes are time-consuming and costly, often resulting in information gaps and out-of-date reporting.

With the help of the Siemens Energy Management Suite (EMS), power generating companies can greatly improve their processes on all levels and gain access to key operational information on a timely basis. This efficient and forward-looking solution assists power generation companies to address the challenges of today's business environment with leading-edge technologies specifically designed for power generation.

Daunting challenges for power plant operators

Mature energy markets are characterized by market interventions such as deregulation and unbundling, strict supply agreements and fluctuating fuel costs. IT landscapes are more complex than ever before, yet integration of data and information from the fleet to the business remains elusive. In particular, the flow of information between medium- and long-term asset management systems and day-to-day operational information is inadequate in today's business environment.

In many cases, periodic and ad hoc reports are prepared manually, greatly adding to the cost of acquiring, aggregating, and validating data from multiple systems. Power plant operators are facing a growing shortage of skilled personnel as our aging work force prepares for retirement. New solutions are needed to secure corporate knowledge and experience which will be needed in the future.



The situation is quite comparable in emerging markets, with the additional complication of high growth rates that demand rapid expansion of generation capacities. This not only sets high standards for dependable capacity planning but also increases demand for skilled personnel and job training programs for individuals entering the profession. Modern IT systems offer maximum support and operational safety with minimum training time and cost. The issues include manageability of fast-growing multi-vendor I&C and IT landscapes, including the replacement of manual, paper-based procedures with ERP software and IT solutions for production monitoring.

Your requirements

Power plants must meet these challenges to remain competitive in the current market conditions. An innovative, enterprise-wide, flexible solution able to address multiple requirements coming from different corporate sectors, provides the help needed:

- Operations management is primarily interested in timely, reliable information. Current production figures need to be correlated with key performance indicators (KPIs) to enable sound decision making
- IT management wants to offer integrated solutions to users in order to accelerate and streamline corporate processes throughout the organization and simultaneously reduce time and costs
- Reliability management aims at optimizing repair operations and reducing their costs. To accomplish this, access to timely and accurate information describing plant and component status is essential. Manual processes should be automated as far as possible

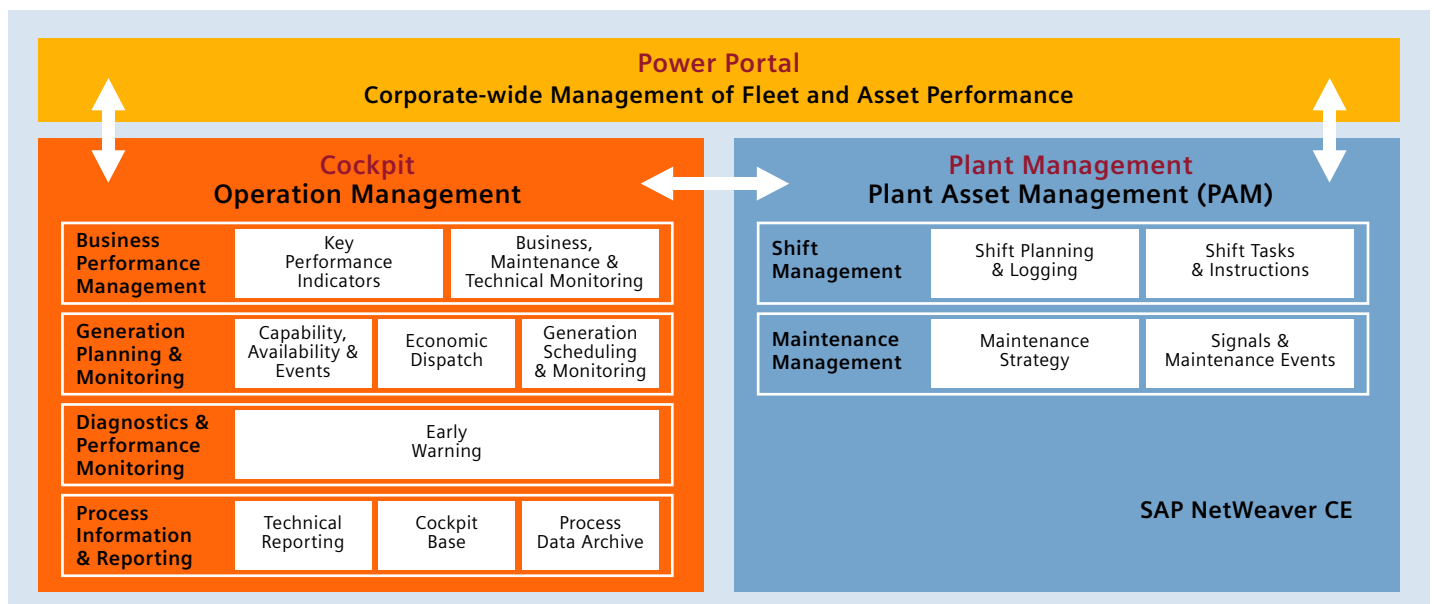
The Solution: Siemens Energy Management Suite

The Siemens Energy Management Suite (EMS) is Siemens’ fundamental answer to the challenges power generation companies face today. It enables the

streamlining of processes on all relevant levels and helps maintain and strengthen competitiveness under adverse conditions.

Siemens Energy Management Suite (EMS) can also be used as an integration platform. This allows EMS to integrate with existing applications providing access to data not readily available previously. The added functionality of EMS provides functionality and transparency to fleet operations. EMS provides decision makers with access to the information they need – when and where they need it.

The Energy Management Suite’s advanced IT products and solutions provide crucial support for continued profitable operation of power generation plant equipment. Large data volumes are managed and can deliver information to the user community appropriate to their specific role. Near real-time access to data, reporting and graphical displays provide a sound basis for effective decision making.





