

# Corporate Profile

**IHI Corporation**



# Realize your dreams

At IHI Group, we design and build progressive engineering solutions for people and planet.

Our heritage is built upon a shared culture of striving for the highest standards in every facet of our business. This approach commits all relationships to our management philosophy of contributing to the development of society through technology.

We work alongside customers, stakeholders and fellow employees to deliver outcomes that positively affect the world and its inhabitants.

This powers our relationships to greater outcomes, and also makes good commercial sense. At our core, we are people who apply forward thinking to find lasting solutions to the toughest problems.

IHI Group. Realize your dreams.

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## Management message

# Seeking to become a more trusted corporate group by strengthening our earnings foundations

It is a pleasure to overview the activities of the IHI Group, which I am honored to lead.



President and  
Chief Executive Officer  
**Tsugio Mitsuoka**

IHI was established as Ishikawajima Shipyard in 1853. We have since evolved into a comprehensive heavy industry manufacturer that can contribute to social progress by relentlessly pursuing technological excellence and by cultivating advanced engineering capabilities.

## Accommodating Diverse Needs

The global business landscape is transforming at lightning speed. The global economy has become increasingly more complicated as the economic climates of emerging nations have diversified, international economic partnerships have progressed, and as the industrial structure has changed. Swift progress in information technology has made it even more important to be innovative in our products and services offering, while incorporating information and communication technologies that keep pace with advancements in manufacturing. Social infrastructure demands are diversifying around the globe. The focus for emerging nations is to tackle urbanization and industrialization. The priorities for developed countries include addressing the challenges of population decline and aging infrastructure. It is more important than ever for IHI to identify and cater to the diversifying customer value requirements that stem from such transformations in our operating climate.

## Initiatives to strengthen our earnings foundations

It was against this backdrop that we launched Group Management Policies 2016. Through this initiative, we seek to create a structure to reinforce business strategy implementation and ensure consistent profitability in construction. We also aim to supply solutions that create customer value and deliver advanced products and services so we can strengthen our earnings foundations. We are therefore prioritizing the following three initiatives in our drive toward tomorrow:

- Accelerate business concentration and selection by undertaking new portfolio management approaches to clarify the direction of business strategies
- Enhance estimate processes and risk reviews as part of efforts to strengthen the project implementation structure, creating a setup that enables us to stabilize earnings
- Employ shared Group functions that we reinforce by concentrating resources and integrating capabilities, thereby transforming our business model while making our operations more competitive

## Realize your dreams

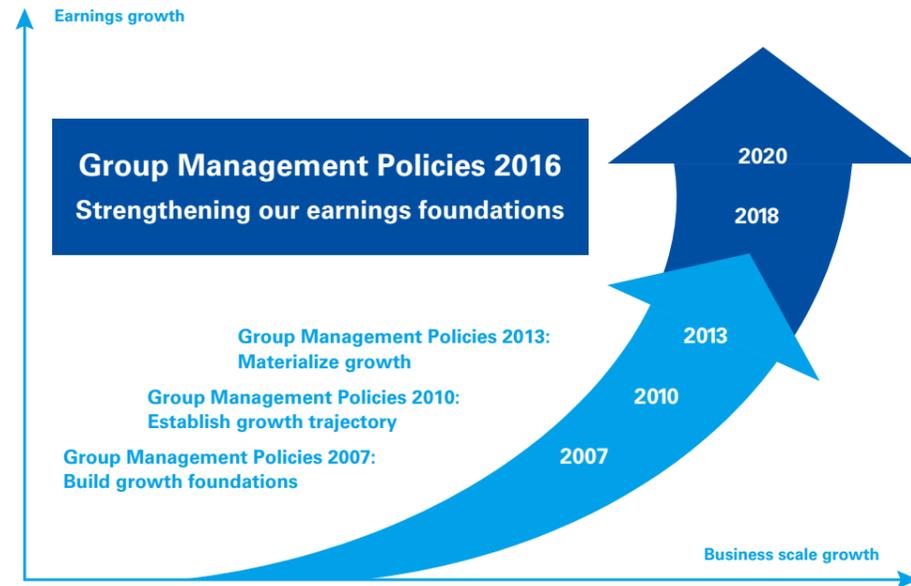
Our management principles are “Contribute to the development of society through technology” and “Human resources are our single most valuable asset”. Our corporate message of “Realize your dreams” epitomizes the mission we embarked on more than 160 years ago to leverage our technology and human resources to help humankind’s greatest dreams come true.

We look forward to your ongoing support and encouragement as the IHI Group endeavors to fulfill its mission by growing sustainably and enhancing corporate value while building trust among all of its stakeholders.

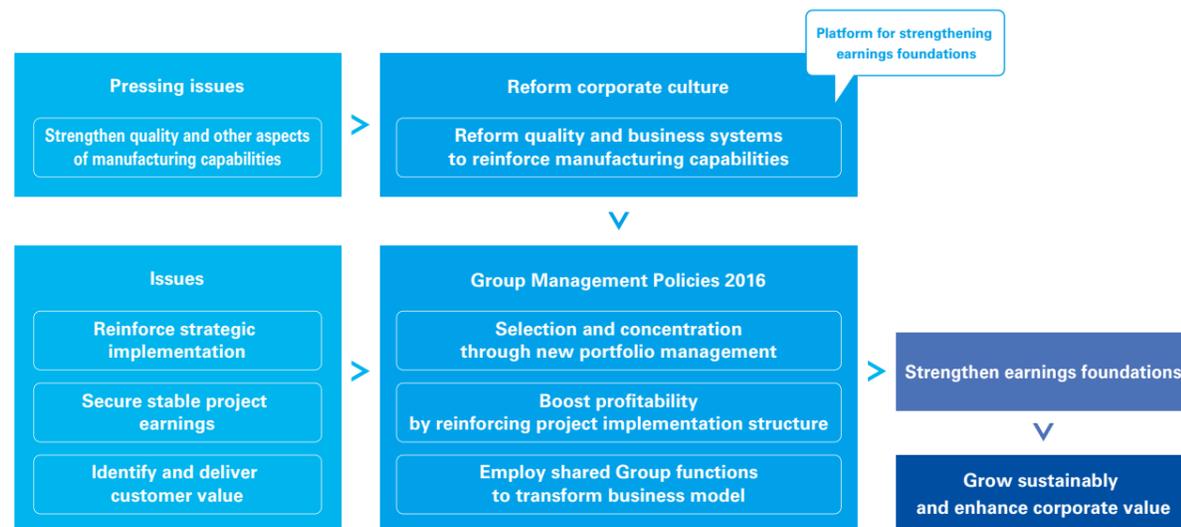
# Positioning of Group Management Policies 2016

## IHI Group Vision

The IHI Group seeks to solve the various environmental, industrial, social, and energy related problems of the 21st century, through using engineering expertise to focus on "Monozukuri" technology. In striving towards these goals, IHI is becoming a global enterprise offering the safety and security for the benefit of both the environment and humanity.



# Overview of Group Management Policies 2016



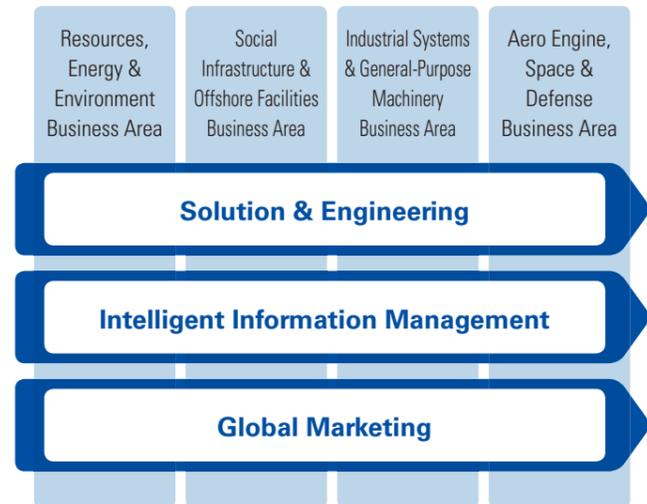
\* For details about Group Management Policies 2016, refer to "About IHI > Management Policy > Group Management Policy" on the IHI website.

# Shared Group Functions

## Shared Group Functions

IHI has four business areas, namely Resources, Energy & Environment Business Area; Social Infrastructure & Offshore Facilities Business Area; Industrial Systems & General-Purpose Machinery Business Area; and Aero Engine, Space & Defense Business Area. Its three shared Group functions are solution & engineering, intelligent information management, and global marketing.

We will properly identify diversifying customer value and strengthen collaboration on shared Group functions while both business operation divisions and the shared Group functions co-create values to accelerate a transformation of our business model and create customer value.



## Shared Functions

### Solution & Engineering

The solution & engineering shared function has enabled us to package products, services, technologies, and other resources from all areas of the IHI Group to extend the value chain for our customers by offering them innovative solutions to their needs.

### Intelligent Information Management

The intelligent information management shared function contributes to the growth of all business units by embedding information and communications technology in their products and services. This headquarters can leverage such technology to gather and analyze product operations, maintenance, environmental, and other data to create more advanced offerings that employ predictive diagnostics and match customer business model requirements.

### Global Marketing

The global marketing shared function plays three key roles in accelerating the globalization of the IHI Group. The first is to expand locally oriented businesses to help multinational customers. The second is to ensure that regional businesses operate nimbly without compromising governance. The third is to cultivate people who embrace the challenges and opportunities of an interconnected world. We are conducting these activities first mainly in the regional headquarters covering the Americas, China, and Asia-Pacific countries.

# Business Areas

## Resources, Energy & Environment Business Area

Minimizing Environmental Impact



● Large-scale tower type boiler  
(Photo is provided by J-POWER (EPDC))

We maintain stable supplies of energy that are essential to industrial progress and comfortable lifestyles while aiming to minimize global warming. We leverage our expertise and proprietary technologies in coal, natural gas, nuclear power, and in renewables to optimize product and service mixes while minimally affecting the environment.

- Energy ● Storage, Pharmaceutical & Processing Plants, Environmental Systems

## Social Infrastructure & Offshore Facilities Business Area

Underpinning the Essentials of Modern Living



● The Akashi-Kaikyo Bridge

In social infrastructure, security, offshore and urban development, as well as in other fields, we leverage our technological capabilities and experience to ensure that nations and societies are safer and more secure.

- Social Infrastructure ● Offshore Structures and Urban Development

## Industrial Systems & General-Purpose Machinery Business Area

Transforming the World's Industrial Infrastructure



● Turbocharger for automobiles

We offer innovative systems/technologies and optimal solutions to help transform industrial infrastructure around the world. We are helping companies enhance manufacturing processes and create more sophisticated products so they can continue to satisfy their customers in the years ahead.

- Separators, Compressors, and Turbochargers ● Parking, Transport Machinery, and Logistics Systems
- Industrial Machinery & Systems ● Agricultural Machinery

## Aero Engine, Space & Defense Business Area

Opening New Horizons



● GEEnx™ turbofan engine

We draw on world-class technologies and organizational strengths to help make air travel more comfortable and safer and better for the environment while expanding space exploration to benefit humankind.

