



# CSR Report

Corporate Social Responsibility Report

MHI Social and Environmental Report

**2007**

# Creed

1. We strongly believe that the customer comes first and that we are obligated to be an innovative partner to society.
2. We base our activities on honesty, harmony, and a clear distinction between public and private life.
3. We shall strive for innovative management and technological development from an international perspective.

## Reason for Instituting the Creed

In Japan there are many enterprises with their own "creeds" which simply represent their management concept.

Mitsubishi Heavy Industries, Ltd. has a creed of this type, also. It was instituted in 1970 on the basis of the policy advocated by Koyata Iwasaki, president of Mitsubishi Goshi Kaisha in the 1920s, to indicate the essential attitude of the

company, the mental attitude of employees, and the future directions of the company.

The reason for instituting the present creed is so that all of us can call to mind our one hundred years of tradition and strive for further development in the future.

Issued June 1, 1970

## Editorial Policy

Mitsubishi Heavy Industries, Ltd. (MHI) published its first Environmental Report in 2001 and then in 2004 started to publish Social and Environmental Reports with an expanded scope that included economic and social considerations. Since then, we have reported not only on corporate governance and compliance that promote sound management but also responsibilities related to manufacturing, MHI's core business, as well as actions to meet these responsibilities.

In 2007 edition, we are including feature articles related to energy, automobiles and space development, which represent current challenges and concerns in contemporary society and are also positioned as priority business fields in the company's medium-term business plan. The articles describe how the company is responding to society's expectations in these areas.

In the "Message from the President," we invited the participation of a notable public figure so that we could hear candid opinions about MHI and communicate our CSR\* approach and efforts in an easy-to-understand manner.

We use this report as an important communication tool for diverse stakeholders and will continually improve its content and presentation.

## Disclaimer

In addition to objective information on the past and present status of Mitsubishi Heavy Industries, Ltd. and its Group companies, this report also contains plans, perspectives, and forecasts based on business plans and management policies as of the date of publication. These forecasts are based on information available at the time of publication and therefore the actual status and outcome of future business activities may differ from these forecasts as a result of changes in the given variables.

## Scope of this Report

### Target organization:

The information contained in this report pertains to Mitsubishi Heavy Industries, Ltd. The company profile, however, includes some consolidated data, such as sales and number of employees.

### Target period:

April 1, 2006 through March 31, 2007  
(includes information on some activities after March 31, 2007)

## Referenced Guidelines

- Global Reporting Initiative (GRI) "Sustainability Reporting Guidelines" (2002 edition "G2" and the third edition "G3")
- "Environmental Reporting Guidelines" (2003 edition) issued by the Japanese Ministry of the Environment

\* "Guideline Comparison List" will be posted on our website in October 2007.

## Date of Issuance

June 2007 (previous issue: June 2006)

\*CSR: Corporate Social Responsibility

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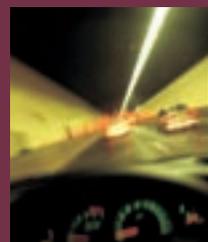
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## The Production System Innovation Planning Department was set up to cultivate and advance manufacturing capabilities

**Kitagawa:** There has been talk recently that the capability of Japanese manufacturers is falling. In this context, I heard that MHI has set up an organizational entity called the Production System Innovation Planning Department. (see p. 41)

**Tsukuda:** Manufacturers must be able to survive severe competition while reducing costs. MHI has also reduced its workforce and limited capital investment for many years. This has helped us survive an era of mega-competition in a rapidly globalizing market. At the same time, however, we now fear that our own manufacturing capability may have declined due to the loss of experienced employees through retirement, aging equipment, and the weakened ability of business processes to run PDCA (Plan, Do, Check, Act) cycles under the pressure of intense oper-

ating conditions, leading to an inability to fully respond to increasingly sophisticated and diversified customer needs.

Therefore, we established the Production System Innovation Planning Department, which reports directly to the president, as a “control tower” for the transfer, cultivation and ongoing evolution of the Company’s own manufacturing capabilities.

**Kitagawa:** Is this because your production system has not sufficiently responded to changes in the business environment?

**Tsukuda:** Yes, I think you can say so. I wanted to find a way to address this challenge. Since the activities of the Production System Innovation Planning Department are intended to recognize and solve this problem, I’ve placed the vice-president as my right hand in charge overall.

In these activities, we are introducing a cyclic production system into the build-to-order business, based on the standardization and modularization\* adopted in the mass production business, and reviewing the manufacturing process itself.

## V i s i o n & M i s s i o n

# Addressing and solving global problems through manufacturing. What is MHI’s mission and responsibility?

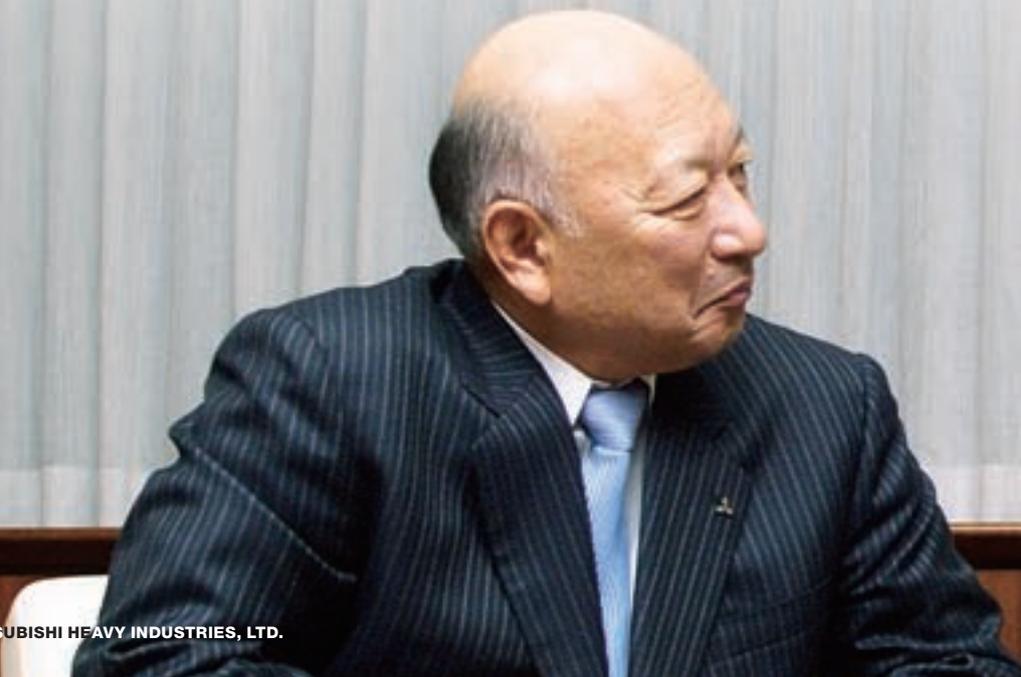
Masayasu Kitagawa

Dialogue

Kazuo Tsukuda

*Professor of the Okuma School of Public Management  
at Waseda University*

*President of Mitsubishi Heavy Industries, Ltd.*



**Kitagawa:** You have modified your corporate governance from the perspective of manufacturing. However, manufacturing not only requires capabilities that are enhanced through organization and structure but know-how that baby boomers have gained through actual practice and a sense of commitment that comes from association with a company's products, for example.

**Tsukuda:** You are right. The first thing the Production System Innovation Planning Department did was to completely visualize our operations, including both the negative and positive points of manufacturing, the expertise of individual workers and small examples that are the result of commitment. Improvements identified in this process have been deployed Company-wide to establish best practices in individual plants.

\* **Modularization** :An approach to manufacturing using fewer components for diversified products; the use of common, standardized parts can simultaneously improve quality, cost, and delivery (QCD).

### Focusing on process visualization and training human resources to ensure the safety of each product

**Kitagawa:** A series of product-related accidents in Japan has raised public concern anew over the product liability of companies. MHI's products include nuclear power equipment that require extremely high levels of safety and rockets that must always successfully fulfill their missions in the extreme conditions of outer space. What are you doing in order to ensure the reliability of these products?

**Tsukuda:** MHI manufactures an extremely wide range of products from space rockets, power plants, seagoing vessels, and industrial equipment to household air conditioners. Since the required level and approach to ensuring safety vary by product, we spare no efforts in clearly delineating processes that guarantee our products can be used safely.

Engineers tend to assume they know the products they manufacture better than anyone else. We diligently train our employees, however, to apply clearly defined methods and processes to quality control, and not to rely solely on their own judgment.

**Kitagawa:** I see. Clearly the reliability of safety reviews of a nuclear power equipment, for example, cannot be ensured by a method determined by a single engineer but must involve a process that has been thoroughly visualized ahead of time with the involvement of a large number of people. What about the rocket program that was transferred to MHI by Japan Aerospace Exploration Agency (JAXA)? (see p. 31)

**Tsukuda:** The purpose of the operational transfer was to ensure integrated management of the manufacturing process. In the past, multiple manufacturers handled the production of the various components that make up a rocket and JAXA managed the overall process. Process management like this, however, must be based on a complete understanding of manufacturing. Therefore, MHI, which has proven expertise in constructing large-scale systems that bring together multiple suppliers, was entrusted to review and assess the quality of suppliers and other manufacturers as well as its own processes by assigning a control manager over each component. In addition, an in-house review board conducts a final overall examination to determine whether a rocket should be launched.

**Kitagawa:** In constructing a huge system product like a rocket, it is important to thoroughly control the quality of individual components and construct a framework to integrate these components into a single system.

**Tsukuda:** We are an experienced integrator in the creation of large-scale systems and take pride in being a front runner in the space business. Once we are entrusted with operations like this, we are determined to assume complete responsibility right up to launch.



## Strengthening a compliance system based on reflection after an earlier incidence of bid-rigging and the results of an internal survey

**Kitagawa:** To earn public trust as a corporation, compliance with corporate ethics and laws is also important in addition to ensuring product safety. MHI, however, has been accused of rigging bids in the past. What are your thoughts about compliance as the foundation of CSR?

**Tsukuda:** The Company has repeatedly warned all employees against violating any standard of compliance, especially the Act on Prohibition of Private Monopolization and Maintenance of Fair Trade, to prevent breaking any laws, including those prohibiting bid-rigging. We set up our Compliance Committee in 2001 to reinforce our compliance efforts. In 2005, however, we betrayed the public trust when an MHI employee was arrested on suspicion of violating Japan's Antimonopoly Act through bid-rigging and MHI itself was indicted. MHI, which takes pride in being the representative manufacturing enterprise in Japan, should never have violated compliance standards in the first place. The entire Company is now working to more rigorously ensure compliance to regain public trust.

**Kitagawa:** You had already been emphasizing compliance. How, then, did the bid-rigging incident occur?

**Tsukuda:** We have been able to continually improve by always seeking the most effective approach. Unfortunately, however, some employees may have a hard time letting go of old values and assumptions such as placing top priority on protecting the business under one's own scope of responsibility to safeguard one's job, or that what the Company really expects from employees is to achieve its targets and ensure that sales are made. In addition, internal audits that had been conducted in the related departments could not provide suf-

ficient monitoring of those who maintained these kinds of assumptions and failed to find the bid-rigging in advance.

**Kitagawa:** What are you doing now based on this review?

**Tsukuda:** In August 2005, we set up the Order Compliance Committee to deliberate, examine, improve and diligently implement measures to prevent Act on Prohibition of Private Monopolization and Maintenance of Fair Trade violations with the advice of external experts. Bids for any public work can now be adequately monitored. External members of the committee recognize this as a system with unprecedented transparency.

**Kitagawa:** Just as with quality, the order receiving process is also visualized to prevent violations. However, it is also necessary to change the mindset of individuals with regard to their own work before pursuing structural efforts.

**Tsukuda:** In order to change the mindset of every staff member in the MHI Group, from executives to employees, we further reinforced our structure by setting up a Departmental Compliance Committee (see p. 44) in each department in April 2006 and also enhanced our compliance training programs. In addition to these training programs, we are working to create a workplace environment in which everyone feels proud of being a part of MHI and is able to work confidently and safely.

**Kitagawa:** Do you believe this will prevent any future bid-rigging?

**Tsukuda:** Yes. I'm convinced that we have eliminated the possibility of bid-rigging as a result of the new structure and strengthened training system in the wake of the bid-rigging associated with the steel bridge construction project.

## Recognizing the common challenge of environmental conservation for all humankind, we promote the reduction of environmental load through our products as well as our business activities

**Kitagawa:** Another important issue is the reduction of environmental load in our business. As demonstrated by the recent announcement of the EU's goal to achieve a 20% reduction in CO<sub>2</sub> emissions from 1990 levels by 2020, the prevention of global warming has become a worldwide challenge. How is MHI addressing this issue?

**Tsukuda:** I believe MHI is one of only a few corporations that has the potential to respond on a global scale to resolving the problem of global warming. For instance, our thermal power plants reduce CO<sub>2</sub> emissions and help to save fossil fuels by using high-performance turbines that enhance combustion efficiency. We also provide technologies and products worldwide to harness natural energy sources, including solar energy, wind power, geothermal power and biomass as well as CO<sub>2</sub> withdrawal technology. Nuclear power generation mentioned earlier is now being reassessed as a clean energy that does not emit CO<sub>2</sub> in its operation. We are responding to global demand as an enterprise that is capable of producing and offering all the equipment required for nuclear power plants.

**Kitagawa:** What about reducing CO<sub>2</sub> emissions associated with the production activities of your company?

**Tsukuda:** The medium-term environmental targets set in 2002 called for a reduction in CO<sub>2</sub> emissions from our factories to 6% of 1990 levels by 2010. However, we developed a



**Kazuo Tsukuda**

Born in 1943, Mr. Tsukuda graduated from the School of Engineering of the University of Tokyo in 1968 with an advanced degree in marine mechanical engineering and joined Mitsubishi Heavy Industries immediately upon graduation. After serving as deputy general manager of Takasago Machinery Works and general manager of Nagoya Machinery Works, he became a member of the board of directors of MHI in June 1999. In April 2002 he was appointed a managing director and the general manager for the Global Strategic Planning & Operations Headquarters. In June 2003, Mr. Tsukuda became president of Mitsubishi Heavy Industries.

new CO<sub>2</sub> reduction plan starting from last year and into this year because the level of emissions has been edging up due to recent increases in production and new capital investment as well as new and expanded plants. We have been introducing photovoltaic installations developed by the Company into our facilities and are planning to add 720 kW to all facilities in 2007.

**Kitagawa:** Recently, the trading of CO<sub>2</sub> emissions credits is being actively pursued.

**Tsukuda:** We are considering the trading of emissions credits as one means for achieving our target. We can obtain emissions credits for reductions obtained from wind power generators and photovoltaic installations we have delivered to countries around the world. If this is not enough, we may also purchase credits.

**Kitagawa:** I heard that you have started a desert environment improvement project as an activity unique to MHI.

**Tsukuda:** In cooperation with domestic universities and research institutes along with Saudi Arabian organizations, we are conducting research into securing water resources in desert areas for greening by utilizing renewable energy. Specifically, we will inaugurate an experiment for creating a given area of forestland in the Arabian Peninsula that will in turn generate clouds to release rain, further expanding the forest.

**Kitagawa:** That sounds like a magnificent project.

**Tsukuda:** It will take at least 20 years before we can observe actual results, but I believe that creating such long-range visions and taking action to realize them also represent a significant mission entrusted to the MHI Group by society.

### Launching the CSR Committee and Working Group to establish the CSR of the MHI Group

**Kitagawa:** We have discussed various topics related to CSR. How is a large organization such as MHI promoting Company-wide CSR activities?

**Tsukuda:** It certainly requires tremendous effort to thoroughly manage CSR in an organization like MHI. However, since its foundation the Company has maintained the traditional Mitsubishi attitude as set forth in the Three Corporate Principles and Creed, which provides the groundwork for CSR as socially responsible corporate management. Based on this, we have worked on corporate ethics, compliance, environmental conservation activities and social contribution. We have also set up committees such as the Compliance Committee and the Environment Committee to ensure penetration into this field. In addition, we are a member of the United Nations Global Compact.

Nevertheless, we have realized that issues remain to be addressed, as shown in the bid-rigging incident we discussed. We, therefore, set up the CSR Committee chaired by me and the CSR Department (see p. 42) as its secretariat in October 2006 to present an explicit stance that places CSR at the center of management and to deploy CSR in every aspect of our business activities. At the same time, we assigned a CSR Director and a CSR Practice Manager in each headquarters,



## Masayasu Kitagawa

Born in 1944, Mr. Kitagawa graduated from the School of Commerce of Waseda University in 1967. He served in the Mie Prefecture Assembly for three consecutive terms starting in 1972 and was elected in 1983 as a member of the Lower House, where he served for four consecutive terms, serving as vice minister of education while in office. In 1995, he was elected governor of Mie Prefecture (served two consecutive terms) and was at the forefront of the decentralization movement that advocated, "Start from ordinary citizens," and aggressively promoted a system for zero-based project evaluation and pursued reform while encouraging public information disclosure. He introduced "Manifesto," which clearly and publicly states achievements against goals and the measures taken for these achievements as well as the financial resources required. After serving two terms, he left office in April 2003. He is currently professor of the Okuma School of Public Management at Waseda University and co-leader of the National Congress for 21st Century Japan.

division, works and spin-off subsidiary to encourage voluntary activities in the field.

**Kitagawa:** Beyond valuing traditional philosophy you have also started to build an organizational and systematic CSR promotion structure. However, I would like to see you continue to carry forward your founding spirit. Words that continued to convey meaning over a long history, such as the family philosophy of the Ohmi merchants, "Winners on three sides: the seller wins, the buyer wins and the public wins," still hold true in today's global economy.

**Tsukuda:** Winners on three sides — these words definitely relate to the concept of CSR.

**Kitagawa:** It would be wonderful if a global company could demonstrate this traditional spirit or philosophy of Japan and in doing so fulfill CSR today. Why don't you at MHI develop language that expresses this concept of CSR activities and disseminate it inside and outside the Company?

**Tsukuda:** Younger employees and female employees have just formed a CSR Working Group and started to develop CSR action guidelines and activity plans for the entire Group. I expect that younger employees will reword Mitsubishi's founding spirit of terms that will be more readily understood today and reflect them in actual activities.

**Kitagawa:** I hope a new MHI climate will be created, building on the imagination of younger employees who will support the Company in the future as well as female employees, who are expected to play a larger role, enabling the Company to leap forward. I have high hopes for the outcome.

**Tsukuda:** We will certainly strive to measure up to your expectations. Thank you very much for the meaningful conversation today.

Profile

Company Profile

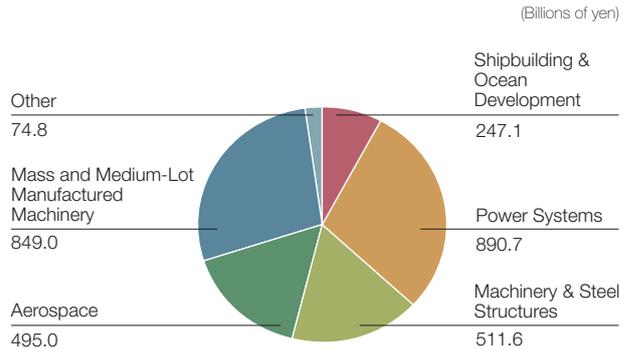
Trade Name: Mitsubishi Heavy Industries, Ltd.  
 Head Office: 16-5, Konan 2-chome, Minato-ku, Tokyo  
 President: Kazuo Tsukuda  
 Foundation: July 7, 1884

Establishment: January 11, 1950  
 Capital: 265.6 billion yen (as of March 31, 2007)  
 Employees: 32,552 (as of March 31, 2007)

Segments, Headquarters and Divisions

Segments	Headquarters and Divisions
Shipbuilding & Ocean Development	•Shipbuilding & Ocean Development Headquarters
Power Systems	•Power Systems Headquarters •Nuclear Energy Systems Headquarters
Machinery & Steel Structures	•Machinery & Steel Structures Headquarters
Aerospace	•Aerospace Headquarters
Mass and Medium-Lot Manufactured Machinery	•General Machinery & Special Vehicle Headquarters •Air-Conditioning & Refrigeration Systems Headquarters •Paper & Printing Machinery Division •Machine Tool Division

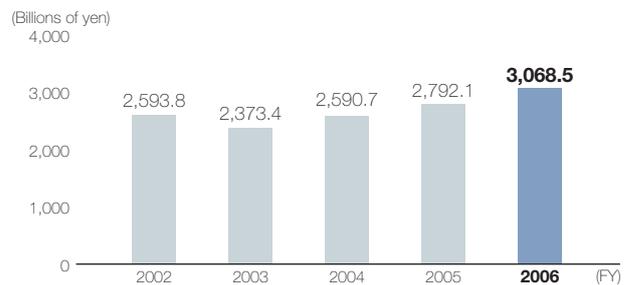
FY 2006 sales by industry segment (Consolidated)



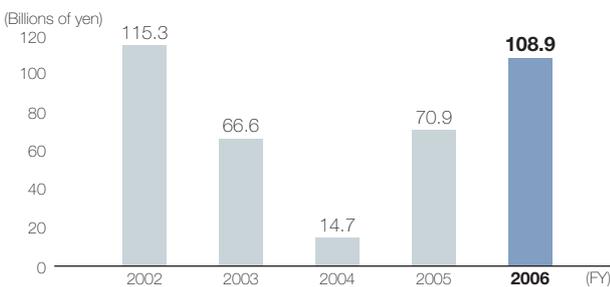
Orders received (Consolidated)



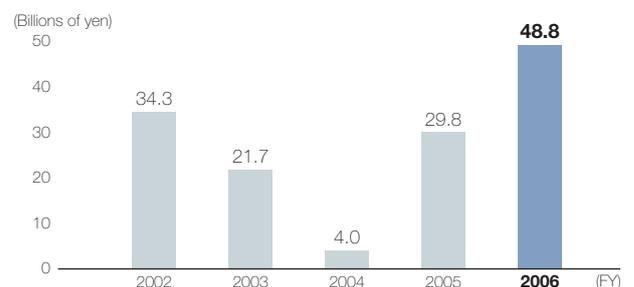
Net sales (Consolidated)



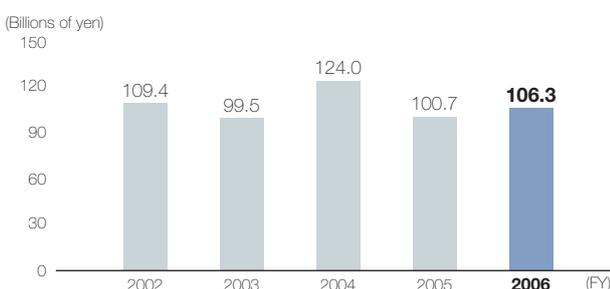
Operating income (Consolidated)



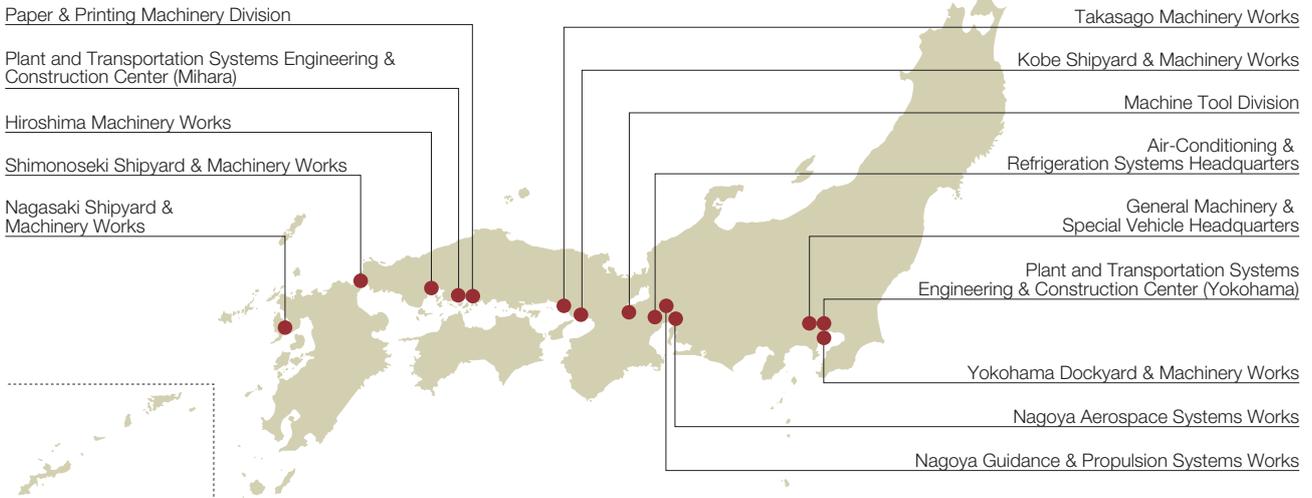
Net income (Consolidated)



Research and development expenditures

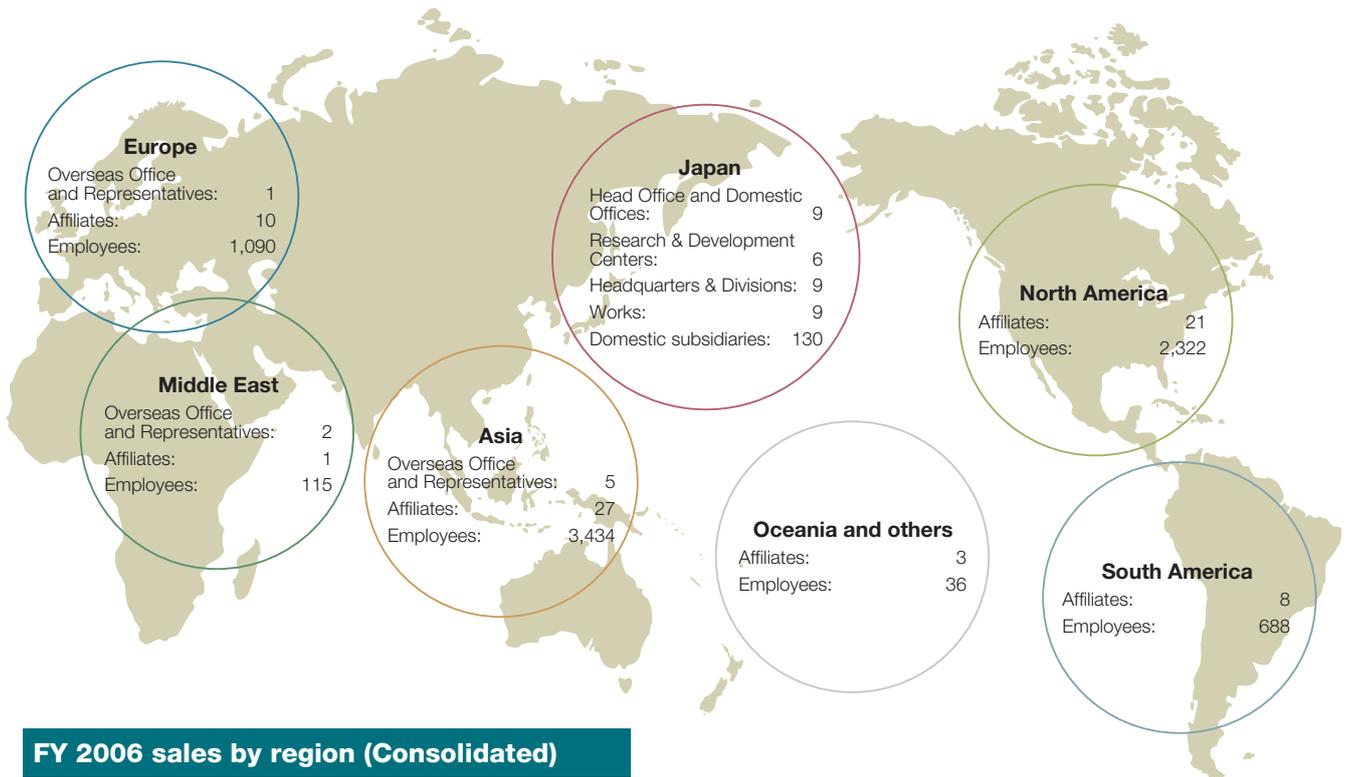


## Domestic production sites

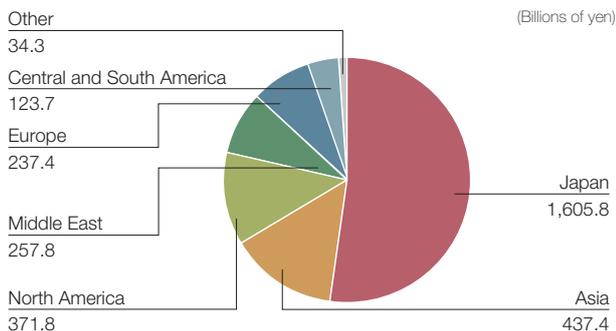


## Operating Bases and Employees by Region

Total number of employees (Consolidated): 62,940 (as of March 31, 2007)



## FY 2006 sales by region (Consolidated)



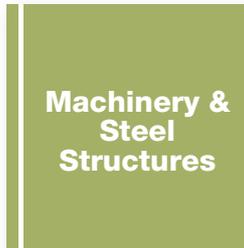
**Businesses and products**



Cruise ship "Diamond Princess"

**Sea vessels**

- Passenger ships
- LNG carriers
- Oil carriers
- Container carriers
- Naval vessels
- Patrol vessels



**Machinery & Steel Structures**



Flue gas desulfurization system



**Shipbuilding & Ocean Development**



137,100 m<sup>3</sup> LNG carrier "Puteri Intan Satu"

**Ocean development**

- Submersible research vehicles
- Oceanographic research ships



Deep submersible research vehicle "Shinkai 6500"



Flue gas CO<sub>2</sub> recovery plant

**Environmental conservation**

- Waste incinerators
- Industrial waste treatment systems
- Soil-ground water purification systems
- Biomass utilization systems
- Electrostatic precipitators
- Flue gas desulfurization systems
- Flue gas CO<sub>2</sub> recovery plants



Center-less Ferris wheel

**Culture, sports and leisure**

- Stage machinery systems
- Sports and leisure facilities



Combined cycle power generation plant

**Thermal power generation plants and other facilities**

- Combined cycle power generation plants
- Steam turbine
- Gas turbine
- Boilers
- Diesel engines
- Fuel cells



M501G Gas Turbine



Ammonia and urea fertilizer plant

**Chemical plants**

- Petrochemical plants
- LPG and LNG production, transportation and receiving facilities
- Methanol plants
- Fertilizer plants



**Power Systems**

**Renewable energy**

- Wind turbine plants
- Water turbine plants
- Geothermal power plants
- Photovoltaic systems



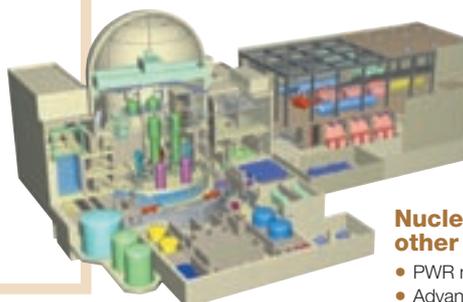
Electronic Road Pricing System (ERP)

**Automobile related**

- Toll collection equipment (ETC, etc.)
- Electronic Road Pricing System (ERP)
- Motors for EVS/HEVS



Wind turbine power generation equipment



The latest PWR nuclear power plant for the United States (US-APWR)

**Nuclear power plants and other facilities**

- PWR nuclear power plants
- Advanced reactor plants
- Nuclear fuels
- Nuclear fuel cycle plants

**Transportation systems**

- Automated People Mover System
- Rail Transit System
- Maglev System (HSST)
- Monorail (Suspended Type)



Automated People Mover "Crystal Mover"

**General/metals machinery**

- Iron and steel manufacturing machinery
- Rubber and tire machinery



Hot strip mill (PC mill)



Akashi-Kaikyo Bridge



Shield machine

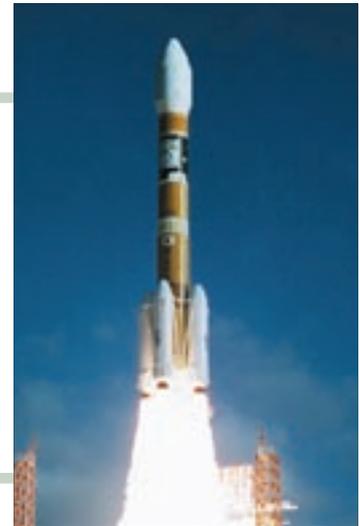
**Basic facilities and structures, others**

- Bridges
- Coastal structures
- Hydraulic gates
- Tunnel boring machinery
- Cranes for iron works and factories
- Quayside container cranes
- Mechanical parking systems

**Aerospace**

**Space equipment**

- H-IIA launch vehicle
- Rocket engines



H-IIA Launch Vehicle (Photo courtesy of Japan Aerospace Exploration Agency (JAXA))



Boeing 777 transport (international co-development)

**Aviation**

- Commercial Aircrafts
- Aircraft engines
- Jet fighters
- Helicopters

**Guided weapon systems**

- Missiles
- Torpedoes

**Mass and Medium-Lot Manufactured Machinery**



Ceiling recessed commercial use air-conditioner

**Air-Conditioners, etc.**

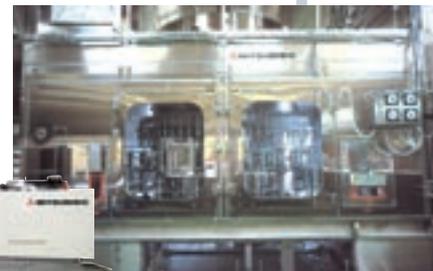
- Residential use air-conditioners
- Commercial use air-conditioners
- Automotive thermal systems
- Transport refrigeration units
- Centrifugal & Absorption liquid chiller



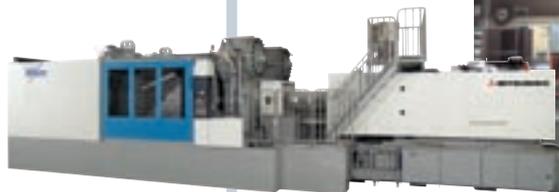
SuperDry Gear Hobbing Machine "GE Series"

**Industrial machinery**

- Machine tools
- Printing machinery
- Pulp and paper machinery
- Paper processing machinery
- Plastic Injection Molding Machine
- Food and packaging machinery
- Commercial washing machines



PET aseptic filling system



Super sized electric plastic injection molding machine 3000em

**Engines**

- Industrial engines
- Marine engines
- Engines for power generation



High-efficiency gas engine cogeneration systems

**Construction machinery**

- Earthmoving and grading machinery
- Civil engineering and foundation work machinery

**Special vehicles**

- Tanks
- Armored personnel carriers

**Loading and transport**

- Forklift trucks
- Automatic guided vehicles
- Heavy cargo carriers



Forklift trucks "GRENDIA"

Special Feature

MHI's Response  
to the Demands  
of Society

Pride and  
Responsibility  
in  
Manufacturing

1

# Energy & MHI

Global warming and the depletion of natural resources accelerating in tandem with rising demand for energy worldwide today are serious issues that must be addressed on global scale. MHI, by providing power plants that utilize a variety of energy resources — thermal, hydro, nuclear, solar, wind, etc. — is contributing to achievement of the “best energy mix” in countries everywhere.

# Achieving the “best energy mix” is an issue of global proportions. MHI supplies a variety of products and technologies toward its realization.

Worldwide energy consumption is rising steadily, and further increases on large scale are anticipated in tandem with population growth and economic expansion especially in China, India and other Asian nations. Through 2030, reliance on fossil fuels, including coal and natural gas, is projected to continue, with oil continuing to account for the major share within overall energy resource consumption. As of December 2005, proved reserves of fossil fuels were estimated at 40.6 years for oil, 155 years for coal and 65 years for natural gas<sup>\*1</sup>. As such, promotion of energy conservation, use of renewable natural energy resources and development of new energy resources today are issues of vital importance.

Along with rising energy consumption, however, emissions of carbon dioxide (CO<sub>2</sub>) are also increasing, and as a contributing factor to global warming such emissions today are also a profoundly serious issue. It is projected that if CO<sub>2</sub> emissions continue to increase at current rates, by the end of this century global temperatures will be 1.4-5.8°C higher than in 1990, and the resulting melt of glaciers and expansion in ocean waters will cause sea levels to rise by 9-88cm<sup>\*2</sup>. It is also said that changes in climate mechanisms will engender frequent abnormal weather patterns and have drastic impact on natural ecosystems and on our human living environments and underlying foundations.

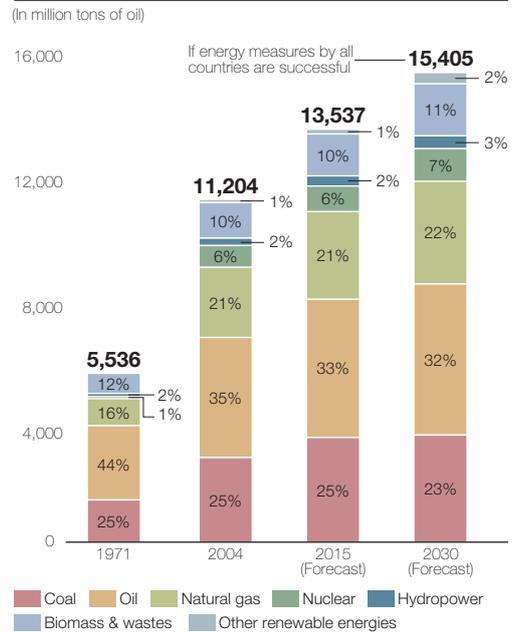
To respond to depletion of available energy

resources and the problems surrounding global warming, the world is increasingly embracing the view to pursue the “best energy mix,” i.e. utilizing a variety of energy resources in appropriate balance rather than depending excessively on any particular energy resource or resources. In recent years the United States, Europe and China have revamped their energy policies in line with this thinking, and in Japan a “New National Energy Strategy” was formulated in May 2006 that primarily targets the creation of an energy safety assurance structure based on diversification of supply sources and development of alternative energy resources complemented by unified resolution of energy and environmental issues.

