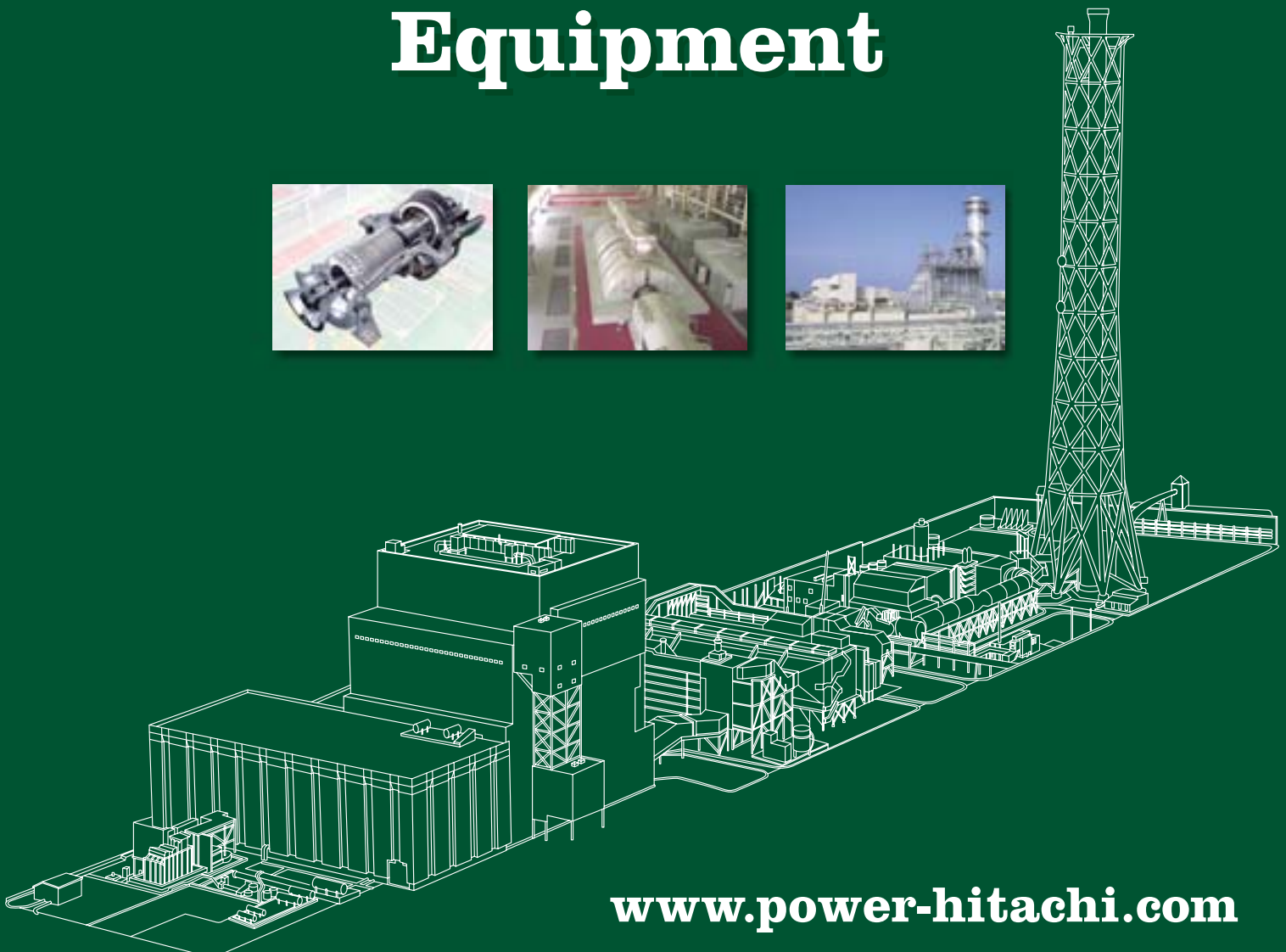




Thermal Power Plant Equipment

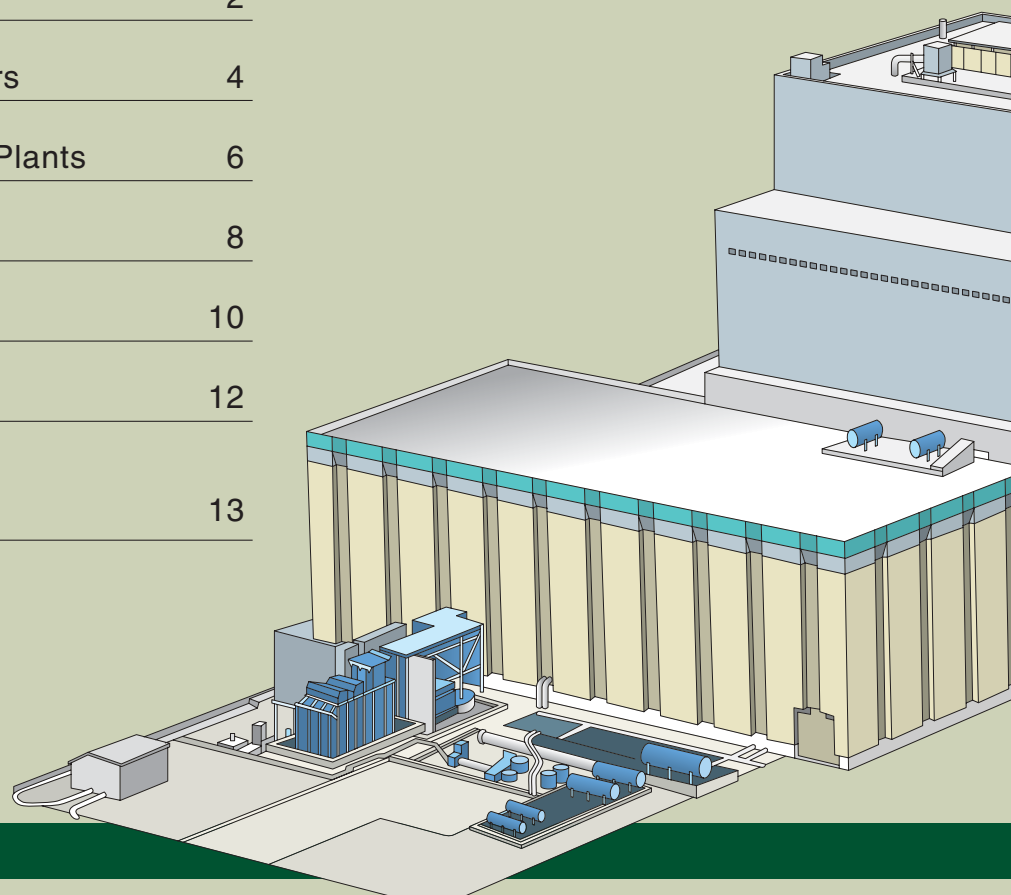





Thermal Power Plant Equipment

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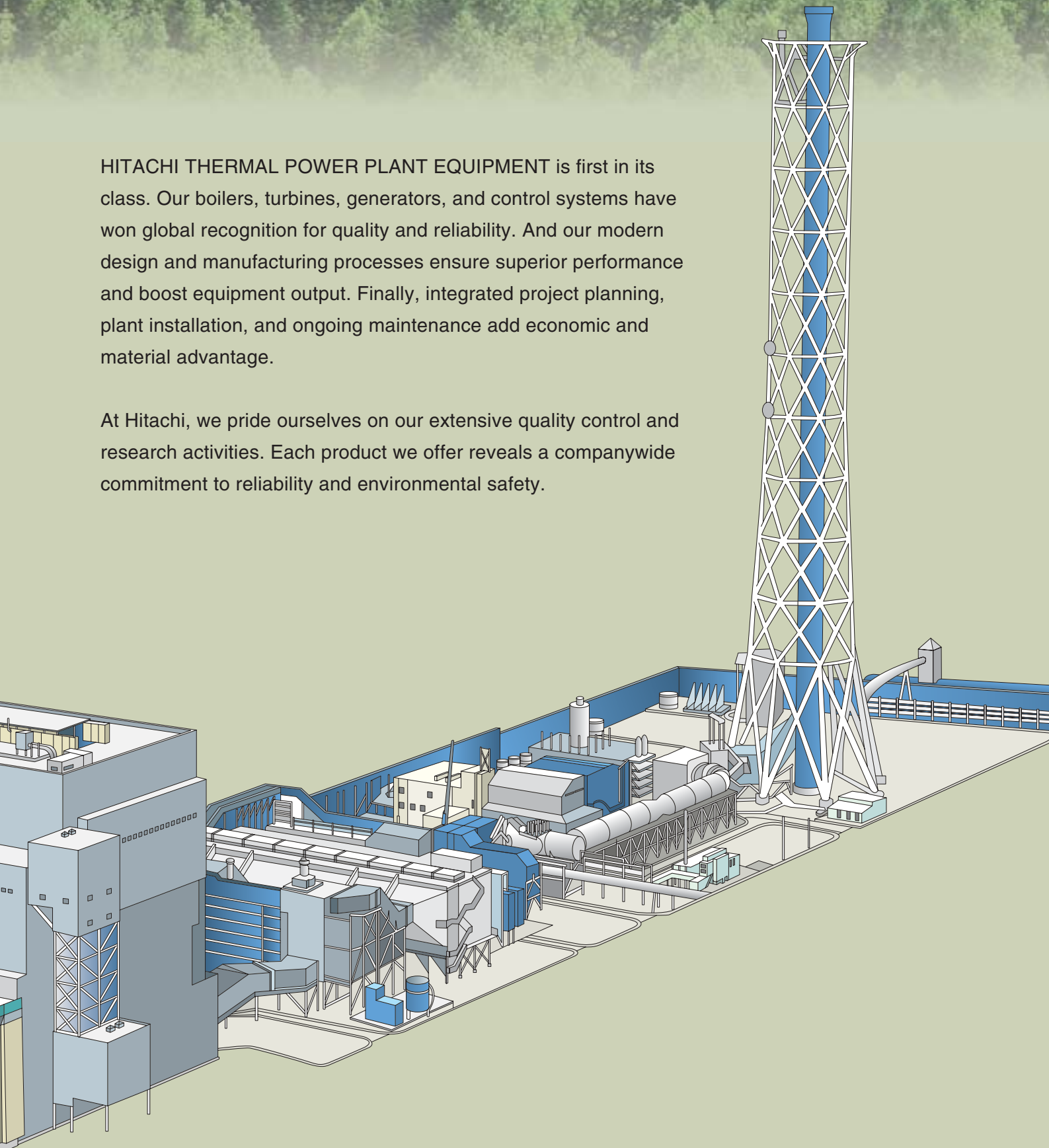
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HITACHI THERMAL POWER PLANT EQUIPMENT is first in its class. Our boilers, turbines, generators, and control systems have won global recognition for quality and reliability. And our modern design and manufacturing processes ensure superior performance and boost equipment output. Finally, integrated project planning, plant installation, and ongoing maintenance add economic and material advantage.

At Hitachi, we pride ourselves on our extensive quality control and research activities. Each product we offer reveals a companywide commitment to reliability and environmental safety.





Boilers

Determining plant output and efficiency,

boilers are core elements in thermal power generation systems.

We offer an extensive lineup of boilers for coal, oil, and natural gas fired plants.

Further, we offer waste heat recovery boilers for combined cycle plants.

Our designs include natural circulation, forced once-through, and fluidized bed combustion boilers.

We built Japan's largest coal-, oil-, and gas-fired boilers (all over 1,000MW), and have the know-how to deliver much larger ones.

Environmental safety and fuel efficiency are primary concerns at Hitachi.

That's why our boilers include numerous developments and design refinements that boost performance safely and efficiently.

In fact, one of our low NOx reduction burners was honored with a "JSME medal" in 1986.

This award is given to the most excellent technology in Japan every year.

This burner was also recognized by the Environmental Agency of Japan.

The Agency recognized it as the best burner in Japan by awarding it the "Prize of the Director General of the Environment Agency" and "the most excellent technology for environmental safety." This design is now operating in several countries—contributing to safer plant emissions and environmental protection.