- Aero engines ● Rocket Systems & Space Exploration ● Defense equipment and systems

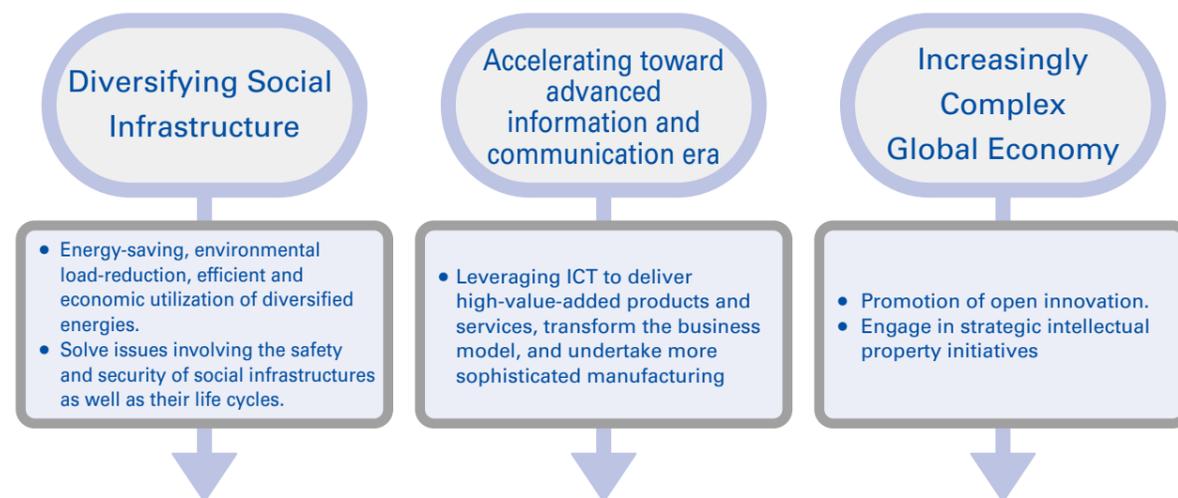
# Research and Development

The IHI Group has formulated a clear strategy to develop technologies by drawing on its collective strengths while sharing the medium- to long-term R&D direction throughout the Group.

This strategy focuses R&D based to the three megatrends of “Diversifying Social Infrastructure”, “Accelerating toward advanced information and communication era”, “Increasingly Complex Global Economy”, and also encompasses technological areas that are group-wide priorities.

Social development will be led by the efforts to increase the production efficiency, to reduce the environmental load, and to create new business model using advanced ICT. IHI Group continues to cultivate new contributions to society.

R&D underpins a technology-driven IHI Group.



**IHI Group Technology Focus Areas**

**Applied Technologies to Enhance Products and Services**  
 ICT and Robotics / Energy Management Technology / Numerical Analysis and Optimization Technology / Advanced Manufacturing and Productive Process Innovation Technology / Rotating Machinery Technology / Chemical Process Technology

**Fundamental Technologies**  
 Structural Strength Technology / Material Technology / Combustion Technology / Heat and Fluid Technology / Vibration and Machine Element Technology / Welding and Bonding Technology / Control and Electronic Technology

**Technology Focuses for the Future**

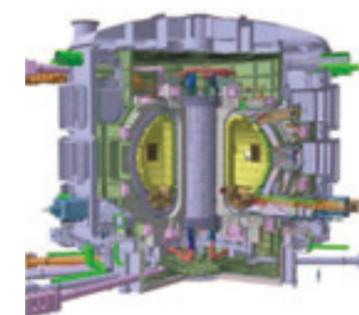
- Developing core technologies and product lines for the hydrogen and ammonia value chains to cater for the needs of a low-carbon society
- Using robotics, the Internet of Things, and artificial intelligence to integrate predictive and learning technologies to materialize smart factories, systems, and societies that optimally accommodate demand and supply, climate change, and production efficiencies

# R&D Highlights

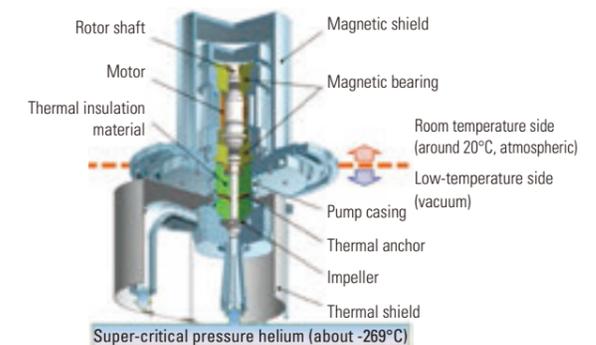
## Cryogenic Rotating Machinery Technologies

These machines operate in environments whose temperatures are close to absolute zero (-273.5°C). Only a few companies worldwide can design and manufacture such equipment, which maintains high-performance in minimizing heat inleak in cryogenic areas. The IHI Group is a world-class player in this field, constantly exploring high-performance technologies for centrifugal turbo machines, design technologies for high-speed rotors, and component technologies for rotating machinery.

CERN, the European Organization for Nuclear Research, adopted cryogenic rotating machinery in its Large Hadron Collider, contributing significantly to the discovery of the Higgs Boson particle. The machinery is also used in ongoing research with the International Thermonuclear Experimental Reactor, contributing to an international project that aims to harness the energy of fusion reactions as powerful as those of the sun.



International Thermonuclear Experimental Reactor  
 © ITER Organization (www.iter.org/)



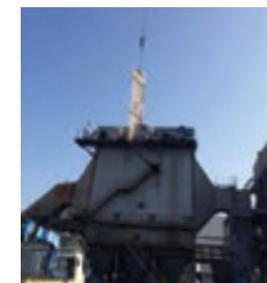
Cryogenic rotating machinery  
 Sectional view of super-critical pressure helium circulation pump

## High-temperature, high-pressure boiler technologies to lower carbon dioxide emissions and carbon dioxide capture technologies

IHI has helped alleviate global warming by working on advanced ultra-supercritical, or 700°C (A-USC) boiler technologies for high thermal generation efficiency and technologies to capture carbon dioxide from exhaust gases.

We conducted tests on A-USC boilers with a view to commercialization, using new nickel-based alloys to withstand higher temperatures and pressures

than conventional setups. IHI used a 20 ton-CO<sub>2</sub>/day pilot plant employing an amine solution to establish a proprietary carbon dioxide capture process. We manufactured a 0.5 ton-CO<sub>2</sub>/day demonstration plant applying our technologies, conducting long-term operational tests at an Australian power plant. IHI will continue to cultivate its development capabilities to maintain its technological prowess.



Installation for A-USC boiler test



Producing mock-up for A-USC boiler application



20 ton-CO<sub>2</sub>/day pilot plant for carbon dioxide capture and 0.5 ton-CO<sub>2</sub>/day demonstration unit at IHI's Aoi Works before shipment to Australia

# Business Development

## Development of Unmanned Ground and Maritime Systems

IHI is researching and developing and commercializing unmanned systems to eliminate human risks in dangerous places in resources, engineering, disaster response, security, defense, and other fields. Unmanned Ground Systems (including Unmanned Ground Vehicles) undertake research and other work in disaster zones and in contaminated and dangerous areas. Unmanned Maritime Systems (including Unmanned Underwater Vehicles and Unmanned Surface Vehicles) go venture where humans cannot

remain for long periods to look for resources and objects and support operations by relaying communications on the sea surface. We are materializing such systems by drawing on mechanical and remote control technologies to enable operations in harsh environments while developing robotics that employ sensors to measure and recognize terrains and obstacles and to navigate along safe routes. We are working to apply robot technologies to regular industrial fields.



A remotely controlled heavy carrier robot at semi-underwater environment (UGV)



UUV



USV

Source: Acquisition, Technology & Logistics Agency website: (<http://www.mod.go.jp/atla/kansouken.html>)

Note: This work was supported by Council for Science, Technology and Innovation, "Cross-ministerial Strategic Innovation Promotion Program (SIP), Infrastructure Maintenance, Renovation, and Management". (funding agency: NEDO)

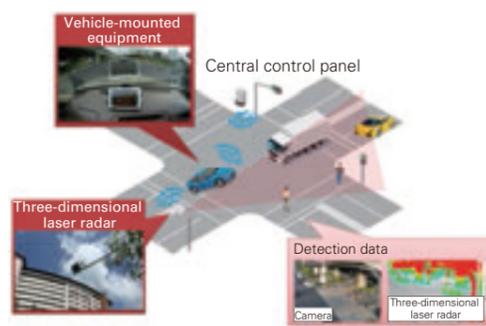
## Open Innovation: Social Experiments and IHI Innovation Centre in Singapore

IHI collaborates with businesses, national government bodies, universities, and other customer entities in the drive to build new value. In December 2012, we joined with Singapore's national Agency for Science, Technology And Research (A\*STAR) to launch a social experiment using 3DLR (3-dimensional laser radar) from intelligent transportation systems. The goal was to create a safe driving support system that would reduce traffic accidents. We have incorporated various ideas and requests in building advanced

traffic information management systems in the lead-up to Intelligent Transportation Systems World Congress 2019, which Singapore will host. We established the IHI Innovation Centre at our Yokohama Works in November 2014 to drive open innovation with technical attaches at three sites around the world. The facility has stepped up innovation efforts by engaging with visiting customers from Japan and around the world through its Collaboration Area and Inspiration Area.



Singapore social experiment



Safe driving support system configuration

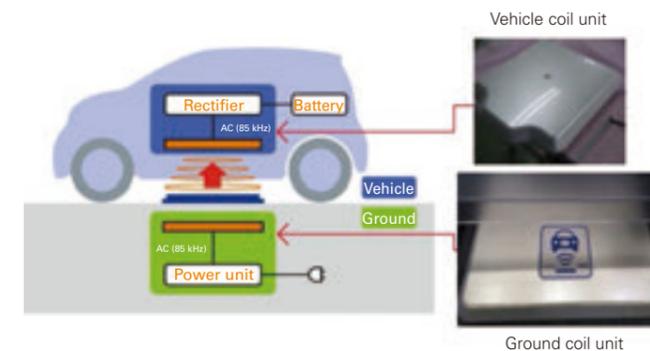


IHI Innovation Centre after renovation

## Wireless Charging System for Electric Vehicles

Wireless charging technology will enable sending electric power without cables. We develop a large-power wireless charging system of several kilowatts and aim at commercialization within a few years. We experiment with a test vehicle equipped with wireless charging capability to verify and promote the technology. A wirelessly charged vehicle can be charged by stopping at a charging spot, without cumbersome work to connect and disconnect a charging cable. You won't get your hand or cloth dirty from contact

with cables. The technology will make an electric vehicle easier to use and more widely accepted, thus contribute to achieve more environmentally friendly society. IHI creates sophisticated machinery by developing technologies in various fields, including electricity, control systems and electromagnetic field analysis. IHI's wide range of technologies are combined for development of the wireless charging system. IHI will continue to develop and make available new products needed in society.