MHI, as one of a few companies able to provide power plants and equipment that utilize an array of energy resources, is supporting worldwide initiatives to achieve the best energy mix and is contributing on global scale to realizing stable energy supplies and curbing global warming.

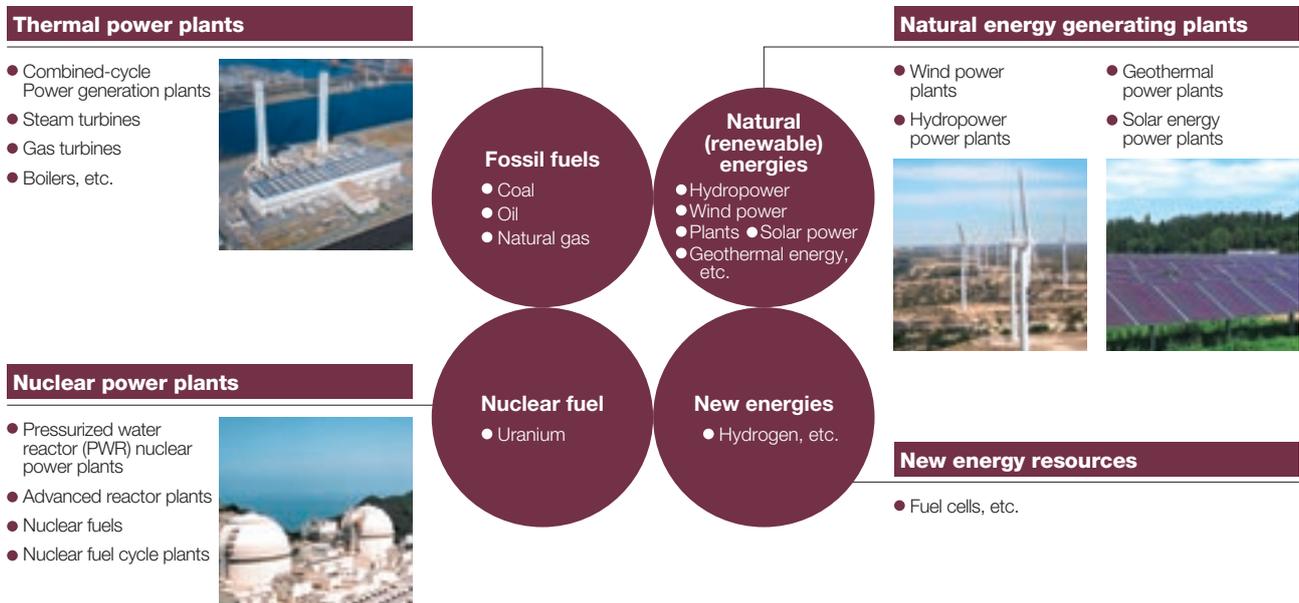
<sup>\*1</sup> BP Statistical Review of World Energy June 2006  
<sup>\*2</sup> Intergovernmental Panel on Climate Change (IPCC)

**World Energy Supply and Forecasts, by Fuel Type**



Source: International Energy Agency “World Energy Outlook 2004/2006”

## MHI Products and Businesses Supporting the Quest for the Best Energy Mix



# Thermal Power Generation

## MHI is pursuing increasingly efficient thermal power generation and a lighter environmental burden through high-temperature and combined-cycle power generation technologies

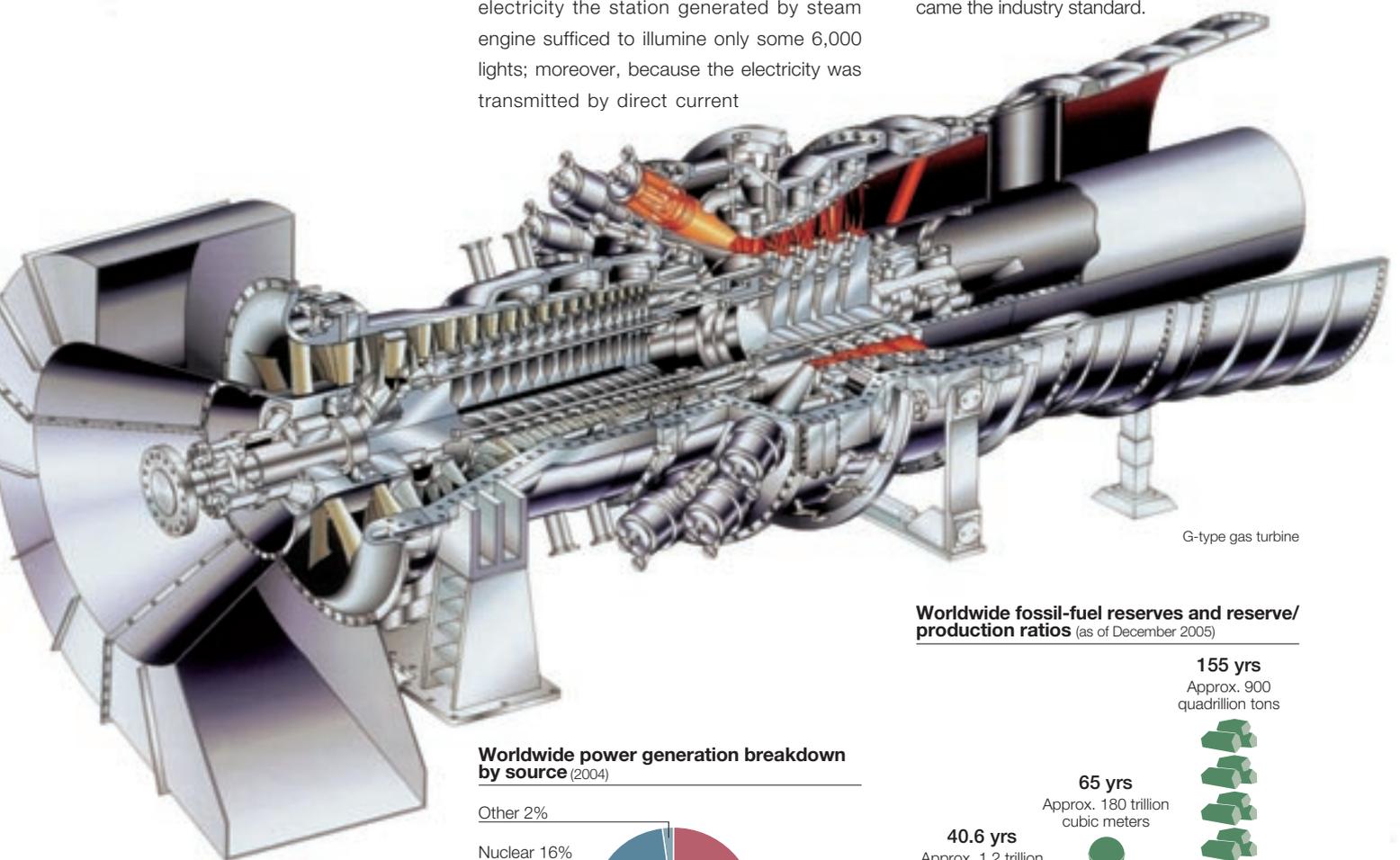
For more than 100 years everyday life and industry have been supported by thermal power generation, an efficient method of generating electricity stably from various fuels using facilities of modest size capable of adjustable output in line with fluctuating demand. Even today, more than 65% of power supply worldwide derives from thermal generation. Through the years, starting with the successful production of Japan's first steam turbine back in 1908, MHI has achieved numerous breakthroughs, both domestically and globally, in boosting the energy efficiency of thermal power generation while also easing its burden on the environment.

### Global warming, depletion of natural resources: Problems stemming from the world's most prevalent power generation method

The world's very first fossil-fueled central power station opened in New York City, on Pearl Street in lower Manhattan, and began supplying electricity on a commercial basis in 1882, just three years after Edison invented the incandescent light bulb. The 540kW of electricity the station generated by steam engine sufficed to illumine only some 6,000 lights; moreover, because the electricity was transmitted by direct current

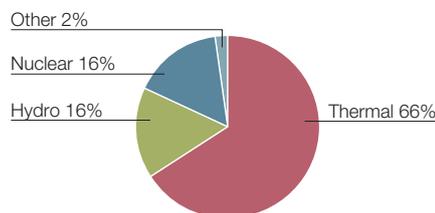
at a low voltage of 110V, it could be sent no farther than 1-2km.

Japan's first DC thermal power station went onstream in 1887, in Tokyo's Kayabacho district. It supplied power to customers only within its immediate vicinity, including the Tokyo Post Office. That same year, a large-scale thermal power plant was completed in Deptford, England that operated on alternating current (AC), which subsequently became the industry standard.



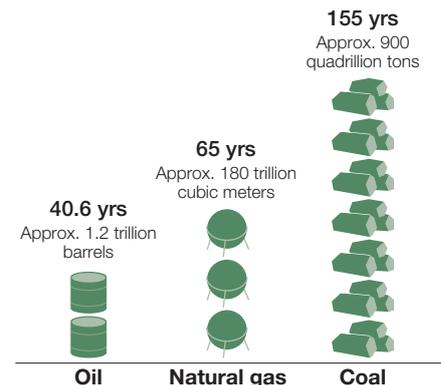
G-type gas turbine

### Worldwide power generation breakdown by source (2004)



Source: International Energy Agency "World Energy Outlook 2006"

### Worldwide fossil-fuel reserves and reserve/production ratios (as of December 2005)



Source: BP Statistical Review of World Energy June 2006

The Deptford station succeeded in sending electricity at a high voltage of 10,000V over distances exceeding 10km, thus reaching as far as London, where electric lights came to replace gas lamps.

In this way, initially fossil-fueled power plants were created to light up large cities. Subsequently, however, as they became capable of supplying power to broad areas as social capital indispensable to national and industrial development, the power stations' primary movers expanded in scale as they sequentially evolved from steam engines to steam turbines, and on to gas turbines. Also, as fuel options expanded from coal to oil and natural gas, plant operators acquired the leeway to choose their fuel in accordance with local features and circumstances.

Today, thermal power creates more than 65% of all the electricity generated worldwide. However, the CO<sub>2</sub> emissions resulting from this use of fossil fuels are creating major problems in terms of global warming and depletion of natural resources.

**Development of the world's first gas turbine with entrance temperature in the 1,500°C class, for higher thermal efficiency**

The key to solving these problems lies in the achievement of higher efficiency, i.e. reducing energy loss and acquiring the maximum

amount of power from a given quantity of fuel. MHI's thermal power plant business is in itself the history of this quest for higher efficiency.

MHI first succeeded in significantly enhancing thermal efficiency in 1908 with production of a steam turbine (Japan's first) in which steam turned the impeller; it was developed to supersede piston-driven steam engines. In 1911, the company began producing steam-generating boilers, thereby paving the way to become a manufacturer of thermal power plants. Then in 1963, the company succeeded in producing a gas turbine (Japan's first), in which the fuel is placed in compressed air and the impeller is turned by combusted gas at high temperature and under high pressure.

Another epoch-making technology for MHI is dry low-NO<sub>x</sub> combustion, which the company commercialized — for the first time anywhere worldwide — in 1984. In lieu of the earlier method of injecting water and steam in order to remove NO<sub>x</sub> (nitrogen oxides) from power generator exhaust gas, dry low-NO<sub>x</sub> combustion uses no water whatsoever. Today, in view of its conservation of water resources and achievement of higher efficiency, the technology has become the global standard.

In recent years, MHI has been concentrating on technology enabling higher-temperature gas turbines. With gas turbines, as the temperature at the entrance of the turbine is progressively raised, the operation of the

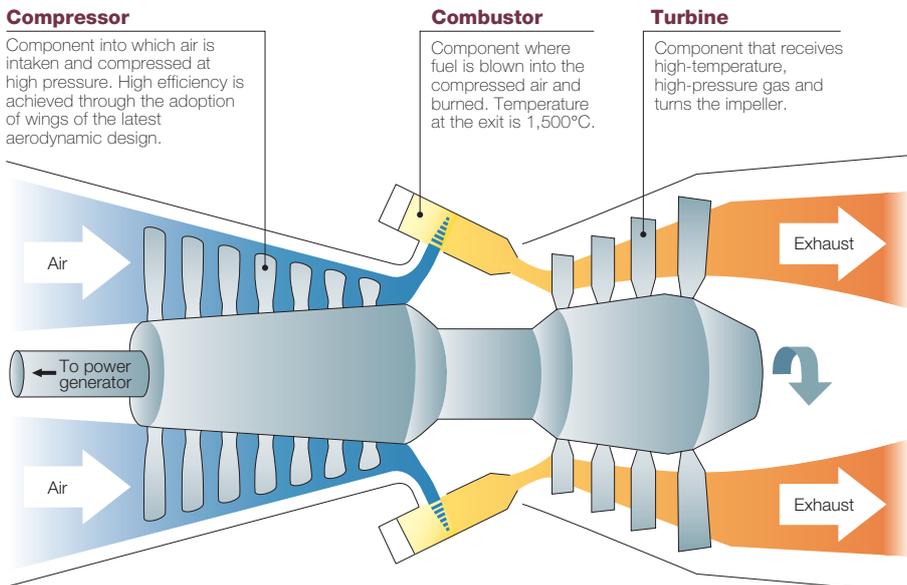


Casing



Air compressor

**Gas turbine configuration**



## Thermal power generation

### Main thermal power plants

To date, MHI has delivered numerous thermal power plants worldwide while pursuing diversity in fuel sources; today these include not only coal, oil and natural gas but also heavy fuel oils, vacuum residue (VR) and by-product gas produced in the steel-making process (blast-furnace gas).

### Thermal power plants

- Coal-fired plants
- Oil-fired plants
- Gas-fired plants
- Recovery boiler-fired plants
- VR-fired plants

### Combined-cycle power plants

- Gas turbine combined-cycle (GTCC) plants
- Integrated gasification combined-cycle (IGCC) plants



IGCC plant

electricity-producing turbine becomes increasingly more efficient, enabling the acquisition of more electricity. Toward that end, in 1997 MHI, applying its latest technologies in areas including aerodynamics, cooling, combustion, materials and coating, successfully developed and demonstrated the practical operation of the M501G gas turbine, which features a temperature at the entrance of approximately 1,500°C, up from the earlier global norm close to 1,350°C. Since 2004, the company has been participating in a national project to develop the elemental technology for a high-efficiency gas turbine in the 1,700°C class. Through these initiatives, MHI has come to win high acclaim for its gas turbine technologies worldwide.

### GTCC and IGCC combined-cycle plants enable even higher efficiency and reduce environmental loads

Today, MHI is moving forward with gas turbine combined-cycle (GTCC) technology, which, through a combination of gas and steam turbines, boosts efficiency further and succeeds in reducing environmental loads.

With GTCC, first fuel such as natural gas is burned to generate electricity by gas turbine; the exhaust produced thereby, near 600°C, then generates steam that is used to generate electricity by steam turbine. This configuration results in about 20% higher generation efficiency than when gas turbines are used in isolation, and it also enables curbing of the CO<sub>2</sub> emissions that accompany power generation. In addition, GTCC, by using natural gas as the fuel, enables reduction in NO<sub>x</sub>, SO<sub>x</sub>, soot and other emissions that pollute the air. MHI has also developed blast-furnace-gas (BFG) fired GTCC technology, which uses as fuel the low-calorie gas obtained when the iron ore and coke derived during the steel-making process are put through a reduction reaction. Today, MHI is supplying BFG-fired GTCC plants to destinations including China and India where demand for steel plants is rising.

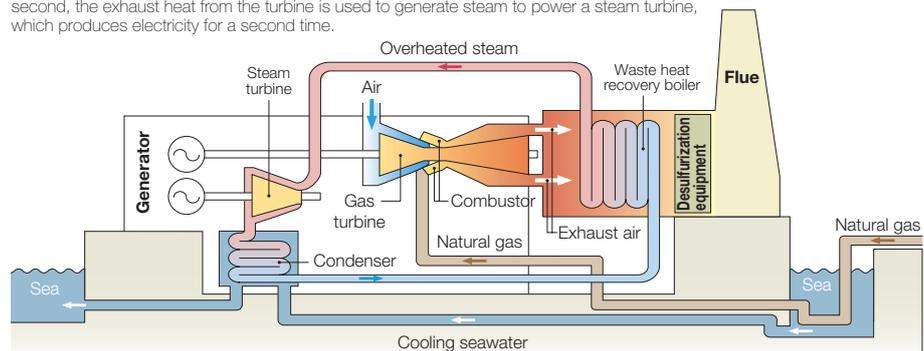
Particularly in China, where there have been numerous cases of BFG produced by steel plants released into the atmosphere, MHI's technology is garnering close attention for its contribution to both the efficient utilization of energy resources and easing of environmental



GTCC plant

### GTCC plant configuration

First, electricity is produced by gas turbine powered by burning natural gas or other fuel; second, the exhaust heat from the turbine is used to generate steam to power a steam turbine, which produces electricity for a second time.



loads. Additionally, because BFG is of lower caloric value than natural gas, sophisticated technology is required to achieve stable combustion of the gas turbine. MHI has created proprietary technology in this area, as illustrated by its development in the 1980s of a BFG-dedicated combustor. Today the company boasts a near 70% share of the global market for BFG-fired gas turbines.

MHI is also conducting research into integrated gasification combined-cycle (IGCC) technology, which is to apply GTCC technology to coal usage. As prices of oil and natural gas have soared in recent years, the potential of coal, which is inexpensive and available in abundant quantity, is again coming into focus. Demand for IGCC plants in the near future is anticipated especially in the United States, where superannuated coal-fired power plants are ripe for renewal.

**Enhancing performance, safety and durability in proactive response to global demand for combined-cycle plants**

While continuing to pursue increasingly higher efficiency and a lighter burden on the environment, it is also important to secure the safety and durability requisite to continuously combust fossil fuels at a high temperature exceeding 2000°C. Since 1997, as a verification testing facility MHI has used a GTCC plant, employing the M501G gas turbine, installed within its Takasago Machinery Works. Here, while verifying the performance, safety, durability and other properties of the company's high-efficiency turbines, MHI is striving to strengthen its thermal power plant technologies in all areas from design to construction.

In addition, as its proactive response to rising demand for GTCC, IGCC and other combined-cycle plants worldwide, MHI is presently fortifying its sales structures in all regions, especially overseas bases in the U.S., Europe and China, and it is focusing on finding and selecting alliance partners to take charge of local production and construction. Furthermore, going forward the company aims to devote itself to offering local technological guidance and support. By establishing a globally integrated system embracing design, procurement and construction, the company aims to enhance the performance, safety and durability of its plant constructions undertaken on a full turnkey basis.



Verification testing equipment at Takasago Machinery Works

**24-hour monitoring to check operating status of thermal power plants worldwide**

To check whether plants are operating safely and stably after going into service and whether efficiency is being maintained, MHI monitors the operating status of the plants it has delivered worldwide 24 hours a day via the Internet. In addition to preventing plant shutdowns caused by equipment failure, the company provides technical services to maintain and boost operating efficiency.



Room for monitoring plant operating status via the Internet

**Expectations held toward MHI**

**I would like to see MHI spread GTCC technology throughout the Chinese mainland, actively adopting improvement measures matching China's situation.**

On April 28, 2007, a ceremony was held to mark the completion of a BFG-fired GTCC plant at Hunan Valin Lianyuan Iron and Steel Co., Ltd. The plant, with a combined gas and steam turbine output of 50MW, marks milestones in China in several ways: as the nation's power plant requiring the least amount of space, achieving commercial operation most swiftly, and boasting the highest power generation efficiency. The GTCC plant, which uses excess low-calorie blast furnace gas and enables reduced environmental pollution and conservation of energy resources, also marks our company's first new step toward realizing a renewable society. This meshes with the energy conservation and recycling economic policy hoisted in our National Development and Reform Commission's (NDRC) policy on development of the steel industry.

I was deeply impressed with the zeal and responsible actions demonstrated by MHI, which was in charge of the core equipment of the plant. Occasionally, differences of opinion arose, however, due to our differences in culture and how we work. I feel that MHI's employees are somewhat lacking in flexibility. I would like to see MHI look more actively at opinions on the Chinese side and on the problems that occur on the job as it continues to create GTCC plants matching the situation of China. I also look forward to MHI spreading this technology throughout the Chinese mainland.



**Zhou Chengyi**  
Lianyuan Iron & Steel Group Co., Ltd.  
Deputy Chief Engineer

# Solar Power Generation

## MHI is taking low-cost, high-efficiency solar power worldwide

Today, everywhere expectations are rising toward solar power as a means of stopping global warming, caused by dependency on fossil fuels, and the depletion of natural resources. However, photovoltaic power systems are fraught with a variety of problems: for example, generation costs are 2-3 times higher than with current household power systems and the output of electricity generated per unit is modest. MHI, applying the world's first high-speed, large-area film production technology, has succeeded in developing low-cost, high-efficiency thin-film PV modules. Going forward, it will pursue further cost reductions and quality enhancements in a quest to take solar power generation worldwide on full scale.

### Solar power generation facilities are increasing worldwide; issues await resolution prior to full-scale adoption

Solar energy, in contrast to fossil fuels such as oil, coal and natural gas, is a clean energy resource that produces neither greenhouse gases like CO<sub>2</sub> nor other harmful substances; it is also a renewable energy source that can be used repeatedly ad infinitum. Today, high hopes are held of solar power worldwide as an answer to the problems of global warming and depletion of natural resources.

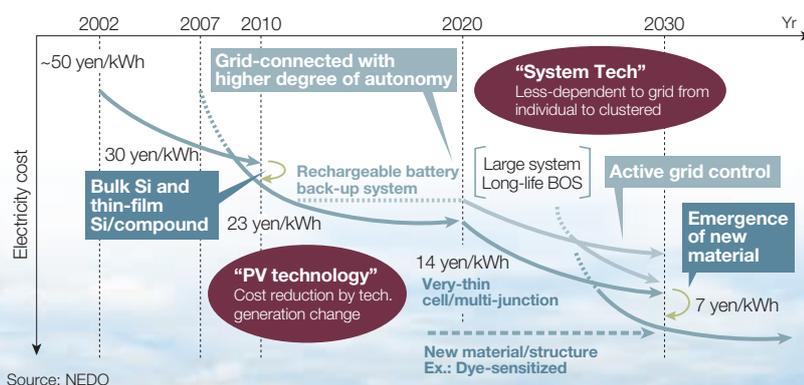
In Germany, legislation was enacted in 2000 hoisting a target of raising the percentage of renewable energy usage within that country's total power supply by more than 100% by 2010. In the EU as a whole, moves to forge legal frameworks to promote active use of renewable energy resources are gathering

robust momentum. In Japan, the amount of power generated by solar energy is increasing each year, aided by the circumstance that in 2005 Japan accounted for roughly 50% of global solar cell production. In these ways, the volume of newly introduced photovoltaic power systems worldwide has expanded from 729MW in 2000 to 3.7GW (3,700MW) in 2005, constituting a high growth rate of 30% per year.

Demand for solar power generation is also projected to expand in the United States, where the Energy Policy Act of 2005 has called for promotion of the development and usage of renewable energy resources, and China, where surging energy consumption and increasingly serious environmental destruction have given rise to a sense of crisis. As a result, by 2010 worldwide demand for solar cells is forecast to exceed 5.6GW (5,600MW).

This growing demand notwithstanding, power generation by solar energy has been fraught with problems in the past. First, generating costs average to ¥66/kWh, which is 2-3 times higher than the current cost of power for home use. Second, rising outside temperatures erode module efficiency (output). Problems such as these will need to be resolved in the future if solar power generation is to spread worldwide in earnest.

**PV Roadmap toward 2030** Scenario for improving the economic efficiency of PV power generation



Solar power farm (near Munich, Germany)

**Proprietary technology led to the development of amorphous and microcrystalline tandem PV modules**

To resolve these problems, MHI has developed amorphous silicon PV module solar cells manufactured by chemical vapor deposition (CVD)\* of silicon (silane gas). With these PV modules, an extremely thin (0.3µm) (0.0003mm) amorphous silicon film is formed on the glass substrate. Compared to conventional crystal type cells, the quantity of silicon used can be reduced significantly and energy employed during the manufacturing process can also be reduced.

Research into amorphous silicon got under way worldwide in the 1970s, but sophisticated technologies have been necessary to achieve the requisite conditions of high speed and uniform film manufacture. In 2000, MHI led the world in establishing a high-speed, large-area film deposition technology capable of forming a uniform film over a wide area using a plasma enhanced CVD system. With this technology, the company succeeded in mass-producing the world's largest amorphous PV module: 1.4m x 1.1m. The new modules were launched into the markets of Germany and other European nations in 2002.

Owing to their low power generation efficiency, however, installation sites for amorphous PV modules are limited. To overcome this problem, on consignment from the New Energy and Industrial Technology Development Organization (NEDO), an "independent administrative agency," MHI set to developing high-efficiency amorphous and microcrystalline tandem PV modules improving on the weaknesses of amorphous PV modules: for example, by applying the special characteristics of thin-film technology to downsize the installation area. As a result of the microcrystalline tandem PV cell's tandem structure, which consists of a microcrystalline silicon cell atop a conventional amorphous silicon cell, they can be used over a broad range of solar wavelength regimes (ultraviolet, visible, infrared); they also offer 30 to 50% higher generating efficiency than that of amorphous PV modules.

Compared to the crystalline type PV modules that currently form the mainstream in the market, these two PV modules permit easy cost reductions, generate power in large volumes and are easily adaptable to large scale and high-volume production, and con-

**Expectations held toward MHI**

**By combining PV modules with other new energy resources, I hope MHI will respond to expectations held of it worldwide, including the developing nations.**

Today, in light of the problems surrounding energy reliance and global warming, the introduction of photovoltaic power systems is beginning to spread worldwide en route to becoming a global phenomenon. Japan, the world leader in terms of production of solar power, is paving the way. In May 2006, for example, Japan formulated a "New National Energy Strategy," and it is vigorously promoting the expanded adoption of solar power systems everywhere.

MHI, although a late starter, began producing PV modules in 2003, and today the company is on the threshold of a major leap. While crystalline silicon solar cells currently form the mainstream, MHI is set to surge forward thanks to the company's development and production of a new, thin-film silicon type of PV module enabling significant cost reductions and market expansion.

As demand for solar power systems is projected to increase exponentially worldwide in the coming years, MHI should be in a prime position, by virtue of its aim to supply energy using solar power systems in addition to manufacturing PV modules, to develop into a comprehensive manufacturer of solar power systems. By applying its technological and marketing strengths as well as its comprehensive strength combined with other new energy resources, I anticipate that MHI will be active in all global markets, including both the developing and developed nations.



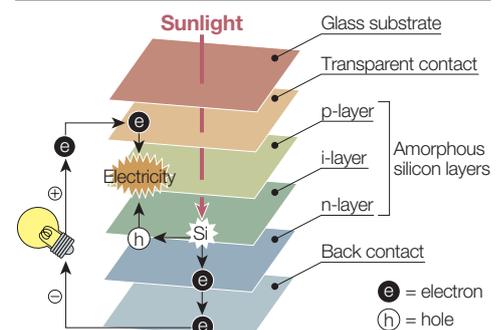
**Osamu Ikki**  
 International Energy Agency  
 Photovoltaic Power Systems  
 Programme  
 Task 1: Exchange and  
 dissemination of information on  
 photovoltaic power systems  
 Japan Representative  
 RTS Corporation  
 President

sequently expectations are rising that they will come to form the mainstream of PV modules going forward. At MHI, plans now call for the pursuit of further cost reductions through greater production expansion and R&D targeted at enhancing efficiency of PV modules, proceeding in accordance with NEDO's "PV Roadmap Toward 2030."

Presently, MHI is strengthening its marketing activities in Europe, particularly in Germany, Italy, France and Spain, and in April 2007 a new factory to produce microcrystalline tandem PVs was placed onstream at the company's Isahaya factory in Nagasaki Prefecture. The new plant has an annual production capacity of 40MW, to complement the 12MW capability in amorphous PV modules. Plans further call for the construction of another factory on the premises, with an annual capacity of 50MW, by July 2008.

\* **Chemical vapor deposition (CVD)** :A deposition method for forming films of various substances. Gaseous materials including the components of the targeted thin film are placed on a heated base substance, and the film builds by chemical reaction.

**Theory of amorphous PV cells**



When sunlight hits the cell, electrons (-) and holes (+) are generated in the i-layer; the electrons move toward the n-layer and the holes to the p-layer. When the transparent electrode (+) and the rear electrode (-) are connected by wire, current flows.

# Solar Power Generation

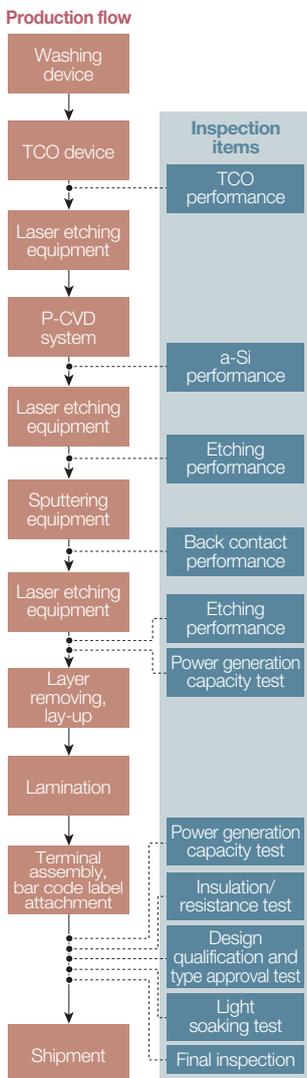


Etching inspection



Deterioration measurement

## Quality control process



### Product quality is stringently controlled against three sets of standards: international, Japanese and German

Maintaining and strengthening the company's quality control are also important.

In the PV module production process, precision is demanded down to several micrometers, and the intrusion of even 0.5 $\mu$ m (0.0005mm) dust particles is impermissible. Also, because amorphous silicon characteristically does not achieve electrical stability until approximately three months have lapsed, post-shipment changes and deterioration rates must be projected in advance. In order to overcome these harsh circumstances and deliver products of outstanding reliability, MHI has configured a quality control system that is extremely stringent. At the Isahaya factory, ISO 9001 certification, the international standard of quality management, has been obtained along with JETPvm certification<sup>\*1</sup>, the Japanese PV module standard, and safety and conformity certification from TÜV<sup>\*2</sup>, Germany's "Technical Inspection Association".

To illustrate the stringency of the company's quality control, the precision of manufacturing processes is continuously maintained at optimal condition through frequent sampling inspections within each process and continuous monitoring of silicon film thickness and etching quality using inspection equipment of various kinds. Also, all completed PV modules are checked for their power-generating performance, durability, etc., and only those that satisfy the quality standards leave the factory. In addition, each and every module shipped carries an identification number, and all production histories and inspection results are recorded and kept on file.

<sup>\*1</sup> **JETPvm certification:**A certification system operated by Japan Electrical Safety & Environment Technology Laboratories (JET). Photovoltaic modules are certification tested for performance, quality and safety and their factory is inspected. Products that can be certified to have properties equivalent to those of the certification model are allowed to attach the "JETPvm certification" mark.

<sup>\*2</sup> **TÜV:**TÜV (Technischer Überwachungs-Verein) performs product certification, quality system inspection, etc. as the certification institution most chosen throughout the EU.

### Because various chemical substances are handled, efforts are focused on environmental protection, safety and health

In producing PV module, MHI makes use of an array of chemical substances, and these must be properly managed and disposed of in order to protect the environment and secure the safety and health of workers on the production floor.

As an example, monosilane (SiH<sub>4</sub>), which is used as raw material in PVs, is both flammable and toxic. Nitrogen fluoride (NF<sub>3</sub>), which is employed as a module cleaning gas, has a global warming potential (GWP) 10,800 times that of CO<sub>2</sub>. Both of these gases are combusted after use, dissolved and treated within the factory to prevent their release into the atmosphere. Meanwhile all waste water from the factory is analyzed for its quality prior to its release, and controls are imposed to prevent effluents of any substances that exceed the Water Pollution Control Law and other standards.

In terms of safety and health issues, particularly heavy weight is accorded to the management of monosilane gas, a raw material of amorphous silicon. When monosilane gas contacts the air, it burns fiercely, and if left to build up, it has the potential to explode. MHI stores and uses more monosilane gas than any other company in Japan, and as such it not only adheres to management standards set by laws and regulations but also provides thorough education and guidance to personnel in charge of safety concerning skill improvement of their workers and maintenance and management of their facilities. In addition, drills are carried out periodically to enable immediate shutdown of equipment and swift evacuation of all employees from the factory in the unlikely event of an aberration on the production line. Furthermore, in matters of procurement the company specifies delivery routes to the factory so that trucks will not pass through residential areas.

Photovoltaic power systems are the target of high expectations as a clean source of energy, and for that very reason MHI believes it is vital to perform related quality control thoroughly, to reduce the environmental burden accompanying their production, and to ensure the safety and health of workers in the production plant.

# Wind Power Generation

## MHI is providing outstanding safe, durable and environment-friendly wind power systems both in Japan and in the advanced U.S. and European markets

In regions throughout the U.S. and Europe where winds blow relatively stably across vast plains, initiatives began early on to develop wind power generation systems. Today, amidst calls for environmental protection and conservation of natural resources, demand for wind power generation is heightening in those countries all the more. In Japan, interest in harnessing wind power has been less prevalent due to the nation's severe meteorological conditions. For wind-generated power systems to gain widespread adoption, improvements are called for with respect to safety, durability and environmental performance. MHI, as Japan's only mass-producer of large-scale wind turbines, is addressing these issues.

### Adoption of wind power is brisk in the U.S. and Europe due to commercial viability and preferential regulations

Air warmed by the sun becomes light and rises (low-pressure system). By contrast, air cooled in the upper atmosphere becomes heavy and descends (high-pressure system). Wind — which is produced by these changes in air pressure — is, like solar power, a “clean” and renewable source of energy that emits no CO<sub>2</sub> or harmful substances. Compared to other renewable energy sources such as solar and geothermal power, generating electricity from wind energy is more viable commercially owing to its lower cost and ongoing advances in achieving high-volume capability; plus, wind energy offers the advantage of enabling power generation both day and night, on both sunny and cloudy days. In addition, in the U.S. and Europe regulations have been put in place that accord preferential treatment to renewable energies, and this resultant “tailwind” is spurring widespread adoption of wind power generation in those regions.

As of December 2006 the total capacity of wind-generated power worldwide is approximately 74GW (74,306MW). This equates to roughly 20 times the amount derivable from

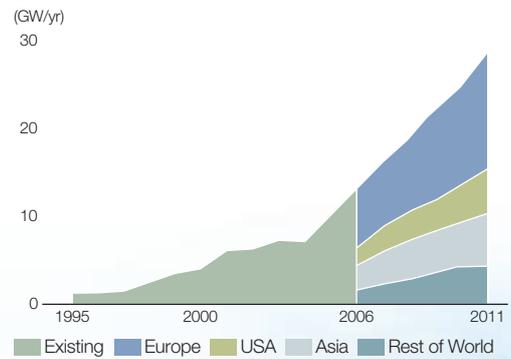
solar power systems, and capacity is projected to continue expanding into the future at a pace of 15,000-30,000MW per year.

Wind power generation also has shortcomings, however. First, it is even more unstable than solar energy. In order to achieve stable wind power generation, thousands of wind turbines must be distributed across different regions. Second, although wind power generation is suited to regions such as the broad plains of the U.S. and Europe where westerly winds blow on a stable basis, it is not suitable in locations like Japan which are very mountainous or buffeted by typhoons or seasonal winds that are subject to changes in wind direction and velocity. Under these circumstances, what will be needed in the future are high-performance and high-durable wind turbines that are capable of maintaining high electric power quality irrespective of wind speed fluctuations and that continue to operate even under harsh weather conditions.

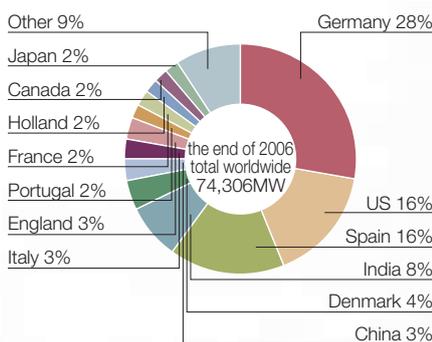
Impact on the local residents cannot be ignored, either. In recent years, wind turbines have become larger in scale in a quest to improve performance. To illustrate, a 2.4MW-class turbine — currently the largest in production — features a tower height of 80m and rotors over 92m in diameter. Measures are thereby called for to pay sufficient consideration to impact on the landscape, to prevent birdstrikes, noise, etc. and to thoroughly implement safety design and quality control in order to minimize accidents from lightning strikes, typhoons, etc.

### Annual Wind Power Development:

Actual 1995-2006 & Forecast 2007-2011



### Global Wind Power Generation (as of December 2006)



Wind Farm (State of Texas)

## Wind Power Generation



Hub assembly line

### Progress in wind turbine development



Nagasaki test unit  
40kW



Okinoerabu-jima  
300kW



Muroran City  
1,000kW



Yokohama prototype  
2,400kW

### Products withstanding Japan's harsh meteorological conditions are garnering eager interest worldwide

Development of wind turbine systems at MHI began in 1980 with production of the first prototype, which employed helicopter propellers as rotor blades. Subsequently, the company carried out R&D of high-efficiency systems responding to worldwide demands, while successive increases in wind turbine scale were pursued: starting from 40kW to 250kW, next to 300kW and then to 500kW.

Especially noteworthy is MHI's best-selling

MWT62/1.0 (MWT-1000A in the domestic market). Commencing with a prototype that initially went into operation in 2002, the MWT62/1.0 incorporates innovations in rotor blade length and shape that enabled efficient power generation even in relatively less windy regions, thus permitting more power generation than earlier systems in the 1MW (1,000kW) class. This improvement has been highly acclaimed, and to date (May 2007) the number of MWT62/1.0 deliveries and orders combined has reached 1,912 worldwide — including 443 units (total generation capacity: 443MW) to Babcock & Brown, America's largest wind power system developer — and 213 units in Japan.