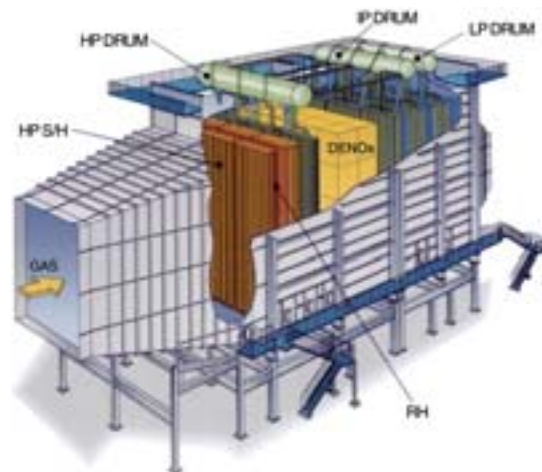
MidAmerican Energy: Walter Scott, Jr. Energy Center Unit 4 (USA)
850MW coal-fired once through boiler



EPCOR Genesee Unit 3 (Canada)
450MW coal-fired once through boiler

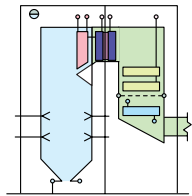
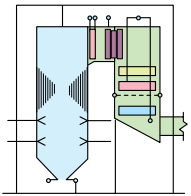
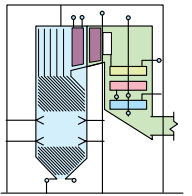
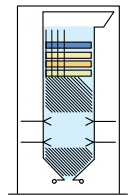


Wang-Qu No.1, 2
Shaxi Lulin Wang-Qu Power Co., Ltd. (China)
600MW coal-fired once through boiler



Heat recovery steam generator
for combined cycle power plant
(Triple pressure with reheater).

Hitachi Coal Fired Boilers

Type	Natural Circulation RBC Type	Once Through UP Type	Once Through Benson Type	Once Through Benson Type
				
Rating (MW)	50 to 350	350 to 1,000	75 to 1,050	to 930
Pressure	Sub critical	Sub critical, Super critical	Sub critical, Super critical	Sub critical, Super critical
Steam temperature	Up to 571°C	Up to 571°C	Up to 610°C	Up to 593°C
Coal type	Bituminous, Sub bituminous		Bituminous, Sub bituminous, Lignite, Anthracite	



Steam Turbines and Generators

Reflecting in-depth R&D, computer-enhanced design, and manufacturing technology, our steam turbines and generators are among the world's best.

We offer models with unit ratings of 1,000MW and more—each emphasizing superior quality, efficiency, and reliability.

Hitachi turbines and generators feature numerous R&D enhancements. For example, we conceived and produced the world's largest mono block turbine rotors.

And we developed advanced turbine blade profiles to enhance generating efficiency.

This commitment to excellence continues well through the production stage.

Hitachi design and production teams implement rigorous quality controls to ensure high performance and reliability.

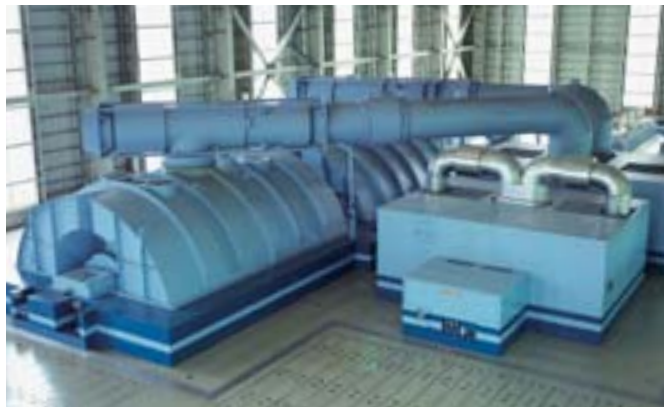
At Hitachi, we offer ongoing, full-service client support. We perform maintenance, plan facility upgrades, and continually stay abreast of customer needs and requests.



Steam turbine for Hokkaido Electric Power Co., Inc., Japan
Tomato-Atsuma Power Station No. 4
700MW, TC4F-43, 3,000 rpm, 25.0 MPa, 600/600°C
Put into service: 2002



Turbine and generator for
ShanXi Power Generation Co., Ltd (China)
Wang-Qu Power Station No.1, 2
600MW, TC4F-40, 3,000 rpm
24.5 MPa, 566/566°C
Generator capacity: 750MVA
Put into service: 2006



Turbine and generator for
Tokyo Electric Power Co., Inc., Japan
1,000MW, CC4F-41, 3,000 rpm
24.5 MPa, 600/600°C
Generator capacity: 675MVA
Put into service: 2003



AC generator for MidAmerican Energy
Walter Scott, Jr. Energy Center (USA)
Capacity: 1,025MVA
Put into service: 2007



Gas Turbines and Application Plants

Hitachi H-25 Gas Turbine has emerged from 30 years of design technology and the extensive global experience of manufacturing more than 520 gas turbine.