Transmit electric power using magnetic field from ground coil unit to vehicle coil unit



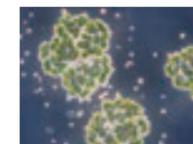
Test at MIDEAS experimental house (Photo courtesy of Mitsui Home Co., Ltd.)

## Developing Biofuel Production Technologies from Algae

Note: IHI is undertaking this effort under commission from NEDO's Strategic Development of Next-generation Bioenergy Utilization Technology.

Algae uses photosynthesis to absorb carbon dioxide, a greenhouse gas. Algae species that can be used to produce fuel have attracted attention for helping resolve environmental and energy issues. IHI has focused on Botryococcus Braunii because it offers vital advantages. One is that it does not compete with the food chain, unlike the edible components that predominate in biofuels. Another is that this algae strain is easy to convert to a fuel

with high oil concentrations. We were able to mass cultivate this algae in an open pond by improving on its already outstanding proliferation capabilities and developing growing processes and equipment. In 2011, IHI, Chitose Laboratory Corporation, and Gene and Gene Technology Corporation established IHI NeoG Algae LLC. With support from NEDO, this joint venture is developing techniques to manufacture algae-based biofuel.



Oil seeping from algae



Oil samples (after extraction on the left and after purification on the right)



1,500-square-meter pilot pond in Kagoshima on left and culture experimentation on right

# Developing Advanced Technologies

## Materials technologies

- Casting, forging, and powder metallurgy
- Microstructure control
- Mechanical property evaluation and residual life assessment
- Assessment technology of environmental durability
- Development and evaluation of materials
- Advanced microstructure analysis

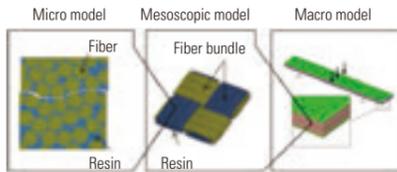


Mockup of the SH header for A-USC boiler

We are optimizing casting, forging, powder metallurgy, and other fabrication processes and using surface modifications to develop technologies that optimize the properties of metallic materials. We are also developing new materials to reduce weight and enhance heat resistance. We are using advanced analytical instruments to develop residual life assessment technology and are developing new techniques to assess the degradation mechanisms of materials.

## Structural technologies

- Fracture mechanics and high-temperature strength assessment
- Fatigue strength and environmentally assisted crack growth assessment
- Impact analysis and fluid structure interaction analysis
- Nonlinear structural analysis
- Composite and steel-concrete composite structure assessment
- Quake resistance, seismic isolation, damping, and structural vibration

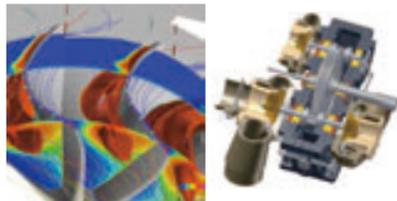


Multiscale analysis of carbon fiber composites

We ensure the structural integrity and safety of Group products by researching and developing structural strength, analysis, and dynamics technologies. We assess new materials for high temperature components and develop simulation techniques to predict the strength. We also conduct R&D into quake resistance, seismic isolation, damping, and structural vibration technologies that underpin safety and security.

## Rotating machinery technologies

- Machine elements (rotor, bearing, gear, and seal)
- Mechanical vibration
- Friction, wear, and lubrication
- Aerodynamic design
- Flow measurement
- CFD (Computational Fluid Dynamics)



Turbine flow analysis

Turbo compressor

We use advanced CFD and flow measurement technologies to improve the aerodynamics of aircraft engines, turbochargers, industrial compressors, and other high-speed rotating machinery. Mechanical elements include rotors, bearings, seals, and gears. We are focusing on improving performance and reliability and cutting environmental impact through these efforts.

## Thermal fluid and combustion technologies

- Heat, fluid, combustion, and wind tunnel testing
- Numerical analysis for heat transfer, phase change, multiphase flow, and combustion
- Heat and fluid measurement and control
- Next-generation energy

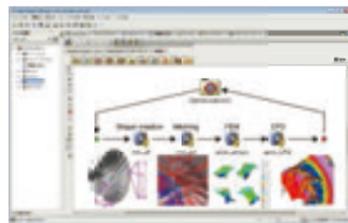


Twin IHI Gasifier (TIGAR)

It is necessary to understand and evaluate complex heat and flows inside the equipment to improve those performances. We help to improve performance through advanced numerical analysis and testing, measurement, and control techniques. We also focus on developing next-generation energy technologies including hydrogen and renewable energy.

## Design engineering and optimization technologies

- Topology optimization
- Design management
- Mathematical modeling
- Large-scale simulation
- Data mining utilizing machine learning
- Multi-physics analysis



Design automation system

We are progressing with R&D into numerical analysis and design engineering technology to support developing products offering optimal performance and to drive design advances and efficiencies. Recent focuses have included developing and applying new optimization technologies and multi-physics analysis to address various physical phenomena. We are undertaking R&D into machine learning to extract key features from big data.

## Welding and joining technologies

- Arc welding and automation
- Laser processing
- Special joining
- Welding phenomena analysis
- Welding material and structural assessment
- Welding testing and evaluation

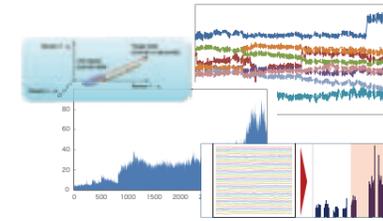


Automatic welding equipment for large boiler pipes

We are developing brand-new welding and joining processes and new materials welding technologies to accommodate product diversification and deliver high added value. For arc welding and other traditional techniques, we draw on advanced power sources, measurement and observation technology, and assessment techniques to provide intelligent processes and help improve the quality and reliability of our products.

## ICT

- IoT (Internet of Things)
- Big data analysis
- Sensing
- Communications and networking
- Systems development and operations
- Mobile and cloud service application
- Information security



Preventive maintenance data analysis

Information and communications technologies are essential for the IHI Group's advances in products, services, and manufacturing. We use sophisticated proprietary data analysis algorithms to analyze operating information of products we deliver to customers and production facilities. We draw heavily on advanced information and communications technologies to propose optimal maintenance and operations plans, manufacturing processes, and new businesses.

## Control and electronics technologies

- Advanced control and optimization
- Control system and embedded software
- Power electronics
- Motor electromagnetic field analysis
- High-speed analog circuit design
- Secondary battery application
- Energy management



Control system building platform

Silicon carbide inverter

We research and develop technologies of control and optimization, building control systems and embedding software to maximize performances of wide product range from machinery to plants.

We are also focusing on electrical and electronics technologies that utilize recent advances in power electronics and on energy management technologies.

## Mechanical system and robotics technologies

- Structural optimization and mechanical design
- Mechanical design for special and clean environments
- Materials handling and factory automation systems
- Undersea and marine instrument design
- Image processing
- Robotics
- Intelligence and autonomous technology



Rolled glass transport and cutting system

Robot-controlled finishing system

We draw on our mechatronics and system engineering technologies to develop production machinery in-house, as well as factory automation systems employing robots and mechanical systems, including undersea and marine instruments.

We are also focusing on R&D in next-generation robots and intelligence technologies and in image processing, three-dimensional data processing, and other recognition technologies.

## Energy and chemical process engineering

- Energy conversion and usage technology
- Catalyst creation and evaluation
- Process simulation
- Chemical reactor and culture apparatus design
- Application technology of algae and microorganisms
- Microbubble applications and water treatment



iPS cell automated mass-culture instrument

We deploy energy and chemical processing technologies in fields ranging from plants to manufacturing facilities. We are developing core catalysts for those processes with reactor design technologies, and advanced process optimization technologies. We are developing technologies for utilization of unutilized resource and carbon dioxide capture, high efficient reactors, iPS cell culturing.

## Reciprocating engine technologies

- Numerical simulation
- Evaluation of combustion and flow with visualization test
- Engine measurement
- Engine performance prediction
- Emission estimation and reduction
- Estimation of reliability

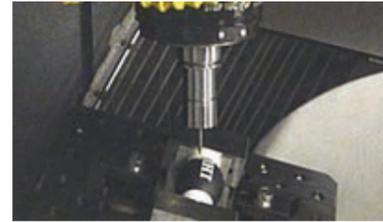


Flow analysis inside engine cylinder

The IHI Group manufactures a wide range of diesel and gas engines for ships, power plants, agricultural, and construction machinery. Through collaboration with our business units, we are able to improve thermal efficiency, reduce emissions, and enhance performance by undertaking R&D that encompasses numerical analysis and elemental tests in order to fully understand phenomena and prototype testing.

## Production engineering

- Machining and forming
- Painting, coating, corrosion protection, and surface modification
- Composite materials processing
- Non-destructive inspection and measurement
- Production systems



Adaptive machining from the integration of measurement and machining

For innovations in the manufacturing process, by using the latest ICT, we are pursuing sophistication of processing techniques, quality assurance techniques, and production systems that optimizes the manufacturing processes.

# Group CSR activities

The IHI Group is committed to meeting the expectations and earning the trust of all stakeholders, from customers, business partners, shareholders, and colleagues to communities everywhere while closely monitoring global issues. In doing so, we seek to deliver more value in the years to come.

## IHI Group CSR Promotion Structure

IHI believes that meeting the expectations of customers and society as a whole, constantly creating and providing practical value, and earning the trust of society are essential to bolstering corporate value.

We accordingly established a CSR Committee in FY2013 to discuss and promote CSR-related matters, including basic Group policies and measures. The president chairs this committee, with the director in charge of CSR serving as vice chair. Committee members include directors and divisional heads.

We will step up efforts to integrate CSR and management in business activities in the years ahead.

## Helping to Resolve Social Issues through Business

The IHI Group helps resolve social issues through its monozukuri, the Japanese concept of meticulously planned and executed manufacturing.

We will endeavor to address four key social issues.

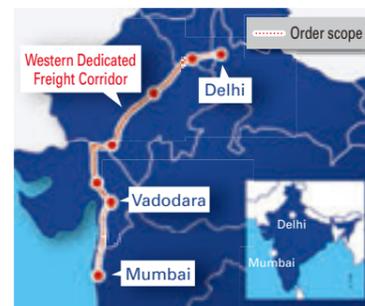
Key social challenges IHI Group is Dedicated to Resolve	
 Cutting carbon emissions and lowering environmental impact	We will contribute to social and environmental sustainability for future generations by shrinking our environmental footprint and providing environmentally friendly products and services.
 Ensuring stable energy supplies	We will provide products and services that make it possible to supply electricity from diverse energy sources to accommodate expanding power demand and changing social conditions.
 Responding to industrialization and advanced urbanization	We increase individual and social safety by providing products and technologies that enhance public services as well as reduce population concentration risks, and by enhancing our industrial productivity and manufacturing processes.
 Healthcare, food and water	We will provide new products and technologies that help resolve medical care and nutrition issues.