For the domestic market, MHI has also developed Japan's largest wind turbine, the MWT92/2.4, featuring rotors 92m in diameter. Verification testing began at the Kanazawa plant of the Yokohama Dockyard & Machinery Works in January 2006, and the MWT92/2.4 has demonstrated ability to produce 6,000MWh of electricity (enough for some 1,200 households) per year per unit with an annual average wind speed of 6m/s and power generation possible even at a modest wind velocity of 3m/s. It has also been shown to be capable of withstanding typhoon-force winds, thanks to its unique design. The company has already received orders from the U.S. and domestic markets for a total of 474 units of 2,400kW turbines, including an order from the American power provider PPM Energy, Inc. for 42 units slated to go into operation in December 2008. Inquiries have also been

### Expectations held toward MHI

#### Expecting a variety of technological and engineering issues to be addressed as wind power generation plant applications expand and come into wider use.

A strong relationship of trust with suppliers is an important foundation of Babcock & Brown's success and growth, and integrity is one of the primary values required in business partners. In this regard, the MPS (Mitsubishi Power Systems Americas, Inc.) are cooperative, friendly, and responsive. Further, MHI's products consistently meet our expectations. In particular, the 1MW class MWT 1000A wind turbine has both excellent availability and generation capacity demonstrating MHI's considerable engineering and manufacturing skill.

However, utilities across the United States have not embraced the electrical characteristics of the MWT 1000A wind turbine technology. Because it does cause concern for the interconnection utilities receiving power onto their grids and requires significant downstream electrical infrastructure and facilities such as capacitor banks. We would welcome greater effort by MHI to more quickly address such technical and engineering issues.

In addition, we are looking forward to larger rotors for low wind speed sites and new wind generator development for better availability and cost effectiveness for cold weather options.

**Ward Marshall**  
Babcock & Brown

received from numerous interested parties throughout Europe and Asia.

**“Smart Yaw” and independent pitch control: proprietary technologies boosting wind turbine safety and durability**

Even prior to the MWT92/2.4, MHI's wind turbines have been highly acclaimed worldwide not only for their powerful performance but especially for their safety and durability achieved in Japan, a country of severe meteorological conditions.

Two representative technologies enabling increased safety and durability in MHI's wind turbines are “Smart Yaw” and independent pitch control. With Smart Yaw, when the wind velocity exceeds 28m (as when a typhoon is approaching), the nacelle (the power generator component atop the tower) is automatically rotated 180° so as to position the entire wind turbine downwind, enabling the rotor position to shift downwind by weathercock effect (which is still available during a blackout caused by typhoon) and the gale-force winds to flow unimpeded.

With independent pitch control, the pitches, i.e. angles, of the three blades are independently changed according to the difference in wind velocities at the top and bottom of the wind turbine caused by ground friction, thereby lightening the load.

To minimize potential damage from lightning strikes, MHI wind turbines feature multiple lightning receptors that function as lightning rods allowing the lightning current to pass to the earth with assurance.

In addition, in developing its wind turbine products MHI evaluates their performance using a large-scale wind tunnel testing facility within its own research center, and conducts long-term endurance tests and accelerator load tests using actual blades. Also, prior to shipment, the reliability of every blade is confirmed through gale-force load testing, ultrasonic (nondestructive) test inspection, etc.

It is thanks to these technological developments and quality control that MHI supplies wind turbines capable of withstanding Japan's powerful typhoons, mountain gusts, etc. Also, as Japan's leading manufacturer of wind turbines, MHI participates on international technology assessment committees: for example, the body for evaluating the international standard

on power performance measurements of electricity-producing wind turbines: the International Electrotechnical Commission's IEC-614100.

**Promoting the adoption of wind power generation in Japan as the nation's only manufacturer of large-scale wind turbines**

Going forward, these technologies must be put to greater use to achieve wider adoption of wind power generation in Japan. MHI believes it has a responsibility in this respect as the nation's sole mass-manufacturer of large-scale wind turbines.

Presently, wind-generated electricity accounts for no more than some 0.3% of the nation's total output, but at a meeting of the Advisory Committee on Energy and Natural Resources in 2001, the Ministry of Economy, Trade and Industry hoisted a target of introducing 3,000MW of wind power systems by 2010. To date (May 2007), MHI has delivered 2,386 wind turbines worldwide (1,603MW) including 289 units (246MW) in Japan.

As of now, wind power generation operations are not subject to the Environmental Impact Assessment Law, and with the exception of some regions environmental assessment and other preliminary studies are not mandatory. Nevertheless, in view of Japan's limited land area, consideration must be paid to the impact of wind turbines on the landscape as well as the ecological system. Already, under the leadership of the Ministry of the Environment a study commission has held meetings embracing experts in related areas, operators involved in wind power development and environment-related groups. MHI is also probing how wind power operations should be developed in Japan through its involvement in various activities, including those of Seto Wind Hill, which was jointly founded together with Ikata Township in Ehime Prefecture.

MHI is putting in place structures to provide total support to wind power generation business, from the planning phase through to after operational launching, both in Japan and abroad.

**Pre-shipment reliability confirmation**

- Gale-force load testing of blades
- Ultrasonic (nondestructive) testing of blade internal bonding

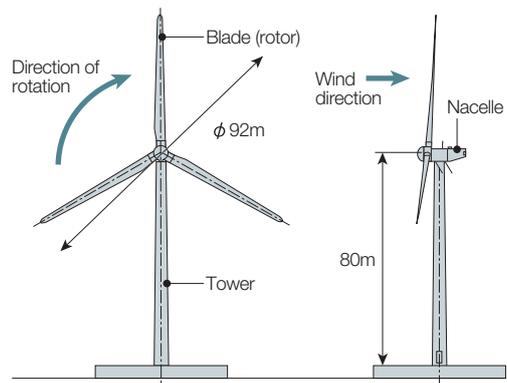


Nacelle assembly line

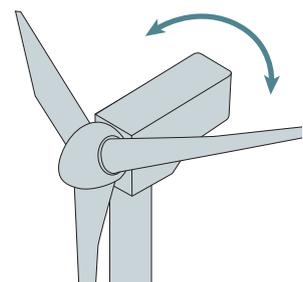


Ultrasonic (nondestructive) blade testing

**Structure of MWT92/2.4**



**What is “Smart Yaw”?**



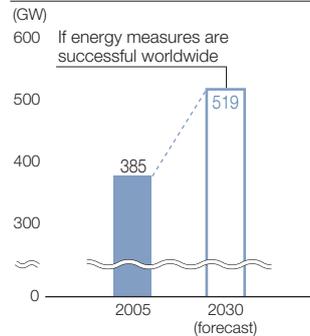
When a large storm approaches, the wind turbine is maintained in the downwind direction to keep the rotor position downwind without yaw motor power, and to allow the gale winds to pass through.

# Nuclear Power Generation

## As one of the world's leading comprehensive nuclear plant manufacturers, MHI is contributing to stable power supply worldwide

Today, nuclear power is once again garnering acclaim worldwide as a “clean” source of energy that can solve the problems of rising energy demand, soaring oil prices and global warming. MHI, as one of the world's leading comprehensive manufacturers of nuclear plants, is contributing to stable power supply worldwide in ways spanning from the design, manufacture, construction and maintenance of generating facilities to the development of next-generation nuclear reactors (next-generation light water and fast breeder reactors) and the forging of a nuclear fuel cycle.

**Nuclear power generation capacity forecast**  
(GW)



Source: World Energy Outlook 2006

### U.S. power provider decides on adoption of nuclear plants wholly “made-in-Japan”

“Order for 2 Nuclear Plants Received from U.S.” “TXU Picks MHI” “First Wholly Made-in-Japan Export” — On March 14, 2007 the press reported that MHI had received orders for two large-scale nuclear power plants. The reports described how TXU, a leading American power provider, had decided on a plan to adopt MHI's latest US-APWR (US Advanced Pressurized Water Reactor) at a power plant being added to the Comanche Peak power station near Dallas, Texas, and had determined to apply to the U.S. Nuclear Regulatory Commission (NRC) for approval to construct and operate the new facility.

Nuclear reactors today broadly divide into two types: pressurized water reactors (PWR) and boiling water reactors (BWR). As seen in the figure to the left, PWRs form the global mainstream. MHI has been developing and building up technology in PWRs for roughly 40 years.

The US-APWR is a large-

scale reactor in the 1,700MW class based on the PWRs developed for domestic use but incorporating performance enhancements to meet U.S. safety and other standards. It features higher output than competing reactors in the same class and the world's highest thermal efficiency: 39%. Safety performance has been significantly improved through the adoption of complete four-train configurations for the high-pressure injection, mechanical, power supply and emergency power supply systems.

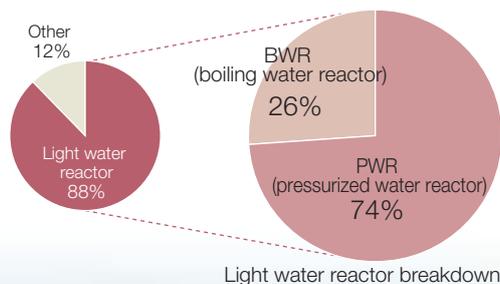
Presently, preparations are under way toward construction of the nuclear plants, including acquisition of Design Certification from the NRC. Plans call for the plants to go commercially on-stream between 2015 and 2020.

### Trump card for stable energy supply and measure against global warming

Behind the adoption of MHI's wholly made-in-Japan nuclear plants by an American power provider are changes in the world's energy situation.

In nations such as the BRICs (Brazil, Russia, India, China), energy demand has surged in recent years due to industrial development, motorization, etc., with the result that oil and

**Worldwide nuclear plant breakdown by type (generating capacity)**



Ohmi Power Station



natural gas prices have soared. Also, how to reduce CO<sub>2</sub> emissions emanating from thermal power generation, in order to avoid climate changes and other unwelcome effects of global warming, has become an issue of worldwide concern.

Meanwhile, in contrast to the oil-producing nations heavily concentrated in the Middle East, countries that produce uranium, the fuel for nuclear power generation, are scattered throughout various regions. What's more, most of these nations are politically stable, and in these respects uranium is more easily procurable. In addition, unlike thermal power generation that uses fossil fuels such as oil, coal and natural gas, nuclear power generation emits zero CO<sub>2</sub>, a cause of greenhouse effects, during the generating process.

For these various reasons, nuclear power generation is once more gathering positive assessments even in the U.S. and Europe. In the U.S., following approval of the Energy Policy Act of 2005, the resumption of new nuclear plant construction in that country was decided for the first time in nearly 30 years. In the UK and Finland, plans have likewise been put forth to promote such constructions. Indeed, countries worldwide, including China and India, are pushing forward with plans to construct nuclear plants to meet their surging

energy demand.

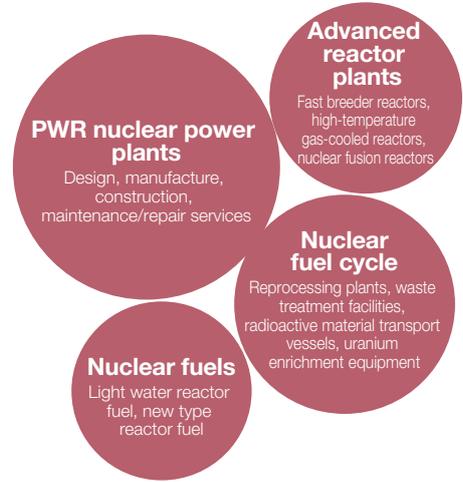
The International Energy Agency (IEA) is projecting that if nuclear power generation is actively promoted, new demand by 2030 will reach 134GW (134,000MW).

**Supporting the promotion of nuclear power generation as Japan's only PWR manufacturer**

MHI has been active as Japan's only PWR plant manufacturer ever since 1970, when the company delivered the first commercial nuclear power station to the Mihama power plant of The Kansai Electric Power Co., Inc. Today, MHI is highly acclaimed as one of the world's foremost comprehensive nuclear power equipment manufacturers handling everything from PWR plant design, production, construction and maintenance services to nuclear fuel processing, to advanced reactor plants (fast breeder reactors, high-temperature gas-cooled reactors, fusion reactors) and nuclear fuel cycle plants.

In Japan, new PWR constructions have been in abeyance for roughly the past 10 years due to a variety of circumstances such as the economic environment and the power supply-

**MHI Nuclear Power Operations**



**Expectations held of MHI**

**I expect information disclosure, compliance and safety — of course — but also passing-on, maintenance and development of nuclear power technologies**

When we think of CSR, I am unsure as to just what time scale we are meant to assume. In many cases, it seems we are not thinking of social responsibility decades into the future. And yet, with nuclear power I believe there are responsibilities that span fairly long periods of time.

The nuclear reactors used to generate power are utilized continuously for more than 60 years after construction. And in the case of radioactive wastes, these must be isolated from humans for several hundred to perhaps twenty or thirty thousand years. Institutions that have involvement with nuclear power are thus called on to bear responsibility for issues having extremely long time spans. What's more, when one thinks about global environmental problems, fossil fuel resources and the like, it is no exaggeration to say that nuclear power is the only energy source upon which mankind can fundamentally rely. Another responsibility is to plan for the future by developing nuclear power technologies and forging the social infrastructure that will enable nuclear power's usage.

Needless to say, for companies that shoulder responsibility for nuclear power, matters such as information disclosure, accountability, compliance and priority of safety are of extreme importance. An even more important social responsibility, however, is the passing-on, maintenance

and development of nuclear power technologies. In this context, are Japan's nuclear power companies — and MHI in particular — carrying out these responsibilities? The nuclear power generating plants currently in use still have a fairly long time until they will be ready for refurbishing. Until such time, there is not likely to be any new demand for nuclear reactors in the domestic market. How will this blank period of time be weathered? This is what will decide whether the nuclear power companies will be able to fulfill their responsibilities. They will either need to expand into the overseas markets or conceive of uses for nuclear power other than power generation. In MHI's case, remarkable achievements are being made in the former case, as illustrated by the company's receipt of orders from the U.S. for constructions of new nuclear plants. Moreover, the successes recorded in the U.S. should lead to business in the developing countries also. In that respect, MHI's efforts are to be highly commended.

I would also like to add that, from the perspective of scandals involving nuclear power, no major problems have occurred involving MHI since the accident of the steam burst at the Mihama Nuclear Power Plant.



**Hiroyuki Torii**  
 Tokyo Institute of Technology  
 Professor, Research Laboratory  
 for Nuclear Reactors

# Nuclear Power Generation



Replacement steam generator under production at the Kobe Shipyard & Machinery Works

### Major power plant orders to date

#### Domestic

Deliveries completed	23units	19,366MWe
Under construction	1unit	912MWe
Deliveries scheduled	2units	3,076MWe

#### Overseas

<b>Belgium</b>		
Replacement steam generator	Total 10 units	
<b>France</b>		
Replacement steam generator	Total 6 units	
<b>US</b>		
Replacement reactor vessel head	Total 15 units	
Replacement steam generator	Total 6 units	
US-APW	2 plants (pending formal contracting)	
<b>Finland</b>		
Reactor vessel	Total 1 unit	
<b>Slovenia</b>		
Replacement steam turbine	Total 1 unit	
<b>China</b>		
Reactor coolant pump	Total 8 units	
Reactor vessel	Total 2 units	
<b>Taiwan</b>		
Steam turbine	Total 2 units	
<b>Mexico</b>		
Steam turbine	Total 2 units	
<b>Spain</b>		
Replacement steam turbine	Total 1 unit	
<b>Sweden</b>		
Replacement reactor vessel head	Total 3 units	

and-demand situation. Even during that period, however, MHI maintained and improved its PWR technology through its ongoing development and export of major large-scale replacement equipment for existing plants overseas, including steam generators, reactor vessel heads, pressurizers and turbines. Most recently, in June 2005 the company received an order for six replacement steam generators for France, in April 2006 an order for two steam generators for Belgium, and in May 2006 an order for four reactor vessel heads for the U.S. MHI is thus involved in the manufacture of all major PWR components.

Based on this solid record, MHI today is targeting to supply the U.S. and other countries with large-scale PWRs, and plans are under way to launch supply of medium-scale reactors in the 1,100MW class jointly developed with AREVA of France. Meanwhile in Japan a number of new construction projects are under way: these include a third unit for the Tomari plant of Hokkaido Electric Power Co., Inc., slated

to go into commercial operation in December 2009, and third and fourth units — the first domestic APWRs based on the US-APWR — for the Tsuruga plant of the Japan Atomic Power Company. In addition, MHI, as Japan's only PWR plant manufacturer, is involved in a third-sector project to develop next-generation light water reactors in preparation for replacement demand around 2030.

### Pursuit of greater safety and the quest to establish a safety-oriented corporate culture

It is precisely because expectations toward nuclear power generation are rising worldwide in this manner that maintaining and improving safety are becoming an ever more important topic.

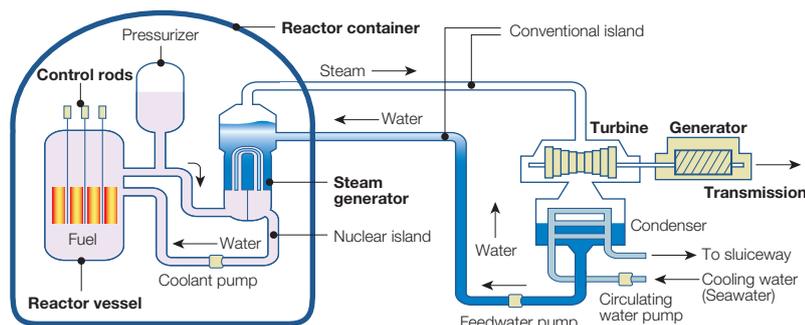
MHI believes that achieving safety and security is the fundamental and foremost mission of a plant manufacturer, and the company devotes its energy to securing the safety and security of nuclear power plants from the dual perspectives of manufacturing and operation.

In the area of manufacturing, MHI has forged an advanced quality assurance system, dubbed "N (Nuclear) Standards," since it entered the nuclear power business in the 1970s. The company strives to carry out those standards strictly while undertaking revisions meshing with legal revisions as well as circumstances surrounding technology and products.

With respect to operations, once a plant goes onstream MHI undertakes regular equipment inspections and analyzes and evaluates the inspection data. The company is also pouring its energies into developing technologies for conducting maintenance and operation more safely, including inspection-and-repair robots to perform work in locations not readily accessible by personnel and operational training simulators. Furthermore, the company continues to train workers engaging in inspection and maintenance services at general safety training centers and nuclear power service centers established in its factories.

In addition, in December 2004 MHI founded a Managing Board for Innovation in Nuclear Business (see page 43) chaired by the President. The Board works toward improving and firmly establishing a corporate culture and organizational approach to the safety and security of nuclear power.

### PWR (pressurized water reactor)



The PWR is a reactor in which the nuclear island (primary system) and conventional island (secondary system) are separated by steam generators. In addition to enabling a compact reactor core design, PWRs offers such advantages as outstanding fuel economy, minimal generation of radioactive waste, and easy operation and maintenance.

**Focusing on nuclear plant waste treatment technologies and the establishment of a fuel cycle**

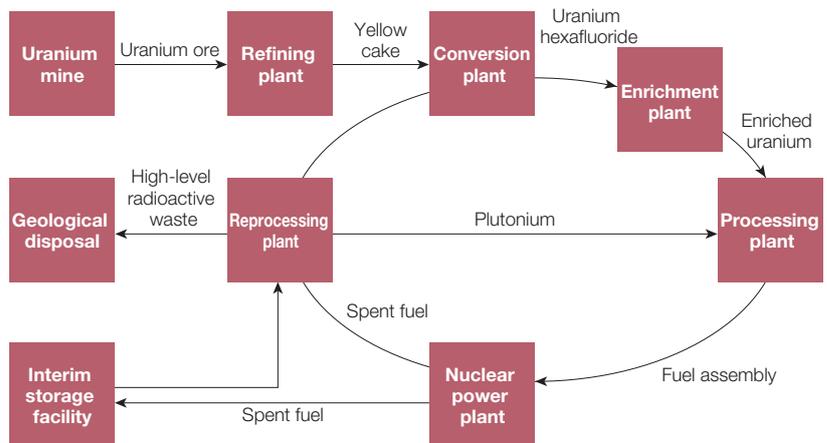
Safe use of nuclear power requires more than the safe operation of power plants: equally important is safety assurance in the management, treatment and disposal of spent fuel and radioactive waste and throughout the lifecycle of nuclear power generation, through to safe handling of decommissioned plants.

To ensure such safety, MHI is working to develop waste treatment technologies that accommodate final storage and treatment methods. From a comprehensive perspective spanning from waste generation to treatment, the company is pursuing treatment and disposal systems that are both practical and economical. It is also developing safe and economical plant decommissioning technologies: for example, technologies for decommissioning reactors, etc. and practical applications of clearance level certification equipment (inspection validation equipment to check that waste is being properly disposed of according to its level of radiation) for measuring the radiation of low-level radioactive wastes generated in large volumes during facility decommissioning.

Proper treatment and reprocessing of spent fuel are also indispensable for making effective use of limited uranium resources, and this is especially important in Japan, a national of modest natural resources. MHI is working toward the establishment of a nuclear fuel cycle for recovering and reusing uranium and plutonium recoverable from spent fuel through its participation in the development, design and construction of the various facilities at Japan Nuclear Fuel Limited's (JNFL) reprocessing plant in Rokkasho, Aomori Prefecture. In this way, progress is under way toward the creation of nuclear plants that excel in safety, reliability and economy.

In addition, MHI is actively involved in a "plutothermal" project that is expected to conserve uranium resources through use of mixed oxide (MOX) fuel, a blend of uranium and plutonium. MHI has also been selected as the core company in a national project targeting the development of a fast breeder reactor (FBR) enabling optimal use of uranium resources by creating more fuel than is consumed during power generation; the company will continue

**Nuclear fuel cycle**



The fuel used in a nuclear reactor contains still usable uranium and plutonium produced within the reactor. The "nuclear fuel cycle" is the process by which such uranium and plutonium are separated and recovered from the spent fuel and reprocessed so that they can be used again as fuel.

to play an important role in this project in the coming years.

**Promoting broad, correct understanding of nuclear power through dialogue with society**

Besides the foregoing initiatives, MHI, in a quest to win broad and more accurate understanding of and greater familiarity with nuclear power generation and its technologies, proactively engages in a variety of public acceptance (PA) activities. These include tours of its factories and open meetings to explain the workings of nuclear power.

In fiscal 2006, 5,117 members of the public took part in the company's PA tours of its nuclear power system manufacturing facilities, bringing the total number of tour participants during the past 10 years to roughly 40,000. During the tours, visitors are given easy-to-understand explanations, using slide presentations and other aids, of the current status of nuclear power generation — including the energy picture in Japan and globally and environmental issues — and MHI's initiatives in this area. They are also escorted through the factory where gigantic structures weighing upwards of two to three hundred tons are manufactured using compound machine tools among the largest in scale anywhere in the world. Visitors who have taken these tours frequently comment on their awe at the overwhelming scale, their satisfaction at seeing the cutting edge in production technology, and their newfound understanding of the need for nuclear power generation.



Rokkasho Reprocessing Plant



Training under way at the Nuclear Service Center

Special Feature

MHI's Response  
to the Demands  
of Society

Pride and  
Responsibility  
in  
Manufacturing

2

# Motor Vehicles and MHI

The auto industry today is being called on to achieve further evolutionary advances and nonstop technological innovation targeting improved safety and riding comfort, intelligent operation, lightening of environmental burdens, etc. MHI, by applying its advanced knowhow and technology cultivated as a company involved in manufacturing, is contributing to resolving the issues faced by the auto industry.

# From engine and air-conditioning system parts to sophisticated road traffic system products, MHI is responding to the issues and demands of the auto industry.

MHI, applying its technology and knowhow cultivated in a broad range of industrial fields — design enabling improvements in both quality and productivity, machining and processing enabling the production of high-precision parts, and production systems enabling streamlining and optimization of complex manufacturing processes — provides a highly varied array of products and systems that solve problems challenging the auto industry and respond to customer demands.

MHI supplies parts of all kinds to support a pleasant, high-performance ride.

air-conditioner, engine and power train parts

Manufacturing facilities and integrated production systems

MHI is contributing to the rationalization, optimization and enhanced precision of production processes.

## MHI's Vehicle-related Products

MHI supplies facilities of all kinds for testing performance, safety and riding comfort.

Testing equipment and simulation systems

ITS-related parts and solutions

MHI is developing intelligent transportation systems (ITS) to reduce accidents and congestion.

## In the automotive field too, MHI manufactures products friendly to the environment.

### ■ Engine valves

In the manufacturing process, engine valves are treated to prevent them from emitting substances that contaminate the environment. Environmental measures are implemented throughout the product lifecycle.



### ■ Car air-conditioning systems

MHI is developing components based on new natural coolants satisfying European refrigerant regulations.



### ■ Dry cut hobbing machines

Dry cut hobbing machines use no cutting oil during the gear-cutting process, thereby eliminating problems relating to waste oil, oil smoke, etc. Compared to wet cut hobbing machines, they also achieve 2.5 times faster cutting speed, 10 times longer tool life and a 20% savings in energy.



### ■ EV/HEV motor systems

Applying its industrial servo motor technologies, MHI is developing high-efficiency motor systems for use as prime movers in electric and hybrid electric vehicles.



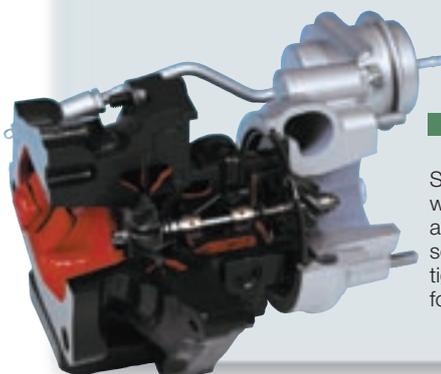
### ■ ETC systems

MHI's newest ETC system is nearly 50% smaller, 40% lighter and 30% more energy-efficient than the company's first system launched in 2001.



### ■ Supersized electric injection molding machines: 2300em-3500em

MHI's supersized em series feature newly developed proprietary mechanisms and systems enabling a 60% reduction in power consumption compared to hydraulic injection molding machines. Operating noise has also been reduced through the adoption of a proprietary direct-drive motor.



### ■ Turbochargers in increasing demand amidst tightening of environmental standards

Spurred by the newly emerging markets, especially in Asia, the number of motor vehicles in use worldwide is increasing each year. At the same time, however, concerns are deepening toward air pollution stemming from vehicle gas emissions, global warming and depletion of fossil fuel resources, with the result that environmental standards imposed on vehicles are becoming ever tighter in countries everywhere. Against this backdrop, automakers around the world today are focusing on small turbochargers for passenger cars. (See page 29)

# Turbochargers

## MHI is making diesel engine exhaust gas cleaner with its variable-geometry (VG) turbochargers

**In the face of environmental issues and soaring fuel prices, the auto industry is vigorously moving to develop clean diesel engines**

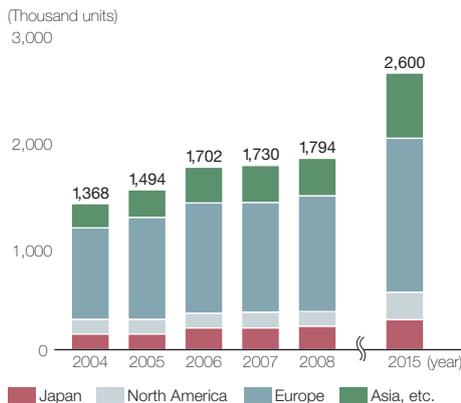
Vehicles powered by diesel oil deliver higher fuel efficiency and emit less CO<sub>2</sub> than vehicles that operate on gasoline. For those reasons, when the issue of global warming began to draw attention in the mid-1990s, a rapid shift got under way from gasoline to diesel vehicles in Europe, where diesel engines were originally created and where interest in the engines had been strong. Today, roughly 50% of all newly registered vehicles in Europe are diesels.

Diesel vehicles present a problem, however, in that they emit significant amounts of particulate matter (PM), thought to have injurious effects on the respiratory organs, and nitrogen oxides (NO<sub>x</sub>), said to be a cause of photochemical smog. In Japan and the U.S., as an outgrowth of air pollution stemming from vehicle emissions, which became a social issue during the 1960s and 1970s, PM and NO<sub>x</sub> emission standards have traditionally been severe; furthermore, the popular conception of diesel vehicles has not been favorable. For those reasons, in both countries diesels

presently account for less than 1% of all newly registered passenger cars, far lower than the corresponding percentage for Europe.

This polarized situation has now been challenged with the announcement in July 2005 of a draft proposal on new vehicle emission standards for Europe referred to as "Euro5." Whereas earlier standards focused on CO<sub>2</sub> emissions, the European Commission's newly issued policy has called for PM and NO<sub>x</sub> emissions to be reduced to the levels in force in Japan and the U.S. In the meantime, prices of crude oil and gasoline have soared steadily in recent years. As a collective result, competition has intensified among automakers to develop new "clean" diesel engines offering high fuel efficiency plus minimal pollution. Today this contest is under way worldwide.

**Projected global turbocharger demand**



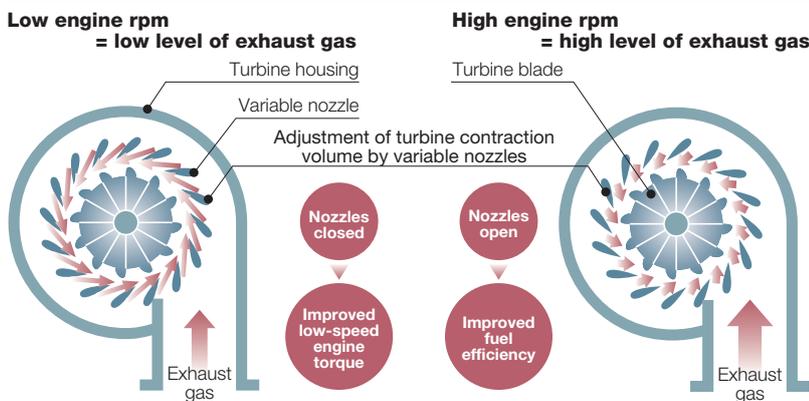
### New variable-geometry (VG) turbocharger makes important contribution to cleaner diesel engines

As a system ancillary to clean diesel engines, today demand is growing for turbochargers. A turbocharger is a device that boosts combustion efficiency by utilizing exhaust gas to turn a turbine; the rotation drives a compressor on the same axis as the turbine, with the result that air is taken in, compressed and fed (supercharged) to the engine. In recent years, a major contribution to the achievement of clean diesel engines has come from establishment of a technology known as "exhaust gas recirculation" (EGR). With EGR, the exhaust gas used to rotate the turbine is recirculated into the intake stream, a process that results in dilution of the oxygen in the intake, which lowers the temperature and curbs emissions of NO<sub>x</sub>.

EGR has not been problem-free, however. As an example, if the amount of gas exhaust fed to rotate the turbine is excessive, it triggers incomplete combustion, causing an increase in PM emissions.

In response to this problem, MHI has developed a variable-geometry (VG) turbocharger

**VG turbocharger configuration**



The opening/closing of the variable nozzles attached to the turbine controls supercharge pressure. Pressure is optimally controlled by closing the nozzles at low engine rpm and opening the nozzles at high engine rpm.

that curbs PM emissions by meticulously controlling the exhaust gas pressure and recirculation quantity, thereby boosting effectiveness in curbing NOx emissions. Realization of the optimal EGR volume has been enabled by adjustment, using variable nozzles, of the turbine's contraction volume and changing of the exhaust gas pressure. These complexly configured VG turbochargers adopt durable and wear-resistant materials and structure that together ensure normal operation within a severe environment of high temperatures and no lubricants and permit optimal control of the boost pressure and exhaust gas recirculation.

Driven by the new VG turbocharger, sales of MHI's small-scale turbochargers for passenger cars topped 3 million units in fiscal 2006. In order to respond to brisk demand going forward as well, MHI is now strengthening its production facilities at its mother factory — the General Machinery & Special Vehicle Headquarters in Sagami-hara, Kanagawa Prefecture — and at MHI Equipment Europe B.V., its European production base located in Almere, The Netherlands. It is also making strides in boosting the speed of response to local market needs and minimization of inventories.

**In response to increasingly sophisticated and complex products, MHI is supporting customers and boosting quality control throughout its supply chain**

In addition to increasing production capability, MHI is also focusing on sustaining and improving quality. In June 2005 a Turbocharger Technical center was established within the General Machinery & Special Vehicle Headquarters, featuring enhanced equipment such as a test bench for verifying the performance and durability of engines and peripheral devices and hot-gas testing equipment. The center conducts performance and endurance testing not only on new turbochargers made in-house but also on engines developed by the automakers, MHI's customers. In ways such as this, MHI supports the development operations of its clients.

MHI has also fortified its in-house quality control system with acquisition of ISO/TS16949\* quality management certification,

and it is requesting that all primary suppliers forge quality management systems conforming to ISO9001. Also, in light of the increasing number of suppliers resulting from the growing complexity of MHI's VG turbochargers and other products, the company is also, when deemed necessary, paying direct visits to secondary suppliers as well, undertaking activities to firmly root its thinking on quality control. In these ways, the company is strengthening quality control throughout its entire supply chain.

By simultaneously expanding its supply capacity and securing optimal quality through the foregoing quality control initiatives, MHI is now aiming to achieve the second-largest global market share in the field of small turbochargers for passenger cars.

\* ISO/TS16949 :Quality management standards appending items unique to the auto industry to ISO9001 standard



Automated production lines



Cartridges (core turbocharger component) assembled on the automated production lines



Testing at Turbocharger Technical center

**Expectations held toward MHI**

**Instead of playing an important role behind the scenes, I would like to see MHI engage in active dialogue and adopt a more proactive stance, demonstrating its strong determination to be a leader in the auto industry's development.**

In recent years turbochargers have been filling an important role in the development of diesel engines, an area in which calls are heard not only for measures against noise pollution but also for environmental measures relating to NOx emissions, etc. Most recently, especially, with the development of exhaust gas recirculation (EGR) technology demand is calling for the assured intake into the engine of increasingly larger volumes of exhaust gas. In that respect, MHI's newly developed VG turbocharger is garnering high acclaim not only for the way it keeps effective boost pressure but also as a system that promotes use of EGR, which is an issue for the automakers. It's no wonder this has been achieved by MHI — a company that can integrally carry out everything from material development through product design and manufacture.

Still, from the standpoint of one involved in the auto industry, what I would like to see is for this technology to be promoted more widely, with MHI going directly to where vehicles are developed and manufactured, to listen to, and actively incorporate, the views of those in charge of vehicle development, as well as those of journalists like myself. Instead of playing an important role behind the scenes, I would like to see MHI engage in active dialogue and adopt a more proactive stance, demonstrating its strong determination to be a leader in the auto industry's development.



**Takeshi Aoike**

*Motor journalist  
 Member of Automotive  
 Researchers' and  
 Journalists' Conference of  
 Japan (RJJC) and Society  
 of Automotive Engineers  
 of Japan, Inc. (JSAE)*

Special Feature

MHI's Response  
to the Demands  
of Society

Pride and  
Responsibility  
in  
Manufacturing

3

# Space Development and MHI

In April 2007 oversight of the H-IIA Project, to develop Japan's main rocket, was transferred into MHI's hands. Here, MHI and experts discuss such matters as product responsibility, quality control, product safety, economy and future business developments.



Photo courtesy of Japan Aerospace Exploration Agency (JAXA)

## Stakeholders Roundtable

# MHI's Responsibility to Support Space Development – Today and Tomorrow – and Hopes for the Future



**Shinichi Nakasuka**  
Professor, Department of Aeronautics and Astronautics, University of Tokyo

**Keiko Chino**  
Senior Writer, the Yomiuri Shimbun

**Jiro Kouchiyama**  
Executive Director, Office of Space Flight and Operations, Japan Aerospace Exploration Agency

**Takashi Maemura**  
Senior Chief Technology Supervisor and Engineer, Nagoya Aerospace Systems Works, Mitsubishi Heavy Industries

**Shoichiro Asada**  
Head of Space Division, Aerospace Headquarters, Mitsubishi Heavy Industries

### What should be the aim of MHI's rocket launch operations?

**Asada:** To begin, I would like to ask what hopes you all have with respect to rocket launching.

**Nakasuka:** What's most important is for Japan to secure its own rockets that can be launched when wanted and that are virtually immune to failure. I would like to see MHI fulfill a role in securing rockets that will launch with certainty also so that a variety of satellites can be sent up into space. One more thing, I'd like to see technology that would enable launches

not just twice a year, but more frequently.

**Maemura:** With its current facilities, MHI is capable of manufacturing four to five rockets a year. But because there's no demand in Japan to match such numbers, it would be necessary to launch foreign satellites.

**Nakasuka:** That's where the difficulty lies. There are already a lot of competing rockets on the market overseas, and I have some doubt as to whether or not satellite launching would make it as a business.

**Maemura:** Rockets account for only 1-2% of MHI's total sales. Top management

### H-IIA Rocket Launches Privatized to Meet Changing Times

Commencing in April 2007, the H-IIA rocket project underwent privatization. Under an agreement on contracting of launch services concluded between MHI and the Japan Aerospace Exploration Agency (JAXA), MHI is now wholly responsible for all aspects from the rocket's production to launching. JAXA is now in charge of safety management, etc.

The objectives of the privatization move are to unify production responsibility, strengthen the sales structure and reduce costs. In reflection of the failed launches of domestically produced rockets in the past and the wide coverage in the media those failures were given, the hopes of the Japanese people — and the eyes of the world — are focused on MHI in expectation of seeing successful launches ahead. Against that backdrop, MHI's responsibilities are extremely weighty, including how the company will enhance rocket quality, control costs and achieve successful launches while managing multiple manufacturing partners, and how it will achieve a proper balance between maintaining and improving Japan's rocket technology and economic demands.