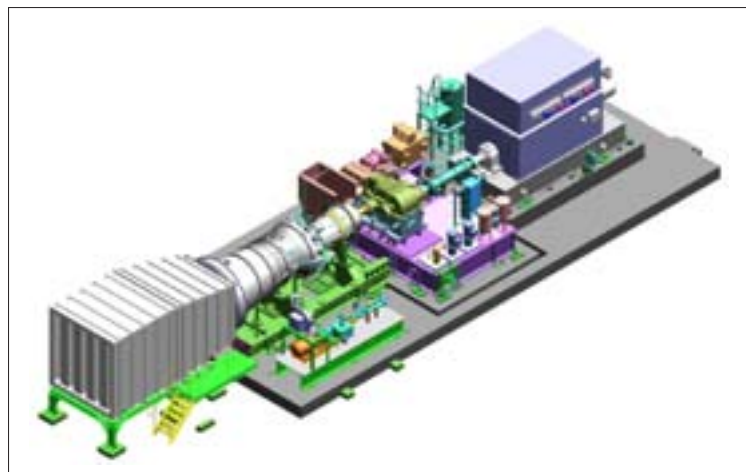
An attractive capital cost structure, proven fuel flexibility, short delivery cycles and high thermal efficiency all translate to a high return on Investment.

We also offer a complete range of application plants (combined cycle, cogeneration, etc.). These include gas turbines, waste heat recovery boilers, steam turbines, and control systems.

Each maximizes power plant efficiency. To enhance environmental safety, we were first to produce NOx removal systems for gas turbine exhaust.



Hitachi H-25 gas turbine





Elebal simple cycle plant (Venezuela)



Delta simple cycle plant (Nigeria)



Hitachi, Rinkai combined cycle plant (Japan)



Uralsk cogeneration plant (Kazakhstan)



Betara Complex Development Project
motor driven compressor drive (Indonesia)



Air Quality Control Systems

As one of the world's largest industrial manufacturers, we're eager to do our part for air quality control.

For years we have therefore offered a strong lineup of air quality control systems.

These systems are ideal for meeting the flue gas control requirements of any oil-, gas-, or coal-fired power plant.

One example: we produced the world's largest flue gas desulphurization (FGD) and NOx removal (DeNOx) system for our 1,000MW coal-fired boilers.

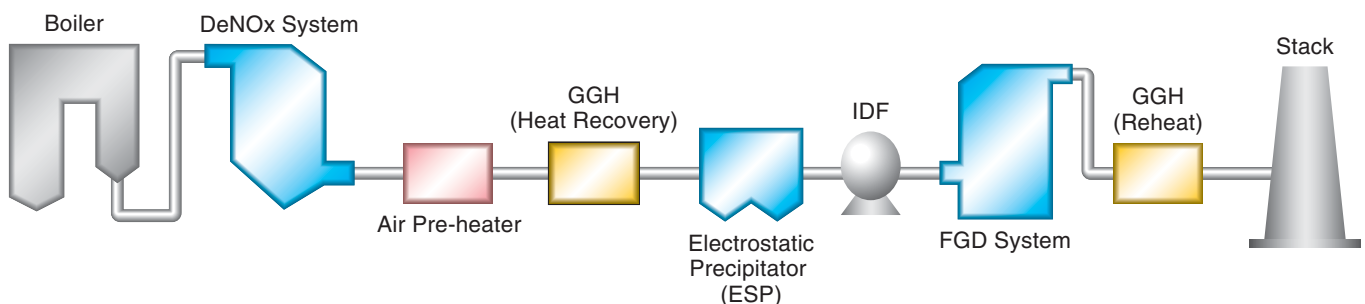
And we have licensed this technology to North American, European, and Asian manufacturers.