## Contributing to national progress by developing social infrastructure

IHI Infrastructure Systems Co., Ltd., a joint venture with Larsen & Toubro, India's largest general contractor, received an order from the Dedicated Freight Corridor Corp., whose parent is India's Ministry of Railways, for bridges along a freight route linking Delhi and Mumbai. The initiative is part of the Delhi-Mumbai Industrial Corridor project that both the Japanese and Indian governments are promoting as a centerpiece of economic collaboration initiatives between the two nations, and is slated for completion in October 2019.

The route will slash shipment times, streamlining India's logistics network and contributing to economic development.

The IHI Group will continue contributing to progress in nations around the world by developing social infrastructure.



Planned Western Dedicated Freight Corridor

## Environmental Initiatives

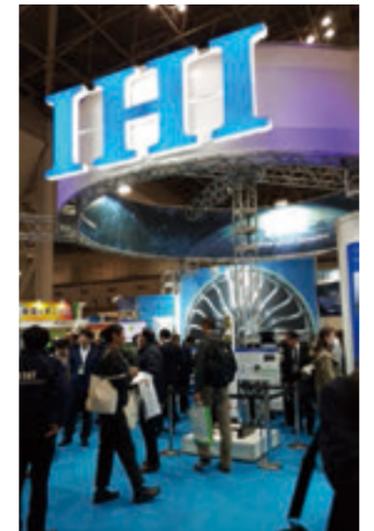
The IHI Group has made lowering its ecological impact and safeguarding the environment a key mission.

IHI Group Environmental Vision 2013, a five-year environmental plan through fiscal 2018, aims to reduce our environmental impact through our products and services and through our operations and also fosters the Group's environmental management efforts. We deployed an in-house certification scheme in fiscal 2014 to identify products offering outstanding environmental performances.

### Exhibiting at Eco-Products 2015

In December 2015, IHI again exhibited at Japan's foremost environmental fair, Eco-Products 2015. Our booth attracted more than 5,300 visitors, showcasing the Group's product lineup and technologies to help mitigate and adapt to climate change.

A questionnaire distributed at the event underscored high expectations for the contributions of IHI's manufacturing technologies to climate change. We will endeavor to engage with stakeholders to drive further progress with our environmental initiatives.



IHI's booth at Eco-Products 2015

## Community Service

The IHI Group provides value to society by making employees aware that they are part of society and by extending CSR beyond its operations.

We undertake various community service based on five themes.



## Nurturing Tomorrow's Scientific Talent

The IHI Group engages in social initiatives as a precision engineering enterprise to cultivate tomorrow's scientific talent. As part of that commitment, we joined hands with Ochanomizu University Science & Education Center to develop an aero engines course in keeping with elementary school science curriculum guidelines. The course starts by highlighting the history of these engines and using models, after which students experiment to deepen their understanding. In fiscal 2015, we conducted course lessons at elementary schools near IHI facilities.

We aim to step up our program to interest elementary students in precision engineering technology and help cultivate tomorrow's engineers.



Jet engine model

► **CSR Information** <http://www.ihi.co.jp/csr/english/index.html>

# Domestic Network and Main Works

As of March 31, 2016

- Offices
- Works
- Branches and Sales Offices

## Head Office

Toyosu IHI Bldg., 1-1, Toyosu 3-chome, Koto-ku, Tokyo 135-8710  
TEL: +81-3-6204-7800

## Akishima Office

IHI Akishima Bldg., 3975-18, Haijima-cho, Akishima-shi, Tokyo 196-8686  
TEL: +81-42-500-7250

## Yokohama Engineering Center

1, Shin-Nakahara-cho, Isogo-ku, Yokohama-shi, Kanagawa 235-8501  
TEL: +81-45-759-2111

## Headquarters Representatives' Office, Aioi District

5292, Aioi, Aioi-shi, Hyogo 678-0041  
TEL: +81-791-24-2206

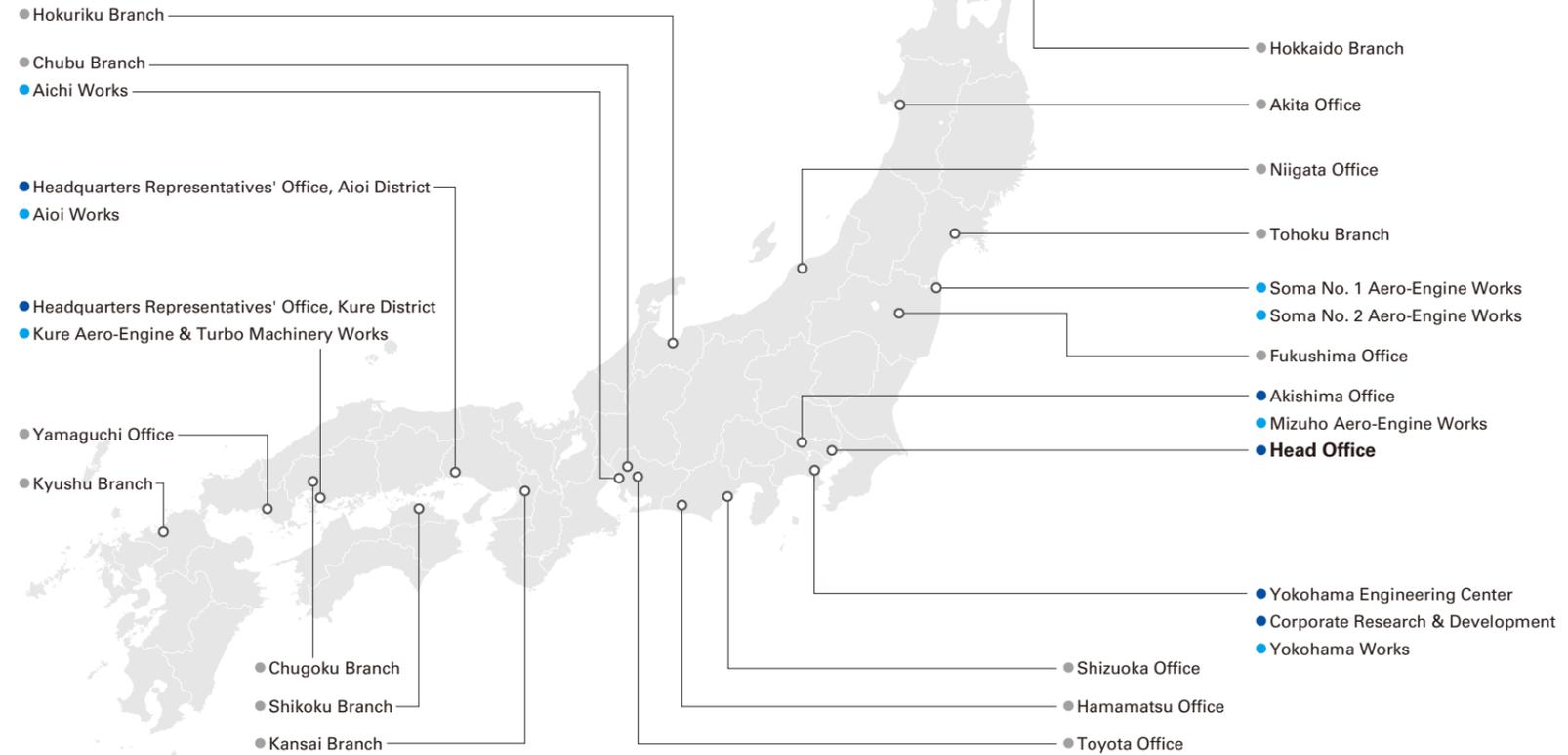
## Headquarters Representatives' Office, Kure District

2-1, Showa-cho, Kure-shi, Hiroshima 737-0027  
TEL: +81-823-26-2105

## Corporate Research & Development

1, Shin-Nakahara-cho, Isogo-ku, Yokohama-shi, Kanagawa 235-8501  
TEL: +81-45-759-2213

● Okinawa Office



**Kure Aero-Engine & Turbo Machinery Works**

Site Area 47,797m<sup>2</sup>  
Products & Services Parts of gas turbine power plants, jet engines and gas turbines  
Certificates JIS Q 9100 & JIS Q 9001 (ISO 9001), JIS Q 14001 (ISO 14001), JIS Q 27001 (ISO/IEC 27001), Nadcap



**Aioi Works**

Site Area 183,823m<sup>2</sup>  
Products & Services Boilers, LNG tanks, pressure vessels for chemical plants and prefabricated piping systems  
Certificates ISO 9001, ISO 14001, ASME (S, U, U2)



**Aichi Works**

Site Area 733,767m<sup>2</sup>  
Products & Services Steel structures, offshore structures, LNG tanks (SPB™ tanks), and deck machinery  
Certificates ISO 9001, ISO 14001, OHSAS 18001, Approval of Manufacturers for Deck Cranes (NK)



**Yokohama Works**

Site Area 226,673m<sup>2</sup>  
Products & Services Reactor pressure vessels, containment vessels, heat exchangers for nuclear power plants, reactors and towers for chemical plants, steel structure, rotating machinery and other industrial machinery  
Certificates ASME (N, NPT, U, U2, NA, NS, S), ISO 9001, ISO 14001



**Mizuho Aero-Engine Works**

Site Area 167,963m<sup>2</sup>  
Products & Services Assembly and overhauling of jet engines, gas turbines and space development equipment and defense systems  
Certificates JIS Q 9100 & JIS Q 9001 (ISO 9001), FAA Repair Station, JCAB Repair Station, EASA Maintenance Organization, CAAC Maintenance Organization, ISO 14001, JIS Q 27001 (ISO/IEC 27001), Nadcap



**Soma No. 1 Aero-Engine Works**

Site Area 181,673m<sup>2</sup>  
Products & Services Parts of jet engines, gas turbines and space development equipment  
Certificates JIS Q 9100 & JIS Q 9001 (ISO 9001), JIS Q 14001 (ISO 14001), JIS Q 27001 (ISO/IEC 27001), Nadcap



**Soma No. 2 Aero-Engine Works**

Site Area 192,629m<sup>2</sup>  
Products & Services Manufacturing of aero engine parts, gas turbine parts, and space development-related parts  
Certificates JIS Q 9100 & JIS Q 9001 (ISO 9001), JIS Q 14001 (ISO 14001), JIS Q 27001 (ISO/IEC 27001), Nadcap

# Main Group Affiliates and Works in Japan

## Resources, Energy & Environment Business Area

### IHI Enviro Corporation

<https://www.ihico.jp/ike/en/index.html>  
Services related to the design, manufacturing, installation, maintenance and management, renovation and repair, operational instruction, operation maintenance management, sales and lease of biomass treatment facilities, wastewater treatment facilities, and related machinery and instruments