#### H-IIA Launch Service Structure after Privatization

Starting in April 2007, MHI now takes complete charge of all satellite and other launches by H-IIA rocket, handling everything from service contracting with the customer to rocket production and actual launching.

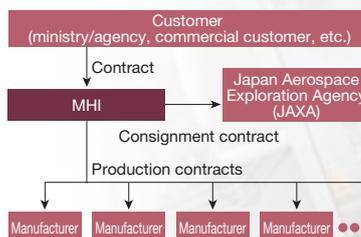


Photo courtesy of Japan Aerospace Exploration Agency (JAXA)

**Stakeholders Roundtable**



**Jiro Kouchiyama**  
*Executive Director, Office of Space Flight and Operations, Japan Aerospace Exploration Agency (JAXA)*  
 Graduated from Waseda University in 1970 with a degree in science and engineering. Joined the (former) National Space Development Agency of Japan (NASDA) as a development engineer. Subsequently served there in charge of development of various rocket vehicles and as H-1A Project manager in the Space Transport Systems Office. Became Executive Director of JAXA in April 2006.



**Keiko Chino**  
*Senior Writer, the Yomiuri Shimbun*  
 In 1979, graduated from the Department of Psychology of the Faculty of Letters at The University of Tokyo and joined the Yomiuri Shimbun. After affiliations in the political, economics and science departments, starting in January 1999 she served as Deputy Editor of Yomiuri's Commentary and Analysis Department. In April 2007 she became a Senior Writer.



**Shinichi Nakasuka**  
*Professor, Department of Aeronautics and Astronautics, University of Tokyo*  
 In 1988, graduated from the University of Tokyo's Graduate School of Engineering with a Dr. Eng. in Aeronautics and Astronautics. Joined IBM Japan, where he did research in artificial intelligence and factory automation. In 1990, joined the faculty of the University of Tokyo. After serving at the Research Center for Advanced Science and Technology and as Associate Professor in the Department of Aeronautics and Astronautics, became a Professor in the Department in 2004.

through the years has successively touted rockets as the culmination of our technologies and the symbol of a company that thrives on technology, and they have said that maintaining the nation's main rocket is both MHI's responsibility and its pride. But in order for MHI to carry out this duty and simultaneously make it work as a business, a certain number of launches has to be secured.

**Nakasuka:** What's needed, then, are the "numbers."

**Maemura:** Yes. In fiscal 2006, for example, we launched four rockets, which is more than usual. A large number of launches inevitably leads to the discovery of anomalies, and that's important.

**Asada:** It's by finding such anomalies and making the needed improvements on an ongoing basis that rockets are perfected. Technology can't be refined without dealing with rockets in some number. Japan has launched an industrially viable liquid-fuel rocket only 43 times, whereas Russia's Soyuz, which is used as a manned rocket, has been launched as many as 1,600 times. I think it's only after launches in an amount like that that astronauts can ride them with peace of mind.

**Nakasuka:** The more launches undertaken, the fewer the anomalies. Striving to avoid failure is imperative, but failures are also important in order to ultimately succeed.

**Kouchiyama:** I'd like to emphasize one more thing, that "launches" aren't the only

technology involved with rockets. Launching is only half the story. Launch technology also has to be supported by technologies in rocket manufacture and servicing and in commercializing the rocket industry. The other half of the story, though, is requisite capability in R&D. Going forward, I think Japan's rocket technology has to be elevated from both of these aspects.

**Chino:** From the perspective of the Japanese people, we want to see successful launches. It's the nature of the newspaper industry that if all launches ahead are successful, gradually they will no longer be newsworthy and articles concerning launches will become increasingly smaller; but if there's even one failure, the news will suddenly be splashed all over the papers. Some may criticize the press for giving huge coverage only in instances of failure, but when a launch fails people become interested in knowing that's going to happen ahead, and that's why a failed launch becomes big news. This is something that needs to be understood.

**Nakasuka:** What I'd like to see is for the time



**Quality Assessment Activities: Leaving No Glitch Unturned**

With rockets, quality control centers on ferreting out potential glitch-causing factors — finding problem points prior to launch.

Rocket components are of enormous number, and even a single quality lapse can lead to mission failure. To avert such lapses, MHI undertakes inspection and evaluation during the design and manufacturing stages as well as by a special department in charge of component quality assurance. In addition, wholly integrated assessments are rendered by individual evaluators appointed for each type of sub-system component. (See figure on page 34)

The evaluators consist of staff in charge at the section chief level and administrative representatives. They examine everything from the design requirement phase through the final assessment phase, confirming — and in all cases attesting to with their signatures — that there are

no problems prior to launch. The same evaluations are also carried out for devices and systems for which other companies are in charge.

Presently, where special importance is being placed within quality assurance activities is in trend data management. To illustrate how trend data management works, for a particular valve that has been used in the tank systems of several rockets already launched, the component's values are computed and its quality is evaluated using its trend data, default values, etc. Quality is then enhanced further from the perspective that merely lying within the default range is not enough; there must also be a reason for any components that lie outside the trend. Since the higher the number of launches, the greater the volume of such data, this is a good example of how rocket reliability is raised.

to come when rocket engineers will say a successful launch is all a matter of course.

**Asada:** I'd like for such time to come quickly. Today, assiduous efforts are being made. Until now, we've never felt peace of mind regarding a rocket launch until the satellite separated without incident.

**Kouchiyama:** Inherently, reliability should be taken for granted; it's strange to make a big fuss about it. I too think that we have to work so that launches are completed as a matter of course.

**Responsibilities and Expectations Held of MHI Manufacturing**

**Kouchiyama:** I agree that experiencing failure is important. But what I'd like to see is for MHI to aspire to perfection in manufacturing. I'd also like the company to have the "power of thinking" to support and enable the realization of that aspiration. My personal theory is that to acquire such power of thinking, further R&D — the other half of the story — is indispensable.

**Maemura:** Roughly 10 years have already passed since the H-IIA rocket was developed, so our young generation of engineers has no experience in development. Development fosters creativity, which in turn leads to the power of thinking. The result of such thinking, in turn, is more thinking, and it's through this cyclical repetition that engineers grow.

**Asada:** Mr. Maemura and I have been extremely fortunate in having spent a great deal of time involved in the development of the H-I and H-II. While monitoring those rocket



launches, we always pursued R&D toward the next step, and that experience enabled us to grow as engineers. For that reason, from now on also I hope, while monitoring launches, to begin R&D into new areas as well, to train young engineers to grow within that process.

**Chino:** The majority of the Japanese people may think proudly that launching foreign satellites using the H-IIA would demonstrate Japan's technological strength, but what we ultimately hope for is the cultivation of the next generation of engineers and improvement in this nation's rocket technology. From that perspective, I think the next goal should be clearly defined and engineers trained within that R&D process. Where clarity is needed is concerning the transport system envisioned for the future: should it be "reusable" as opposed to today's "single-use" model, or



**Takashi Maemura**  
 Senior Chief Technology Supervisor and Engineer, Nagoya Aerospace Systems Works, Mitsubishi Heavy Industries



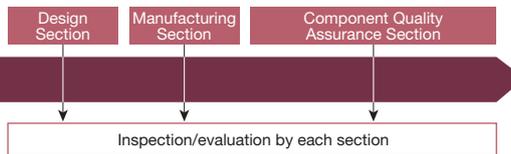
**Shoichiro Asada**  
 Head of Space Division, Aerospace Headquarters, Mitsubishi Heavy Industries

**H-IIA Project Quality Assessment System**

● **MHI in-house production/inspection**

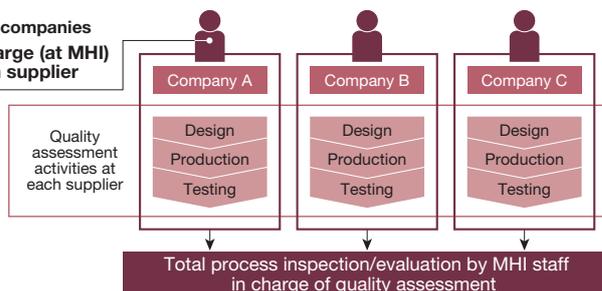
Inspection/evaluation by staff in charge of sub-system component assessment

- Overall system evaluation
- Guidance and control system evaluation
- Structural system evaluation
- Propulsion system evaluation Etc.



● **Production/inspection at other companies**  
 Establishment of person in charge (at MHI) of quality assessment for each supplier

- Payload fairing
- Solid rocket booster
- Avionics Etc.



**Kazumi Abe**

General Manager, Corporate Social Responsibility Department, Mitsubishi Heavy Industries

## Stakeholders Roundtable



1st stage engine production



1st stage rocket being placed on launch pad

should it be something else?

**Kouchiyama:** Cultivating engineers who will conceive the next project leads to the next step in R&D. Furthermore, technology developed in this way also leads to enhancement of the H-IIA's reliability.

**Nakasuka:** Young engineers who come on board later have a poor sense of the wisdom that engineers who were involved from the outset accumulated through their years of experience: notions such as just what is important and the knowledge that doing such-and-such will lead to a failure. Passing on such wisdom, and how that can be done, is of great importance — and is necessary, I think, not only within MHI itself but also to the people working for its partner companies.

To enable continual launches of the H-IIA, cost reductions must be pursued; but at the same time, the question must be addressed as to how to maintain motivation in the people working for partner companies near the same level as they had during the early stages of development. I feel this is an extremely vital task for MHI in view of its need to simultaneously achieve cost reductions and reliability.

**Asada:** You're absolutely right. We too view maintaining the motivation of our partner companies to be a major issue.

Since rockets are systems of large scale, total in-house production is impossible. We therefore integrate items that we have made for us by our many competitors and partner

companies, and naturally we have to manage their quality. It's extremely difficult to manage everything completely, however, in cases of subcontracted or sub-subcontracted work.

What we're doing today therefore is to promote "SQRAM\*," a program devised to strengthen our relationships with our partner companies. As an example, we invite the people who make things for us to come to our factories, where we show them where their company's products are being used. These workers come away with the emotional uplift of seeing how their products are actually being of use, and this, I believe, is boosting their motivation.

**Kouchiyama:** To achieve cost reductions, it isn't enough just to manage overall costs. We think that JAXA too needs to have the ability to probe down to the detailed cost factors and discuss with manufacturers what can be done to make things cheaper. This is another topic on which we want to work together with MHI, for it is the most important aspect of pursuing cost reductions.

**Abe:** The foremost objective of MHI's commercial missions is to maintain the reliability and certainty of our launches, but we can't allow ourselves to be lax concerning cost reductions.

**Chino:** I've long been dubious as to how profitability could be achieved as a privatized business. Unless explanations are offered in response to various doubts — such as why the government would give this much support to the business of a single private enterprise, or to what extent MHI seeks government's support — and transparency is improved, misunderstanding would result.

**Asada:** Privatization means delegating responsibility for the "operation" of Japan's main rocket. Operation consists primarily of taking charge of everything from coordinating with satellite customers to rocket production and launching. Enhancing main rocket reliability, securing stable launch opportunities and launch infrastructure, etc. are roles that the government should continue to take charge of. What we're saying is please make a clear distinction between the private and public sectors' respective duties; we're not asking for the government's support. Perhaps

### Probing a New Manufacturing System Eliminating Initial Failures

For large-scale systems such as rockets where failures are unallowable, MHI believes it must seek out a new way of manufacturing different from conventional reliability-based design.

In the case of products that are manufactured in large numbers — automobiles, for example — eliminating initial failures during the development phase is natural, but even more important is to boost the product's reliability as a way of preventing accidents after it is sold. But with products that are made in small quantities — like rockets — the only option is to totally eliminate initial failures before the product is delivered.

The main cause of initial failures is improper design. At MHI, initial failures of this kind are referred to as "inevitable failures." Such failures occur as a matter of inevitable course and not by accident. The company sees such failures as "built-in." MHI aims to establish new processes that will eliminate such "inevitable" failures.



this isn't being conveyed properly to the general public.

We believe that global competitiveness will be enhanced by having the government shoulder areas that it should shoulder and having MHI strive for its own cost reductions. We're asking for these functions to be carried out in ways that are transparent.

**Kouchiyama:** We're accountable to organizations such as the Space Activities Commission of the Ministry of Education, Culture, Sports, Science and Technology, so we at JAXA would also like to see this done.

**Abe:** Hearing what's just been discussed, I feel we too, as a manufacturer, need to offer the doubting public clear explanations.

\* **SQRAM** : Supply-chain Quality Re-engineering Assessment Managing team

### Japan's Future Space Development and MHI's Role

**Maemura:** JAXA's long-term vision is to reach the moon's surface. The goal is to send up an unmanned spacecraft by around 2017, and then to set up a base on the moon. The ultimate aim is to develop a transport vehicle for shuttling back and forth between the Earth and the moon. MHI thinks it too could participate in a dream of a project like this, and we will soon make our own proposal of vision for a lunar exploration.

**Kouchiyama:** Whether going to the moon or exploring other stars, the obstacle is not having a good means of space transportation. To resolve this problem, we want to move forward, a little at a time, while cooperating with everyone. The H-IIA is the base, the starting point.

**Chino:** I've been reporting on space development for more than 15 years, and my impression is that the vision for space development you are all taking about today differs little from that of 15 years ago. If your vision is ambiguous, it won't be able to receive the people's support, and while I think it's important to hoist a vision, I feel that yours would appeal little to their hearts and minds.

**Nakasuka:** The moon is well and good, but I think that what has to be done now most is to look at the Earth — how space development can contribute to protecting the Earth's environment, how it can contribute

to the Earth's sustainability. Don't you think these things need to be given more serious consideration?

Japan possesses extremely sophisticated environmental protection technologies. It may not get to the moon, but I think Japan would do better putting forth a vision as to how it might function as "guardian" of the environment.

**Asada:** Doing so would make Japan a country respected by the world.

**Nakasuka:** This, I think, is what a company like MHI should do: gather environmental data using the satellites it launches by its rockets, apply that data to environment-related business here on the Earth, and form a link between outer space and the Earth. Integrating all of these things isn't something that can be done by just any company.

**Abe:** So what you're suggesting is for MHI to link its environmental business and space development. As you say, it is only a company like MHI that's capable of this. Hearing this suggestion of yours makes me happy; yet it also makes me humble, realizing once more the size of the role MHI can play for the sake of the Earth's community and all humankind.

**Asada:** I hope to take the valuable opinions you have offered today and apply them to our space development business, including the H-IIA rocket, and to the various business operations we are developing here on Earth, so that MHI will become a company that can make further contributions to society. Thank you all very much.



Photo courtesy of Japan Aerospace Exploration Agency (JAXA)

## CSR Challenges and the State of Our Efforts

In order to extend CSR management across the entire Group, MHI has determined and categorized the challenges the company faces and is working to develop specific measures tailored to address each challenge. We also set up the CSR Committee in 2006 to promote strategic, comprehensive CSR activities across the company.

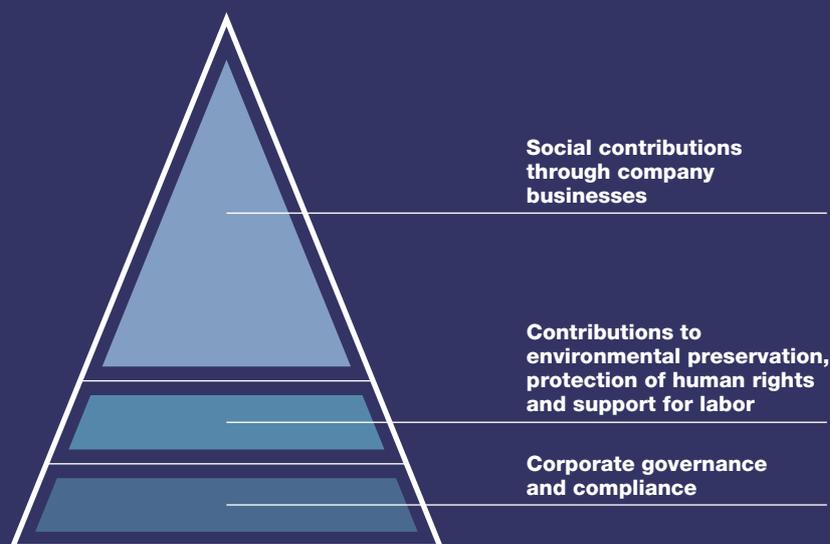
Category	Challenge	Status	Detailed description
<b>Management</b> P39 ▶	<b>Reinforcing corporate governance</b>	In June 2005, an Executive Officer system was launched to clearly separate directors' management oversight functions from business execution functions. Management oversight functions were strengthened by selecting 3 of 17 directors and 3 of 5 auditors from outside. The audit function was also reinforced by ensuring the accuracy and finely assessing of business execution by having the auditors attend key meetings, including the Executive Committee and business planning sessions.	P40 ▶
	<b>Enhancing internal control systems</b>	We bolstered efforts based on our basic policy for internal control systems and set up the Group Management Department in April 2007 to enhance management functions throughout the entire Group.	P40 ▶
	<b>Maintaining and strengthening manufacturing capabilities</b>	The Production System Innovation Planning Department was launched in April 2006. In 2006, we reinforced methods, production process and facilities, and human resources under the theme of strengthening in-house manufacturing capability.	P41 ▶
	<b>Forging a CSR promotion structure</b>	To promote strategic and comprehensive CSR activities, the CSR Committee, chaired by the President, was set up in October 2006. In addition, the CSR Working Group was launched with younger and female employees in February 2007 to boost activities from the bottom up.	P42 ▶
	<b>Pursuing thorough compliance</b>	To complement the activities of the company-wide Compliance Committee, the Departmental Compliance Committee and the Compliance Liaison Conferences were set up to strengthen the Group's compliance promotion structure.	P44 ▶
<b>Environment</b> P49 ▶	<b>Global warming countermeasures</b>	The 2010 reduction targets for respective headquarters, divisions and works were redefined based on adjusting the percentage change (between fiscal 1990 and 2005) of unit energy consumption in production and internal business transfer.	P55 ▶
	<b>Reducing waste generation, emissions and landfill waste disposal</b>	The target is zero emissions in all the company works by 2010. In fiscal 2006 three works achieved the standard, bringing the number of works that accomplished zero emissions to 7 out of 15.	P57 ▶
	<b>Properly managing chemical substances</b>	Reduced organochlorides, substances subject to PRTR, and others through proper management and the use of alternatives. In addition, a guideline for managing chemical substances contained in products was developed in response to domestic and overseas regulations.	P58 ▶
<b>Customers</b> P62 ▶	<b>Ensuring quality and product safety</b>	Since MHI produces a wide variety of products across a broad range of fields, the company ensures strict control of product quality and safety by setting standards for each headquarters, division and product.	P62 ▶
	<b>Enhancing customer satisfaction (CS)</b>	Offices to promote CS activities were set up in the planning department of each works to promote improvement activities for individual products, departments and sections while holding CS training sessions to raise employee awareness.	P63 ▶

Category	Challenge	Status	Detailed description
<b>Shareholders and investors</b> <b>P64 ▶</b>	<b>Communicating with shareholders and investors</b>	Meetings and status briefings by individual headquarters were held in addition to semiannual performance briefings. The website was enhanced to facilitate shareholder understanding of the company's business. Semiannual plant tours were held.	<b>P64 ▶</b>
	<b>Distributing surplus</b>	A year-end dividend of 3 yen per share was disbursed for fiscal 2006. Together with the interim dividend of 3 yen, total dividends for the year were 6 yen, a 2-yen increase over the previous year.	<b>P64 ▶</b>
<b>Suppliers</b> <b>P65 ▶</b>	<b>Ensuring fair dealing</b>	The Material Department and the Internal Audit Department of the Head Office conducted audit on compliance with laws related to procurement with suppliers. Thorough compliance training was conducted for employees engaged in procurement activities.	<b>P65 ▶</b>
	<b>Pursuing efforts for CSR-based procurement</b>	Started review of supplier evaluation items in January 2007. Incorporation of CSR viewpoint is under consideration.	<b>P66 ▶</b>
<b>Employees</b> <b>P67 ▶</b>	<b>Utilizing and cultivating diverse human resources</b>	Utilization of diverse human resources is promoted through the active recruitment of mid-career and female workers, the establishment of a new system for rehiring employees, and the creation of a website for handicapped individuals. To further develop human resources, MHI conducted a hands-on training program for technicians and career improvement seminars for female employees while operating a MBO system based on dialogue with supervisors and "360° Research" focused on middle managers.	<b>P67 ▶</b>
	<b>Building a better working environment</b>	Promoted the creation of an excellent working environment by obtaining the "Kurumin Mark" certification based on the Next Generation Nurturing Support Measures Promotion Law, implementing a training program on preventing human rights violations, constructing an occupational health and safety management system, conducting labor-management councils at each level, and implementing "Town Meetings."	<b>P68 ▶</b>
<b>Contributions to society</b> <b>P70 ▶</b>	<b>Living together with the community</b>	MHI deploys various activities tailored to the specific characteristics and culture of the respective communities to contribute to community development and revitalization.	<b>P70 ▶</b>
	<b>Transfer "the heart of Japanese manufacturing" as well as "the arts of science and technology" to the next generation</b>	MHI has developed and produced more than 700 kinds of products in its long history, cultivating "the heart of Japanese manufacturing" and "the arts of science and technology". To pass its knowledge and skills onto succeeding generations, MHI has a tradition of organizing educational activities such as science classes with experiments for children. The number of annual visitors to the Mitsubishi Minatomirai Industrial Museum exceeded 0.12 million for the first time.	<b>P70 ▶</b>

## Responsibilities and actions of MHI

# Management

In the course of deploying businesses that support the social infrastructure and contribute to public interest, MHI makes every effort to fulfill its social responsibility as a corporation by strengthening and enhancing its corporate governance, internal control, compliance and CSR structures to fully conform with prevailing laws, rules and social norms and to promote fair and sound management.



Based on “The Three Principles” shared by all Mitsubishi Group companies from the earliest days, the fundamental spirit of MHI has been to contribute to society through business activities and to earn the public trust through the sincerity of corporate operations. MHI has provided technologies and products that support the social infrastructure on the principle of fair and sincere corporate activities, thereby responding to customer trust and contributing to social development – this is the foundation of the company’s corporate social responsibility.

## Corporate Governance

MHI consistently works to promote fair and sound management rooted in full compliance with the law. The company continuously strives to improve its management structure in a quest to develop its business operations as well as fulfill its social responsibilities and diligently seeks to enhance transparency by providing timely, accurate information to both shareholders and society at large.

### Corporate Governance Structure

#### Strengthening the oversight functions of the Board of Directors by adding another outside Director

The Board of Directors makes important management decisions and oversees the execution of business operations. MHI is strengthening management oversight functions through the appointment of outside directors. Currently, of the company's 17 directors, three are from outside MHI. Additionally, MHI has established an Executive Committee to provide a forum for discussing important matters related to business execution. This allows for a more cohesive approach to discussion as part of the operational execution framework centered on the President, and consequently leads to more appropriate management decisions and business execution.

MHI overhauled its corporate governance framework in June 2005 to improve the soundness and transparency of management and increase efficiency and flexibility. The main components of this reform included streamlining the Board of Directors while increasing the number of outside directors, shortening the terms of directors, and introducing an Execu-

tive officer system. These modifications were aimed at enhancing the oversight functions of the Board of Directors and clearly delineating the roles and responsibilities of directors and Executive officers. Directors are responsible for general oversight of the company's operations and making important business decisions, while Executive officers are responsible for the day-to-day business and affairs of the Company. Subsequently, in June 2007, MHI appointed an additional outside director to make the decision-making process more sound and transparent.

MHI has adopted the corporate auditor governance model where the statutory auditors are responsible for monitoring the executive actions of directors. The Board of Statutory Auditors is comprised of five members, three of whom are outside appointments. In accordance with auditing policy and allocation of duties determined by the Board of Auditors, statutory auditors attend meetings of the Board of Directors, the Executive Committee and other key meetings related to business planning, enabling them to accurately assess the status of management execution in a timely manner. Statutory auditors also audit the execution of director duties by conducting spot checks and verifying compliance with relevant laws and regulations, and by monitoring the status and operation of internal

control systems. The Statutory Auditor's Office has been set up with its own dedicated staff to support and facilitate the work carried out by the Statutory Auditors.

Statutory auditors also periodically exchange information and opinions with accounting auditors and cooperate closely in other ways, including receiving audit reports and participating in accounting audits as needed.

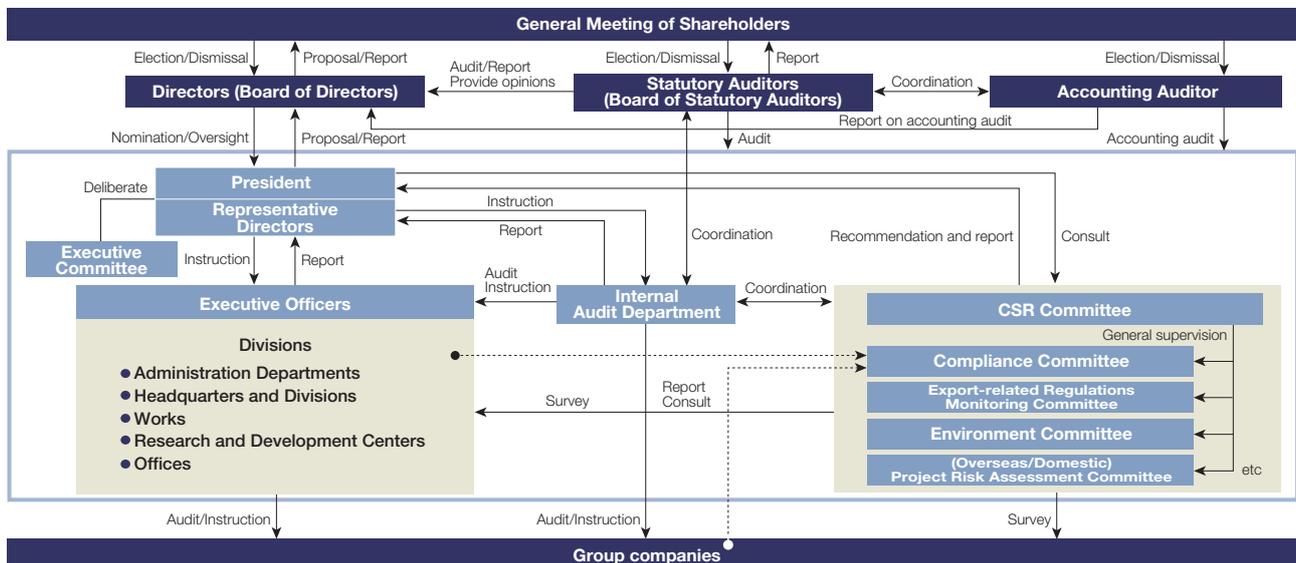
### Enhancing Internal Control Systems

#### Steadily promoting measures under a basic policy for internal control systems

MHI continually improves its internal structures to more effectively respond to risks, including those related to compliance.

In May 2006, the Board of Directors formulated a basic policy for internal control systems to ensure business operations are conducted appropriately and efficiently. Under this policy, the company is steadily promoting thorough compliance, reinforcing risk management, and improving the effectiveness of internal audits. Furthermore, the Group Management Department was set up in April 2007 as means for strengthening internal controls and promoting CSR across the entire MHI Group.

Corporate Governance Structure (including internal control system) (as of April 1, 2007)



## Management

### The launch and activities of the Production System Innovation Planning Department

Improving manufacturing capabilities – as our fundamental business infrastructure – through human resources, facilities and methodologies

The ability to create outstanding products is the source of competitive strength in the manufacturing industry. Securing and strengthening this ability has become a critical management issue amid today's increasingly severe business climate. MHI must address a variety of challenges, including the development and enhancement of human resources, the transfer of expertise and skills, and the innovation of facilities and business processes in response to rapidly growing demand for increasingly sophisticated and diversified products as well as severe cost competition.

In light of this situation, MHI established a

new Production System Innovation Planning Department in April 2006 to re-examine its approach to manufacturing which supports the foundation of the company's management, and to identify and cultivate unique manufacturing capabilities. The new department is positioned directly under the aegis of the company President.

The Production System Innovation Planning Department functions as a control tower to oversee Production System Innovation Planning Groups set up at individual worksites, the company-wide Production System Innovation Planning Conference, consisting of promotion leaders at each works, and the Managers Conference, which is organized across all works by function (manufacturing, design and quality). In this role, the department is able to address the challenges commonly shared across the company and to address problems that are difficult for individual works to handle as they arise.

### Focus in fiscal 2006 and progress achieved

In fiscal 2006, its first year of operation, the Production System Innovation Planning Department worked on strengthening manufacturing methods, production processes facilities, and human resources under the theme of strengthening in-house manufacturing capabilities.

#### •Manufacturing methodologies

In terms of manufacturing methodologies, we are introducing production systems into the build-to-order business that have been previously implemented in the mass production business, such as efforts to thoroughly standardize parts at the design level, and as a result simultaneously improve product quality, cost and delivery time, while at the same time reviewing the manufacturing process itself. Furthermore, some of the enhancements we are working on include: reforming the design process to respond to the demands of individual customers; improving efficiency and accuracy utilizing digital tools such as 3D-CAD; and encouraging information sharing and improved coordination with suppliers.

#### •Manufacturing facilities

In facilities, we are upgrading our core facilities and bringing together all of our knowledge from across the entire company to create the world's premier factories.

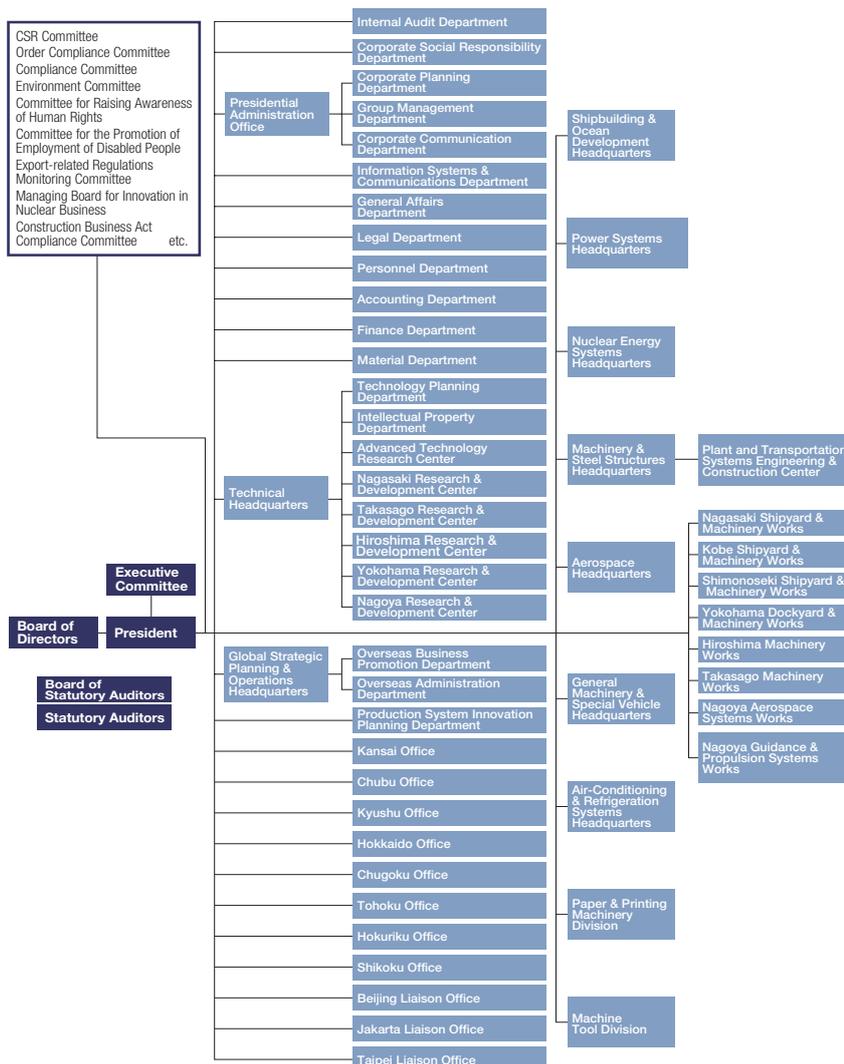
#### •Human resources for manufacturing

We are seeking to establish sophisticated production technology by bringing together the know-how we have accumulated in our related production fields and the expertise and skills we have acquired into an explicit body of knowledge. We are also actively recruiting and training a large number of new graduates and reemploying experienced technicians to expand our team of technicians who support manufacturing.

In addition, "hands-on training" (see p. 67), in which veteran employees guide younger workers, is conducted at individual works to ensure the transfer of knowledge and know-how from skilled technicians to younger generations and to smooth generational transitions.

We are actively investing the necessary management resources to promote these actions.

Organization Chart (as of April 1, 2007)



## CSR Promotion Structure

MHI has established a structure to powerfully promote CSR in order to become a company trusted by society, with CSR as the axis of management. The CSR Committee chaired by the President plays a central role in reviewing and following up on the progress of CSR promotion across the company as well as identifying specific issues and developing CSR policies.

### Reinforcing the CSR Promotion Structure

#### Launching the CSR Committee to promote strategic and comprehensive activities

In its quest to promote CSR-based management, MHI has established 11 separate committees covering issues such as compliance, environmental protection and respect for human rights. These committees have developed and implemented specific measures.

In July 2005, a CSR Center was established to promote connection and coordination among these committees and related departments as well as to encourage of the sharing of information company-wide. In addition, a CSR Committee chaired by the President was founded in October 2006 to further strengthen these activities and promote strategic, comprehensive CSR activities across the company with the CSR department placed under the direct control of the President.

At the first CSR Committee held in December 12, MHI established its basic approach to CSR: To become a trusted company by living up to the expectations of

society by providing highly reliable products that support the foundation of society, always from the point of view of society. We are currently pursuing activities focused on (1) promoting company-wide CSR and (2) monitoring the progress of the CSR measures carried out by the existing committees and office organizations.

To establish an effective internal structure for (1), the company constructed a promotion structure by assigning a CSR Director and a CSR Practice Manager in each headquarters, division and works and subsidiary in January 2007.

We also launched CSR Working Group activities in February 2007 to determine CSR action guidelines that will form the foundation of employee CSR activities and symbolic CSR activities consistent with the company's business from the point of view of younger and female employees.

In terms of (2), the CSR Committee receives regular reports on the status of activities carried out by individual committees and office organizations, and reviews their challenges and progress.

#### Activities of individual committees

Each committee is implementing appropriate activities based on its annual plan. The CSR Committee chaired by the President will review and follow up to confirm that the activities of individual committees incorporate PDCA cycles in line with the CSR management policy.

#### Major Committee Activities

##### •Compliance Committee

The Compliance Committee was established in May 2001 and is chaired by the Director in charge of compliance with membership consisting of the Compliance Officers of respective departments. Today, the committee is discussing and following up on a broad range of measures to promote compliance company-wide (see p. 44).

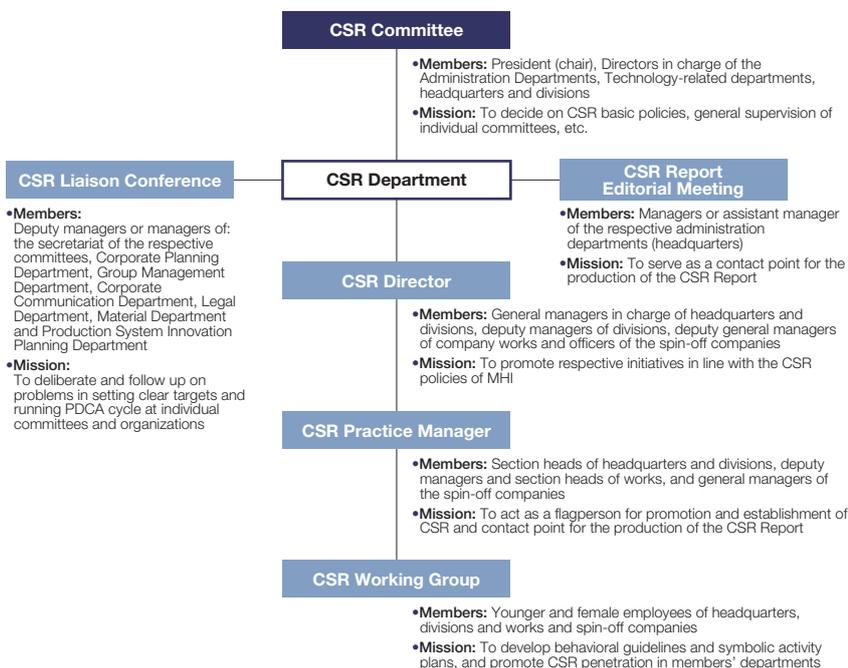
In fiscal 2006, a Compliance Committee was also set up in each affiliate to conduct voluntary compliance promotion activities (see p. 44).

##### •Environment Committee

The Environment Committee was established in 1996 as an inter-departmental organization to shift the focus of activities from simply preventing pollution to promoting environmental activities from a broader perspective. Each year the committee plans and proposes environmental measures to be carried out company-wide and sets the direction for the year. It also promotes and follows up on the environmental protection plans prepared annually by the respective headquarters, divisions and works.

Since fiscal 2006, members have also been selected from the respective headquarters, divisions and works so that the committee can formulate action plans based on the characteristics of the respective businesses and actual state of the production field, while working on achieving medium- to long-term targets and strengthening environmental management (see p. 50).

#### CSR Promotion Structure



## Management

### •The Committee for Raising Awareness of Human Rights

The Committee for Raising Awareness of Human Rights was founded in 1992 to foster correct understanding of and contribute to the resolution of human rights issues, in conformity with the spirit of respect for human rights. The Committee strives to raise awareness of human rights, formulates basic policies for training in matters that impact human rights, draws up and implements training programs, coaches in-house instructors in carrying out the training, and provides connection and coordinates with related administrative institutions (see p. 68).

### •Committee for the Promotion of Employment of the Handicapped

The Committee for the Promotion of Employment of the Handicapped was established in 1992 to proactively expand employment opportunities for the handicapped. The Committee's duties include formulating basic policies relating to employment of the handicapped, drawing up and implementing related plans, raising in-house awareness of problems affecting the handicapped, and connecting and coordinating with relevant administrative agencies and organizations (see p. 67).

