



SIEMENS

Ingenuity for life

Power Plant Operation and Maintenance Services

[siemens.com/power-generation-services](https://www.siemens.com/power-generation-services)

O&M Portfolio to choose from

Siemens is not only a major component or solution provider in the power plant business, but also a major service provider offering O&M services for your complete power plant.

O&M Advisory

A team of well-trained specialists will advise your team in ramping up the O&M mobilization and in the performance of duties during the commercial operation phase over a period of at least three years. When our specialists leave the site, all necessary processes will be in place, implemented and optimized, and your team should be able to successfully operate and maintain the power plant on their own in the future.

O&M Management

Siemens specialists occupy the key management positions of the O&M site organization and manage your power plant team over a period of at least four years. On-the-job training

is continuously performed to make sure that your team can manage the power plant after our specialists have left the site.

Full Scope Maintenance (FSM)

The comprehensive maintenance package which includes all maintenance activities performed by Siemens for the power plant with a mix of local personnel and a limited number of specialists. The operation-related tasks remain with the owner. This package offers predictable maintenance costs and very limited risks regarding the maintenance of the plant. The equipment covered can be the gas turbine only, the power train or the complete power plant.

An FSM contract can be combined with a complete power plant O&M Advisory in order to support plant operation.

Full Scope O&M

The comprehensive package which includes the complete O&M of the power plant performed by Siemens with a mix of local personnel and

a limited number of specialists. With this concept most of the O&M risks lie with Siemens and you can concentrate on your core business. This contract type typically includes the highest performance warranties.

Depending on your needs, the above services can be offered for the gas turbine, the power train or the complete power plant. All services are fully in line with global power plant best practices and adhere to the highest quality, environmental, health and safety standards, such as ISO 9001, ISO 14001 and OHSAS 18001, since Siemens O&M services are IMS certified.

The above pillars form the basis for the services provided by Siemens and offer a great level of flexibility in order to meet your requirements.

The larger the scope you entrust Siemens with, the more Siemens will be able to manage your assets in an optimal way.

Other individual services you can benefit from

Siemens O&M also offers a range of individual services, which our customers can order independently of our main products. Typical individual services are:

O&M Training

Siemens' Operation & Maintenance Training is a people-driven business. Experienced power plant personnel must be available in all technical areas of the power plant. Competency management and training are key factors in fulfilling this requirement.

A wide range of simulators are available that are remotely connected to your installation for effectively training the operating personnel under almost "live" conditions. Training can be provided on almost every technical topic in the field of gas-fired power, for operations or maintenance personnel. The level of knowledge of the operation personnel can be tested with the established Operator Certification Program.

A dedicated O&M Safety Certificate (O&M tailored EHS trainings) can also be provided. The aim is to have the best people in place to serve the customer's demand the best extent possible.

O&M Audits and Assessments

Siemens O&M offers an audit service, initially developed to continuously review Siemens own O&M teams and

their performance, to analyze and evaluate the performance of management and processes in a power plant.

Seven main elements of your business are analyzed by means of a standardized system in order to identify potential for improvement. The in-depth assessment based on an integrated management system focused on power plant operation and maintenance enables a thorough evaluation of your business. Compliance with ISO 9001, ISO 14001 and OHSAS 18001 is also monitored through this audit.

Siemens O&M also offers external O&M Assessments whose scope is tailored to the customer's requirements. The aim of the assessments is to support the customer in identifying weaknesses and strengths of their organization to allow the customer to further improve his performance.

O&M Global Expert Center

A group of experts is located in our O&M offices in Germany with remote access to all critical information in our O&M power plants. The main task of the Global Expert Center is to solve technical issues as soon as possible to

keep availability of the power plants on a high level, foster regular information exchange between sites and keep power plants informed of fleet problems. With the aid of remote monitoring tools the experts can rapidly understand and analyze the technical problems the power plant is encountering. The experts have access to Siemens Engineering and key subcontractors who can be contacted when required to solve a specific or fleet-related problem.