### IHI PACKAGED BOILER CO., LTD.

<http://www.ibk-ihico.jp>  
Sales and maintenance service of packaged boilers

### IHI Plant Engineering Corporation

<http://www.ipec-ihico.jp/>  
Services related to the engineering, procurement, construction, commissioning, and maintenance of oil processing, petrochemical, chemical, and pharmaceutical plants / plant equipments supply

### IHI Plant Construction Co., Ltd.

<https://www.ipc-ihico.jp/en/index.html>  
Engineering and construction of power generation facilities (thermal, nuclear, wind and solar), storage facilities, blast furnaces for steelworks and other types of equipment and facilities

### Kanamachi Purification Plant Energy Service Co., Ltd.

Power and steam supply to Tokyo Metropolitan Government Bureau of Waterworks

### Kotobuki Iron Works Co., Ltd.

<http://ktk-aiioi.jp/>  
Manufacturing of boiler and diesel engines parts



Site Area 19,000m<sup>2</sup>  
Products & Services Manufacturing of parts for generators and conservation of parts for turbine casings, diesel engines, and others  
Certificates ISO 9001 (JIS Q 9001)

### Diesel United, Ltd.

<https://www.ihico.jp/du/english/home/home.html>  
Engineering, manufacturing and maintenance of diesel engines



Main Works **Aioi Works**  
Site Area 98,882m<sup>2</sup>  
Products & Services Diesel engines, gas engines and related equipment  
Certificates ISO 9001 (JIS Q 9001), ISO 14001 (JIS Q 14001)

### Toyosu Energy Service Co., Ltd.

Supply business operations; electric power, steam, hot water, and air conditioning

### NIIGATA POWER SYSTEMS CO., LTD.

<http://www.niigata-power.com/english/index.html>  
Manufacture, sale and other services for diesel engines for marine, power generation and rail-traction use, gas engines, gas turbines, and Z-peller<sup>®</sup> propulsion units



Main Works **Ohta Plant**  
Site Area 151,561m<sup>2</sup>  
Products & Services Diesel engines, gas engines, dual-fuel engines and Z-peller<sup>®</sup> propulsion systems  
Certificates ISO 9001, ISO 14001, NK, LR

### NICO Precision Co., Inc.

<http://www.nico-precision.com/en/index.html>  
Manufacture and sale of parts for motors

### Japan Jurong Engineering Co., Ltd.

<http://jjel.co.jp/en/>  
Plant engineering service (JEL Group's sales liaison in Japan), Engineer dispatching/recruiting service

### TOSHIBA IHI Power Systems Corporation

Fabrication of casing and nozzle diaphragm for steam turbines

### Aomori Plant Co., Ltd.

<http://www.apl-ho.co.jp/>  
Nuclear power facility remodeling, construction and maintenance

## Social Infrastructure & Offshore Facilities Business Area

### IHI Infrastructure Systems CO., LTD.

<http://www.ihico.jp/iis/english/index.html>  
Design, fabrication, construction, diagnosis, repair, and conservation of bridges, floodgates, and other steel structures, and manufacture, sale, and installation construction of disaster prevention devices



Main Works **Sakai Works**  
Site Area 170,145m<sup>2</sup>  
Products & Services Design, fabrication, construction, assessment, repair and maintenance of bridges, gates and other steel structures  
Certificates ISO 9001 (JIS Q 9001), ISO 14001 (JIS Q 14001), and OHSAS 18001

### IHI Construction Service Co., Ltd.

<http://www.ihico.jp/iik/>  
Engineering, maintenance and repair of bridge, gates and steel structures, pre-stressed concrete product manufacture and construction work design, execution, etc.

### IHI CONSTRUCTION MATERIALS Co.,Ltd.

<http://www.ikk.co.jp/>  
Manufacturing and installation of pre-cast concrete materials

### Livecon Engineering Co., Ltd.

<http://livecon.co.jp>  
Patent management and supervision for construction materials

### San-Etsu Co., Ltd.

<http://sne-net.co.jp/>  
Maintenance and repair of track maintenance machines, snowplows and construction equipment, and engines, etc.

### JIM TECHNOLOGY CORPORATION

<http://www.jimt.co.jp/>  
Design and sale of tunnel boring machines and equipment

### Niigata Transys CO., LTD.

<http://www.niigata-transys.com/english/index.html>  
Manufacture and sale of rolling stock, industrial vehicles, snowplows, etc., and design, manufacture, and construction of automated guide-way transit



Main Works **Niigata Works**  
Site Area 98,512m<sup>2</sup>  
Products & Services Rolling stock, automated people movers, light-rail vehicles, maintenance cars and snow plows  
Certificates ISO 9001 (JIS Q 9001)

### Chiba Warehouse Co., Inc.

<http://www.chibasoko.co.jp>  
Warehousing, real estate rental, and peripheral businesses

## Industrial Systems & General-Purpose Machinery Business Area

### IHI Transport Machinery Co., Ltd.

<http://www.iuk.co.jp/english/index.html>  
Development, design, sales, manufacture, installation, maintenance, remodeling and Operation and Management services of Parking Systems and Materials Handling System



Main Works **Numazu Works**  
Site Area 125,075m<sup>2</sup>  
Products & Services Tower parking (pallet type), Tower parking (rotary type), Super square parking, Multi-Story parking, and other systems  
Certificates ISO 9001

### IHI Fuso Engineering Co., Ltd.

<http://www.fuso-e.co.jp/>  
Engineering, manufacturing, construction and maintenance services for parking systems

### Nishi-Nihon Sekkei Engineering Co., Ltd.

<http://www.ihico.jp/nms/>  
Design and drafting of transport machinery and other steel structures

### IHI Machinery and Furnace Co., Ltd.

<http://www.ihico.jp/ims/en/>  
Engineering, manufacture, sales, and service of vacuum and new material furnaces, vacuum degreasing machines, and other heat treatment equipment



Main Works **Kakamigahara Works**  
Site Area 16,084m<sup>2</sup>  
Products & Services Vacuum heat treatment furnaces, vacuum carburizing furnaces and vacuum degreasers  
Certificates ISO 9001

### IHI Technical Training Institution

<http://www.tti-a.co.jp/>  
Construction machinery and cranes operator training, etc.

### Voith IHI Paper Technology Co., Ltd.

<http://www.voithihi.com/index%20english.html>  
Design, manufacture, sale, installation, and maintenance and repair of paper manufacturing plants

### IHI Logistics & Machinery Corporation

<http://www.ihico.jp/ilm/>  
Sales, design, fabrication, purchasing, construction, installation, modification, repairs of material handling systems, FA systems and industrial machinery, as well as the servicing and maintenance of devices and parts

### CENTRAL CONVEYOR COMPANY, LTD.

<http://www.centralcv.co.jp/>  
Engineering, manufacturing and selling of logistics equipment and industrial machines

### Paul Wurth IHI Co., Ltd.

<http://www.ihico.jp/hipw/en/index.html>  
Engineering, manufacture, sales, construction, installation, and maintenance services for iron-making machinery (blast furnaces and related facilities, coke ovens, coke dry quenching, and iron-making-related environmental facilities)

### IHI Shibaura Machinery Corporation

<http://www.ihishibaura.com/english/>  
Development, manufacture and sale of engines, tractors, grass and lawn management machines, disaster prevention equipment, water purification equipment, anti-bacterial and deodorizing devices, castings and electronic control units



Main Works **Matsumoto Factory**  
Site Area 110,839m<sup>2</sup>  
Products & Services Engines, tractors, grass, management machines and disaster prevention equipment  
Certificates ISO 9001 (JIS Q 9001), ISO 14001 (JIS Q 14001)

### IHI STAR Machinery Corporation

<http://www.ihistar.com/english/>  
Manufacture and sale of agricultural machinery for tractors



Main Works **Chitose Works**  
Site Area 86,100m<sup>2</sup>  
Products & Services Tractor implements, such as hay and grass harvesting equipment  
Certificates ISO 9001

### IHI Ionbond Japan Co., Ltd.

Coating services and coating equipment sales and services

### IHI Compressor and Machinery Co., Ltd.

<http://www.ihico.jp/icm/>  
Manufacturing and sales of general-purpose compressors, turbochargers for ships, hydraulic motor, hydraulic pumps, gear and lubricating systems. Plant engineering, installation, maintenance, and after-sales services



Main Works **Tatsuno Works**  
Site Area 89,058m<sup>2</sup>  
Products & Services Compressors, turbochargers for ships, and hydraulic motors  
Certificates ISO 9001, ISO 14001, DNV, LR, ABS, BV, KR, CCS, JG, NK and CR

### IHI Turbo Co., Ltd.

<http://www.ihico.jp/itj/>  
Manufacture and sale of turbochargers for vehicles



Main Works **Kiso Works**  
Site Area 65,194m<sup>2</sup>  
Products & Services Automotive turbochargers and superchargers  
Certificates ISO/TS 16949, ISO 14001, NK, JG

### Clover Turbo Co., Ltd.

Repair, design, manufacture, sales and service of after-market turbochargers

## Aero Engine, Space & Defense Business Area

### INC Engineering Co., Ltd.

<http://www.ihico.jp/inc/laneng/index.html>  
Manufacturing of sound and vibration control equipment

### IHI AEROSPACE CO., LTD.

<http://www.ihico.jp/ia/en/index.html>  
Design, manufacture and sales of space equipment and defense machinery



Main Works **Tomioaka Plant**  
Site Area 490,490m<sup>2</sup>  
Products & Services Launch vehicles, other space equipment systems and defense rocket systems  
Certificates JIS Q 9100 & ISO 9001 (ISO 9001), ISO 14001 (JIS Q 14001), JIS Q 27001 (ISO/IEC27001), OHSAS 18001

### IHI AEROSPACE ENGINEERING CO., LTD.

<http://www.ihise.co.jp/>  
Design, research, and experiment subcontracting for space development equipment

### IHI Aero Manufacturing Co., Ltd.

<http://www.ihico.jp/iam/>  
Manufacture of aircraft jet engine compressor blades and vanes



Site Area 15,271m<sup>2</sup>  
Products & Services Manufacture of aircraft jet engine compressor blades and vanes  
Certificates JIS Q 9100, ISO 14001, Nadcap

### IHI CASTINGS CO., LTD.

[http://www.ihico.jp/icc/hp\\_eng/index.html](http://www.ihico.jp/icc/hp_eng/index.html)  
Manufacture and sale of precision casts



Main Works **Soma Works**  
Site Area 15,281m<sup>2</sup>  
Products & Services Precision castings for aero engines and industrial gas turbines  
Certificates JIS Q 9100 & JIS Q 9001, JIS Q 14001 (ISO 14001)

### IHI Jet Service Co., Ltd.

<http://www.ihico.jp/jis/>  
Gas turbine maintenance, technical support for aero engines and space equipment, etc.