### •Export-related Regulations Monitoring Committee

The committee was set up in 1987 to reinforce export control, a topic of grave importance to a company like MHI that exports a broad range of products. Each department has one member in charge of related matters. Committee members from the Presidential Administration Office and the departments of management gather once a month to hold a committee meeting to review these items. The committee also shares information on the status of each department, draws up and implements in-house education

programs and provides departments with instruction and supervision as needed.

In fiscal 2006, the committee focused on employee education and held training sessions for raise the capacity of designers to classify an export products or a technology needs an export license or not. Outside lecturers were invited to the Yokohama Building, Nagoya Aerospace Systems Works, Kobe Shipyard & Machinery Works, Hiroshima Machinery Works and Nagasaki Shipyard & Machinery Works for training on export determination.

In addition, the committee developed and began operating an e-learning program in fiscal 2007 so that employees could gain basic knowledge of export-related laws and regulations at their own initiative.

### •Construction Business Act Compliance Committee

The Construction Business Act Compliance Committee was launched in October 2003 to actively improve compliance with the Construction Business Act. Since then instructors from the Organization to Promote Proper Dealings in the Construction Industry have been invited every year to hold seminars and disseminate knowledge on the Construction Business Act.

In fiscal 2006, a total of nine seminars were conducted under the theme of "rules of fair relations between original contractor and subcontractor" in works and the Head Office with 799 participants, including employees of affiliate companies.

The committee office also serves as an in-house resource for consultation related to Construction Business Act. While providing employees with guidance on legal interpretation, the office consults with the authorizing government agencies on particularly complex matters.

The committee is thoroughly establishing compliance with the Construction Business

Act by promoting the improvement of our Construction Business Act system, which was originally established in 2004, strengthening its functions for monitoring qualifications and appropriate allocating engineers while proactively carrying out special audits and on-site inspections of works and offices.

### •Order Compliance Committee

This committee was established in August 2005 to ensure compliance with the Act on Prohibition of Private Monopolization and Maintenance of Fair Trade and to maintain and advance proper bidding activities. Composed of the Director in charge of the Internal Audit Department, relevant section managers and the administrative general managers or deputy business managers in charge of managerial matters of the various headquarters and divisions, the committee discusses and determines measures for ensuring proper fairness in bidding and monitors the progress of their implementation.

### •Managing Board for Innovation in Nuclear Business

This board was set up in December 2004 as an internal reform committee led by the President in response to the accident at the Mihama power station in August of the same year, in which a breakage occurred in the secondary piping of Unit 3. To improve the safety and security of nuclear power, the board is employing RCA (Root Cause Analysis) to examine organizational challenges and problems that can lead to accidents and noncompliance. In fiscal 2006, the Board began establishing the Quality Management System for Nuclear Energy Business to integrate quality management across the Nuclear Energy Systems Headquarters, Kobe Shipyard & Machinery Works and Takasago Machinery Works (see p. 25).

## TOPICS

### CSR Working Group of younger and female employees set up to determine CSR behavioral guidelines and specific action plans

The CSR Working Group, which consists of younger and female employees, was set up pursuant to a recommendation by the CSR Committee in December 2006. A total of 46 members (27 men and 19 women) gathered from across the company and group companies to hold three Working Group sessions from February to March 2007.

The objective of the Working Group is to nurture employees' sense of involvement in CSR activities. Members worked to develop a specific action plan for deploying CSR activities and CSR Action guidelines through group discussions on such topics as MHI's strengths and characteristics and CSR priorities.

CSR Working Group recommendations will be forwarded to the CSR Committee, which will discuss and ultimately decide the action guidelines and action plans that will form the basis for promoting CSR activities across the entire MHI Group.



Group discussion on specific plans and aspects of CSR activities

# Compliance

In order to instill awareness of compliance in each employee of the Group, from directors to employees, the company established a promotion structure encompassing the entire company and divisions while moving forward on projects for sharing compliance-related policies and information with its affiliates.

## Thoroughly advancing compliance

### Strengthening the Group compliance structure

The company has promoted the undertaking of business activities with fairness and integrity in compliance with laws and social norms, and in May 2001 set up a Compliance Committee. The committee is chaired by the director in charge of compliance and its members are the general managers of the related departments. Every year, the committee develops and implements a broad range of measures to promote compliance.

In fiscal 2006, we carried out these three measures for thoroughly implementing the

company's compliance measures throughout the Group.

### (1) Expanded Compliance Committee

The company expanded the membership of the Compliance Committee, which had consisted of relevant section managers of the Head Office. The committee structure has been established to facilitate activities tailored to the actual conditions of the respective departments by assigning the general managers of the various divisions and headquarters, deputy business managers in charge of managerial matters, branch managers and deputy general managers in charge of managerial affairs of company

works to serve as compliance officers and committee members.

The Compliance Committee convenes twice a year to discuss company-wide compliance promotion plans and review the meetings of the Departmental Compliance Committees and Compliance Liaison Conferences, the progress of action on letters submitted to the special contact point, and the implementation of compliance promotion training sessions.

### (2) Established a Departmental Compliance Committee at each headquarters, division and works

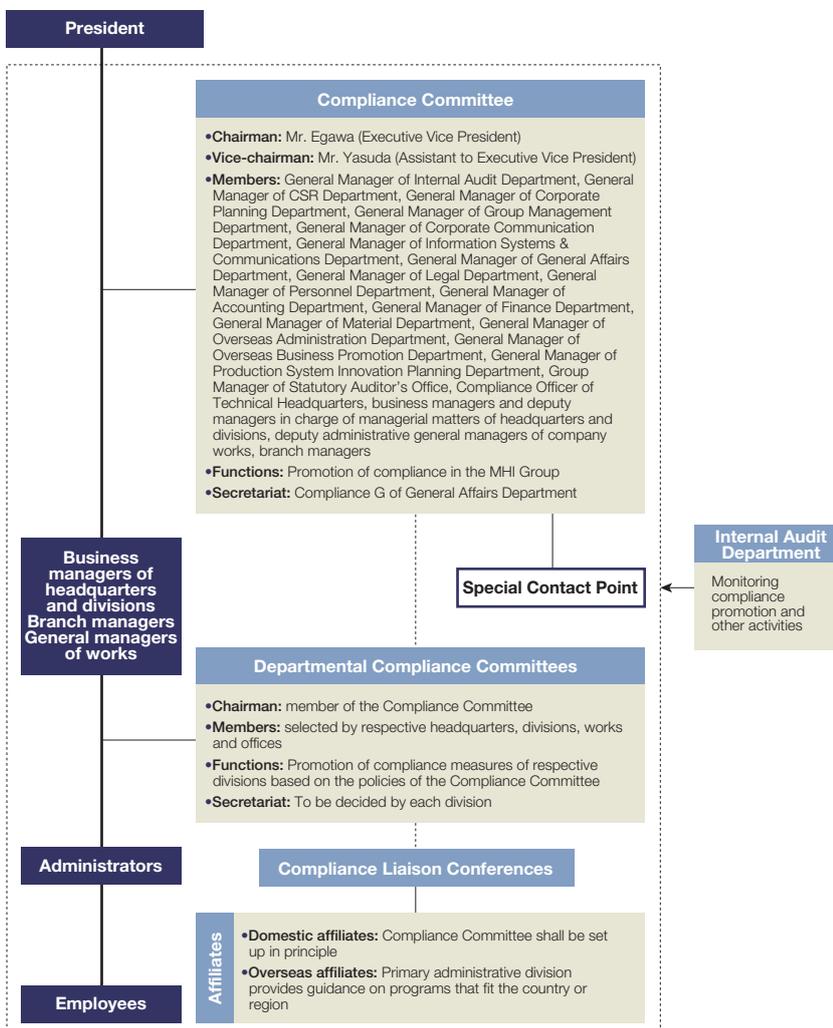
Starting April 2006, Departmental Compliance Committees were established at all company headquarters and works. The respective compliance officers of the headquarters, divisions and works that participate in the Compliance Committee chair the committees that deliberate, execute and follow-up on compliance promotion policies and plans within their respective departments. They also carry forward responses to individual projects and other related activities. Departmental Compliance Committees meet once every three months and their activities are consolidated and followed up by the company-wide Compliance Committee.

### (3) Established Compliance Liaison Conferences with affiliates

Starting April 2006, Compliance Committees were also set up in each affiliate company to conduct voluntary compliance promotion activities.

At the same time, the company established Compliance Liaison Conferences for each division to ensure coordination with affiliates. Compliance officers of the respective divisions serve as chairpersons and regularly exchange compliance-related information with the affiliates that closely concern the divisions as well as check the progress of individual measures implemented by the Group.

### Compliance Promotion Structure



## **Preventing recurrence of Antimonopoly Act violations**

### **Major measures and their status**

Under suspicion of violating Japan's Antimonopoly Act\* (through bid-rigging) in relation to bridge construction orders from the Ministry of Land, Infrastructure and Transport and the former Japan Highway Public Corporation, MHI was indicted in June 2005 for its dealings with the Ministry of Land, Infrastructure and Transport, and in August the company and its representative in charge of sales were indicted in conjunction with their involvement with the former Japan Highway Public Corporation. In September, Japan's Fair Trade Commission recommended that MHI be barred for its part in these events.

Also in June 2006, the company and its representative in charge of sales were indicted on suspicion of violating Japan's Antimonopoly Act (through bid-rigging) in conjunction with the bidding for raw sewage treatment facilities followed by an on-site inspection by Japan's Fair Trade Commission on suspicion of violating the Antimonopoly Act (through bid-rigging) in conjunction with the bidding for tunnel ventilation equipment and flood gate doors in March 2006. We are reinforcing our efforts to fully comply with the Antimonopoly Act to ensure that these situations never occur again.

### **(1) Commitment at the Managerial and Administrative Levels**

At the Executive Committee held in July 2005, the company pledged to strictly observe the Antimonopoly Act, stringently refrain from any actions that might be seen as suspicious, and thus absolutely prevent recurrence of any incident of the kind that has occurred. The Board of Directors passed a resolution in the same month to observe the Antimonopoly Act. In response to the resolution of the Board of Directors, a declaration of similar intent was executed by all general managers of the company's headquarters, divisions, branches and works. Furthermore, they ordered their subordinates, through in-house meetings, memoranda and company

newsletters, to strictly observe all compliance rules. In addition, the company required all company employees in positions of section manager and above associated with divisions that sell to the public sector to submit written pledges to observe the Antimonopoly Act.

### **(2) Improvement of Business Operation Methods and Development of Monitoring Systems**

The company has drafted standards of conduct pertaining to contacts by sales personnel with competing firms. Among other issues, the guidelines define the permissible scope of such contacts, and even within this scope, such contacts must be reported to the compliance officer both prior to and following said contact.

Within all sections that sell to the public sector, for all business involving competitive bidding and order receipt, a compliance check sheet is used to confirm that no aspects of these contacts run afoul of any laws and regulations. The sales section head or group leader is required to sign the check sheet as evidence that confirmation has been made. Compliance officers confirm the content and usage of the compliance check sheets in their respective departments.

### **(3) Reinforcement of Our Oversight and Monitoring System**

In July 2005, the company established a new Internal Audit Department reporting directly to the President. The new configuration has been conducting audits to ensure proper operations in individual headquarters and divisions as well as adequate implementation of compliance-related measures.

In addition, a new Order Compliance Committee was established in August 2007, composed of the director in charge, related section managers and the general business managers or deputy managers in charge of managerial matters in various headquarters and divisions. Convened every other month, the committee, with the advice of external experts, discusses and makes decisions on measures to ensure fairness in bidding.

### **(4) Improvement in Personnel Evaluation and Operational Management**

The company is also working to strengthen its efforts from the perspective of personnel evaluation, business management and staff assignments.

In personnel evaluation, for example, evaluation items include "attitude toward compliance" as one of the criteria for assignments and job transfers. Any violations elicit strict disciplinary action.

In addition, the company has devised a mechanism whereby employees who have been involved in selling to the public sector are periodically transferred to a different job as a general rule to ensure that no employee remains in charge of public sector business for an extended period of time. Regarding technical advisors who are former civil servants hired full-time or part-time, the company is re-clarifying that these advisors will not be involved in sales activities and exchanges formal letters to document this understanding.

### **(5) Ensuring Proper Fairness in Bidding by All Affiliates**

From January to March 2006, the company conducted a survey involving all its affiliates regarding their involvement in business with the public sector. As a result, 23 companies were found to regularly participate in bidding on public-sector projects and had implemented the same compliance measures as MHI by April 2006.

Measures are also being implemented at other affiliates to ensure proper bidding through the Compliance Committee, the Compliance Liaison Conferences, and other related supervisory entities.



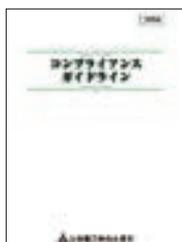
Compliance Committee

\* **Antimonopoly Act** : Act on Prohibition of Private Monopolization and Maintenance of Fair Trade

## Comprehensive Compliance Education

### Preparation and Distribution of Compliance Guidelines

In September 2001 the company established the "MHI Compliance Guidelines," which stipulate basic guidelines on corporate compliance. The guidelines have been summarized in a pocket-sized card format and distributed to all employees so they can carry them. Furthermore, to ensure that every employee understands the guidelines and behaves accordingly, MHI distributed a compliance guideline booklet, Compliance Guidelines, which has been published and distributed to managers for the purpose of guidance, with additions and revisions provided to all employees in May 2007. All internal rules and



Compliance Guidelines

documents appearing in "Compliance Guidelines" are posted on the intranet for easy access by everyone.

### Expansion of Compliance Promotion Training

To ensure thorough compliance in all areas, it is essential to raise the awareness of this issue in each and every employee. For this purpose, a unique compliance promotion training program has been carried out since fiscal 2003 for all employees in individual worksites, with those in higher positions and their subordinates, involving discussions about problems that can occur in actual business settings. Since fiscal 2005, the frequency of these training sessions has been increased to twice a year. In fiscal 2006, more than 30,000 employees took part in this training with a participation rate of over 90%.

A total of 52 discussion themes have been selected, with discussion related to fair trade added in fiscal 2006. Opinions expressed by many participants exhibit the steadily growing awareness of compliance, including statements such as, "The program effectively promoted compliance in our division," and "I was reminded of how important it is to act with a clear understanding of social ethics and common sense when performing business activities rather than simply assuming

that the existing practice is correct."

Compliance education that was formerly provided only to employees being promoted to group heads has also been extended to those being promoted to section managers or supervisors since fiscal 2005. As a result, 1,150 employees participated in the program in fiscal 2006.

Compliance education is provided to new recruits upon joining the company. In addition, in fiscal 2006, discussion-oriented training was implemented and occurs six months after employees join the company.

The company also carries out other training programs for gaining legal knowledge and encouraging a willingness to comply with the law. Sales division employees receive training twice a year using a manual for abiding by the Antimonopoly Law (released in 1993 and revised in 2005) published by the company, while those in the procurement di-

vision receive annual training on procurement activities including, the Act against Delay in Payment of Subcontract Proceeds, Etc. to Subcontractors.

Executives of overseas operating bases and persons in charge of export sales receive regular education on import and export-related laws and relevant local laws while those in charge of accounting receive training on accounting and tax practice.

### Compliance Awareness Survey

The Compliance Committee has conducted a "Survey on Compliance Awareness" every year since fiscal 2004 to measure progress in the implementation of these initiatives, the awareness of compliance among the company's employees and their everyday behavior toward increasing the effectiveness of our compliance efforts.

## MHI Compliance Guidelines

### I. Business activities

**In addition to making social contributions through the provision of safe, high-quality products and services, MHI shall conduct its business activities responsibly and in compliance with all laws and propriety.**

1. The company will consistently strive to provide products and services that are both safe and of outstanding quality.
2. In the performance of its business activities, the company will engage in free and fair competition in compliance with the Antimonopoly Law, and will comply fully with the Act against Delay in Payment of Subcontract Proceeds, Etc. to Subcontractors, the Construction Business Act, and all other relevant laws and regulations.
3. The company will abide by all laws and regulations, and never deviate from socially accepted practices, in matters related to gift-giving or entertainment activities involving civil servants and suppliers.
4. The company will conduct its business and tax accounting properly in accordance with all relevant laws, accounting standards and internal rules.
5. In the performance of its business dealings with other countries, the company will comply with all laws and regulations relating to import and export as well as all local laws and regulations.

### II. Relationship between the company and society

**MHI shall exist in harmony with society as a good corporate citizen, by making ongoing efforts to protect the environment, etc.**

1. The company will abide by all environment-related laws and regulations and strive in every way to protect the environment.
2. The company will disclose information relating to its operations appropriately and in a timely manner.
3. The company will keep any and all political donations within the scope stipulated by law.
4. The company will respond firmly to any forces working counter to the interests of society.

### III. Relationship between the company and employees

**MHI shall secure a safe and healthy working environment for its employees; on their part, employees shall make a clear distinction between their work and private lives and execute their professional duties faithfully and in compliance with all laws and internal rules.**

1. The company will abide by all labor-related laws and regulations, and will strive to secure a safe and healthy work environment.
2. All employees will comply with all internal rules, including work rules.
3. Employees will not engage in any discriminative behavior or sexual harassment.
4. Employees will handle company secrets appropriately, and never disclose such secrets without authorization.
5. Employees will not engage in unfair (insider) stock trading.

## Management

In fiscal 2006, a questionnaire was sent to 12,976 employees (approximately 40% of all employees were randomly selected) of whom 9,231 (71.7%) responded. In the survey, 90.3% of respondents answered that they had become more aware of compliance. This shows a further improvement in the awareness of compliance compared with 88.9% of the fiscal 2005 survey.

Furthermore, all the indicators for "level of compliance awareness," "violation potential," "recognition of the MHI Compliance Guidelines," and "workplace environment regarding compliance" have improved over the previous year. We believe this indicates steady progress in our compliance promotion efforts.

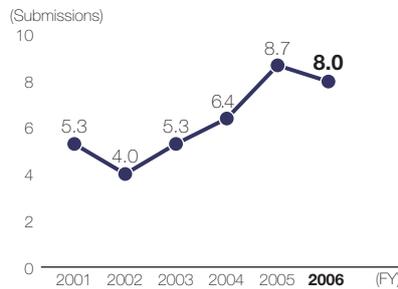
### Setting up a Contact Point for Reporting and Consultation

In June 2001 MHI established a Hot Line as a special contact point for reporting and consultation within the Compliance Committee to enable the company to detect and correct at an early stage any unlawful or inappropriate activity. The Hot Line receives written submissions from employees of the company, affiliates or suppliers.

Since its opening, the number of such

submissions has increased annually to a monthly average of seven to eight in fiscal 2006. We believe this indicates an elevated awareness of compliance among employees as well as the effectiveness of the Hot Line. The Compliance Committee quickly investigates each report and effectively addresses issues. The company fully protects those who submit letters to ensure they are not treated unfavorably for having provided this information by having the Compliance Committee monitor each situation.

**Submissions to the Special Contact Point**  
(monthly average)



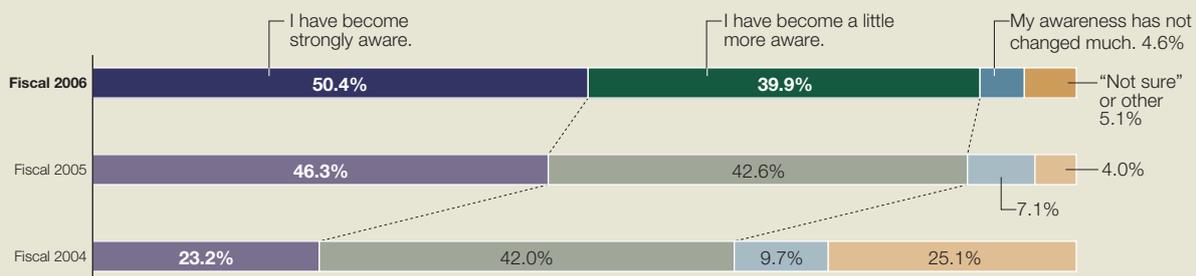
### Formulating the company's own guidelines for preventing bribery involving foreign civil servants

In accordance with the Unfair Competition Prevention Law and applicable laws and regulations in other countries, MHI has operated under a basic policy of never attempting to bribe a civil servant of a foreign country to obtain an improper advantage. "The MHI Compliance Guidelines" also prohibit improper business dealings that run counter to the spirit of compliance.

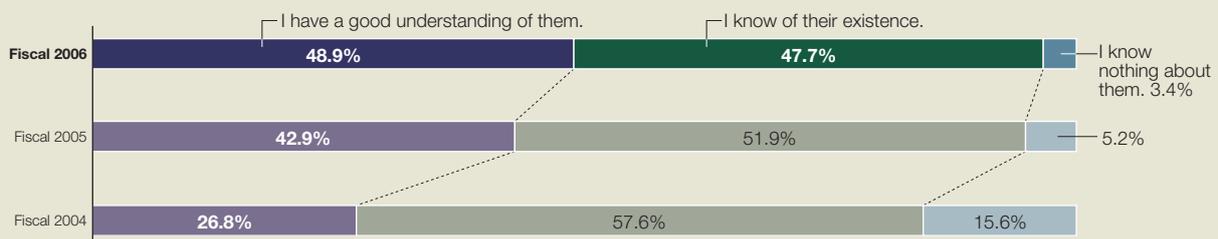
In conjunction with these aims, the company established a Guideline for the Prevention of Bribery Involving Foreign Civil Servants in April 2005. This Guideline provides detailed explanations on the content of the Unfair Competition Prevention Law and the company's basic approach, and also indicates specific conduct guidelines for entertaining or giving gifts to foreign civil servants. In addition to this guideline, an English version, Guidelines to Prevent Bribery of Foreign Public Officials released by the Ministry of Economy, Trade and Industry, and other documents have been posted on the Intranet so that all those involved in the company will be able to act properly in the course of conducting business overseas.

## Results of Compliance Awareness Survey

### Q How has your awareness of compliance changed?



### Q Are you familiar with MHI's Compliance Guidelines?



## Protecting Personal Information

In conjunction with the enforcement of the Act on the Protection of Personal Information, MHI formulated its own Personal Information Protection Policy and disseminated it both inside and outside the company. In addition, the company formulated Personal Information Protection Rules and the Personal Information Management Manual, compiled key points related to our business into a digest format and distributed it to all employees to maximize awareness of this issue. Education related to protecting personal information is also administered within the framework of compliance promotion training programs by employee level – for example, to new employees, newly appointed supervisors, and so forth – as well as general training for all employees. In addition, a personal information database registration system has been developed as a means for unifying the handling of personal data by registering all the databases owned by respective divisions.

Going forward, the company will continue to improve its system of education by employee level and compliance promotion training to further elevate employee awareness. At the same time, periodic studies into in-house data management will be undertaken in a quest for continuous improvement in the company's handling of personal information using tools such as a checklist on personal information protection.

## Measures against Leakage of Confidential Information

MHI has taken various steps over the years to raise employee awareness of management of confidential information. These include the establishment of in-house rules for managing confidential data, documents, and other information; setting down standards on information security management and other information systems; and the preparation and distribution of a



"MHI guide on how to prevent leaks of confidential information"

## Personal Information Protection Policy

**Mitsubishi Heavy Industries, Ltd. (hereinafter "MHI") recognizes that all personal information managed and used in its business activities must be handled and protected with the utmost care. Therefore, MHI will follow the basic policy stated below.**

1. MHI will not acquire any personal information through falsehood or other improper means.
2. MHI will use personal information only to the extent and for the purposes specified, which will be made publicly known or notified to the persons to whom the information pertains.
3. MHI will endeavor to keep such personal information accurate and up-to-date.
4. MHI will take necessary and appropriate measures to maintain the security of such personal information.
5. MHI will furnish its employees and contractors handling such personal information with the necessary and appropriate guidance and supervision.
6. MHI will not provide personal information to any third party without the consent of the person involved.
7. If MHI receives an inquiry from a person about the use or content of personal information related to that person, it will provide a reasonable response.
8. If MHI receives any complaints regarding the handling of personal information, it will resolve such complaints in a prompt and appropriate manner.
9. MHI will establish rules and management systems for proper handling and protection of personal information and will thoroughly adhere to them.
10. MHI will engage in a strong effort to further enhance personal information protection systems by regularly reviewing and updating all rules and procedures regarding the handling of personal information, including this policy.
11. MHI will comply with all applicable Japanese laws and regulations regarding the handling of personal information.

April 1, 2005  
Kazuo Tsukuda, President  
Mitsubishi Heavy Industries, Ltd.

 For the full text, refer to the following:  
[http://www.mhi.co.jp/policy/e\\_main2.html](http://www.mhi.co.jp/policy/e_main2.html)

manual on management of confidential information and a MHI guide on how to prevent leaks of confidential information.

In August 2005, the computer of an employee at a company that collaborates with MHI was infected by a virus resulting in of the leakage of data related to inspections of power-generating turbines, including water turbines. Then in August 2006, it was discovered that data on nuclear power plant inspection had leaked from a PC privately owned by an MHI employee due to a similar cause. Some electric power companies responded by suspending MHI from new business for a period of several months.

In light of these information leaks, the company reinforced its prohibition against using privately owned PCs for business and installing software that is not required for company operations. To boost assurance, MHI intends to take actions including: (1) stronger measures for conveying confidential information outside the company (such as encoding of external memory devices and e-mail, and clarification of the procedure); (2) the promotion of exchanges of memoranda on preventing information leakage with service agents; (3) repeated efforts to achieve widespread recognition of specific procedures and rules relating

to confidential information management and information security; and (4) improvement of educational materials and implementation of training tailored to employees at every level. At the same time, the company is monitoring the state of implementation through internal audits.

## MHI shall reject all contacts with organizations involved in activities in violation of the law or accepted standards of responsible social behavior

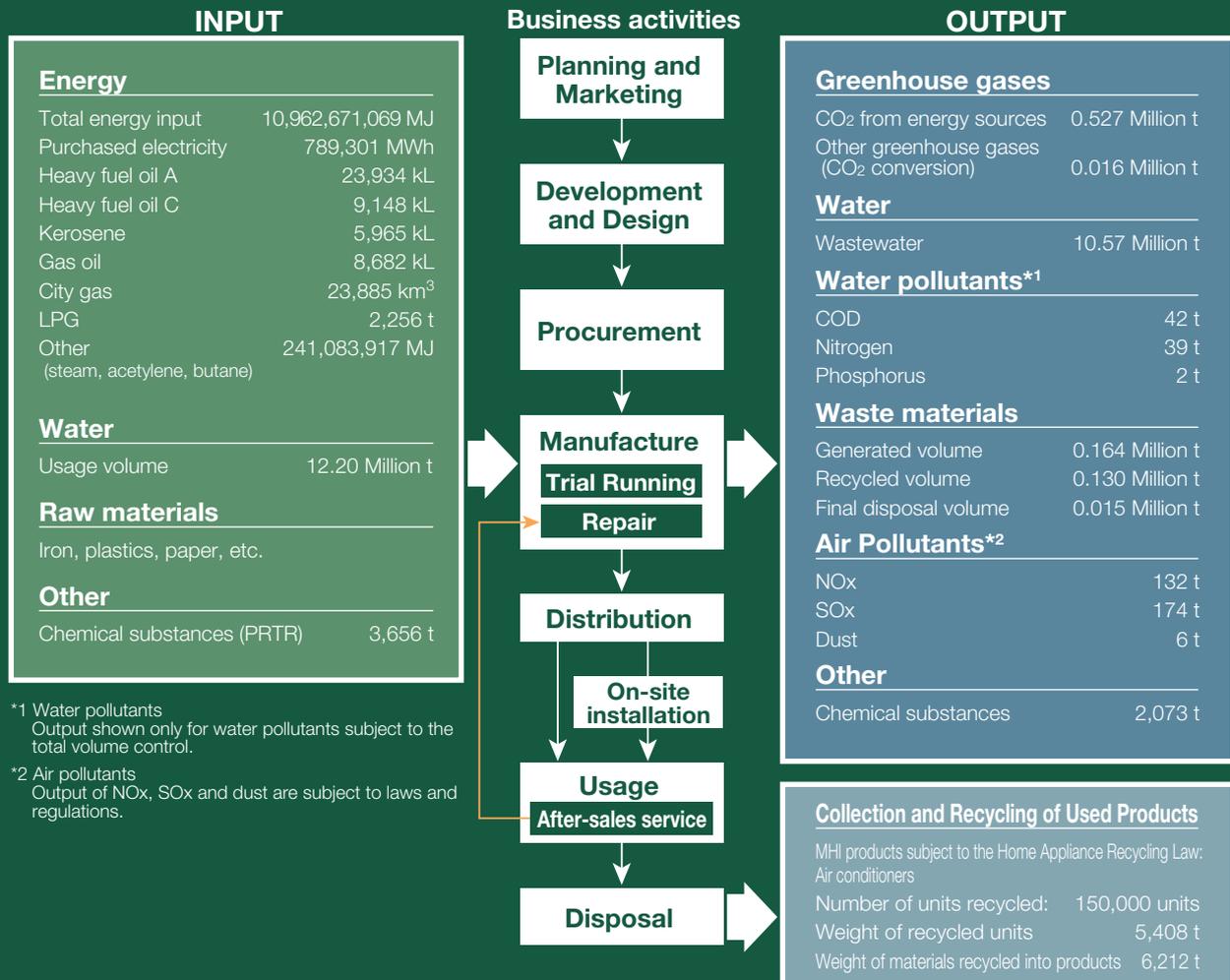
The order and safety of civil society continue to be threatened by antisocial forces. Based on this situation, the company has stipulated, "The company will respond firmly to any forces working counter to the interests of society," in MHI Compliance Guidelines to articulate its stance against antisocial forces.

In terms of specific responses, in situations involving undue claims made to the company, MHI has thoroughly established a policy to respond as an organization in cooperation with the divisions involved. In addition, the company has publicized the ideal mind set and essential concepts for responding to undue claims through compliance promotion training, and other actions.

## Responsibilities and Actions of MHI

# Commitment to the Global Environment

MHI is working to alleviate the increasing environmental burdens across the globe by providing environmentally friendly products and technologies in diverse fields as well as by deploying environmental preservation activities throughout the product lifecycle from development and design to procurement of raw materials, production, on-site installation and final disposal.



## Commitment to the Global Environment

### Environmental Management

MHI established an Environment Committee and an environmental management structure based on the PDCA Cycle (Plan, Do, Check and Act) to advance environmental preservation activities in concert with all departments and Group companies.

#### Establishment of an Environmental Management Structure across the Group

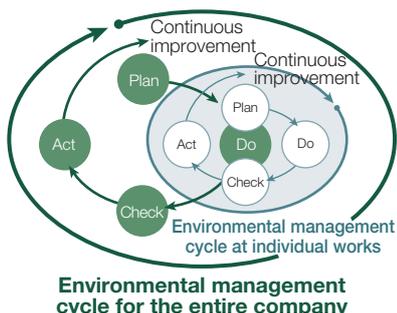
##### Reinforcing the environmental management structure company-wide and at individual works

In 1996, the company set up the Environment Committee chaired by the director in charge of the environment to plan annual environmental actions for the entire company.

Two entities have been set up to efficiently implement decisions throughout the company rendered by the Environment Committee: The Environment Liaison Conference, which gathers those responsible for environmental activities in their respective works twice a year; and the Energy Conservation Liaison Conference, which determines actions for conserving energy and reducing CO<sub>2</sub> emissions. In addition, environmental committees have been set up in all headquarters, divisions and works to both carry out company environmental policies and also undertake environmental management activities corresponding to the specific features of each works.

An annual promotion plan that defines specific control items and response methods is developed to prevent pollution and to ensure thorough compliance with environment-related regulations including the Law Concerning the Rational Use of Energy, the Air Pollution Control Law and the Law Concerning the Promotion of Measures to Cope with Global Warming. The progress of implementation is reported to the Environment Committee.

#### PDCA Cycle of environmental management

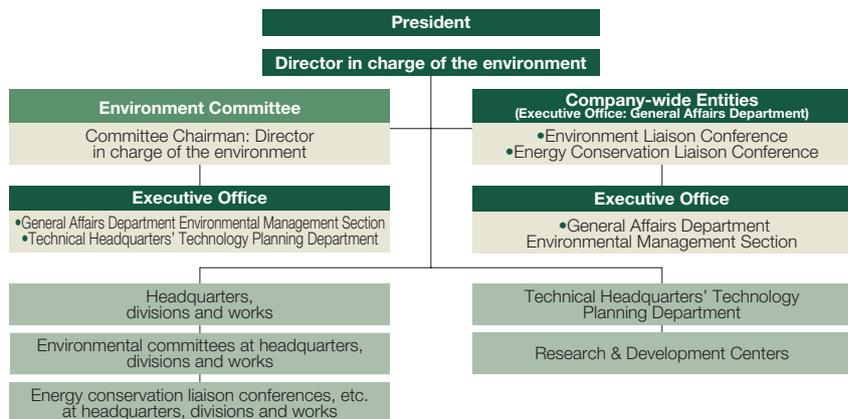


#### Grasping the Status of Efforts by Each Company to Reinforce Management across the Entire Group

In order to establish an environmental management structure across the Group, MHI not only

controls activities within the company but also pushes forward the construction of environmental management systems in each affiliate and strives to simultaneously grasp the status of efforts and current challenges (see p. 51).

#### Environmental Management Structure



#### Basic Policy on Environmental Matters

(Established 1996)

As clearly laid out in provision 1 of its creed — “We strongly believe that the customer comes first and that we are obligated to be an innovative partner to society.”— MHI believes its primary purpose is to contribute to society through its R&D, manufacturing and other business activities. Accordingly, in the performance of its business activities the company shall embrace the awareness that it is an integral member of society and, in all aspects of its business activities, it will strive to reduce burden on the environment and shall devote its comprehensive technological capabilities to the development of technologies and products that will protect the environment, as its way of contributing to the development of a sustainable society.

#### Action Guidelines

(Established 1996)

1. Accord high priority to environmental protection within company operations, and take steps company-wide to protect and enhance the environment.
2. Clarify roles and responsibilities regarding environmental protection by developing an organized structure to deal with environmental protection matters, defining environment-related procedures, etc.
3. Strive to alleviate burden on the environment in all aspects of company business activities—from product R&D and design to procurement of raw materials, manufacture, transport, usage, servicing and disposal—through pollution prevention, conservation of resources, energy saving, waste reduction, reuse and recycling.
4. Strive to develop and provide advanced, highly reliable, wholly proprietary technologies and products that will contribute to solving environmental and energy problems.
5. Strive continuously to improve and enhance environmental protection activities not only by fully complying with environmental laws and regulations but also, when necessary, by establishing, implementing and evaluating independent standards and setting environmental goals and targets.
6. In the performance of business activities overseas and exportation of products, pay full heed to impact on the local natural and social environments and strive to protect those environments; also, become actively involved in technological cooperation overseas in matters of environmental protection.
7. Take steps to raise environmental awareness among all employees through environmental education, etc., undertake activities to provide environment-related information to the public, and proactively make environment-enhancing contributions to society.

## Commitment to the Global Environment

### Establishing a Management System Based on its Own Standards

#### Establishing two unique standards that are compliant with ISO and Eco Action 21

In April 2006, MHI's Head Office obtained ISO 14001 certification joining all 15 domestic works in achieving this distinction. The works individually carry out internal environmental audits based on ISO 14001 to confirm the effectiveness of their environmental management systems and environmental performance.

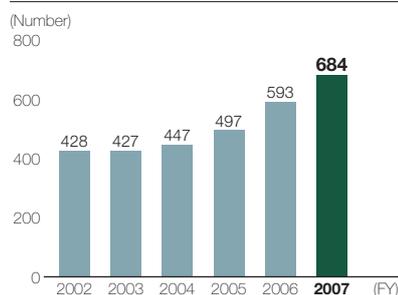
MHI created two environmental standards of its own to promote the introduction of environmental management systems across the Group: "M-EMS" is based on ISO 14001 while "M-EMS EcoAction" is modeled after EcoAction 21, a set of guidelines developed in Japan. The company is assisting its affiliates in constructing systems and obtaining certification through such actions as the development of manuals, on-site guidance, and the introduction of consultants.

To implement these standards, MHI's environmentally related divisions registered 14 environmental chief auditors and 9 environmental auditors who completed courses and acquired external qualifications.

#### MHI holders of certified public qualifications related to the environment (as of April 1, 2007)

Area of qualification (category)	Number
Environmental measurement (Density, noise and vibration)	7
Energy management	117
Pollution prevention management (Air and water quality (Class 1 to 4), noise and vibration)	429
Pollution prevention management supervision	16
Supervision in handling of specified chemical substances, etc.	963
Supervision in handling of organic solvents	1,720
Waste disposal facilities engineering management (Waste disposal engineering manager)	28
Management of specially managed industrial wastes	159

#### Registered ISO Internal Auditors



As the result, 97 out of MHI's 129 domestic affiliates have now successfully set in place environmental management systems as of March 31, 2007 (see p. 52).

#### Implementing Environmental Education Geared to Positions to Encourage Environmental Activities across All Operations

To raise awareness of environmental issues in each employee, MHI has developed environmental education curriculums for all employees geared to their specific position, from new employees to upper management. The curriculums are implemented by respective works.

In addition to a semi-annual internal auditor training course, the company also conducts special training for employees engaged in painting or the handling of hazardous materials. The goal of the program is to instruct employees in the potential environmental impact of their tasks, the proper methods for daily management, monitoring and measurement, and how to deal with emergency situations.

### Controlling and Improving Response to Potential Environmental Impact Risks

#### Clarifying the risks at each works and addressing them through daily management

In order to protect the global environment, beyond observing related laws and regulations it is vital for the company to accurately identify potential risks inherent in its business activities—for example, accidents that could result in environmental contamination—and to establish procedures to prevent such occurrences. In addition, it is crucial that the company be ready to respond swiftly and properly to any emergency situation that may arise.