Dust removal systems are also leaders in their class.

Since 1925, we have produced more than 1,500 dry and wet type electrostatic precipitators, bag-filters, and other dust removal equipment.

Air quality control is an ongoing challenge, and we are determined to further our discoveries. Our R&D laboratories are working hard to develop equipment of superior reliability.

Typical Air Quality Control System





Hitachi DeNOx systems are operating throughout the world, contributing to safer plant emissions. This 700MW coal-fired plant in Germany is one such example.



Hitachi electric precipitator (EP), using moving electrodes for dust collection, is a worthwhile investment for flue gas treatment systems.



Hitachi FGD systems are recognized worldwide for contributing to emission safety. This unit operates in a 1,050MW plant.



Hitachi DeNOx systems for gas turbines must meet tough emission control standards. Many Japanese and U.S. power plants have turned to Hitachi technology. This 80MW gas turbine uses one of our DeNOx systems.



Plant Control Systems

Electric power plant managers depend upon control systems of superior reliability. At Hitachi, we guarantee this reliability through exacting quality control standards, testing, and solid design technology.

We design and manufacture a full line of plant control systems, including control computers. Our equipment stresses economical, safe plant operation from start-up to shutdown. In-house digital control technology and computing know-how have led to numerous performance and reliability enhancements. To assist the training of operation managers and create realistic plant situations, we also develop simulation equipment.



Central control equipment for 1,000MW coal-fired thermal power plant.

An integrated transmission network between computer and controller enables large volume data transfer and high speed transmission. It also eliminates the need an equipment used between the computer network and controller network. CRT operation architecture and other data logger functions (trend display, etc.) related to human interfacing can be installed in a small control server (HF-W) and a horizontal autonomous distributed system enables simplification of the system. APS (Automatic Plant Start-up and Shut-down System), performance calculation and log functions, are handles by a RS90 series computer server.



Our digital control systems, such as the HIACS-5000M, bring plant safety and reliability to new heights. We offer a full line of control systems for a variety of thermal power plants.



Gas turbine control equipment.



Hitachi's most advanced autonomous distributed computer control system.



Research and Development

With a research and development staff of 8,000 highly trained professionals, Hitachi R&D is expanding corporate goals and achievements.

In Japan alone, we operate ten major research laboratories – each instilling our product lineup with scientific advances and marketing advantage.

To improve environmental safety and operating efficiency, the Power and Industrial Systems Research & Development Laboratory tests coal gasification, advanced gas turbine system and ultra-high voltage power transmission.

The Hitachi Research Laboratory enhances heat-resistant super alloys, and control computers. The Mechanical Engineering Research Laboratory explores advanced turbines, pumps, and compressors.

Numerous other laboratories support these core centers to form an R&D network second to none.



This new design steam turbine features a variety of innovations.



AHAT(Advanced Humid Air Turbine) System pilot plant at the Katsuta Research Center.

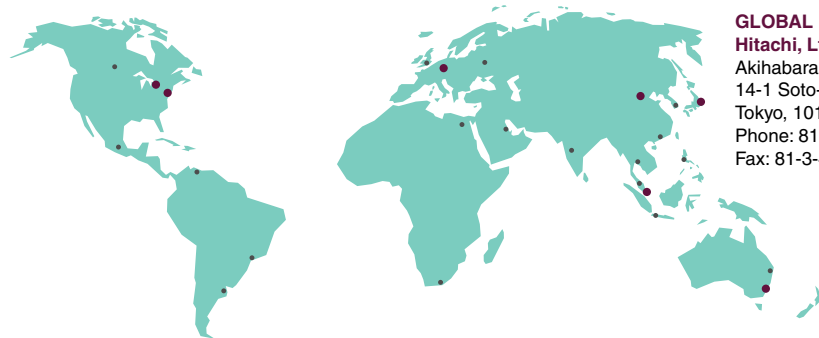


H-25 Gas Turbine low NOx Combustor for DME/LPG

Global Maintenance Services

Hitachi satisfies customers' minimum life cycle cost strategies.

- Upgrading of plant performance
- Maintenance planning support
- Spare parts supply and parts repair service
- Technical advisor for customer's maintenance activities
- Long term service agreement
- Remote monitoring diagnostic service
- Answer service via Internet



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