### IHI MASTER METAL Co., Ltd.

Manufacture and sale of precision casting materials and special alloys and other products



Site Area 12,557m<sup>2</sup>  
Products & Services Steel and non-ferrous alloy melting stocks for casting  
Certificates JIS Q 9100 & ISO 9001, JIS Q 14001 (ISO 14001), ISO/IEC17025, Nadcap

## Others

### IHI Business Support Corporation

<http://www.ihico.jp/ibsb>  
Real estate management, insurance agent business and data processing services and more

### Seiban Development Co., Ltd.

Management of golf courses

### IHI Scube Co., Ltd.

<http://www.iscube.co.jp/>  
Development, maintenance and support of computers and network systems related to information and communication, engineering, manufacturing, and others. Management service of computer systems operation maintenance, and staffing service

### IHI NeoG Algae

Research and development and feasibility studies for algae-based bio-fuels

### IHI Trading, INC.

<http://www.ihico.jp/iti/>  
Sales of various kinds of machinery

### IHI Inspection & Instrumentation Co., Ltd.

<http://www.iic-hq.co.jp/english/index.html>  
Inspections and measurements of plants and components. Chemical and environmental analysis. Development, engineering, design, manufacture, and installation of control and monitoring systems including various types of testing equipment and automotive environmental inspection and measurement equipment

### Takashima Giken Co., LTD.

<http://www.takashima-giken.co.jp/>  
Design, manufacture, sale, installation, repair, and maintenance of various types of non-destructive inspection equipment

### MEISEI ELECTRIC CO., LTD.

<http://www.meisei.co.jp/english/>  
Manufacture and sale of devices and equipment for telecommunications, electrons, electrical measuring, and information processing, etc., construction design, contracting, and other incidental services, etc.

### MEISEI MANAGEMENT SERVICE CO., LTD.

Temporary staffing services, land and property cleaning, maintenance and security services, etc.

# Global Network

## Overseas Representative Offices

- 1 PARIS
- 2 MOSCOW
- 3 ISTANBUL
- 4 ALGIERS
- 5 DUBAI
- 6 NEW DELHI
- 7 BANGKOK
- 8 HANOI
- 9 KUALA LUMPUR
- 10 JAKARTA
- 11 BEIJING
- 12 TAIPEI
- 13 SEOUL



## EUROPE

- Regional companies**
- 1 U.K./ IHI Europe Ltd.
- Resources, Energy & Environment Business Area**
- 2 SPAIN/ Felguera-I.H.I., S.A.
  - 3 NETHERLANDS/ Niigata Power Systems(Europe)B.V.
  - 4 GERMANY/ IHI Power System Germany GmbH
  - 5 GERMANY/ Steinmüller Engineering GmbH
- Industrial Systems & General-Purpose Machinery Business Area**
- 6 U.K./ Perkins Shibaura Engines Limited
  - 7 NETHERLANDS/ IHI Hauzer Techno Coating B.V.
  - 8 SWITZERLAND/ IHI Ionbond AG
  - 9 GERMANY/ IHI VTN GmbH
  - 10 GERMANY/ IHI Charging Systems International GmbH
  - 11 GERMANY/ IHI Charging Systems International Germany GmbH
  - 12 ITALY/ IHIMER S.p.A
  - 13 ITALY/ IHI Charging Systems International S.p.A.

## PACIFIC

- Regional companies**
- 14 AUSTRALIA/ IHI ENGINEERING AUSTRALIA PTY. LTD.
  - 15 AUSTRALIA/ IHI Oxyfuel Australia Pty. Ltd.

## ASIA

- Regional headquarters**
- 16 SINGAPORE/ IHI ASIA PACIFIC PTE. LTD.
- Regional companies**
- 17 THAILAND/ IHI ASIA PACIFIC (Thailand) Co., Ltd.
  - 18 TAIWAN/ IHI Taiwan Corporation
- Resources, Energy & Environment Business Area**
- 19 SINGAPORE/ Jurong Engineering Limited
  - 20 SINGAPORE/ Niigata Power Systems (Singapore) Pte. Ltd.
  - 21 THAILAND/ IHI Power System (Thailand) Co., Ltd.
  - 22 MALAYSIA/ IHI POWER SYSTEM MALAYSIA SDN BHD
  - 23 MALAYSIA/ ISHI POWER SDN BHD
  - 24 INDONESIA/ PT. Cilegon Fabricators
  - 25 INDONESIA/ PT. IHI Gasification Indonesia
  - 26 PHILIPPINES/ IHI PHILIPPINES, INC.
  - 27 PHILIPPINES/ Niigata Power Systems Philippines, Inc.
- Social Infrastructure & Offshore Facilities Business Area**
- 28 VIETNAM/ IHI INFRASTRUCTURE ASIA CO., LTD.
- Industrial Systems & General-Purpose Machinery Business Area**
- 29 THAILAND/ IHI TURBO (THAILAND) CO., LTD.
  - 30 THAILAND/ IHI Machine Tech Asia Co., Ltd.
  - 31 MALAYSIA/ IHI Transport Engineering Malaysia Sdn. Bhd.
  - 32 INDONESIA/ PT. IHI Transport Machinery Indonesia
  - 33 TAIWAN/ IHI System Technology Taiwan Co., Ltd.
  - 34 KOREA/ Hyundai WIA IHI Turbo Co., Ltd.
  - 35 KOREA/ IHI Turbo Korea Co., Ltd.

## CHINA

- Regional headquarters**
- 36 CHINA/ IHI (Shanghai) Management Co., Ltd.
- Regional companies**
- 37 CHINA/ IHI (HK) LTD.
- Resources, Energy & Environment Business Area**
- 38 CHINA/ Niigata Power Systems (Shanghai) Co., Ltd.
- Industrial Systems & General-Purpose Machinery Business Area**
- 39 CHINA/ IHI-Sullair Compression Technology (Suzhou) Co., Ltd.
  - 40 CHINA/ Changchun FAWER-IHI Turbo Co., Ltd.
  - 41 CHINA/ WUXI IHI TURBO CO., LTD.
  - 42 CHINA/ ISHIKAWAJIMA SCE (XIAMEN) CONSTRUCTION MACHINERY CO., LTD.
  - 43 CHINA/ SHANGHAI STAR MODERN AGRICULTURE EQUIPMENT CO., LTD.
  - 44 CHINA/ Perkins Shibaura Engines (Wuxi) Co., Ltd.
  - 45 CHINA/ Jiangsu IHI Fengdong Vacuum Technology Co., Ltd.

## AMERICAS

- Regional headquarters**
- 46 U.S.A./ IHI INC.
- Regional companies**
- 47 U.S.A./ IHI Power Generation Corp.
  - 48 BRAZIL/ IHI do Brasil Representações Ltda.
  - 49 BRAZIL/ ISHIKAWAJIMA-HARIMA SUL-AMERICA LTDA.
- Resources, Energy & Environment Business Area**
- 50 U.S.A./ IHI Southwest Technologies, Inc.
  - 51 U.S.A./ IHI E&C International Corporation
  - 52 U.S.A./ NitroCision, LLC
  - 53 CANADA/ IHI Canada Projects Inc.
  - 54 MEXICO/ Contratistas IHI E&C México, S.A. de C.V.
- Social Infrastructure & Offshore Facilities Business Area**
- 55 U.S.A./ IHI California Inc.
- Industrial Systems & General-Purpose Machinery Business Area**
- 56 U.S.A./ Perkins Shibaura Engines LLC
  - 57 U.S.A./ IHI Turbo America Co.
  - 58 U.S.A./ IHI Press Technology America, Inc.
  - 59 U.S.A./ New Metal Engineering, LLC
- Aero Engine, Space & Defense Business Area**
- 60 U.S.A./ IHI-CCR, LLC.



57 IHI Turbo America Co. (U.S.A.)

Site Area 40,470m<sup>2</sup>  
 Products & Services Automotive turbochargers and superchargers  
 Certificates ISO/TS 16949

## Works of Overseas Affiliates

 <p>1 IHI Charging Systems International Germany GmbH (GERMANY)</p> <p>Site Area 122,276m<sup>2</sup>                  Products &amp; Services Automotive turbochargers                  Certificates ISO/TS 16949, ISO14001</p>	 <p>13 IHI Charging Systems International S.p.A. (ITALY)</p> <p>Site Area 18,900m<sup>2</sup>                  Products &amp; Services Automotive turbochargers                  Certificates ISO/TS 16949, ISO14001</p>	 <p>24 PT. Cilegon Fabricators (INDONESIA)</p> <p>Site Area 250,000m<sup>2</sup>                  Products &amp; Services Boilers, steel structures, container cranes, piping and pressure vessels, HRSG                  Certificates ISO 9001, ASME (S, U, PP), OHSAS 18001</p>	 <p>28 IHI INFRASTRUCTURE ASIA CO., LTD. (VIETNAM)</p> <p>Site Area 140,000m<sup>2</sup>                  Products &amp; Services Manufacturing, installation, repair, and maintenance of steel structures and concrete products                  Certificates ISO 9001</p>	 <p>29 IHI TURBO (THAILAND) Co., Ltd. (THAILAND)</p> <p>Site Area 53,753m<sup>2</sup>                  Products &amp; Services Automotive turbochargers                  Certificates ISO/TS 16949, ISO 14001, OHSAS 18001</p>	 <p>40 Changchun FAWER-IHI Turbo Co., Ltd. (CHINA)</p> <p>Site Area 43,000m<sup>2</sup>                  Products &amp; Services Automotive turbochargers                  Certificates ISO/TS 16949, ISO14001, OHSAS 18001</p>	 <p>41 WUXI IHI TURBO CO., LTD. (CHINA)</p> <p>Site Area 16,000m<sup>2</sup>                  Products &amp; Services Automotive turbochargers                  Certificates ISO/TS 16949, ISO 14001</p>	 <p>60 IHI-CCR, LLC. (U.S.A.)</p> <p>Site Area 3,825m<sup>2</sup>                  Products &amp; Services Repair of jet engine parts and accessories                  Certificates FAA Repair Station</p>
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# Historical Highlights

IHI helped pioneer Japan's heavy industry. We started out by accumulating shipbuilding technology that we applied to industrial machinery, plant manufacturing and construction. Now we are a key provider of massive elements of industrial and social infrastructure.

Our products underscore our management philosophy of contribute to the development of society through technology.



**1853**  
Ishikawajima Manufacturing Shipyard established to protect to invasion of western countries, after a fleet under U.S. Commodore Matthew Perry arrived  
The Mito clan set up this facility on instructions from Japan's feudal government.



**1866**  
Completed the Chiyodamaru, Japan's first steam-powered warship  
This vessel employed the first naval steam engine manufactured in Japan.



**1876**  
Established Ishikawajima Hirano Shipyard  
Tomiji Hirano set up the nation's first private sector shipyard.



**1887**  
Constructed the Azuma Bridge across the Sumida River  
Japanese engineers designed and manufactured what was the nation's largest iron truss bridge.



**1907**  
Established Harima Dock Co., Ltd.  
Seitaro Karahata, the head of Aioi village (now Aioi City) in Hyogo Prefecture, established that firm.



**1911**  
Completed steel structures for Tokyo Central Station (now Tokyo Station)  
The company broke away from the convention of erecting a scaffold, winning accolades among architects by using two movable cranes instead.