The company has prepared a manual based on ISO standards for each works—

encompassing such issues as risk identification methods, daily management procedures and contingency plans—to identify latent environmental risks and improve our ability to prevent them.

Each works also regularly carries out emergency response drills for various hypothetical emergencies, for example, oil spills. A system is also in place so that in the event of any emergency situation in any plant, the company's in-house crisis management information system quickly conveys information to the President.

#### Remediation of Contaminated Soil and Ground Water

MHI is also taking important steps to detect and eliminate any contamination present in the soil or groundwater at the company's works. Furthermore, the company is working to eliminate the use of all volatile organic compounds (VOCs) that could potentially pollute the environment.

In fiscal 2006, soil testing was carried out at three company sites (two in Nagoya and one in Tokyo) where there was an opportunity to sell land. The tests found no contamination at the site in Tokyo but revealed soil contamination from heavy metals (lead, arsenic, mercury and selenium) at the former site of the Taiko Plant (Higashi-ku, Nagoya) in April 2006. These results were followed by the detection of arsenic contamination at the former location of the Moriyama Tennis Courts (Moriyama-ku, Nagoya) in May of the same year.

The test results were reported to the local government authorities, disclosed to the surrounding communities and publicly released. In both cases, although there was no adverse impact on the surrounding environment, the company took action to excavate and remove the contaminated soil.

#### Sites with VOCs\*1 exceeding legal limits, and remediation status

Site	Location	Soil and groundwater contamination	Soil contamination	Remediation status	Remediation method*2
Air-Conditioning & Refrigeration Systems Headquarters, Biwajima Plant	Nishi-Biwajima-cho, Kiyosu-city, Aichi	○		Under way	A,B
Former Industrial Machinery Division	Nagoya, Aichi	○		Under way	A,C
Nagoya Aerospace Systems Works, Oye Plant	Nagoya, Aichi	○		Monitoring after completion of soil gas absorption	
Nagoya Guidance & Propulsion Systems Works	Komaki, Aichi	○		Under way	A,C
Kobe Shipyard & Machinery Works, Main Plant	Kobe, Hyogo		○		
Hiroshima Machinery Works, Kannon Plant	Hiroshima		○	Monitoring	
Takasago Machinery Works	Takasago, Hyogo		○		

\*1 Tetrachloroethylene, trichloroethylene, 1,1,1-trichloroethylene, cis-1,2-dichloroethylene, 1,1-dichloroethylene, dichloromethane, benzene  
\*2 Major remediation methods include: (A) groundwater pumping, (B) soil gas absorption and (C) iron powder mixing.

## Environmental Management Systems Adopted at MHI and its Subsidiaries

### ISO 14001 accreditation at MHI works and research & development centers

	Base	Date of issue (or registration)
MHI site	Yokohama Dockyard & Machinery Works	Oct. 31, 1997
	Nagasaki Shipyard & Machinery Works	May 22, 1998
	Takasago Machinery Works	Jun. 26, 1998
	Air-Conditioning & Refrigeration Systems Headquarters	Nov. 20, 1998
	General Machinery & Special Vehicle Headquarters	May 21, 1999
	Paper & Printing Machinery Division	Sep. 3, 1999
	Plant and Transportation Systems Engineering & Construction Center (Mihara)	Sep. 3, 1999
	Hiroshima Machinery Works	Sep. 30, 1999
	Shimonoseki Shipyard & Machinery Works	Nov. 24, 1999
	Nagoya Guidance & Propulsion Systems Works	Dec. 18, 1999
	Kobe Shipyard & Machinery Works	Feb. 18, 2000
	Iwatsuka Area (formerly Industrial Machinery Division)	Apr. 1, 2000
	Machine Tool Division	Dec. 28, 2000
	Plant and Transportation Systems Engineering & Construction Center (Yokohama)	Jun. 29, 2001
	Nagoya Aerospace Systems Works	Oct. 1, 2003
	Head Office	Apr. 6, 2006
	Research & development centers	Nagasaki Research & Development Center
Advanced Technology Research Center		Nov. 9, 2006
Yokohama Research & Development Center		Nov. 9, 2006
Hiroshima Research & Development Center (Mihara)		Dec. 5, 2006
Nagoya Research & Development Center		Dec. 26, 2006
Takasago Research & Development Center	Mar. 9, 2007	

### ISO 14001 accreditation at MHI subsidiaries

	Base or Company name	Date of issue (or registration)
Domestic affiliates	MHI Solution Technologies	Aug. 28, 1998
	Mitsubishi Agricultural Machinery Co., Ltd.	Jul. 24, 2001
	Nagoya Ryoju Estate Co., Ltd.	Mar. 14, 2002
	Nishinon Ryoju Estate Co., Ltd.	Jul. 12, 2002
	Chubu Jukan Operation Co., Ltd., Head Office	Jan. 13, 2004
	Mitsubishi Environment Engineering Co., Ltd. Yokohama Branch	Apr. 12, 2004
	Ryojin Co., Ltd., Printing Division, Tokyo Plant (including Head Office)	Apr. 23, 2004
	Ryojin Co., Ltd., Biwajima Branch	Jul. 22, 2004
	Ryojin Co., Ltd., Mihara Branch	Aug. 3, 2004
	Mihara Ryoju Machinery Works Co., Ltd.	Feb. 16, 2005
	Ryowa Engineering Co., Ltd.	Feb. 17, 2005
	Shimonoseki Ryoju Estate Co., Ltd.	Mar. 14, 2005
	Ryoju Estate Co., Ltd.	Mar. 17, 2005
	MHI Food & Packaging Machinery Co., Ltd.	Mar. 17, 2005
	Seibu Jukan Operation Co., Ltd., Head Office	Mar. 22, 2005
	Kusakabe Co., Ltd.	Mar. 24, 2005
	Tamachi Bldg. Co., Ltd.	Mar. 25, 2005
	Higashi Chugoku Ryoju Estate Co., Ltd.	Mar. 29, 2005
	Hiroshima Ryoju Estate Co., Ltd.	Apr. 9, 2005
	Mitsubishi Environmental Engineering Co., Ltd., Head Office	Apr. 9, 2005
	Ryoju Coldchain Co., Ltd.	Apr. 22, 2005
	Dia Precision Casting Co., Ltd.	May 11, 2005
	Tokiwa Machinery Works Ltd.	May 18, 2005
	Jukan Operation Co., Ltd., Head Office	Aug. 1, 2005
	MHI Aero Space Logitem	Jan. 5, 2007
Overseas affiliates	MHI-Haier (Qingdao) Air-Conditioners Co., Ltd.	Dec. 14, 1998
	MHI Equipment B.V.	Nov. 9, 2001
	Mitsubishi Caterpillar Forklift Europe B.V.	Jul. 25, 2002
	Mitsubishi Heavy Industries Climate Control Inc.	Jun. 12, 2003
	Mitsubishi Power Systems, Inc., Orlando Service Center	Feb. 18, 2004
	MHI Automotive Climate Control (Shanghai) Co., Ltd.	Jul. 11, 2005
	CBC Industrias Pesadas S.A.	Dec. 1, 2005
	Mitsubishi Heavy Industries Korea Ltd.	Dec. 17, 2005
	Mitsubishi Heavy Industries Mahajak Air Conditioners Co., Ltd.	Dec. 21, 2005
	Mitsubishi Heavy Industries-Jinling Air-Conditioners Company, Ltd.	Jan. 24, 2006
	MHI Machine Tool (Hong Kong) Ltd.	Mar. 30, 2006
	Mitsubishi Heavy Industries, (Hong Kong) Ltd.	Apr. 5, 2006
	MLP Hong Kong Ltd.	May 25, 2006
	Mitsubishi Heavy Industries, (Shanghai) Co., Ltd.	Jul. 5, 2006
	MHI-Pomchai Machinery Co., Ltd.	Jul. 17, 2006
	Mitsubishi Heavy Industries India Private Ltd.	Dec. 7, 2006
	Mitsubishi Heavy Industries Singapore Private Ltd.	Jan. 21, 2007

### EcoAction 21 accreditation at MHI affiliates

	Base or Company name	Date of issue (or registration)
Domestic affiliates	Daiya Building Service Co., Ltd.	Apr. 21, 2005
	Nuclear Development Corporation	May 30, 2005
	Ryonichi Engineering Co., Ltd.	Oct. 31, 2005

### K-EMS accreditation at MHI affiliates

	Base or Company name	Date of issue (or registration)
Domestic affiliates	Seiry Engineering Co.	Dec. 24, 2004
	Kinki Ryoju Estate Co.	Feb. 23, 2005
	Shinryo Hi Technologies	Feb. 23, 2005
	MHI Environment Engineering Co., Kobe Branch	Mar. 24, 2005
	Engineering Development Co.	Mar. 24, 2005
	Nuclear Power Training Center	Mar. 24, 2005
	MHI General Services Co., Ltd.	Mar. 24, 2005
	Ryojin Co., Ltd., Kobe Branch	Mar. 24, 2005
	Techno Data Engineering Co., Ltd.	Feb. 27, 2006
	Energis Ltd.	Mar. 23, 2006

### Kamakura EcoAction 21 accreditation at MHI affiliates

	Base or Company name	Date of issue (or registration)
Domestic affiliates	Shonan Monorail Co., Ltd.	Apr. 4, 2007

### MHI affiliates adopting M-EMS (based on ISO 14001)

	Base or Company name	Date of issue (or registration)
Overseas affiliates	Kensa Kenkyusho Inspection Co., Ltd.	Apr. 25, 2005
	Ryojin Co., Ltd., Tokyo Solution Center	Apr. 26, 2005
	MHI Printing & Paper Converting Machinery Sales Co., Ltd.	May 12, 2005
	MHI Air-Conditioning & Refrigeration Systems Corporation	May 13, 2005
	MHI Bridge & Steel Structures Engineering Co., Ltd.	May 16, 2005
	MHI Forklift Sales Co., Ltd.	Jul. 12, 2005
	MHI Engines Systems Co., Ltd.	Jul. 12, 2005
	Mitsubishi Engine North America, Inc.	Jan. 19, 2007
	MHI Injection Molding Machinery, Inc.	Jan. 19, 2007
	MLP U.S.A., Inc.	Jan. 19, 2007

### MHI affiliates M-EMS EcoAction (based on EcoAction 21)

	Base or Company name	Date of issue (or registration)
Domestic affiliates	Mihara Ryoju Engineering Co., Ltd.	Apr. 20, 2005
	Ryojin Co., Ltd., Sagamihara Branch	Apr. 25, 2005
	Shunjusha Ltd.	Apr. 26, 2005
	MHI Sagami High-tech, Ltd.	May 9, 2005
	Ryosen Engineers Co., Ltd.	May 10, 2005
	MHI Turbo-Techno Co.	May 11, 2005
	Hiroshima Dia System Co., Ltd.	May 11, 2005
	Ryoju Transportation Equipment Engineering & Service Co., Ltd.	May 12, 2005
	MHI Marine Engineering, Ltd.	May 16, 2005
	Churyo Engineering Co., Ltd.	May 16, 2005
	Ryojin Co., Ltd., Minatomirai Branch	May 16, 2005
	MHI Aerospace Systems Corporation	Jul. 12, 2005
	MDS Corporation	Jul. 22, 2005

### Affiliates incorporated into ISO 14000 certification at MHI works or Head Office

	Base or Company name	Date of issue (or registration)	MHI division or works
Domestic affiliates	MHI Plastic Technology Co., Ltd.	Apr. 1, 2000	Iwatsuka Area (formerly, Industrial Machinery Division)
	Socio Diamond Systems Co., Ltd.	Oct. 8, 2004	Paper & Printing Machinery Division
	Ryojin Co., Ltd., Nagoya Branch	Oct. 22, 2004	Nagoya Aerospace Systems Works
	MHI Aerospace Production Technologies, Ltd.	Oct. 22, 2004	Nagoya Aerospace Systems Works
	Diamond Air Service Incorporated	Oct. 22, 2004	Nagoya Aerospace Systems Works
	Ryojin Co., Ltd., Shimonoseki Branch	Nov. 22, 2004	Shimonoseki Shipyard & Machinery Works
	Kanmon Dock Service Co., Ltd.	Nov. 22, 2004	Shimonoseki Shipyard & Machinery Works
	Shimonoseki Ryo-Jyu Engineering Co., Ltd.	Nov. 22, 2004	Shimonoseki Shipyard & Machinery Works
	Ryojin Co., Ltd., Iwatsuka Branch	Jan. 6, 2005	Iwatsuka Area (formerly, Industrial Machinery Division)
	MHI Industrial Machinery Co., Ltd.	Jan. 6, 2005	Iwatsuka Area (formerly, Industrial Machinery Division)
	MHI Machine Tool Engineering Co., Ltd.	Feb. 25, 2005	Machine Tool Division
	Ryojin Co., Ltd., Kyoto Branch	Feb. 25, 2005	Machine Tool Division
	MHI Aero Engine Service Co., Ltd.	Apr. 11, 2005	Nagoya Guidance & Propulsion Systems Works
	MHI Logitec Company Limited	Apr. 11, 2005	Nagoya Guidance & Propulsion Systems Works
	MHI Diesel Service Co., Ltd.	May 12, 2005	Kobe Shipyard & Machinery Works
	Nuclear Plant Service Engineering Co., Ltd.	May 12, 2005	Kobe Shipyard & Machinery Works
	Sinryo Thermal Power Plant Service Engineering Co., Ltd.	May 12, 2005	Kobe Shipyard & Machinery Works
	Sanshin-Tec. Ltd.	May 12, 2005	Kobe Shipyard & Machinery Works
	Mitsubishi Heavy Industries Turning Machinery & Geotechnology Co., Ltd.	May 12, 2005	Kobe Shipyard & Machinery Works
	MHI Parking Co., Ltd.	May 14, 2005	Yokohama Dockyard & Machinery Works
	Ryojin Co., Ltd., Yokohama Branch	May 14, 2005	Yokohama Dockyard & Machinery Works
	Ryoju Estate Co., Ltd., Yokohama Branch	May 14, 2005	Yokohama Dockyard & Machinery Works
	MHI Energy & Service Co., Ltd.	May 14, 2005	Yokohama Dockyard & Machinery Works
	Koryo Inspection & Service Co., Ltd.	May 14, 2005	Takasago Machinery Works
	MHI Gas Turbine Service Co., Ltd.	May 14, 2005	Takasago Machinery Works
	Koryo Engineering Co., Ltd.	May 14, 2005	Takasago Machinery Works
	Ryojin Co., Ltd., Takasago Branch	May 14, 2005	Takasago Machinery Works
	Nuclear Plant Service Engineering Co., Ltd., Takasago Division	May 14, 2005	Takasago Machinery Works
	MEC Engineering Service Co., Ltd.	Jun. 23, 2005	Hiroshima Machinery Works
	Hiroshima Ryoju Engineering Co., Ltd.	Jun. 23, 2005	Hiroshima Machinery Works
	MHI Plant Construction Co., Ltd.	Jun. 23, 2005	Hiroshima Machinery Works
	Mitsubishi-Hitachi Metals Machinery, Inc.	Jun. 23, 2005	Hiroshima Machinery Works
	Ryojin Co., Ltd., Hiroshima Branch	Jun. 23, 2005	Hiroshima Machinery Works
	Sagami Logistics & Service Co., Ltd.	Sep. 13, 2005	General Machinery & Special Vehicle Headquarters
	Choryo Senpaku Kouji Co., Ltd.	Sep. 22, 2005	Nagasaki Shipyard & Machinery Works
	Ryojin Co., Ltd., Nagasaki Branch	Sep. 22, 2005	Nagasaki Shipyard & Machinery Works
	Choryo Inspection Co., Ltd.	Sep. 22, 2005	Nagasaki Shipyard & Machinery Works
	MHI Oceanics Co., Ltd.	Sep. 22, 2005	Nagasaki Shipyard & Machinery Works
	Kowa Industry Co., Ltd.	Sep. 22, 2005	Nagasaki Shipyard & Machinery Works
	Choryo Control Systems Co., Ltd.	Sep. 22, 2005	Nagasaki Shipyard & Machinery Works
	Choryo Designing Co., Ltd.	Sep. 22, 2005	Nagasaki Shipyard & Machinery Works
	MHI Maritech, Ltd.	Sep. 22, 2005	Nagasaki Shipyard & Machinery Works
	Choryo Software Co., Ltd.	Sep. 22, 2005	Nagasaki Shipyard & Machinery Works
	Chiyoda Lease Co., Ltd.	Sep. 22, 2005	Nagasaki Shipyard & Machinery Works
	Ryosan Co., Ltd.	Sep. 22, 2005	Nagasaki Shipyard & Machinery Works
	MHI Machine Tool Sales Co., Ltd.	Jan. 13, 2006	Machine Tool Division
	Ryoju Estate Co., Ltd., Department of Facilities Management Service	Apr. 6, 2006	Head Office
	Tamachi Bldg. Co., Ltd., Shinagawa Building Management Center	Apr. 6, 2006	Head Office
	MHI Personnel Staff, Ltd.	Apr. 6, 2006	Head Office
	MHI Tourist, Ltd.	Apr. 6, 2006	Head Office
MHI Accounting Service, Ltd.	Apr. 6, 2006	Head Office	
MHI Finance Co., Ltd.	Apr. 6, 2006	Head Office	
Dia Food Service Co., Ltd.	Apr. 6, 2006	Head Office	
Daiya PR Co., Ltd.	Apr. 6, 2006	Head Office	
Computer Software Development Co., Ltd.	Apr. 6, 2006	Head Office	
Advanced Reactor Technology Co., Ltd.	Apr. 6, 2006	Head Office	
Diamond Air Service Inc.	Apr. 6, 2006	Head Office	
E-Techno, Ltd.	May 13, 2006	Kobe Shipyard & Machinery Works	
Choryo Engineering Co., Ltd.	Aug. 21, 2006	Nagasaki Shipyard & Machinery Works	
Foods Ryowa Co., Ltd.	Nov. 27, 2006	Shimonoseki Shipyard & Machinery Works	

## Commitment to the Global Environment

## Targets and Progress

## Targets and progress in 2006

○ = Target achieved or progressing on schedule    △ = More effort required    × = Target not yet achieved

Item	Medium- or long-term target	Progress through fiscal 2006	Evaluation
<b>Reduced waste generation and emissions</b>	By 2010, total waste generation reduced to 170,000 tons (greater than 20% reduction from 1992 level): to be achieved by conserving resources and reducing the purchase of materials	Total emissions: 164,000 tons 24.1% reduction from 1992 level	○
<b>Reduced landfill waste disposal</b>	By 2010, zero landfill waste disposal at all works to be achieved through reuse and recycling	Zero emissions achieved by Yokohama Dockyard & Machinery Works, Takasago Machinery Works, General Machinery & Special Vehicle Headquarters, Nagoya Guidance & Propulsion Systems Works, Air-Conditioning & Refrigeration Systems Headquarters, Iwatsuka Area (Former Industrial Machinery Division), the Machine Tool Division and in May 2007 the Paper & Printing Machinery Division	○
<b>Elimination of equipment using PCBs</b>	By 2010, total elimination of lighting ballasts and high-voltage equipment using PCBs	Replacement progressing as scheduled; for equipment using high concentrations of PCBs, registration (at Japan Environmental Safety Corporation) was completed ahead of schedule and a basic contract for disposal was signed	○
<b>Reduced emissions of organochlorides</b>	Zero atmospheric emissions of dichloromethane, trichloroethylene and tetrachloroethylene by 2010: to be achieved through total management and reduced release of organochlorides	Atmospheric discharge: 21.2 tons 91.9% reduction from 1996 level	△
<b>Reduced CO<sub>2</sub> emissions</b>	By 2010, 6% reduction in CO <sub>2</sub> emissions (from 1990 level): to be achieved through reduction efforts at all production plants	CO <sub>2</sub> emissions: 527,000 tons 11.8% above 1990 level	△
	By 2010, addition of solar power systems capable of generating 520 kW (1,000 kW in cumulative total)	Decided to introduce 720 kW in 2007 (1,090 kW in cumulative total)	○
<b>Reduced fluorocarbon usage</b>	By 2010, completely replace potentially ozone-depleting HCFCs with 100% ozone-safe HFCs, etc.	Emissions in fiscal 2006: 11.3 tons Efforts under way toward complete elimination in fiscal 2010	△
<b>Environmental management system</b>	Ongoing renewal of ISO 14001 certification at all domestic works	Renewals of ISO 14001 processed on continuing basis by all 15 domestic production sites. ISO 14001 certification successfully obtained by the Head Office Departments and 6 Research & Development Centers	○
<b>Database for environmentally friendly management</b>	By 2007, database developed on the company's environmental burden	Study carried out on online tabulation of environmental performance data, environmental accounting, etc.	△
<b>Promotion of environmental accounting</b>	Continuation of environmental accounting; completion of online tabulation system by 2007		
<b>Ongoing issuance of environmental reports</b>	Continuing issuance; ongoing content improvements	Issuance of new Social and Environmental Report incorporating CSR-oriented content	○
<b>Promotion of green purchasing</b>	Promoting the purchase of environmentally friendly products based on the company's own green purchasing guidelines	Green procurement rate: 89.1%	△
<b>Promotion of environmentally friendly design</b>	Promotion through establishment of a working group to develop in-house standards for environmentally friendly product design	Design for Environment Task Force carried out LCA actual condition survey and developed a concept for managing hazardous substances	△

## Environmental Accounting

MHI quantitatively measures its investment outlays and costs incurred for protecting the environment within the performance of the company's business activities as well as the relative benefits of these efforts. The company refers to the "Environmental Accounting Guidelines" published by the Ministry of the Environment. Furthermore, since fiscal 2003 MHI has estimated the economic benefits (from reduced CO<sub>2</sub> emissions) generated when customers use the company's products.

### Cost of Environmental Protection

Overall, environmentally oriented investments and costs decreased in fiscal 2006 from the previous year, partially due to reduced R&D outlays.

Economic advantages worth a total of 4.4 billion yen were reaped during the year, largely from income acquired through recycling

and cost reductions achieved through energy conservation.

### Estimated Reduction in CO<sub>2</sub> Emissions Due to the Usage of the Company's Products

Recognizing the reduction of CO<sub>2</sub> associated with using the company products as an economic benefit for customers, MHI under-

takes an annual estimate of the amount of CO<sub>2</sub> emissions that are reduced through the usage of MHI products. The most outstanding contribution was made by nuclear power plants, which emit no CO<sub>2</sub>.

In fiscal 2006, reduced emissions associated with the use of gas turbine combined cycle plants significantly increased, reducing CO<sub>2</sub> emissions by nearly 2.6 million tons.

### Environmental Protection Costs and their Economic Benefit

(Unit: millions of yen)

Cost category	Activities in FY 2006	Investment		Cost		Economic benefit		Description	Environmental protection benefits
		2005	2006	2005	2006	2005	2006		
1. Production activities		2,805	2,517	4,453	4,544	2,828	4,435		
(1) Pollution control	Maintenance and operation of wastewater and flue-gas treatment systems	1,170	1,433	1,644	1,804	368	255	Reduction in wastewater treatment costs	Reduced emissions of air and water pollutants
(2) Global environmental protection	Energy conservation	1,423	549	590	253	561	695	Cost reduction from energy conservation	Reduced energy input
(3) Recycling	Reduced waste generation, recycling	212	535	2,219	2,487	1,899	3,485	Income derived from recycling, cost reduction from reduced waste generation	
2. Upstream and downstream costs	Recycling of household electrical appliances and container packaging	2	0	71	42	—	—		
3. Management activities	Development of environmental management systems, ISO Office, publication of MHI Social & Environmental Report	15	23	840	994	—	—		
4. R&D	Development of environmentally friendly products	1,229	1,486	6,413	7,937	—	—		Development of diverse environmentally friendly products
5. Public and social activities	Support of environmental protection initiatives, greening activities	9	1	460	365	—	—		
6. Environmental remediation	Soil remediation measures	105	1	517	1,456	—	—		Prevention of oil and chemical spills
	<b>Total</b>	<b>4,165</b>	<b>4,028</b>	<b>12,754</b>	<b>15,338</b>	<b>2,828</b>	<b>4,435</b>		

Total capital investments in FY 2006: 123.4 billion yen. Portion related to the environment: 4.0 billion yen (3.2%)  
Total R&D outlays in FY 2006: 102.4 billion yen. Portion related to the environment: 9.4 billion yen (9.2%)

### Economic benefit for customers (CO<sub>2</sub> reduction from using MHI products in FY 2006)

Product	CO <sub>2</sub> reduction (1,000 tons)	Amount (millions of yen)	Basis of calculation	
Nuclear power plants	50,952.91	481,505	Estimates based on actual output generated in FY 2006 by nuclear power plants built by MHI <sup>1,2</sup>	
Thermal power generation	Conventional thermal plants	222.00	2,098	Estimates based on MHI's actual delivery record in 2006 <sup>1,2</sup> (compared to earlier MHI plants) Generation efficiency up 7.56% over 1990 level
	Gas turbine combined cycle plants	2,598.00	24,551	Estimates based on MHI's actual delivery record in 2006 <sup>1,2</sup> (compared to earlier MHI plants) Generation efficiency up 15.73% over 1990 level
	Industrial power plants (biomass power generation)	125.00	1,181	Estimates based on MHI's actual delivery record in 2006 <sup>1,2</sup>
Geothermal power plants	199.00	1,881	Estimates based on MHI's actual delivery record in 2006 <sup>1,2</sup>	
Renewable energy power generation (wind and photovoltaic power generation)	146.74	1,387	Estimates based on MHI's actual delivery record in FY 2006 <sup>1,2</sup>	
Gas engine cogeneration systems	263.30	2,488	Estimates based on MHI's actual delivery record in FY 2006 of MACH-30G gas engines and GSR series Miller cycle gas engines <sup>1,2,3</sup>	
Centrifugal liquid chillers	117.48	1,110	Estimates based on MHI's actual aggregated delivery record up to FY 2006 (compared to earlier models) <sup>1,2</sup>	
Forklift trucks	39.63	375	Estimates based on sales record of "GRENDA" in FY 2006 (compared to earlier models) <sup>1</sup>	

<sup>1</sup> The Ministry of the Environment's pro forma value of 9,450 yen per t-CO<sub>2</sub> was used in calculating monetary amounts.

<sup>2</sup> Comparisons were made against the volume of CO<sub>2</sub> emissions per kWh of electricity used in Japan (=0.379 kg-CO<sub>2</sub>: the actual result reported for FY 2001 by the Federation of Electric Power Companies of Japan).

<sup>3</sup> In addition to<sup>2</sup>, comparisons concerning calorific values were made against heavy fuel oil A-burning boilers with an efficiency rating of 90%, assuming total utilization as steam and hot water.

## Commitment to the Global Environment

### Countermeasures against Global Warming

Having already implemented significant measures to cut CO<sub>2</sub> emissions at numerous plants, including the adoption of cogeneration systems and equipment enabling outstanding energy savings and superlative operating efficiency, MHI is working on reducing CO<sub>2</sub> emissions from its production facilities to ensure achievement of the 6% reduction that is Japan's target under the Kyoto Protocol.

#### Promoting Measures to Conserve Energy and Reduce CO<sub>2</sub> Emissions

##### Specific reduction targets for individual headquarters, divisions and works

In fiscal 2006, MHI examined its energy-saving/CO<sub>2</sub>-reducing plans in detail and developed a policy for the entire company. The plan classifies CO<sub>2</sub> reduction items into four categories according to the efficiency of CO<sub>2</sub> reduction and items involving high CO<sub>2</sub>-reducing efficiency will be implemented without question, while other items are subject to consultation at the time of replacing old equipment. Increases due to factory construction and so forth will be compensated by purchasing emission quotas so that the company can meet its target as a part of its social responsibility.

In order to accelerate CO<sub>2</sub> reduction activities, various reduction targets were set for individual headquarters, divisions and works. In the past, all divisions, headquarters and works had the same target of a 6% reduction from the level of FY 1990. This target value was reviewed based on the adjustment of the percentage change (between fiscal 1990 and 2005) of unit energy consumption in production and internal business transfers.

MHI intends to implement the items in the order of their effectiveness in reducing CO<sub>2</sub> emissions while laterally deploying the measures across its headquarters, divisions and works to accelerate progress toward achieving the targets.

##### CO<sub>2</sub> Emissions in Fiscal 2006

In fiscal 2006 MHI's CO<sub>2</sub> emissions resulting from energy use were 527,000 tons, 11.8% above the level of 1990, the baseline year. This is slightly lower than fiscal 2005, but still substantially above the target to be reached by fiscal 2010, and therefore requires further improvement.

The increase is largely attributable to the increase of energy-consuming equipment

due to the construction of new factories for aircraft, power systems, and other products, and the increased fuel usage in conjunction with increased production due to such factors as the introduction of new facilities.

##### Purchase of Green Power

MHI is an active participant in the Green Power Certification System promoted by Japan Natural Energy Co., Ltd. (JNE). Under this system, since April 2002 MHI has contracted to purchase 1MkWh of wind-generated power from JNE each year for a period of 15 years. MHI uses this clean power at its Head Office Building and at the Mitsubishi Minatomirai Industrial Museum.

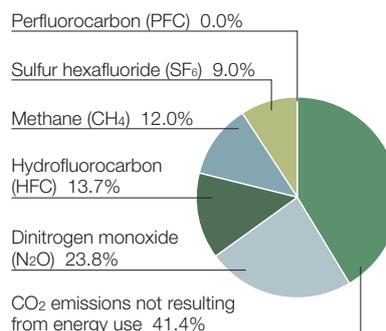


Green power certificate

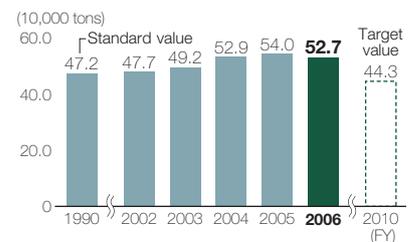
##### Measures to Reduce Greenhouse Gases

MHI recently established an internal standard for accurate calculation, tabulation and legal notification of greenhouse gases, and has started tabulation based on this standard. The result: emissions of greenhouse gases other than CO<sub>2</sub> resulting from energy use in fiscal 2006 was equivalent to 16,000 tons of CO<sub>2</sub>.

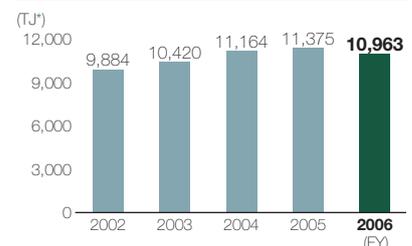
##### Breakdown of greenhouse gas emissions (excluding CO<sub>2</sub> emissions resulting from energy use)



##### Change in CO<sub>2</sub> emissions

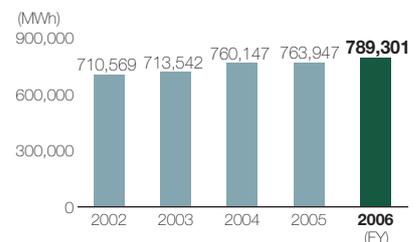


##### Change in gross energy input



\* TJ (tera joule) = 1 trillion joules (1,000,000,000,000J)

##### Change in electricity purchase



##### Photovoltaic Power System Installed in Company Works

MHI began installing amorphous solar cell modules, developed in-house, in fiscal 2002. By the end of 2005, these cumulative installations offered a total generation capacity of 480 kW.

In fiscal 2006, the company decided as an additional measure to install facilities for a further 780 kW by the end of fiscal 2007.



Yokohama Bldg.

### Measures to Curb Energy Use in Transport

In fiscal 2006, MHI strengthened its efforts to reduce energy use in transport by launching a project team to discern the status of energy use in transport and explore how to reduce it in response to the enforcement of the revised Law Concerning the Rational Use of Energy in April 2006.

In fiscal 2007, the company plans to hold study sessions for supervisors at headquarters, divisions and works, and to also explore specific energy-saving measures.

### Energy-saving Activities in Offices

In June 2005 MHI joined the national "Team Minus 6%" campaign promoted by the Ministry of Environment. Now, in the third year of the campaign, "Cool Biz" in summer (office air-conditioning systems set to 28°C, no ties) and "Warm Biz" in winter (office air-conditioning systems set to 20°C) have taken root in MHI offices. In addition to temperature setting, the company has engaged in diverse energy-saving activities, including thinning out the operation of elevators and introduc-

ing high-efficiency lighting.

MHI also published and distributed a list of energy-saving activities to all employees, which organizes the energy-saving impact by items such as air-conditioning, lighting, refrigeration and television in a easy-to-understand manner so that every employee can promote energy-saving measures at home as well.



## TOPICS

### Accomplished CO<sub>2</sub> Reduction by Reinforcing Energy-Saving Activities (Shimonoseki Shipyard & Machinery Works)

In addition to the existing energy-saving activities, Shimonoseki Shipyard & Machinery Works started to strengthen and further advance energy-saving activities in fiscal 2006 to reduce wastefulness through total energy management while introducing equipment such as high-efficiency lighting and compressed air dehumidifying/de-oiling equipment to meet the company-wide CO<sub>2</sub> reduction target.

#### (1) Turning off unnecessary lighting equipment

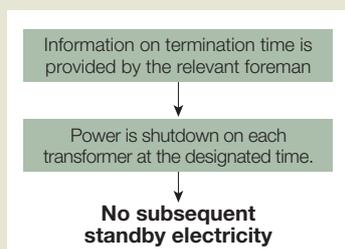
Campaign to turn off unnecessary lights, turning factory lighting off during sunny days, etc.



#### (2) Total management of air-conditioner operation

- Temperature setting:  
Summer (Cool Biz) 28°C  
Winter (Warm Biz) 18°C
- Thorough maintenance check (equipment check, filter cleaning, etc.)

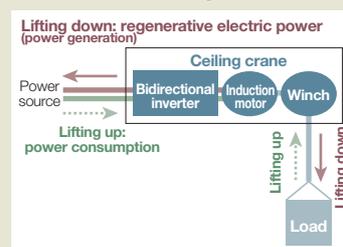
#### (3) Improving the efficiency of receiving and transformation equipment, individual power activation/shutdown by system



#### (4) Implementation of air and gas leak diagnosis and renewal of piping

- Implementing air and gas leak diagnosis, and maintenance and improvement (April 2006)
- Replacing worn out piping to prevent leaks

#### (5) Utilizing electric power from ceiling crane regenerative braking



Regenerative electric power during lifting down is taken out using a bidirectional inverter and put into the power source, thereby contributing to energy-saving and CO<sub>2</sub>-reduction.

#### (6) Factory air distribution

37 kW compressor was newly installed



#### Deploying energy-saving activities on the two fronts of improving equipment and raising awareness

My major responsibility is to develop plans for introducing energy-saving equipment. The work incorporates various energy-saving functions when improving and replacing equipment. Our foremen lead the air and gas leak check patrol to prevent leaks as well as to raise energy-saving awareness.



**Isamu Nakazawa**  
Acting Manager of the Production Planning Section, Shipbuilding & Repair Department

We will continue our energy-saving activities on the two fronts of improving equipment and raising awareness.

#### (7) Other measures

- Setting PC to energy-saving mode
- Stopping supply of hot water for hand washing during summer (June to October)

Although the energy-saving impact of these activities is not necessarily significant when taken separately, their accumulated effect is large.

Commitment to the Global Environment

Resources Conservation and Waste Management

MHI is taking the initiative to achieve zero emissions at all company facilities by 2010. The company vigorously sorts all recyclables, works to explore new recycling contractors, and encourages the sharing of information on recycling operators, while at the same time holding company-wide meetings on how to achieve zero emissions.

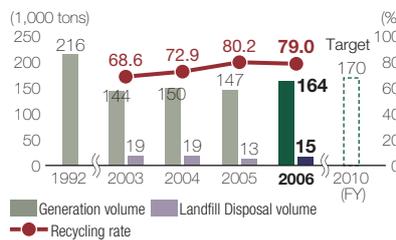
Curbing Waste Generation, Release and Disposal

MHI previously set a target for reducing the volume of the company's waste to less than 170,000 tons by 2010, and implemented aggressive initiatives toward that goal to reduce waste output and promote recycling within the various works. As a result, the target was achieved in fiscal 2006 with a waste output of 164,000 tons.

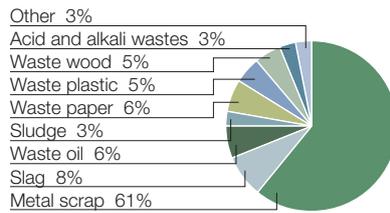
In terms of its target to achieve zero waste emissions at all MHI works by 2010, in fiscal 2006 the Air-Conditioning & Refrigeration Systems Headquarters, Iwatsuka Area and Machine Tool Division joined the four works (Yokohama Dockyard & Machinery Works, Takasago Machinery Works, General Machinery & Special Vehicle Headquarters, Nagoya Guidance & Propulsion Systems Works) that had already accomplished the target. In

May 2007, the Paper & Printing Machinery Division (including Plant and Transportation Systems Engineering & Construction Center (Mihara)) also accomplished the target.

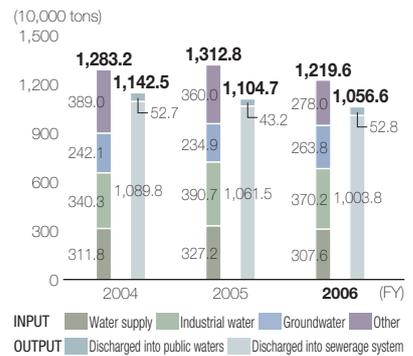
Waste generation/disposal volumes and recycling rate



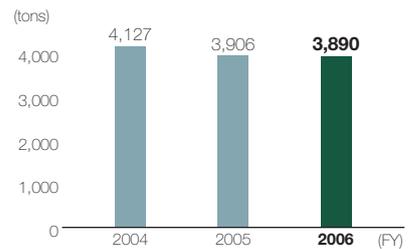
Waste generation by material



Water usage and discharge



Paper usage



TOPICS

Two Works and One Area Achieved Zero-emissions

Air-Conditioning & Refrigeration Systems Headquarters

The Air-Conditioning & Refrigeration Systems Headquarters had been working on waste recycling and set a target for reducing treatment costs from the 2005 level. The Headquarters fulfilled the company's in-house zero-emissions standard in late July 2007, reducing annual treatment costs by several million yen. This was achieved largely by thoroughly sorting waste (mainly waste plastic) in-house that had formally been done by an intermediate treatment service.