O&M Asset Management

With the Full Scope Maintenance or the Full Scope O&M, Siemens O&M implements an Asset Management in line with ISO 55.000 to enable the customer to create the highest possible value from his power plant. Therefore, continuous improvement and adaption of the maintenance strategy, operation and the installation itself in line with, for example, a changing market environment or advanced technical possibilities are key factors in ensuring the success of the project. By aligning both the owner's and Siemens' O&M targets, it is ensured that they are always moving forward together to ensure the best possible

performance. Open communication and close cooperation between owner and Siemens O&M is the basis for success.

Computerized Maintenance Management System (CMMS) Implementation

Siemens utilizes an in-house web-based Computerized Maintenance Management System (WebBFS) in all power plants operated by us. This software tool contains various modules for managing the power plant, such as maintenance planning and tracking, shift management, permit-to-work system, parts and consumables inventory management, purchasing and cost controlling. It is a beneficial tool to aid the power plant team in performing their job in an ordered, efficient and safe manner. It also serves to store the historical maintenance data of the power plant. Siemens specialists will set up the system for you and aid you in feeding the required information into the system.

Heat Recovery Steam Generator (HRSG) Inspections

Experience has shown that it is of utmost importance to regularly assess – beside the gas turbines – the steam

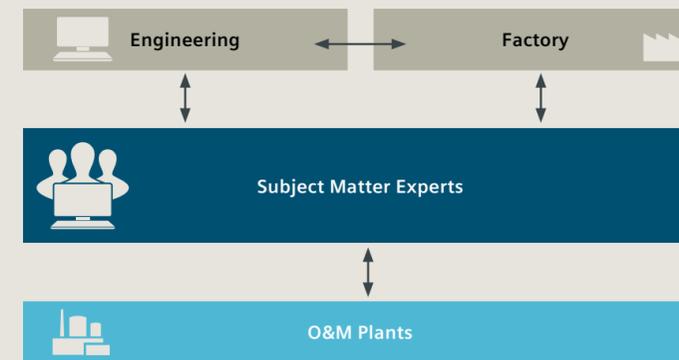
turbines, generators and other important plant equipment. Siemens O&M has developed inspection programs to monitor the condition of the HRSGs during minor and major scheduled outages of the power plant. Through these inspections technical issues of the HRSGs are detected at an early stage and mitigation strategies are available to avoid further deterioration of the equipment, keeping availability high and the maintenance costs on a low level.

Document Management System

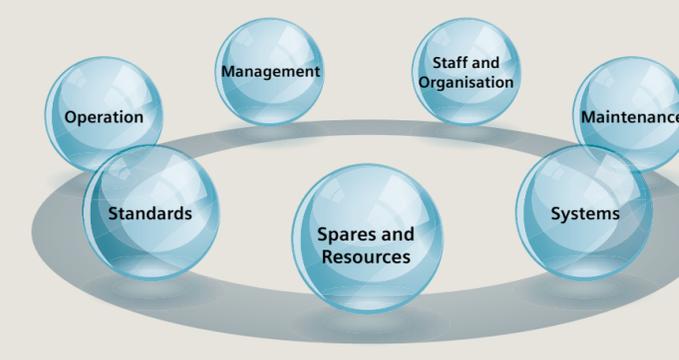
Siemens has developed a document management system for power plant documentation named Tecdocpower. It is a web-based tool to facilitate the management of power plant documentation with access from different locations. The documentation within the system is structured using an intuitive interface and reflecting the outline of the power plant and its equipment. It is linked to the CMMS and an important tool for power plants to assure orderly storage of documentation and rapid access to information when and where required.



O&M Portfolio



O&M Global Expert Center



Elements of O&M Audit



Modular Maintenance Management System

With more than a century of service to the power generation industry, Siemens brings its tradition of experience, quality and expertise to every project. As one of the world's largest combined cycle power plant operators, our operation and maintenance (O&M) fleet experience totals more than 26 gigawatts worldwide with customers on five continents.

Whether you are an independent power producer, a public utility or a manufacturer producing your own power, Siemens O&M can help you boost your operating efficiency, reduce downtimes, mitigate your risks, widen your competitive edge, maximize your performance and increase the profitability of your assets.

Our O&M portfolio ranges from individual services to an all-inclusive long-term operation and maintenance program. We can tailor the contract scope to your individual requirements.

Benefits of Operation & Maintenance Contracts



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