**1945**  
Produced the Ne20, Japan's first jet engine  
The engine powered the successfully maiden flight of Japan's first jet.



**1959**  
Established Ishikawajima do Brasil Estaleiros in Brazil  
This was the first Japanese-owned shipyard overseas and heralded the overseas expansion of Japanese companies.



**1960**  
Established Ishikawajima-Harima Heavy Industries Co., Ltd.  
This was the fruit of a merger between onshore machinery leader Ishikawajima Heavy Industries Co., Ltd., and Harima Shipbuilding & Engineering Co., Ltd., a top player in its sector.



**1978**  
Built the world's first barge-mounted pulp manufacturing plant specifically for Brazil  
IHI built this 230-meter facility, mounted it on a barge, and towed it to Brazil.



**1988**  
Constructed the Second Bosphorus Bridge  
It is a 1,510-meter suspension bridge in Istanbul linking Asia with Europe.



**1997**  
Constructed large shield tunneling machine for Tokyo Bay Aqualine  
With a diameter exceeding 14 meters, this machine dug a 2,853-meter tunnel under Tokyo Bay.



**2002**  
Delivered Japan's first tower boiler  
We delivered this 600MW boiler to the Isogo Thermal Power Station. The second boiler that we delivered to that facility, in 2009, attained the world's highest steam condition.  
(Photo provided by J-Power (EPDC))



**2011**  
Participating in a project for an advanced GENx™ jet engine  
We have a roughly 15% share in the international program for this jet engine, which offers significantly improved fuel economy.



**2013**  
Epsilon Launch Vehicle  
This solid, next generation propellant launch vehicle delivers high performance and low cost.  
(photo courtesy of JAXA)



**2015**  
Reached total production of 50 million turbochargers for automobiles  
IHI group reached a total production volume of 50 million turbochargers. We will expand production and sales activities worldwide while meeting various needs based on our highly reliable development and production technologies.

## 2016 TOPICS

### Resources, Energy & Environment Business Area

Order from Mozambique's state power company for construction of gas-fired combined-cycle power plant  
This will be the country's first gas-fired combined-cycle power plant. When completed, it will account for 20% of domestic power demand. IHI will supply the main equipment and oversee the facility.



### Social Infrastructure & Offshore Facilities Business Area

Contract Award for Bridge Construction and Rehabilitation Project in Bangladesh  
We have been awarded the rehabilitation for the Kanchpur, Meghna, and Gumi bridges and construction of a second bridge, parallel to the existing bridges. We will be utilizing our technological expertise and know-how, and contribute to the economic development of Bangladesh through the project.



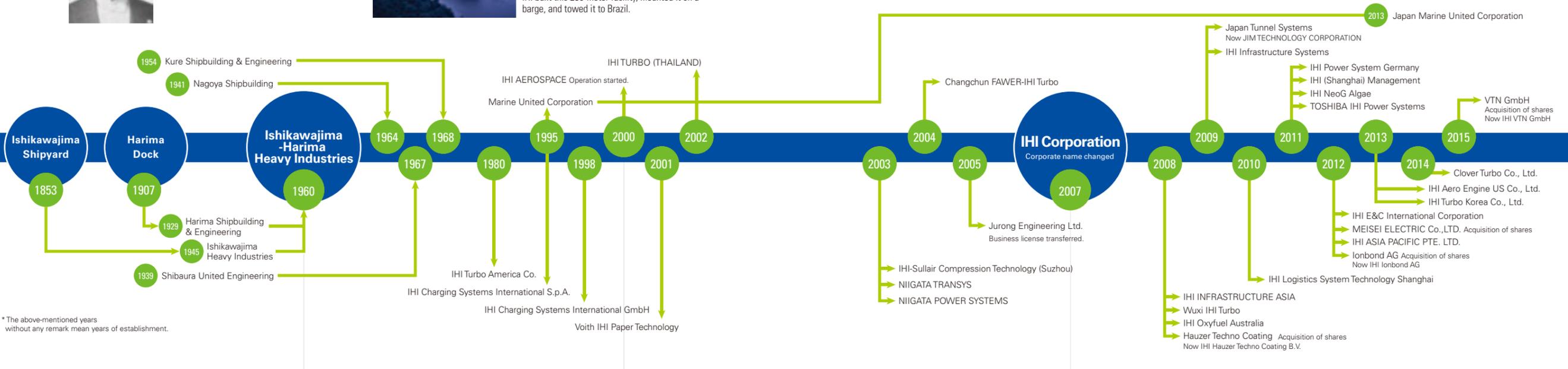
### Industrial Systems & General-Purpose Machinery Business Area

Leading German Heat Treatment Services Company VTN Acquired  
Heat treatment technology alters material properties such as strength and hardness so machinery parts can perform more diverse and advanced tasks. Combining IHI's heat treatment equipment manufacturing and sales capabilities with VTN's process engineering will enable IHI to offer even more attractive heat treatment processes.



### Aero Engine, Space & Defense Business Area

A320neo powered by PW1100G-JM entered into service.  
IHI participates PW1100G-JM program with 15% share through Japanese Aero Engine Corporation. We developed our own composite technology to be incorporated to the fan case and the Structural Guide Vane which contribute weight reduction and fuel efficiency.

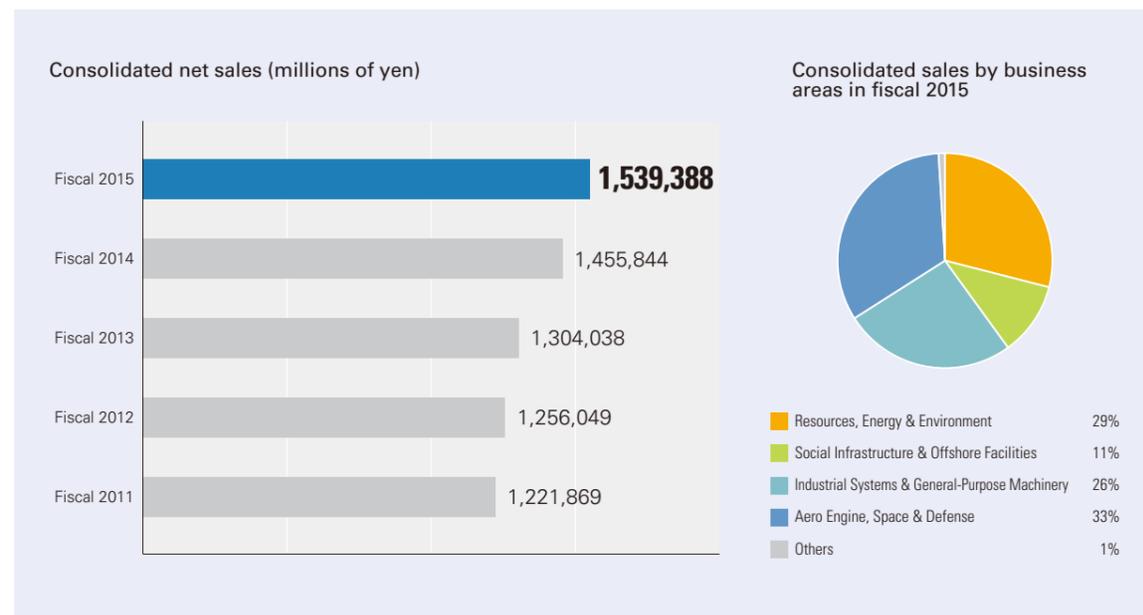


\* The above-mentioned years without any remark mean years of establishment.

## Company Profile (as of March 31, 2016)

Year of establishment	1853
Capital	107,165 million yen
Number of employees (on consolidated basis)	29,494
Works	7
Branches in Japan	8
Overseas representative offices	13
Affiliated companies in Japan	73
● Subsidiary companies in Japan	52
● Affiliated companies in Japan	21
Overseas affiliates	158
● Overseas affiliated companies	125
● Associated companies overseas	33

## Net Sales



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# Resources, Energy & Environment Business Area

## Boilers

IHI has supplied the world with highly efficient and reliable coal-fired boilers that draw on its advanced technologies. With boilers based on our Clean Coal Technology, we contribute to the effective and economical use of valuable energy resources. We will continue to provide models employing coal and other fuels to customers around the world. We are augmenting flue gas treatment systems by pushing ahead with development to rapidly commercialize oxy-fuel combustion technology and CO<sub>2</sub> chemical absorption technology that lowers carbon dioxide emissions. We are also working on gasification and pre-dry technologies for lignite, a low-grade coal. We are accommodating diverse customer needs by supplying compact packaged boilers that deliver heat and steam to factories and other facilities.



Large-scale tower type boiler  
Photo is provided by J-POWER (EPDC)



Boiler for IPP and PPS

### Main Products

- Boilers
- Packaged boilers
- Flue gas treatment systems

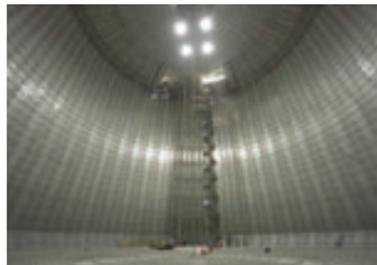


Small packaged once through boiler

## Processing & Pharmaceutical Plants

IHI is Japan's leading provider of LNG receiving terminals and storage tanks. We are also active overseas, with a strong track record in India, Qatar, Mexico, Taiwan, the United States, and China. Particularly for LNG storage tank construction, we are able to handle all types of tanks including Double-walled metal tank, Pre-stressed concrete (PC) full containment tank and in-ground membrane tanks, with leading global market shares for such facilities.

In such diverse areas as natural gas liquefaction, oil refining, petrochemicals, LPG, pharmaceutical and other process plants, we have a strong track record in Japan and internationally in integrating everything from engineering to procurement, construction, and startups.



World's largest capacity LNG underground tank (Membrane)  
Photo is Provided by TOKYO GAS



LNG receiving terminal  
(Sempra's Cameron LNG receiving terminal in Louisiana, USA)  
Photo used with the permission of Sempra LNG  
©All rights reserved by Sempra LNG



In-ground LNG storage tank

### Main Products

- Oil & Gas plants
- Chemical plants
- Natural Gas Liquefaction plants
- LNG receiving terminal / storage tank
- Pharmaceutical / Fine Chemical plants
- Vertical pulverizing super-hybrid mills
- Fired Heater
- Air-cooled heat exchangers
- Chemical plant equipment
- Cooling towers



LPG plant



Natural Gas Liquefaction plant



Pharmaceutical plant

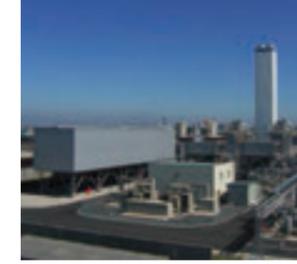
## Gas Turbines, Gas Engines & Diesel Engines

IHI provides wide variety of power generating products including gas turbines, diesel engines and gas engines with simple-cycle, co-generation and combined-cycle power systems. We also provide remote monitoring, engine maintenance, and other services throughout product lifecycles. We are achieving the reduction of NO<sub>x</sub> and CO<sub>2</sub> emissions by adopting high-efficiency and low emission type of gas turbines.