Looking ahead, we further promote reuse of waste to create a recycling society.



Staff in charge at the Biwajima Plant



Staff in charge at the Matsuzaka Plant

Machine Tool Division

As a result of reviewing and changing the recycling contractor and working on thoroughly sorting waste, the Machine Tool Division met the company's in-house standard of zero emissions and announced its achievement on September 27, 2006. It was not easy to find an operator to recycle the large amount of waste oil we generate, but recycling has been made possible with the cooperation of our current recycling contractor. The operator also helped us to dispose of confidential documents to realize low-cost recycling. In the future, we will pursue 100% recycling while working to



Staff in charge at the Machine Tool Division

reduce waste generation.

Iwatsuka Area

Waste plastics in the Iwatsuka Area used to be incinerated on the premises and the burned residue was buried. We terminated the use of the incinerator and have been working on recycling waste plastics, paper and confidential documents.

In terms of other waste, we promoted recycling through such measures as setting up a sorting sample demonstration space to ensure that waste is sorted and dumped by the person who generated it and exploring new recycling operators for high-mix, low-volume waste. As a result, we fulfilled the company's in-house standard of zero emissions at the end of August 2006.

Going forward, we will seek more efficient



Staff in charge at Iwatsuka Area

recycling methods with less environmental burden to further reduce the generation of waste.

## Management of Chemical Substances

MHI takes every possible action to manage the chemical substances required for its production processes in ways that enable their safe usage and storage. All works make effective use of MSDS\*<sup>1</sup> to ensure complete safety for both the customers and company employees. Efforts are also being taken to curb the use and emissions of organochlorides through the development of alternative manufacturing processes and changing to alternative substances.

### Curbing the Use and Emissions of Chemical Substances through Proper Management and Alternatives

#### Reducing organochlorides

Although steady progress has been achieved toward zero atmospheric emissions of tetrachloroethylene, trichloroethylene and dichloromethane through measures including modifying manufacturing methods and switching to water-based cleansers, as of the end of fiscal 2006 the company had only reduced emissions by 91.9%, falling short of its initial target. The failure was due to the increased usage of dichloromethane, a removal agent, in tandem with expanded production volumes.

Evaluation testing and other initiatives are currently under way toward settling on alternative agents to replace dichloromethane. Looking ahead, the company will continue verifying the effectiveness of other agents and also explore new methods toward achieving zero atmospheric emissions by 2010.

#### Emissions of Substances Subject to PRTR\*<sup>2</sup>

In fiscal 2006, MHI emitted a total of 2,073 tons of substances subject to PRTR compliance (excluding dioxins). This represented a reduction of about 7.3% from the previous year.

Roughly 97% consisted of emissions of xylene, toluene and ethylbenzene, which are substances primarily used in painting and cleaning applications. Although the company is working to reduce these emissions through measures such as switching to water-based paints, the task is proving to be a challenge. Particularly with respect to xylene, which is used for painting ships, shipowners typically specify the use of xylene; this preference, along with the increasing volume of shipbuilding, is making it difficult to reduce xylene.

**URL** Release and transfer data for all substances subject to PRTR compliance can be viewed at:  
[http://www.mhi.co.jp/env/report/chemist01\\_e.html](http://www.mhi.co.jp/env/report/chemist01_e.html)

#### Plan for Disposing of Equipment Using PCBs

As of March 2006, MHI had already registered its disposal of equipment that uses PCBs (polychlorinated biphenyls), either currently in use or stored at its domestic works, with the Japan Environmental Safety Corporation (JESCO), a special entity wholly funded by the Japanese government, and signed a consigning contract for disposal in January 2007.

Today the company is scheduled to completely eliminate the use of equipment using PCBs by 2010.

#### Development and Use of a Guideline for Managing Chemical Substances Contained in Products

As an outgrowth of environmental laws and regulations enacted in Europe—including RoHS, ELV and REACH—there is a growing call today across the globe for the corporate sector to properly manage chemical substances contained in its products as part of their social responsibilities. In July 2006, the “Restriction of Hazardous Substances (RoHS)” Directive\*<sup>3</sup> went into effect. In order to comply with this directive, manufacturers are required to engage in green procurement, that is, the procurement of materials and parts from suppliers who are able to verify that the products do not contain the specified chemical substances. MHI started by creating a management system for chemi-

cal substances contained in air-conditioners, which are on the current list of products subject to RoHS scrutiny, at the Air-Conditioning & Refrigeration Systems Headquarters, where they are manufactured. Moreover, a guideline for managing chemical substances contained in these products is being drawn up for use in response to the RoHS Directive in collaboration with MHI suppliers.

Domestic restrictions affecting the management of chemical substances, including new laws and regulations, are scheduled to be strengthened in the future. MHI intends to pursue green procurement even more vigorously by expanding the initiatives already under way at the Air-Conditioning & Refrigeration Systems Headquarters, strengthening the company’s management of chemical substances contained in its products, and working more closely with its suppliers.

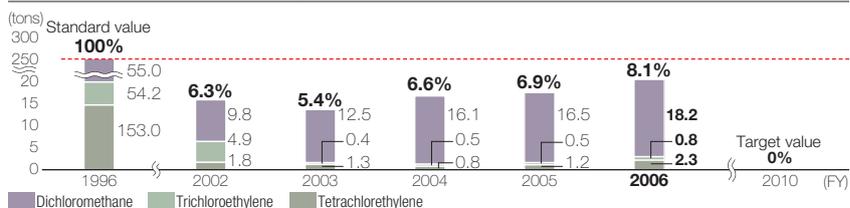
\*<sup>1</sup> MSDS (Material Safety Data Sheet): Material safety data sheets provide information relating to chemical substances when such substances or related products are shipped to other business operators. The sheets describe ingredients, properties, handling methods, etc.

\*<sup>2</sup> PRTR (Pollutant Release and Transfer Register): The PRTR system requires publication of the sources and emission volume of toxic chemical substances and the amounts of such substances removed from manufacturing plants

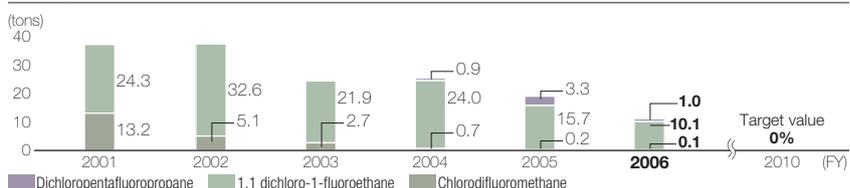
\*<sup>3</sup> RoHS Directive: This regulation prohibits the import into Europe of electrical and electronic products containing any of six specified hazardous substances (such as cadmium, chromium hexavalent and lead).

\*<sup>4</sup> HCFCs (Hydrochlorofluorocarbons): The Montreal Protocol that regulates ozone-depleting substances stipulates that the production of these substances must cease by 2020.

#### Atmospheric emissions of organochlorides



#### Change in HCFC\*<sup>4</sup> emissions



**Commitment to the Global Environment**

**Easing the environmental burden through business operations and products**

MHI is not only working to lessen environmental loads stemming from its own business activities but also, through its various operations and products, is contributing to the advancement of environmental protection by all society.

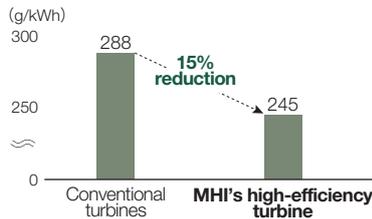
**Development of high-efficiency turbine plant for LNG tankers, significantly reducing CO<sub>2</sub> and NO<sub>x</sub> emissions at sea and dock**



LNG tanker

Some 10-20% of the world's NO<sub>x</sub> emissions are said to derive when ships are in coastal waters or docked at harbor, and as a result regulations on emission gases at sea are being tightened, as illustrated by

**Fuel oil consumption comparison**



the invocation by the International Maritime Organization (IMO) of new amendments to the International Convention for the Prevention of Air Pollution from Ships in May 2005. Another important topic, at a time

when the global warming issue is becoming increasingly serious, is to curb CO<sub>2</sub> emissions from ships, which consume fuel in large amounts.

Against this backdrop, MHI has developed a high-efficiency turbine plant, dubbed the "Ultra Steam Turbine," enabling a 15% reduction in fuel oil consumption compared to earlier turbine ships. The company has also developed an environment-friendly engine, the "UEC Eco-Engine," that reduces NO<sub>x</sub> emissions substantially. Furthermore, the company is working to boost the capacity of LNG tankers and is making significant contributions to enhancing the operating efficiency and reducing the environmental burden of the large tankers that ply the oceans of the world.

**ETC and ERP: non-stop toll collection systems contributing to easing of road congestion in Japan and Singapore**



ERP in-vehicle unit

In order to prevent traffic congestion and enable a smooth flow of traffic, MHI has developed and supplies two



Singapore's ERP system

non-stop toll collection systems: Electronic Toll Collection (ETC) and Electronic Road Pricing (ERP). With ETC, when a vehicle passes through a toll-booth, the toll is automatically collected by radio communication between the transponder

and the antenna at the tollbooth. By eliminating the need for stopping and starting near tollbooths, the system eases traffic congestion and also helps reduce exhaust emissions.

In 1995, MHI supplied the world's first ERP system to Singapore. To date, MHI has supplied infrastructure equipment at 51 locations and 2.2 million transponders, which are now equipped in nearly 99% of all vehicles in use. In these ways, MHI is contributing to easing traffic congestion in Singapore's city center and lightening the environmental burden as well.

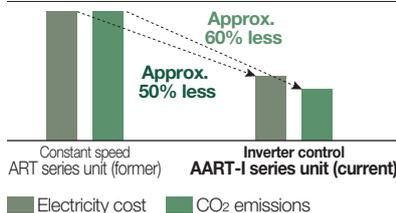
**Variable speed drive centrifugal chillers enabling significant reductions in greenhouse gas emissions through microcomputer control and super-variable speed drive capacity control**



AART series centrifugal chiller

Centrifugal chillers are used not only for air-temperature control in office buildings and factories but also for controlling temperatures within manufacturing processes in chemical plants and other facilities. Going

**Power consumption and CO<sub>2</sub> emission comparisons**



forward, an urgent task is to significantly reduce CO<sub>2</sub> emissions tracing to the industrial sector, especially factories, and the business sector, particularly offices, in order to achieve the targets

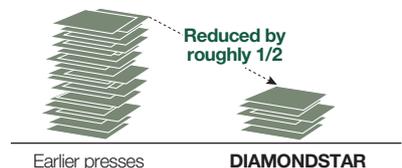
set in the Kyoto Protocol in a quest to curb global warming.

MHI has now significantly boosted efficiency in the most frequently used operating range with the development of its AART-I series of centrifugal chillers featuring super-variable speed drive capacity control. Compared to the company's chillers available 10 years ago, annual electricity costs have been trimmed by 50% and emissions of CO<sub>2</sub>, which has been designated a greenhouse gas, cut as much as 60%. Through the simultaneous achievement of a high level of energy conservation and easing of environmental loads, the new centrifugal chillers are contributing to both the Earth and all society.

## Newspaper offset press boasting outstanding printing quality and speed — a world-record 90,000 iph — is contributing to reduced paper waste in the newspaper industry

In recent years newspaper companies, who produce millions of newspapers everyday, have been eagerly seeking to reduce paper waste and power consumption by achieving higher printing speeds and more stable printing quality, in order to bring the latest news with optimal speed and vivid clarity.

### Reduced paper loss during initial print-runs



In 2004 MHI developed the DIAMONDSTAR newspaper offset press boasting the world's fastest printing speed:

90,000 impressions per hour. Whereas conventional color-matching was performed manually by the press operator, the DIAMONDSTAR's



DIAMONDSTAR

automatic adjustment enables color tone to be sustained at a high level of uniformity. The press's automatic cut-off control system and a control system achieving stable page quality have also reduced paper waste during initial print-runs by one-half to two-thirds that of conventional presses. These enhancements have also enabled shorter operating time, thus contributing to reduction in power consumption.

## Dry cutting system eliminates problems of oil mist, oil waste, etc. while simultaneously boosting accuracy and cutting speed and substantially reducing environmental burdens in gear cutting

Gear-cutting machines perform high-precision cutting of the gear "teeth" used in motor vehicles and machines of all kinds. With conventional processes, however, cutting oil has been used in large amounts to prevent tool wear and remove cutting chips, and this created a variety of problems including oil splash, oil mist and treatment of oil waste. In 1997, MHI developed the world's first "dry" cutting

### GE25A features



system utilizing no cutting oil, which solved an array of problems on the gear-hobbing line. Subsequently the company launched

its "GE Series" of gear-cutting machines incorporating improvements in cutting speed and tool service life, boosting efficiency in the gear-hobbing process and reducing environmental burdens.

Most recently, in September 2006 MHI launched its new GE25A, a super-dry gear-hobbing machine that shortens cutting time by 30% and reduces running costs (excluding tool costs) by 30% compared to earlier systems. In recognition of its high accuracy, operating ease and environmental compatibility, the GE25A is already in use on numerous gear-hobbing lines.



GE25A SuperDry gearhobbing machine

## Fruit-Dry dry-cleaning machine: world's first cleaning machine using natural solvent extracted from fruit peel (Mitsubishi Heavy Industries Industrial Machinery Co., Ltd.)

Standards imposed on the oil-based solvents used in dry cleaning have become increasingly tighter each year due to their generation of suspended particulate matter (SPM), which adversely affects the human body. Meanwhile chlorine-based solvents, which form the mainstream in Europe, are said to be injurious to health and cause soil contamination.

Against this backdrop, Mitsubishi Heavy Industries Industrial Machinery Co., Ltd. has developed "fruit-dry," a natural cleaning solvent using limonene, an essential oil component extractable from the peel

	Oil-based solvents	Fruit-dry
Cleaning strength (KB value)	25~34	69

of oranges and other citrus fruits. Although limonene is categorized as a

volatile organic compound (VOC), it is a natural product of the forest and consumption of waste-using fruit-dry has minimal impact on the environment. Also, while providing higher cleaning strength than the oil-based solvents in general use, fruit-dry is outstandingly biodegradable and virtually worry-free as to its effects on the human body. To promote the use of fruit-dry, which carries a high unit cost per liter, MHI Industrial Machinery has also developed the "Fruit-Dry dry-cleaning machine" that recovers and reuses more than 99% of the solvent, thereby successfully curbing the solvent consumption rate to less than 1%.



Fruit-Dry dry-cleaning machine

Responsibilities and Actions of MHI

# Commitment to People and Society

MHI maintains relationships with diverse populations in various regions and communities in the course of developing and manufacturing products and technologies that are essential for social infrastructures and industry as well as the day-to-day life of people across the world.

To fulfill its corporate responsibility as a social and public entity, MHI has been pursuing its business operations with due consideration for its diverse stakeholders.



**Commitment to People and Society**

**Commitment to Our Customers**

As clearly laid out in its creed – “We strongly believe that the customer comes first and that we are obligated to be an innovative partner to society” – MHI conducts campaigns to ensure safety and improve the quality of its products and to enhance customer satisfaction through continuous improvement activities focused on developing products based on the customer’s point of view.

**Enhancing Product Safety and Quality**

**Strictly controlling product safety and quality by setting standards for each field and product**

MHI develops and produces a wide variety of products, from ocean-going vessels and shipbuilding, large-scale power systems, machinery and steel structures, aerospace and industrial machines to air-conditioners for residential use. Consequently, the company is subject to applicable laws and regulations, safety standards and quality management methods that vary significantly depending on the product. Therefore, we have established specific quality management systems for each headquarters, division and works and set quality standards for each product to ensure compliance with applicable laws and regulations governing product safety and quality.

In addition, recognizing that strengthening fundamental manufacturing operations is

also a key to improving product safety and quality, MHI pursues company-wide activities such as developing human resources and transforming production processes.

This report introduces specific efforts for improving safety and quality associated with the following products and businesses:

- Thermal power generation ..... **P16**▶
- Solar power generation ..... **P19**▶
- Wind power generation ..... **P22**▶
- Nuclear power generation ..... **P25**▶
- Turbochargers ..... **P30**▶
- H-IIA launch vehicles ..... **P33**▶

**Implementing a plan to eliminate asbestos from all products by utilizing alternative materials**

Asbestos, a serious health hazard, has in principle been completely banned (excluding some products that have been granted a moratorium) since September 1, 2006, following the revision of the Industrial Safety

and Health Law.

The company previously used asbestos for steam piping gaskets and packing, sealing for pressurized components, and lagging material in products for which the use of asbestos was permitted due to the difficulty finding substitutes. In September 2005, MHI set up a liaison conference at the general manager level specifically to promote asbestos alternatives at the Head Office. The conference facilitated the exchange of information across the company and drew up an action plan calling for the use of alternatives, targeting complete conversion to alternatives by the end of fiscal 2007. It also conducted research, testing and verification of asbestos-free replacements.

As a result, components of all related products were asbestos-free by August 2006.

MHI also plans to completely utilize asbestos-free material for the insulating foam of launch vehicles, which had been the subject of the moratorium.

**TOPICS**

**Developing JTRAM to be friendly to passengers, operators and the global environment**

Streetcars are used around the world, including Japan as a method of transportation that connects neighboring towns. In recent years, Light Rail Vehicles (LRVs), featuring improved safety, ride quality and traveling performance without emitting exhaust gases while operating, have appeared and attracted attention in the United States and other countries. To encourage the use of LRVs in Japan as well, MHI in cooperation with The Kinki Sharyo Co., Ltd. and Toyo Denki Seizo K.K. developed and produced JTRAM, the first 100%, low-floor LRV in Japan.

In addition to its barrier-free design that allows wheelchair access and ease of movement while onboard, JTRAM has solved the low-floor car problems of narrower aisles and fewer seats by designing separate driving cars and passenger-only cars. Furthermore, operational safety is enhanced by eliminating complicated driving devices and facilitating maximum expansion of the field of view from the control platform. Traveling performance and safety systems including brakes were verified by pilot operation on a test line constructed at the company’s Plant and Transportation Systems Engineering & Construction Center. JTRAM is now operated as a commercial service by the Hiroshima Electric Railway Co., Ltd.



JTRAM



Spacious interior



Control platform that ensures safety

## Commitment to People and Society

### Enhancing Customer Satisfaction (CS)

MHI's underlying stance is that the customer always comes first, and that the company is obligated to be an innovative partner to society. In line with this stance, MHI creates products from the customer's perspective. By integrating technologies and continuously enhancing the company's organizational strength, MHI carries out a wealth of activities for which the entire company works in concert with the goal of boosting customer satisfaction.

#### Management from the Customer's Perspective

"We strongly believe that the customer comes first and that we are obligated to be an innovative partner to society." This is the first declaration of MHI's corporate creed. The company believes that in order to survive in the 21st century, it is vitally important to cultivate a customer-oriented corporate culture in which the company continuously provides products and services that earn customer trust.

During its extensive history of more than a century, the name "Mitsubishi" has earned the trust of its customers by providing products and services that are recognized for superior performance, reliability and price-competitiveness—all made possible by outstanding technologies. Today, however, the needs of MHI's customers and society at large are changing dramatically. We must consistently and objectively question, from the customers' perspective, whether our products truly meet customer needs and are worthy of earning customer recognition for high added value.

Therefore, MHI actively promotes the provision of products and the building of corporate structures that are supported and trusted by customers and society and conducts day-to-day operations firm in the belief that we can sharpen our competitive edge by satisfying our customers.

A business that does not satisfy its customers is not sustainable. Every member of the company will give top priority to how we contribute to customers, and further, to society at large, acknowledging that everything leads to customers and society. Going forward, we will

continue to cultivate management ever mindful of the customer's point of view.

#### CS Promotion Structure

In April 2002 the CS Promotion Office was set up within the Corporate Planning Department, directly reporting to the Presidential Administration Office, and started company-wide customer satisfaction (CS) activities. Since fiscal 2007, the functions of the CS Promotion Office have been integrated into the CSR Department to reinforce CS initiatives. Offices to promote CS activities established in the planning departments of each headquarters, division and works lead efforts related to specific products, departments and sections. Information sharing among works is encouraged to actively incorporate proven practices undertaken in other sections of the company, such as benchmarking and CS action plans.

The CSR Department conducts training sessions to raise CS awareness and also supports the initiatives of individual teams by providing CS-related information and resources.

#### CS Awareness Education

MHI believes that raising CS awareness among all employees is indispensable for firmly setting in place a customer-oriented corporate structure. Toward that end, a variety of educational opportunities are provided, including basic training in CS, management quality training and marketing training.



Marketing training

#### Marketing Case Study Exchange Meetings

In order to conduct business activities that are truly oriented to customers, MHI has been holding marketing case study exchange meetings since March 2004 to share marketing initiatives with individual departments and to discuss issues and actions related to marketing across the entire company.

In the third exchange meeting held in August 2006, about 90 strategists and managers who draft strategies for business, product planning and sales presented four case studies related to the marketing activities of chemical plants and so on with a lively exchange of ideas.

We will further advance our efforts to listen to the opinions of customers and the market through such gatherings and to provide products and services that satisfy our customers.



CS Basic Training



Management quality training

## Commitment to Our Shareholders and Investors

MHI works to forge relationships of trust with shareholders and investors by increasing the soundness and transparency of its management, accurately and promptly disclosing information, and expanding opportunities to communicate with shareholders and investors.

### Communicating with Shareholders and Investors

MHI participates in a variety of events for individual investors in addition to actively cooperating in book interviews published by securities houses for this audience.

In January 2004, the company opened a section titled, "For Individual Investors," on its website to provide easy-to-understand explanations of its business and performance.



**URL** "For Individual Investors"  
<http://www.mhi-ir.jp/finance/ir/index.html> (in Japanese)

### Business and Planning Briefings

In response for the need to know more details on the overall status and plans of individual businesses, MHI holds meetings with analysts and fund managers in addition to semiannual performance briefings. In terms of individual headquarters, in fiscal 2006 a business briefing by the General Machinery & Special Vehicle Headquarters was held in July and a new energy business briefing by the Power Systems Headquarters was held in October of the same year. The content of these briefings can be viewed on the "IR Information" page of the corporate website.

### Plant Tours for Shareholders

The company has been holding semiannual plant tours since March 2005 to deepen shareholder understanding of its business activities. The tours are popular among shareholders, with roughly 1,000 shareholders applying for about 80 tickets available for each tour.

In fiscal 2006, the fourth tour was held at the Nagasaki Shipyard & Machinery Works in September to introduce its turbine plant, shipbuilding plant, historical museum and other facilities using a Nagasaki Port excursion boat to travel between the plants. Another tour was organized in March at the General Machinery & Special Vehicle Headquarters in Sagami-hara, Kanagawa Prefecture and received comments such as, "Seeing the products up close made me feel more connected to them," and "I could sense the high-quality level of the management at this leading manufacturer."

MHI will make use of a questionnaire completed by participants as a reference for further improving future plant tours and their scheduling.



Plant tour at Nagasaki Shipyard & Machinery Works

### Recent dividend disbursements

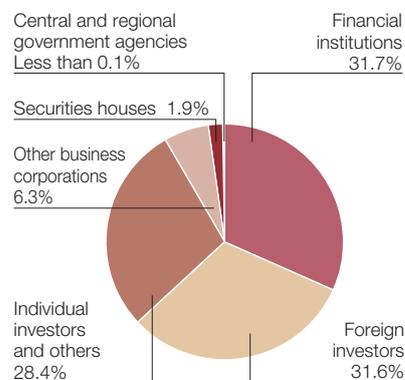
#### Dividend disbursements in the past 5 years

Fiscal year	Dividend per share
2002	6 yen
2003	6 yen
2004	4 yen
2005	4 yen
<b>2006</b>	<b>6 yen</b>

For fiscal 2006, a 3 yen per share year-end dividend was distributed.

In addition to the previously distributed interim dividend of 3 yen per share, total dividends for the year were 6 yen per share, a 2-yen increase over fiscal 2005.

#### Shareholder breakdown



## Commitment to People and Society

### Commitment to Our Suppliers

MHI views its suppliers as important business partners who share the company's desire for mutual prosperity through partnership. In line with this conviction, the company has started creating an evaluation and support structure to strengthen CSR efforts on each side while ensuring that we deal fairly with each other on an equal footing.

#### Ensuring Fair Dealing

##### Announcing MHI's Purchasing Policy that promises fair and equal dealing

MHI's dealings with suppliers are based on openness and fair and equitable evaluation and selection of new suppliers, trusting relationships that encourage growth on both sides and compliance with applicable rules, regulations and social norms.

The company drew up basic policy on procurement in July 2002 and posted it on the corporate website to keep everyone inside and outside of the company informed of this stance. Application guidelines for new suppliers and information on the contact point for material procurement are available on this website.



**URL** MHI's procurement policy on the corporate website:  
[http://www.mhi-ir.jp/info/material\\_e.html](http://www.mhi-ir.jp/info/material_e.html)

##### Monitoring the Legal Compliance of Purchasing Activities through Internal Audits

In its purchasing activities, MHI prohibits any acts that violate laws, including the Act on Prohibition of Private Monopolization and Maintenance of Fair Trade, the Act against Delay in Payment of Subcontract Proceeds, Etc. to Subcontractors and the Construction Business Act .

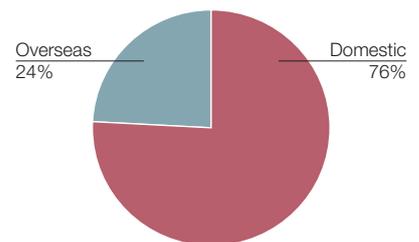
The Material Department and the Internal Audit Department of the Head Office work together to regularly audit purchasing activities and strictly monitor compliance with the basic policy in individual divisions.

##### Assuring the Fair Selection of Suppliers Based on Technology, Quality, Price, and Other Factors

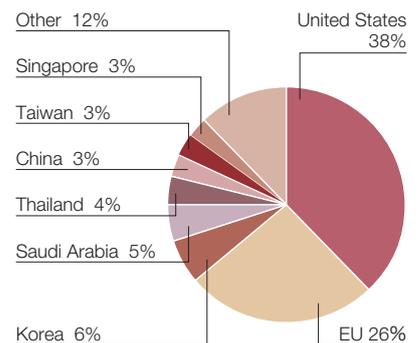
Under company regulations, sections that place orders in principle choose suppliers and determine business terms and conditions. Supplier selection is based on a comprehensive assessment of each candidate's strengths in technology development, supply capability, reliable product quality, price and delivery schedule to ensure fair and equal treatment. Furthermore, the Internal Audit Department confirms whether supplier selection was conducted fairly and impartially through the regular annual audit.

In addition, the company separates the section that will use procured items from the section that places orders and the one that accepts delivery, with all three sections cross-checking the others as a means for preventing spurious orders or other unfair transactions. A system is in place under which multiple employees confirm the appropriateness of order content and procured items at each level of order placement and acceptance inspection. All results are recorded in the system and ledger sheets, which are checked during internal audits.

##### Ratio of domestic/overseas suppliers



##### Breakdown of major overseas suppliers



#### MHI Purchasing Policy

##### 1. Openness

We strive to openly provide business opportunities to suppliers throughout the world, and welcome creative and competitive suppliers.

##### 2. Fairness

We provide competitive opportunities to qualified suppliers, and evaluate and select suppliers fairly based on criteria such as the suppliers' product quality, price, delivery schedule, technology and financial conditions.

##### 3. Partnership

We regard our suppliers as partners based on the mutual understanding that both partners should benefit from the relationship.

##### 4. Compliance

We comply with rules, regulations and social norms based on our compliance management policy, and all information submitted to MHI will be kept and used properly.

### Compliance Training for Employees Engaged in Procurement Activities

The company holds annual training sessions on compliance issues for employees engaged in procurement activities and offers an e-learning program on the Act against Delay in Payment of Subcontract Proceeds, Etc. to Subcontractors.

Compliance training is focused on younger employees in procurement divisions with the goal of raising awareness of compliance based on knowledge of major laws including the Act against Delay in Payment of Subcontract Proceeds, Etc. to Subcontractors, the Construction Business Act and the Stamp Tax Law. The level of understanding is tested at the completion of each training session. Brush-up material is sent to strengthen participant understanding of items that indicate poor comprehension. In fiscal 2006, 34 employees participated in the course with an average test score of 83. Items that scored low will become the focus of training in fiscal 2007 to improve their overall impact.

An e-learning program launched in fiscal 2005 on the Act against Delay in Payment of Subcontract Proceeds, Etc. to Subcontractors targets all employees who may have business contact with suppliers. To date, 7,219 employees have participated. Since fiscal 2006, the target group has been extended to include employees of MHI subsidiaries (in which MHI's holds more than 50% of shares); 482 employees from 51 companies have participated.



e-learning

### Record of compliance training

	Compliance training	e-learning
FY2003	39 participants (one session)	—
FY2004	53 participants (two sessions)	—
FY2005	50 participants (two sessions)	694 participants
<b>FY2006</b>	<b>34 participants (one session)</b>	<b>4,692 participants</b>
FY2007	Yet to be implemented*	1,833 participants

\* Compliance training in fiscal 2007 is scheduled to be held sometime in January 2008.

### Focusing on CSR Procurement Efforts

#### Enhancing partnerships with suppliers to promote CSR

Recognizing that the cooperation of suppliers is essential for companies to fulfill their corporate social responsibility in such areas as product safety, compliance and reduced environmental burden, companies have recently been called upon to clearly declare their CSR policy to business partners, and to seek their agreement, understanding, and cooperation as well.

Against this background, MHI's Material Department is considering the expansion of supplier evaluation items from technical and quality qualifications to include such considerations as environmental protection, compliance, and improved working environments.

This is a part of the effort to further strengthen partnerships with suppliers within the framework of the "Supply Chain Innovation (SC-I) Campaign," which was launched in January in cooperation with the Technical Headquarters, the Production System Innovation Planning Department and the Information Systems & Communications Department.

MHI intends to share common values with its suppliers through efforts like this to promote CSR for mutual harmony and benefit.

#### Suppliers and Compliance

To request supplier cooperation with corporate compliance measures, MHI sends letters to domestic suppliers on such issues as discontinuing obsolete formalities like summer and year-end gift-giving, promoting the use of designated invoices, notifications of compliance contacts, to raise their awareness of compliance and encourage stronger efforts.

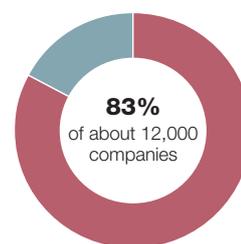
For overseas suppliers, MHI specifies compliance as specific contract terms, since laws and rules vary by country and region.

### Conclusion of an Arrangement to Prevent Information Leaks

For the sake of preventing unauthorized divulgence of personal data and other confidential information, whenever the company provides suppliers with important confidential information it demands that suppliers ensure the information is properly managed and never leaked. These expectations are included in contracts that allow the company to audit suppliers' information management systems as needed.

To protect personal information, an especially key issue since the implementation in April 2005 of related domestic legislation, the company's basic policy has been to sign agreements with all suppliers on the appropriate management of information. As of February 2007, MHI has concluded such arrangements with 83% of about 12,000 related companies.

#### Rate of agreements on proper management of personal information



## Commitment to People and Society

### Commitment to Our Employees

**Believing that human resources are the company's most important asset and that their growth leads to the development of the entire company, MHI is actively working to utilize and cultivate diverse human resources and build a better working environment.**

#### Utilizing and Cultivating Diverse Human Resources

##### Utilization of diverse human resources

###### •Active recruitment of mid-career and female workers

In the course of excelling at manufacturing large-scale products that involve lengthy time-frames, including power generation plants, aerospace equipment and marine vessels, MHI's basic policy for the recruitment and development of human resources had been to hire new graduates and provide ample in-house training.

Recently, however, survival in the increasingly competitive globalized market has required accelerating the deployment of businesses overseas and the development of new products and technologies, increasing the importance of utilizing experienced workers who possess adaptable fighting potential in addition to new graduates. MHI particularly needs a large number of excellent workers who have skill, experience, and human networks that are not available within the company. Therefore, in fiscal 2007, MHI plans to hire about 600 mid-career workers—an approximately 30% increase over the previous year—in addition to about 1,500 new graduates, an approximately 10% increase over the previous year.

The company treats new graduates and mid-career workers equally. From their first day in MHI, mid-career workers play an active role in their respective fields as members of the company, making full use of the skills they have cultivated. MHI is also actively hiring female workers with high expectations for their performance. The number of new female workers has been increasing each year. Recently approximately one quarter of new white-collar recruits with a BA have been women, for example 29 female recruits out of 126 in fiscal 2006.

###### •Rehiring seniors

Recognizing the importance of employing senior citizens, MHI launched a system in October 2003 for rehiring employees after they have reached retirement age, and since then

it has gradually increased the retirement age from 62 to 65.

In April 2006, in light of revisions to legislation concerning the stabilization of employment for senior citizens, the company established a rehiring system, not only within the company but throughout the group to, in principle, embrace all employees who wish to avail themselves of an opportunity for re-employment. Forms of reemployment include both full-time and part-time positions. The employment period is one year, renewable up to a set limit depending on the date of the retirement (maximum is 65 years old).

In fiscal 2006, 389 out of 655 employees who retired signed reemployment contracts under this system.

###### •Expanded job opportunities for the handicapped

Since 1992, MHI has been pursuing efforts to expand job opportunities for handicapped individuals and create a suitable working environment for anyone by establishing an in-house committee specifically for this purpose. The company has been actively taking steps such as opening a website for handicapped individuals named, "mano a mano," which means "hand to hand" in Spanish, while partnering with local job-placement offices and skill-building schools for the handicapped. However, the rate of employment of the handicapped as of April 1, 2007 is 1.66%, which requires even more aggressive efforts to achieve the statutory employment rate of 1.80%.



**URL** Website for handicapped individuals, "mano a mano"  
<http://www.mhi-aspire.jp/tec/mano-mano/> (in Japanese)

#### Skills upgrading and self-fulfillment through training

MHI has established an array of training programs, starting from practical human resource

development based on on-the-job training (OJT) for new employees to programs for current employees depending on their level or function to enhance the knowledge and ability required for their respective jobs. Furthermore, in order to develop human resources capable of supporting the company's global businesses, including international business collaborations and overseas production, MHI actively cultivates truly internationally minded employees by offering them opportunities for training in foreign languages and studying overseas.

###### •Initiatives for skills transfer

Engineering prowess and technical skills for creating reliable products which are the core elements of the manufacturing industry are achieved through knowledge, expertise and hard work that employees accumulate over many years.

In line with this conviction, the company has been deploying hands-on training programs to transfer the skills and expertise of individual employees to junior members in each works. Under this program, highly skilled technicians provide junior and mid-career employees with practical, systematic training over a prescribed period of time.



Hands-on training

###### •For capacity building and realizing the potential of women

MHI implements ongoing efforts to create an environment that enables its female employees to make full use of their abilities and thereby vitalize the workplace. As part of this effort, the company holds career improvement seminars specifically for female employees every year.

Participants learn problem-solving methods, communication skills and other capabilities, and submit specific proposals for business improvement to their supervisors after completing the seminar.

### Mutual understanding and motivation through dialogue

Through regular dialogue between employees and their supervisors, MHI ensures the effective sharing of business targets and a common awareness of issues, communicates the roles and tasks individual employees are expected to fulfill, and listens to requests and business improvement suggestions from employees. As a result, interactive communication is established that contributes to the creation of a dynamic workplace with relationships built on trust, enhancing employee motivation, maintaining high morale and promoting capability building.

#### White-collar employees

MHI adopts a MBO (Management by Objectives) system for employees working in white-collar positions. Every April and October, at the start of each half-year term, individual goals are set for each employee; and at the end of each term, the degree to which these goals have been achieved is evaluated. The processes of goal setting and evaluating achievements are carried out through dialogue between employees and their supervisors. Because the respective goals for each employee are clearly linked to the targets for the overall work division, each employee fully understands, through the processes of the goal setting and the evaluation, their specific role and responsibility for contributing to the division targets and is able to undertake their tasks based on this understanding, with the results reflected in their evaluation.

#### Blue-collar employees

Once a year between April and September, all employees and their respective supervisors discuss work content and volume, attitude to work, and team leadership and cooperation. Employee opinions and requests are also conveyed at this time to ensure mutual understanding.

### 360° Research: A Program for Middle Managers

This program targets middle managers who play important, central roles in their respective workplaces. Under the program, the behavior of section managers is assessed by supervisors, colleagues and subordinates. Results are relayed back to the section manager by their supervisors. By communicating feedback

and evaluations of daily behavior by others, MHI assists middle managers in developing their strengths while at the same time recognizing areas for improvement, thereby encouraging further growth and self-development.

## Building a Better Working Environment

### Supporting a proper balance between work and family life

MHI helps all employees achieve a proper balance between their work and family life. The company's support system extends well beyond obligations regulated by law.

Among its features are the following: (1) a child-rearing leave system which enables employees to take leave until a child reaches the age of 3 if they have not been able to locate a day-care center for the child; (2) a short-time work system for child-rearing can be applied, until a child completes the third grade of elementary school; (3) a care-provider system allowing employees to take leave for up to one year (can be used separately).

MHI is also actively improving its existing system for example, to allow employees to use expired paid holidays, for child rearing or providing care to family members.

As a result of these efforts, the company obtained the Kurumin Mark\* certification in May 2007.

\* **Kurumin Mark:** Confirms the company has been certified by the Ministry of Health, Labour and Welfare for promoting measures based on the Next Generation Nurturing Support Measures Promotion Law.



### Efforts for Raising Awareness of Human Rights

MHI set up the Committee for Raising Awareness of Human Rights in 1992 to promote the creation of a sound workplace in which every employee correctly understands human rights issues and respects the human rights of others. In addition to efforts for raising awareness of human rights in individual workplaces, the committee is developing and implementing training programs for raising awareness of human rights, training in-house instructors, and collecting information and training materials from relevant government institutions.