What Siemens offers you

The Siemens Energy Management Suite consists of a suite of integrated products capable to satisfy all technical, organizational, and business aspects of power generation. In addition, the individual modules are designed in such a way that they can be seamlessly integrated into an existing IT landscape. EMS utilizes a Service Oriented Architecture (SOA) which allows your SAP Enterprise Portal to be used as the single user interface.

1. Cockpit – Operations Management

- **Process Information & Reporting**

There are three modules in this functional area performing the monitoring and technical reporting. The **Process Data Archive** extracts data from the process control and diagnostic systems and stores this information in an easily accessible long-term archive. The **Cockpit Base** collects data from a range of equipment and control systems, displays them graphically and thus provides an overview of the power plant processes at a glance. Data and processed data are stored in a process data archive. Signal values stored in the process data archive are used by the **Technical Reporting** module. The Technical Reporting module includes a series of standard reports templates.

- **Diagnostics & Performance Monitoring**

The Diagnostics and Performance Monitoring system consists of a single module, the **Early Warning System**. This system provides early identification of potential problems on a unit enabling the operator to take corrective action and avoid events. When deviations to normal operating conditions or target

values occur, plant operations personnel are alerted and supplied with detailed information on the deviation.

- **Generation Planning & Monitoring**

Three modules are available to plan and monitor power generation in the most effective and cost efficient way. The **Capability, Availability & Events** module calculates current availabilities and future power output constraints of the generating units and of the power plant as a whole based on maintenance- and repair-data of the generating unit components. Thus, the module provides a rapid overview of the attainable maximum power outputs and availabilities for a predefined time horizon. The **Economic Dispatch** is used to optimize the generating units' operation within a power plant. This is done by allocating the current load request to the individual generating units while allowing for expected load capacities to consider fuel data, heat consumption and efficiencies. Generation resource scheduling is improved from an economic perspective.

- **Generation Scheduling & Monitoring**

enables monitoring of the current generation of the fleet at the power plant level using the operating schedules as a basis. The effects of reduced generation capacities are graphically displayed. This improved information is available as an input when preparing the operating schedules.

- **Business Performance Management**

Performance monitoring collects technical and economic condition information. This information is available as reports and as graphical displays providing insight to the generation planning process.

The Key Performance Indicators

module compares planned values with actual results with reference to availability indicators according to VGB and NERC requirements and thus makes target achievement measurable on scorecards. Deviations are shown and reported and can be traced back to their origins. **Business, Maintenance & Technical Monitoring** is a module used for both economic maintenance monitoring and technical monitoring. It integrates data from the cockpit and other existing systems using standard interfaces. Information is collated and graphically displayed. Should a critical event occur, the Business, Maintenance & Technical Monitoring can be configured to forward the alert via e-mail or SMS.

2. Plant Management – Plant Asset Management (PAM)

Shifts and maintenance need to be organized both effectively and efficiently. The Siemens Energy Management Suite offers two solutions for this purpose:

- **Shift Management**

The solution component **Shift Planning & Logging** was designed and developed specifically to support production shifts in power plants and process plants. In addition to flexible shift planning and supervision, these building blocks enable electronic logging as well as capturing and displaying operational values, shift events and faults. The **Shift Tasks & Instructions** module is used to generate, forward and acknowledge shift instructions and shift orders. Notices are forwarded to the appropriate individual or team for execution. Results of the actions are captured in the log.



- **Maintenance Management**
Maintenance related monitoring of signals from multiple source systems is accomplished by the **Signals & Maintenance Events** module. As threshold values are reached or exceeded, the module enters corresponding shift events in the shift log or automatically triggers repair actions. **Maintenance Strategy** allows maintenance departments to determine their optimal strategy and to document the decisions they make. A customizable graphical decision tree supports decision-making and records the decision criteria. The result is translated into actual work plans.

Years of experience

Siemens IT Solutions and Services successfully implemented the Energy Management Suite in multiple countries over the last several years. Our services include:

- Strategic management and IT consulting
- Development and implementation of projects
- Integration and migration/conversion
- Maintenance and operations
- Application management

How you benefit from working with us

The Siemens Energy Management Suite streamlines the power plant operator's processes on multiple levels delivering tangible measurable benefits.

Production processes improvement:

- Increased equipment availability
- Reduced unplanned outages and capacity flaws
- Enhanced operational flexibility
- High availability of event information and the consequences thereof

For the logistic maintenance and repair processes, the benefits can be found in:

- Reduced maintenance costs
- Minimized frequency of outages
- Shorter repair times

IT processes benefit from:

- Reduced administrative overhead thanks to the portal structure of applications
- Reduced training costs through consistent applications and user interfaces
- Lower cost of the IT landscape

Improved business decision-making:

- Constantly available up-to-date KPIs
- Aggregation and correlation of operational and plant information
- Tailored reporting continuously available

Benefits for your bottom line

All in all, the Siemens Energy Management Suite brings tangible economic benefits to power plant operators. These include more efficient power generation measured in terms of fuel consumption for a specified energy output, reduced maintenance costs per equipment value, optimized deployment of available skilled staff in the maintenance area and significantly reduced administrative overhead. Emissions management and reporting reduce the risk of contractual penalties for service disruptions or excessive emissions.

Siemens – your strong partner for power generation management

Siemens Energy builds and operates energy systems. Siemens IT Solutions and Services offers great expertise in realizing IT solutions. We have a long and successful history supplying the Power Generation industry with products and IT solutions.

Siemens is the world's only company offering a complete product range that spans the entire energy supply chain (generation, transmission and distribution). We combine power plant specific technical know-how with business process expertise and proficiency in the most advanced IT architectures.

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Subject to alteration
Order No.
U29759-J-2401-1-7600
02/2009 | Printed in Germany

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