From April through June in fiscal 2006, the committee conducted a training program on preventing human rights violations for about 1,400 newly appointed managers

and supervisors.

In terms of sexual harassment, a consultation and complaint contact is set up in each works to provide consultation at each workplace.

### Safe and Healthy Workplaces

MHI embraces a basic policy for employee safety and health founded on the following three commitments: (1) Always hold fast to the conviction that life is precious, and carry out safety-first measures appropriate to each position and place; (2) Devote every effort to safety in creating outstanding products that contribute to the development of society; (3) Maintain awareness that sound health is the basis upon which all else depends, and ensure that all employees have a comfortable work environment enabling them to be sound in body.

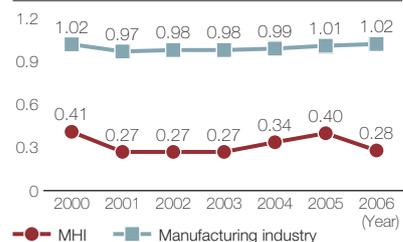
In line with these principles, the company implements a company-wide occupational health and safety management system to promote the creation of a safe and healthy workplace.

#### Measures to prevent work-related accidents and injuries

Based on the occupational health and safety management system, activities are carried out at each works to identify the causes of work-site accidents and injuries, including near-accidents, and to take corrective actions. Efforts are made to reduce the incidence of accidents and injuries by encouraging all employees to promote health and safety management in their respective positions, to take corrective measures as appropriate and to evaluate results as a way of eliminating factors that can cause accidents.

On another level, MHI is also working to create a safe workplace by actively refurbishing or replacing superannuated facilities.

### Industrial accident frequency rate



\* Industrial accident frequency rate: number of deaths or injuries sustained through industrial mishaps per million hours on the job. It is calculated as follows: number of deaths or injuries sustained on the job that require one or more days of leave ÷ (aggregate number of hours worked × 1,000,000).

## Commitment to People and Society

### • Maintaining and improving physical and mental health

MHI proactively supports employees in maintaining their physical and mental well-being. Health management departments have been established at each works to provide health checkups and diagnostic testing, and guidance is offered based on the results of testing to enable employees to maintain their top physical and mental condition. The company also sponsors various events and provides training to promote sound health and to prevent illness.

In addition, a set of guidelines has been drawn up for creating comfortable workplaces with the goal of improving the work environment. In line with these guidelines, initiatives are being taken to maintain and enhance the work environment, work procedures and support systems (such as locker rooms and washrooms).

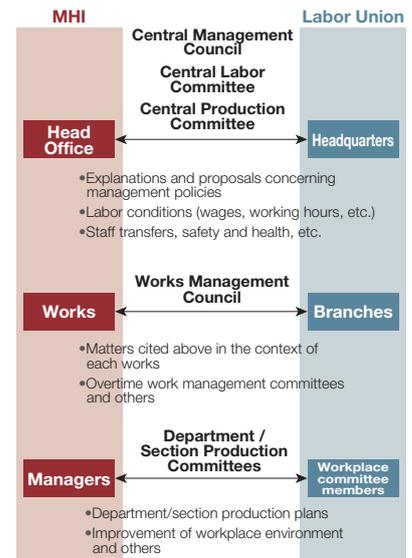
### Communicating between Management and Labor

MHI believes that communication between management and employees is extremely important for carrying out the company's business activities. In line with this thinking, the company's intranet, in-house publications and other resources are fully utilized to disseminate management information and messages from top management to all employees as swiftly as possible.

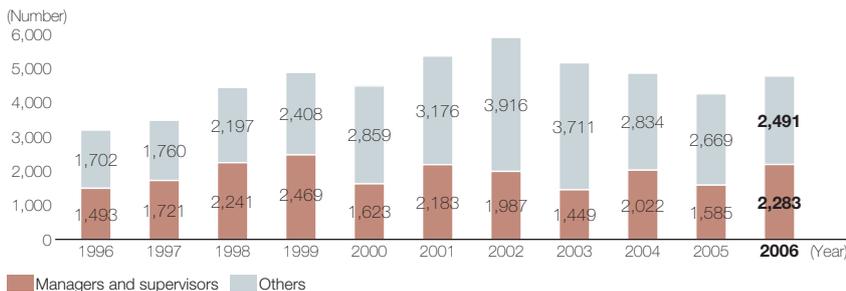
In addition, labor-management consultations are used as a forum for management to both convey management policies and strategies and hear the views of the union for integration into management practices. Consultations are conducted not only between representatives of the Head Office and labor headquarters, but at each level within the

company's works and their respective workplaces regarding various topics. Through these lively discussions, the company is taking concrete steps to foster greater mutual trust and understanding between labor and management.

### Labor-management councils at each level



### Number of the participants in mental health training



## TOPICS

### “Town Meetings” were held at individual works for direct discussion between the President and employees

MHI started the “Town Meeting” in fiscal 2006 with the goals of (1) creating an open climate through direct communication between the president and employees; and (2) directly communicating management policies and the thoughts behind them to enhance employee involvement and motivation. For this purpose, the president visits individual works and engages in dialogue with employees at the assistant manager level or in charge of specific tasks. At the beginning of a Town Meeting, the president explains the vision of the company, corporate performance and challenges, the status of projects in fiscal 2006, corporate social responsibility (CSR), and other key topics, followed by a question-and-answer session of about two hours. After the meeting, a social hour is held for lively and candid discussion.

Since the first session on May 16, 2006 at Kobe Shipyard & Machinery Works, 20 Town Meetings have been held during the first year with the participation of 983 employees who were mainly assistant managers or in charge of key tasks.

In the course of the question-and-answer sessions, participants asked questions such as, “Could you please elaborate what you mean by ‘change’ as the keyword of the business plan” and “What specific things do you have in mind for enhancing employee motivation?” The President presented his thoughts, specific action goals, and other responses to each question. Participants sent forward-looking opinions and comments, including: “I could directly feel where the company is going,” and “Being able to understand the company’s business environment increased my motivation.” MHI will continue holding Town Meetings.



Town Meeting at the Head Office



Town Meeting at the Takasago Machinery Works

## Contributions to Society

MHI undertakes many socially beneficial activities focused on local communities and the development of future generations. As a company whose business operations encircle the globe, MHI is committed to pursuing diverse social contribution activities in the future.

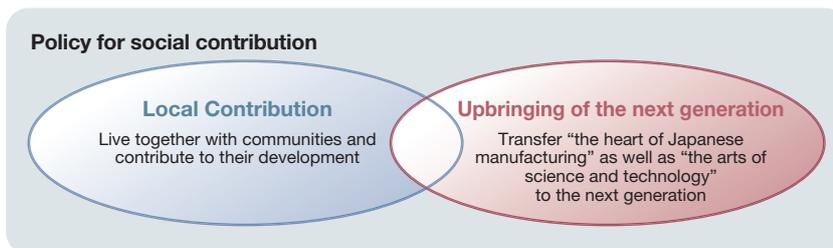
### Fulfilling our Policy on Socially Beneficial Activities

#### Live together with local communities and contribute to their development

Our basic policy is to live together with local communities of branch offices, overseas offices, and associated companies in foreign countries, building strong relationships based on mutual trust. With this in mind, we undertake various activities suitable for local cultures and contribute to the local development and activation both in Japan and overseas.

#### MHI is passing on “the heart of Japanese manufacturing” and “the arts of science and technology” to the next generation

MHI has developed and produced more than 700 kinds of products in its long history, cultivating “the heart of Japanese manufacturing” and “the arts of science and technology”. To pass its knowledge and skills onto succeeding generations, MHI has a tradition of organizing educational activities such as science classes with experiments for children.



### Expenditures on Socially Beneficial Activities

MHI endorses the goals of the “One Percent Club,” a program initiated by the Keidanren (Japan Federation of Economic Organizations) in which participating members pledge to use at least 1% of their ordinary profits or disposable incomes to fund activities for the public benefit. MHI has been a member since the Club’s founding in 1990, and reports its expenditures for such purposes every year.

#### Expenditure on socially beneficial activities

(Unit: million yen)

	2003	2004	2005
Academic research	269	276	148
Education	490	468	682
Community activities	120	72	97
Sports	118	51	106
Other	239	320	241
<b>Total</b>	<b>1,236</b>	<b>1,187</b>	<b>1,274</b>
Percentage of ordinary profit	16.37%	—	3.93%

#### Notes:

\* Figures include cash donations, payments in kind, activities by employees, free use of company facilities, etc., converted to monetary equivalents; activities privately performed by employees are not included.

\* No percentage is provided for 2004 since ordinary profit ended with a loss.

\* Figures for 2006 are now being prepared.

## TOPICS

### Mitsubishi Shinsen Summer School 2006 held at Kobe Shipyard & Machinery Works

Since 1993, Kobe Shipyard & Machinery Works has held its annual Mitsubishi Shinsen Summer Schools, which are experience-based, hands-on events for social studies and scientific instruction during the summer holidays of children. The event includes factory tours and scientific experiments designed for fourth to sixth graders of local primary schools and their parents. In fiscal 2006, the school marked its 15th session, marking a cumulative total of 3,500 participants.

The plant tour consists communicating with “wakamaru,” a robot developed by MHI, introducing space-station products, visiting a vessel construction site and participating in a Q&A session with employees who work at the site. The program is designed to encourage learning by looking at and developing a feel for manufacturing sites that are otherwise not accessible. The science experiment portion of the program began with an open experiment involving a leading-edge electric energy technology developed by MHI, and then continued to a handicraft session and experiments with a fuel cell and a “fruit cell,” as science homework for the summer holidays.

More than 1,000 applications are sometimes received for the maximum enrollment of 200 participants at Mitsubishi Shinsen Summer School. The event is highly appreciated by local citizens, with children expressing such comments as, “I’m surprised at how big the product is,” and “Science is really interesting.” Going forward, MHI intends to continue and enhance “Mitsubishi Shinsen Summer Schools” as a means for bringing science closer to the children who will bear responsibility for the future.



Visiting a vessel construction site



Handicraft and experiment session involving a fuel cell

## Commitment to People and Society

### Representative Social Contribution Activities

#### Voluntary Participation in Area Cleanup Project

Employees of works and offices nation-wide take part in local neighborhood clean-up projects. In fiscal 2005, 6,384 employees participated in these projects.



#### Health Support Consultation

The Kobe Shipyard & Machinery Works holds health consultation meetings in which doctors and nurses from Mitsubishi Kobe Hospital provide guidance on health issues for local residents. The fifth session included a lecture on how to prevent choking on food, blood pressure checks, urine and body fat testing,



and health counseling to assist participants in managing their health.

#### Plant Tour and Internship

MHI's works across the nation hold plant tours for school field trips and other organizations from the standpoint of contributing to community and school education. In fiscal 2005, 21,157 people visited the company's production sites, including launching ceremonies. MHI sites are also actively involved in internships, accepting 160 students in fiscal 2005.



#### Donations of Killifish and Crayfish

A large number of killifish and crayfish, which have become rare in recent years, live in the drainage ditches of the Hiroshima Machinery Works. The works opens the locations where they thrive to nearby kindergartens and elementary schools and also donates them for educational purposes, such as raising and observation.



#### Takasago Pictures Competition

Each August, Takasago Machinery Works holds a picture competition for elementary school children of the city. In 2006, the contest was held under the theme, "If only one wish could come true—What would you wish for now?" and attracted 3,637 entries. The paintings were displayed at local shopping centers and on the Sanyo Electric Railway trains.



#### MHI Charity Concerts

The Takasago Machinery Works has held annual charity concerts since 2003. All profits from the concerts are donated to Takasago City for use in welfare and cultural pursuits. In 2006, the concert generated proceeds of 1.836 million yen.



### TOPICS

#### Mitsubishi Minatomirai Industrial Museum conveys the excitement of science to children

MHI founded the Mitsubishi Minatomirai Industrial Museum in June 1994 with the hope that it would become a place where young people who will be responsible for the future might aspire to great dreams through first-hand contact with science and technology. There are a total of six display zones dedicated to the environment, space, ocean, transportation, energy and technology quests. Cutting-edge technologies are introduced through actual exhibits, scale models, and other approaches. In addition, hands-on corners include a "sky-walk adventure" in which visitors can operate a helicopter, a 3D theater for enjoying virtual adventures, with a sensory audio seat. The museum has



Space Zone



Ocean Zone

been popular for school field trips and excursions because it provides opportunities for experiencing the attraction and importance of science and technology while enjoying them at the same time. In fiscal 2006, more than 0.12 million visitors came to the museum.

#### We will enhance our events and exhibits to nurture budding scientific minds for the future

The events and exhibits of the museum are planned and operated by those who hear the opinions of visitors every day. Each year, we hold more than 50 events, which are so popular that the number of applications always significantly exceeds the enrollment limit, especially for handicraft and experiment classes, and we are asked to expand enrollment. In response, we are currently planning to expand the events and renew the exhibits so that visitors can experience the joy of manufacturing and technology.

In the coming years, we want to remain a museum that provides children an entertaining venue for learning about the joy of manufacturing as well as the attraction and importance of science and technology so that we can nurture budding science minds for the future.



**Yuka Fukuhara**  
Curator of the Mitsubishi Minatomirai Industrial Museum

## Other Social Contribution Activities

### Recovery assistance to areas hit by natural disasters

MHI has long embraced a humanitarian perspective and offered assistance and support to areas worldwide in the aftermath of large-scale natural disasters. We recently donated 62 portable generators (manufactured by MHI) to an area stricken by the Mid Java Earthquake in Indonesia of May 2006. We also donated relief funds to the Ishikawa Anti-disaster Headquarters to help people who suffered setbacks from the Noto Hanto Earthquake of March 2007.

### Rugby Training Session by the MHI Rugby Team

The rugby team of the general Machinery & Special Vehicle Headquarters is very active and has realized its long-sought dream of competing in the top league. Since 1995, the works has been holding rugby training sessions for children at local rugby schools as well as for the general public to contribute to the community through rugby.



Rugby training session

### Button Donation Campaign in Partnership with SAWAYAKA Welfare Foundation

Yokohama Dockyard & Machinery Works joined in the campaign to collect buttons for creating fabric picture-books, collected 2.5 kg of old buttons saved at homes and donated them to the SAWAYAKA Welfare Foundation. These buttons will form a part of



Buttons collected from employees

## Major Support Activities in Recent Years

Year	Disaster	Scale of support (Unit: million yen)	Type of support
2007	Noto Hanto Earthquake	1	Cash donation
2006	Mid Java Earthquake, Indonesia	10	Donation of gasoline generators and cash
2005	Northern Pakistan Earthquake	5	Cash donation
	Hurricane in the southern U.S.	30	Donation of light towers and cash
	Typhoon in China's Liaoning Province	0.44	Cash donation
2004	Sumatra earthquake and tsunami	27.88	Cash donation
	Niigata Chuetsu Earthquake	10	Cash donation
	Torrential rains in Niigata Prefecture	1	Cash donation
	Torrential rains in Fukui Prefecture	1	Cash donation
	Southeastern Iran Earthquake	8	Donation of gasoline generators and cash
2003	Northern Algeria Earthquake	0.42	Cash donation
	SARS epidemic in Taiwan	0.48	Cash donation

fabric picture-books to nurture a gentle spirit for children in facilities at home and abroad.

### Matching Gift Program

Money collected by employees was matched by the company and donated to charitable causes. In 2006, about 0.5 million yen was collected from employees of the Head Office and domestic offices and donated to 35 welfare facilities in the Kanto region, with shape-memory spoons and forks—utensils for use by those who require special care—given to 31 welfare facilities in Kansai region.



Shape-memory spoons and forks

## Representative Social Contributions Overseas

### Endowment of Chair at Hanoi University of Technology

UNESCO, a special agency of the United Nations that seeks to realize a peaceful global community, is promoting the UNISPAR (University-Industry-Science Partnership) Pro-

gram to provide financial and technological assistance to foster industrial and scientific development in developing countries through public-private partnerships.

Since 1998, MHI has endowed a chair at Hanoi University of Technology in Vietnam to support the program's ideals.



Hanoi University of Technology

### MHIA One Percent Club Campaign

Mitsubishi Heavy Industries America, Inc. (MHIA) is involved in various businesses at 17 sites in the United States, including the New York Head Office, and is therefore working on the MHIA One Percent Club Campaign, in which the company provides 1% of its pre-tax income for charitable purposes as a member of the U.S. community. MHIA also donates to cultural and art institutions such as Carnegie Hall as well as educational institutions.

MHI's Activities ( ● Society/ ■ Environment)	Year	Major Events in Japan and Abroad ( ● Society/ ■ Environment)	
		Japan	World
<p><b>1970</b></p> <ul style="list-style-type: none"> <li>■ Completion of Japan's first PWR power plant.</li> </ul> <p><b>1973</b></p> <ul style="list-style-type: none"> <li>■ Inauguration of Environment Management Department.</li> </ul> <p><b>1977</b></p> <ul style="list-style-type: none"> <li>● Development of "Basic Guidelines for Safety &amp; Health Management."</li> </ul> <p><b>1978</b></p> <ul style="list-style-type: none"> <li>■ Creation of Environmental Manager Conferences.</li> </ul> <p><b>1980</b></p> <ul style="list-style-type: none"> <li>● Establishment of Committee on Promotion of Training in the Dowa Issue.</li> </ul> <p><b>1987</b></p> <ul style="list-style-type: none"> <li>● Establishment of Export-related Regulations Monitoring Committee.</li> </ul> <p><b>1989</b></p> <ul style="list-style-type: none"> <li>■ Launch of In-house Conference on CO<sub>2</sub> Measures and In-house Conference on CFC Measures.</li> </ul> <p><b>1992</b></p> <ul style="list-style-type: none"> <li>● Committee on Promotion of Training in the Dowa-Issue renamed Committee for Raising Awareness of Human Rights.</li> <li>● Establishment of Committee for the Promotion of Employment of Disabled People.</li> </ul> <p><b>1993</b></p> <ul style="list-style-type: none"> <li>■ Formulation of voluntary plan titled "Our Approach to Environmental Problems."</li> </ul> <p><b>1996</b></p> <ul style="list-style-type: none"> <li>■ Formulation of "Environmental Policies" and establishment of Environment Committee.</li> </ul> <p><b>1997</b></p> <ul style="list-style-type: none"> <li>■ Acquisition by Yokohama Dockyard &amp; Machinery Works of ISO14001 accreditation, a first among Japan's heavy industrial manufacturers. Launch of R410A-compatible air-conditioners. (R410A: new type of environment-friendly refrigerant)</li> </ul> <p><b>1998</b></p> <ul style="list-style-type: none"> <li>■ Development of system that thermally decomposes PCBs contained in industrial effluents.</li> </ul> <p><b>1999</b></p> <ul style="list-style-type: none"> <li>■ Delivery of combined-cycle power plant incorporating the M701G gas turbine, featuring the world's highest efficiency rating.</li> </ul> <p><b>2000</b></p> <ul style="list-style-type: none"> <li>■ ISO14001 certification completed by all production bases (13 works).</li> </ul> <p><b>2001</b></p> <ul style="list-style-type: none"> <li>■ Engineering Department acquires ISO14001 certification.</li> <li>● Establishment of Compliance Committee.</li> </ul> <p><b>2002</b></p> <ul style="list-style-type: none"> <li>■ Establishment of medium- to long-term environmental activity goals.</li> </ul> <p><b>2003</b></p> <ul style="list-style-type: none"> <li>● Establishment of Construction Business Act Compliance Committee.</li> </ul> <p><b>2004</b></p> <ul style="list-style-type: none"> <li>● Joins United Nations Global Compact initiative.</li> <li>● Establishment of Managing Board for Innovation in Nuclear Business.</li> </ul> <p><b>2005</b></p> <ul style="list-style-type: none"> <li>● Introduction of Executive Officer system.</li> <li>● Establishment of Internal Audit Department.</li> <li>● Establishment of CSR Center.</li> <li>● Establishment of Order Compliance Committee.</li> </ul> <p><b>2006</b></p> <ul style="list-style-type: none"> <li>■ Acquisition of ISO14001 certification by Head Office (including branch offices).</li> <li>● Establishment of CSR Committee.</li> <li>● Establishment of CSR Department.</li> </ul>	<p><b>1967</b></p> <ul style="list-style-type: none"> <li>■ Institution of Basic Law for Environmental Pollution Control.</li> </ul> <p><b>1971</b></p> <ul style="list-style-type: none"> <li>■ Establishment of Environment Agency.</li> </ul> <p><b>1980</b></p> <p><b>1985</b></p> <ul style="list-style-type: none"> <li>● Enactment of Equal Employment Opportunity Law.</li> </ul> <p><b>1988</b></p> <ul style="list-style-type: none"> <li>■ Enactment of Ozone Layer Protection Law.</li> </ul> <p><b>1991</b></p> <ul style="list-style-type: none"> <li>■ Establishment of "Keidanren Global Environmental Charter" and "Keidanren Charter of Corporate Behavior."</li> <li>● Enactment of Child Care Leave Law.</li> </ul> <p><b>1992</b></p> <ul style="list-style-type: none"> <li>■ Ministry of International Trade and Industry requests "Voluntary Plan on the Environment."</li> </ul> <p><b>1993</b></p> <ul style="list-style-type: none"> <li>■ Enactment of Basic Environmental Law.</li> </ul> <p><b>1995</b></p> <ul style="list-style-type: none"> <li>● Child Care Leave Law is revamped into Child Care and Family Care Leave Law.</li> </ul> <p><b>1996</b></p> <ul style="list-style-type: none"> <li>● Revision of "Keidanren Charter of Corporate Behavior."</li> </ul> <p><b>1997</b></p> <ul style="list-style-type: none"> <li>■ Formulation of "Keidanren Voluntary Action Plan on the Environment."</li> </ul> <p><b>1998</b></p> <ul style="list-style-type: none"> <li>■ Enactment of Law Concerning the Promotion of Measures to Cope with Global Warming and Law to Promote Specified Nonprofit Activities.</li> </ul> <p><b>1999</b></p> <ul style="list-style-type: none"> <li>■ Enactment of Pollutant Release and Transfer Register (PRTR) Law.</li> </ul> <p><b>2000</b></p> <ul style="list-style-type: none"> <li>■ Enactment of The Basic Law for Establishing a Recycling-based Society.</li> <li>■ Revision of Law for the Promotion of Recycled Resources Utilization.</li> <li>■ Enactment of Construction Material Recycling Law, Food Recycling Law and Law on Promoting Green Purchasing.</li> </ul> <p><b>2001</b></p> <ul style="list-style-type: none"> <li>■ Establishment of Ministry of the Environment.</li> <li>■ Enactment of Law Concerning Special Measures against PCB Waste and Fluorocarbons Recovery and Destruction Law.</li> </ul> <p><b>2002</b></p> <ul style="list-style-type: none"> <li>■ Ratification of Kyoto Protocol.</li> <li>■ Enactment of Soil Contamination Countermeasures Law.</li> <li>■ Revision of Law Concerning the Rational Use of Energy.</li> <li>● Keidanren revamps "Keidanren Charter of Corporate Behavior" into "Corporate Behavior Charter."</li> <li>● Ministry of Economy, Trade and Industry holds first meeting of CSR Standardization Committee.</li> </ul> <p><b>2003</b></p> <ul style="list-style-type: none"> <li>■ Ministry of the Environment implements trial project for trading of greenhouse gas emissions.</li> <li>■ Emissions standards for diesel vehicles tightened.</li> <li>■ Revision of Waste Management and Public Cleansing Law.</li> <li>● Japan Committee for Economic Development releases 15th Corporate White Paper, entitled "Evolution of Market and Social Responsibility-Minded Business Management."</li> </ul> <p><b>2005</b></p> <ul style="list-style-type: none"> <li>● Enactment of Act on the Protection of Personal Information.</li> </ul> <p><b>2006</b></p> <ul style="list-style-type: none"> <li>● Enactment of New Company Law.</li> <li>● "New National Energy Strategy" formulated.</li> </ul> <p><b>2007</b></p> <ul style="list-style-type: none"> <li>■ Formulation of "21st Century Environmental Nation Strategy."</li> </ul>	<p><b>1948</b></p> <ul style="list-style-type: none"> <li>● Universal Declaration of Human Rights.</li> </ul> <p><b>1972</b></p> <ul style="list-style-type: none"> <li>■ "United Nations Conference on the Human Environment" convenes in Stockholm.</li> <li>■ Adoption of "Statement for Human Environmental Quality."</li> <li>■ Establishment of "United Nations Environment Programme (UNEP)."</li> </ul> <p><b>1976</b></p> <ul style="list-style-type: none"> <li>● "OECD Guidelines for Multinational Enterprises" issued.</li> </ul> <p><b>1981</b></p> <ul style="list-style-type: none"> <li>● "Convention on the Elimination of All Forms of Discrimination against Women" takes effect.</li> <li>● International Year of Disabled Persons.</li> </ul> <p><b>1987</b></p> <ul style="list-style-type: none"> <li>■ Adoption of Montreal Protocol on Substances that Deplete the Ozone Layer.</li> </ul> <p><b>1990</b></p> <ul style="list-style-type: none"> <li>● Institution of "Americans with Disabilities Act."</li> </ul> <p><b>1992</b></p> <ul style="list-style-type: none"> <li>■ "United Nations Conference on Environment and Development" (Earth Summit) convenes in Rio de Janeiro; adoption of "Rio Declaration on Environment and Development" and Agenda 21.</li> </ul> <p><b>1994</b></p> <ul style="list-style-type: none"> <li>● Caux Round Table draws up "Principles for Business."</li> </ul> <p><b>1995</b></p> <ul style="list-style-type: none"> <li>■ "1st Conference of the Parties to the United Nations Convention on Climate Change" (COP1) convenes in Berlin.</li> </ul> <p><b>1996</b></p> <ul style="list-style-type: none"> <li>■ ISO14001 is instituted.</li> <li>■ "2nd Conference of the Parties to the United Nations Framework Convention on Climate Change" (COP2) convenes in Geneva.</li> </ul> <p><b>1997</b></p> <ul style="list-style-type: none"> <li>■ "3rd Conference of the Parties to the United Nations Framework Convention on Climate Change" (COP3) convenes in Kyoto.</li> </ul> <p><b>1998</b></p> <ul style="list-style-type: none"> <li>■ "4th Conference of the Parties to the United Nations Framework Convention on Climate Change" (COP4) convenes in Buenos Aires.</li> </ul> <p><b>1999</b></p> <ul style="list-style-type: none"> <li>■ "5th Conference of the Parties to the United Nations Framework Convention on Climate Change" (COP5) convenes in Bonn.</li> </ul> <p><b>2000</b></p> <ul style="list-style-type: none"> <li>■ "6th Conference of the Parties to the United Nations Framework Convention on Climate Change" (COP6) convenes in The Hague.</li> <li>● "United Nations Global Compact" is instituted.</li> <li>● Issuance of "GRI Sustainability Reporting Guidelines Version 1."</li> </ul> <p><b>2001</b></p> <ul style="list-style-type: none"> <li>■ "7th Conference of the Parties to the United Nations Framework Convention on Climate Change" (COP7) convenes in Marrakech.</li> <li>● ISO Council launches feasibility study on establishing international CSR standards.</li> </ul> <p><b>2002</b></p> <ul style="list-style-type: none"> <li>■ "World Summit for Sustainable Development" convenes in Johannesburg.</li> <li>■ "8th Conference of the Parties to the United Nations Framework Convention on Climate Change" (COP8) convenes in New Delhi.</li> <li>● Release of "GRI Sustainability Reporting Guidelines Version 2."</li> </ul> <p><b>2003</b></p> <ul style="list-style-type: none"> <li>■ First study meeting is held to discuss treaty on safety of radioactive waste management.</li> <li>■ "9th Conference of the Parties to the United Nations Framework Convention on Climate Change" (COP9) convenes in Milan.</li> </ul> <p><b>2004</b></p> <ul style="list-style-type: none"> <li>● Tenth item (on corruption prevention) added to United Nations Global Compact.</li> <li>■ "10th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP10)" convenes in Buenos Aires.</li> </ul> <p><b>2005</b></p> <ul style="list-style-type: none"> <li>■ Kyoto Protocol goes into force.</li> <li>■ "11th Conference of the Parties to the United Nations Framework Convention on Climate Change" (COP11) and the "1st Meeting of the Parties to the Kyoto Protocol" (COP/MOP1) convene in Montreal.</li> </ul> <p><b>2006</b></p> <ul style="list-style-type: none"> <li>● Release of "GRI Sustainability Reporting Guidelines Version 3."</li> <li>■ "12th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP12)" convenes in Nairobi.</li> <li>■ EU announces target of reducing CO<sub>2</sub> emissions by 20%, compared to 1990 level, by 2020.</li> </ul>	

### Iwao Taka

*Professor, International School of Economics and Business Administration, Reitaku University  
Visiting Professor, Graduate School of Management, Kyoto University*



Last year, after reading MHI's CSR Report I pointed out two problems: 1) the company's neglect in setting target dates with respect to issues affecting society, and 2) doubts I harbored about its handling of the issue of bid-rigging.

Concerning the first point, this year's report is again marred by this problem. What the reader wants to know is where the company is heading, how far along it has come toward reaching the goals it has set down, etc. To illustrate, the report introduces the company's initiatives in CSR procurement, but what interests the reader is matters such as knowing what schedule MHI has devised for that purpose. The reason readers are interested in such matters is that by seeing how the company is moving from its past toward its future, they can understand its corporate commitment. In the present report, recording facts. So I feel a great deal of space has been allocated to recording facts, I feel that MHI, unfortunately, has not been able to convey its commitment to the reader.

Regarding, however, I do think that considerable progress has been made. This year's report clearly indicates what the company is doing, with firm resolve, to achieve order compliance. I came away with the impression that there is no falsehood in its corporate stance. From this point on, what I would like to see is for MHI to boost society's trust in it further by reporting on specific achievements in this area (in the form of no infractions occurring).

The Special Feature in this year's report is "MHI's Response to the Demands of Society." In line with its corporate identity, the key to that response is MHI's technological strength.

In April 2006 MHI newly established a "Production System Innovation Planning Department" positioned directly under the company President. Some detractors suggest that the move is no more than a response to what they say is a weakening in the company's production capability, but I do not agree. What I sense here is the extraordinary resolve of top management toward technology, and this is precisely why technology is the centerpiece of this year's Special Feature.

The Earth is on the brink, and ultimately I believe, as do others, that the only thing that can save our planet from crisis is the power of technology. I strongly hope that, as its foremost responsibility to society, MHI will continue to add luster to its technologies to rescue the Earth.

### Takamitsu Sawa

*Distinguished Professor, School of Policy Science, Ritsumeikan University  
Project Professor, Institute of Economic Research, Kyoto University*



In various ways, 2007 is a landmark year with respect to the issue of climate change (global warming). This year marks the 10th anniversary of the adoption of the Kyoto Protocol, the 15th anniversary of the Rio Summit, and the 20th anniversary of the publication of Our Common Future, the report of the UN's Brundtland Commission in which the phrase "sustainable development" was used for the first time. This year also saw the release of the hit film "An Inconvenient Truth," starring former Vice President Al Gore. In addition, the Fourth Assessment Report of the UN Intergovernmental Panel on Climate Change (IPCC) virtually declared that carbon dioxide and other greenhouse gases are the cause of climate change. Indeed, everyone has come to share the true sense that in recent years the climate has gone haywire. For both business corporations and nations, in the future "growth" will come to be driven by the development of technologies that contribute to reductions in greenhouse gas emissions.

Against this backdrop, MHI merits high acclaim as an exemplary example of a company of the 21st century taking up the challenge of protecting global environment. Not only is the company responding adroitly to these changing times by remolding its own management and production processes into structures conducive to easing environmental loads, it is also working to develop power generation systems driven by renewable energies (wind, solar), technologies that will contribute to enhanced efficiency in thermal power generation, and next-generation nuclear reactors.

The fundamental basis of corporate social responsibility (CSR) lies in making contributions to society, but in making such contributions there can be no national boundaries. Today we are being called on to contribute to the global community — i.e. to the 6.5 billion people living on this planet — by pursuing sustainability in the sense of living a rich life while still conforming to the constraint of not imposing any burden on the next generation. Nowhere is MHI's irreplaceable contribution to the global community in greater evidence than in its transfer to other East Asian nations of technologies that contribute to easing the environmental burden. The sustainability of global society is dependent on the ongoing technological developments undertaken by MHI and companies like it, as well as on their efforts to lighten the environmental burden of their operations and production processes — and, on our own rethinking, as individuals, of our current lifestyles.

### Acting on Valuable Opinions



**Hideo Egawa**  
*Senior Executive Vice President  
in charge of CSR*

As in 2006, this year we again received third-party opinions from Professors Iwao Taka and Takamitsu Sawa, both of whom are highly knowledgeable in compliance, energy and environmental technologies. We will address the issues pointed out by these experts, who have been assessing MHI's CSR activities on a continuing basis, by designating them as targets for improvement in our activities during the coming year.

This year, Mr. Taka indicated that MHI still lags in hoisting clearly visible target dates for its various activities affecting society. Reflecting on this lack of adequate improvement to an issue already raised last year, we resolve to set down specific target dates, further clarify the content of our activities, and

link these to our internal activities, to ensure the solid operation of a PDCA (plan-do-check-act) cycle.

Mr. Sawa expressed his high expectations toward MHI's development of technologies to protect the global environment. We pledge to continue to respond, through our business operations, to society's expectations in order to ensure the "sustainability" of the Earth and humankind.

In October 2006 we enhanced our company-wide CSR activity promotion structure with the inauguration of a CSR Committee chaired by the President. Going forward, we will further strengthen and expand this new framework to include activities throughout the MHI Group.



Address all inquiries about this report to:

**Mitsubishi Heavy Industries, Ltd.  
Corporate Social Responsibility Department**

16-5, Konan 2-chome, Minato-ku, Tokyo, Japan  
Postal Code: 108-8215  
Phone: 81-3-6716-3884 Fax: 81-3-6716-5815  
URL: <http://www.mhi.co.jp/>



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**Locations**

**Head Office**

16-5, Konan 2-chome, Minato-ku, Tokyo  
Postal Code: 108-8215  
Phone: 81-3-6716-3111 (main number)  
Fax: 81-3-6716-5800

**Headquarters and Divisions**

**General Machinery & Special Vehicle Headquarters**

3000, Tana, Sagamihara, Kanagawa  
Postal Code: 229-1193  
Phone: 81-42-761-1101 (General Affairs Dept.)  
Fax: 81-42-763-0800

**Air-Conditioning & Refrigeration Systems Headquarters**

3-1, Asahi, Nishi-biwajima-cho, Kiyosu, Aichi  
Postal Code: 452-8561  
Phone: 81-52-503-9200 (General Affairs Dept.)  
Fax: 81-52-503-3533

**Paper & Printing Machinery Division**

1-1-1, Itozaki-Minami, Mihara, Hiroshima  
Postal Code: 729-0393  
Phone: 81-848-67-2054 (General Affairs & Labor Section)  
Fax: 81-848-63-4463

**Machine Tool Division**

130, Roku-jizo, Ritto, Shiga  
Postal Code: 520-3080  
Phone: 81-77-553-3300 (General Affairs Dept.)  
Fax: 81-77-552-3745

**Works**

**Nagasaki Shipyard & Machinery Works**

1-1, Akunoura-machi, Nagasaki  
Postal Code: 850-8610  
Phone: 81-95-828-4121 (General Affairs Dept.)  
Fax: 81-95-828-4034

**Kobe Shipyard & Machinery Works**

1-1-1, Wadasaki-cho, Hyogo-ku, Kobe  
Postal Code: 652-8585  
Phone: 81-78-672-2220 (General Affairs Dept.)  
Fax: 81-78-672-2245

**Shimonoseki Shipyard & Machinery Works**

6-16-1, Hikoshima Enoura-cho, Shimonoseki  
Postal Code: 750-8505  
Phone: 81-832-66-5978 (General Affairs & Labor Section)  
Fax: 81-832-66-8274

**Yokohama Dockyard & Machinery Works**

1-8-1, sachiura, kanazawa-ku, Yokohama  
Postal Code: 236-8515  
Phone: 81-45-775-1201 (General Affairs Dept.)  
Fax: 81-45-775-1208

**Hiroshima Machinery Works**

4-6-22, Kan-on-shin-machi, Nishi-ku, Hiroshima  
Postal Code: 733-8553  
Phone: 81-82-291-2112 (General Affairs Dept.)  
Fax: 81-82-294-0260

**Takasago Machinery Works**

2-1-1, Arai-cho Shinhama, Takasago  
Postal Code: 676-8686  
Phone: 81-79-445-6125 (General Affairs Dept.)  
Fax: 81-79-445-6900

**Nagoya Aerospace Systems Works**

10, Oye-cho, Minato-ku, Nagoya  
Postal Code: 455-8515  
Phone: 81-52-611-2121 (General Affairs Dept.)  
Fax: 81-52-611-9360

**Nagoya Guidance & Propulsion Systems Works**

1200, O-aza Higashi-tanaka, Komaki  
Postal Code: 485-8561  
Phone: 81-568-79-2113 (General Affairs Dept.)  
Fax: 81-568-78-2552

**Plant and Transportation Systems Engineering & Construction Center**

**[Mihara]**

1-1-1, Itozaki-Minami, Mihara, Hiroshima  
Postal Code: 729-0393  
Phone: 81-848-67-2072 (General Affairs & Labor Section)  
Fax: 81-848-67-2816

**[Yokohama]**

Mitsubishi Juko Yokohama Bldg., 3-3-1, Minatomirai, Nishi-ku, Yokohama  
Postal Code: 220-8401  
Phone: 81-45-224-9288 (General Affairs & Labor Section)  
Fax: 81-45-224-9932

**Mitsubishi Minatomirai Industrial Museum**

Mitsubishi Juko Yokohama Bldg., 3-3-1, Minatomirai, Nishi-ku, Yokohama  
Postal Code: 220-8401  
Phone: 81-45-224-9031  
Fax: 81-45-224-9902