We supply gas turbines for high-speed ships and other marine vessels. We also supply a full range of diesel engines, from large engines capable of medium and low speeds to small and midsize models delivering low, medium, and high speeds. Our diverse lineup includes diesel engines for land-based power generators.

### Main Products

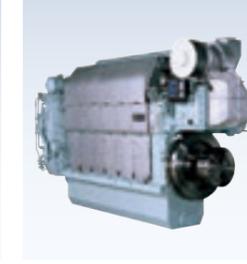
- Simple/combined cycle power generation systems
- Emergency power generation systems
- Co-generation systems
- Diesel engines (marine, land)
- Gas engines
- Gas turbines



Gas turbine power plant "LM6000"



Gas engine "18V28AGS"



Diesel engine "28AHX"



DU-WÄRTSILÄ W9X82 diesel engine

## Environmental Systems

Our systems contribute greatly to environmental protection and remediation. We draw on our technologies and experience and emphasize product, thermal, and materials recycling to provide engineering, construction, operation and maintenance services for waste and industrial effluent as well as public sewage treatment facilities. IHI has a strong history in providing flue gas desulfurization and denitrification facilities for thermal power stations and industrial plants.

### Main Products

- Waste treatment facilities
- Biomass treatment facilities
- Wastewater treatment facilities
- Flue gas treatment facilities



Biomass processing  
(Clean Authority of TOKYO)



Wastewater treatment facility



Flue gas treatment facility

## Nuclear Power Plants

IHI supplies such key components as reactor pressure vessels, primary containment vessels, and piping systems. We develop and construct nuclear fuel cycle systems as well as supply components for conventional boiling water reactors (BWRs) and advanced boiling-water reactors (ABWRs). We have also begun supplying equipment for pressurized-water reactors (PWRs). Moving forward, we plan to engage in decontamination and decommissioning of nuclear power facilities. We also supply chemical plant reactors and other equipment.

### Main Products

- Components for nuclear power plants
- Facilities for nuclear fuel cycle related equipment
- Pressure vessels
- EO reactors



Reactor containment vessel



Reactor pressure vessel for BWR nuclear power plant



Vitrification facility for high-level radioactive waste



EO reactors

# Social Infrastructure & Offshore Facilities Business Area

## Bridges, Water Gates & Steel Structures

IHI has constructed numerous major bridges worldwide. Included are the Seto Ohashi Bridges and the Akashi Strait Bridge in Japan, the Second Bosphorus Bridge and the Golden Horn Bridge in Turkey, the Carquinez Bridge in the United States, and the Binh Bridge and the Nhat Tan Bridge in Vietnam. We are Japan's top manufacturer of water gates for rivers and dams. Our capabilities extend from manufacturing and installation to inspection and maintenance. We contribute to water usage and flood control projects in Japan and overseas, particularly in Southeast Asia. We deliver large steel structures incorporating machinery and put a focus on the increase of hybrid structures, including caissons and pontoons that combine the strengths of steel and concrete. We have integrated steel structures, mechanical, sensor, control, and other technologies to develop active mass dampers and seismic isolation floor systems. These systems serve important disaster prevention roles in high-rise buildings and computer centers.

### Main Products

- Bridges
- Water gate equipment for rivers
- Water gate equipment for dams
- Floating breakwater
- Floating platforms
- Immersed tunnels
- Hybrid caissons
- Composite slabs
- Sound-absorbing panels
- Temporary assembling bridges
- Mass damper systems
- Seismic isolation floor systems



The Akashi-Kaikyo Bridge



Cable-stayed bridge "Nhat Tan Bridge"



Arch bridge "Tsukiji Ohashi"



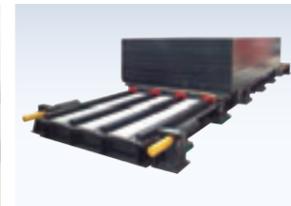
River gate



Dam gate



Hybrid caissons



Active mass dampers

## Shield Tunneling Machines

IHI developed the world's largest shield and rotating shield tunneling machines, which have greatly improved construction efficiency. IHI is the world's leading supplier of automatic segment assembling systems while also providing various types of segments.

### Main Products

- Shield tunneling machines
- Automatic segment assembling systems



Large-diameter shield tunneling machine



Rotating shield tunneling machine



Special section (double-o tube) shield tunneling machine

## Transportation Systems

IHI contributes to traffic safety, which is essential for daily life, in various ways. Furthermore, we supply various railway systems, including ultra-low floor streetcars, which are human- and environment-friendly and essential for building new towns, light diesel locomotives to ensure local traffic, and maintenance vehicles to keep railway systems running.

### Main Products

- Transportation systems
- Rolling stocks
- Snowplows
- Maintenance vehicle



Fukui Railways, FUKURAM



Hiroshima Rapid Transit, Astram Line



Sanriku Railway, Type 36-700

## F-LNG

The IHI Group independently developed SPB™ (Self-supporting Prismatic shape IMO type B) Tanks, which are "LNG Cargo Containment System for LNG Carrier and Floating LNG Unit". The tanks serve on IHI-constructed LNG carriers that have served safely LNG transportation even in the world harshest sea condition between Alaska (Kenai) and Japan for more than 20 years. As LNG demand expands, companies are exploring the use of floating units to develop offshore gas fields. SPB™ systems have attracted attention worldwide as ideal LNG cargo containment system.

FPSO (Floating Production Storage and Offloading) is a floating production system that receives fluids (crude oil and host of other things) from a subsea reservoir and produces, stores and offloads petroleum products to tankers. Our Aichi Works recently completed a one-million-barrel floating vessel that is now operating in Southeast Asia.

### Main Products

- F-LNG/LPG-FPSO
- SPB™ tank (LNG/LPG/LEG storage tank)
- FPSO/FSO
- Semi-Submersible Rig
- Mega-Float, others



SPB™ tank



Conceptual diagram of the F-LNG



FSO ERAWANZ

## Urban Development

We optimize the potential of our real estate holdings by redeveloping company offices and housing nationwide. We engage in leasing and sales, particularly in metropolitan Tokyo. A good example of this approach is in Toyosu, known for former shipbuilding yards, where we are undertaking a massive urban redevelopment project. We also prioritize using idle land, as part of which we operate Japan's biggest mega solar generating business, in Kagoshima, thereby contributing to environmental and social sustainability.



Rental office buildings  
"TOYOSU FORESIA™", "TOYOSU FRONT™"



Dwellings for sale  
"PROUD SEASON HIBARIGAOKA PARK AVENUE"



Kagoshima Megasolar

### Main Products

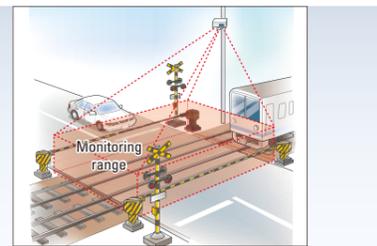
- Real estate leasing and sales

## Security

IHI provides various products based on mechatronics and sensing technologies. IHI 3D Laser radar is applied to Railway level crossing obstacle detection system and Driving safety system as infrastructure sensors. It has achieved over 1,600 units supply record over the world and been exploring for other sensing business fields. IHI also supplies X-ray visual inspection system for large size cargo container, for which IHI is the domestic market leader. We have ample track record for airports and seaports custom check including small and mid-sized X-ray inspection system.



3D laser radar



### Main Products

- 3D laser radar systems
- X-ray inspection systems
- Monitoring equipment
- Oil leak monitors
- Noise reduction systems
- Disaster prevention equipment



Earthquake early warning receiving equipment  
QCAST™ S704



X-ray inspection systems  
(Photo: 0X100100DN)



Oil leak detectors  
Left: Monitor amplifier  
Right: Oil sensor

# Industrial Systems & General-Purpose Machinery Business Area

## Rotating Machinery

IHI provides an array of compact and packaged machinery for plant utilities. Our offerings include separators, filters, dewatering equipment, and air compressors. We draw on many years of expertise from custom-manufacturing compressors, and our liquefied natural gas BOG plant compressors dominate the market. Our organic rankine cycle power generator can produce electricity from water with temperatures ranging from 70°C to 95°C, helping customers to conserve and create energy.

### Main Products

- Separators
- Filters
- Compressors
- Organic rankine cycle power generator
- Gear



Screw Decanter Centrifuge



IHI-Leaf Filter



IHI-FUNDABAC Filter



Centrifugal air compressor



Process gas compressor



Process reciprocating compressor



Organic rankine cycle power generator

## Turbochargers

IHI supplies a wide range of turbochargers from large ones for land and marine power generators to small ones for automobile engines, and has already produced more than 50 million turbochargers for automobiles. We have development, production, and sales bases also in the U.S., Europe, Thailand, China, and Korea and are growing our business worldwide.

### Main Products

- Turbochargers



Turbocharger for automobiles



Turbochargers for marine vessels

## Materials Handling System

IHI has remained a technology leader in this field for a century. We accommodate needs ranging from under one metric ton to thousands of metric tons. Our offerings extend from bulk handling systems, such as port unloaders, jib and overhead travelling cranes for various industries. We leverage advanced technologies in manufacturing through maintenance and modifications. We are Japan's leading manufacturer of materials handling system installed on bulk carrier deck cranes.

We are a top supplier of jib climbing cranes for skyscraper and dam construction.



Continuous ship unloader



Jib crane

### Main Products

- Unloaders
- Coal unloading and transportation facilities
- Overhead traveling crane
- Jib cranes
- Hoists
- Jib climbing cranes



Jib climbing crane for building construction

## Parking Systems

Since installing Japan's first tower parking system in 1962, IHI has drawn on its experience, reliability, and proprietary technology to perfect these products. We look to introduce parking systems with smaller environmental footprints as well as other new types of parking systems. We will continue to provide optimal parking solutions in the years ahead.



Tower parking (pallet type)



Tower parking (pallet-less type)



Super square parking



Multi-story parking

### Main Products

- Parking systems

## Marine Machinery

Deck cranes are installed on bulk carriers and general cargo ships sailing all over the world and used to load a wide range of cargo.

Our Z-peller® is the most propulsion system in the global tugboat market, and has earned an outstanding customer reputation for its high quality and durability. The diverse other applications for this system include fireboats, oil skimmer boats, and other disaster prevention vessels, as well as floating cranes, dredgers, drill rigs, and support vessels.



Deck cranes



Z-peller® propulsion systems

### Main Products

- Deck cranes
- Z-peller® propulsion systems

## Heat & Surface Treating

Heat treatment processes and equipment are used in many industries. IHI supplies an array of equipment to meet user needs. Our heat treatment equipment offerings include vacuum heat treatment furnaces, highpressure dewax sintering furnaces, hot presses, high purification furnaces, vacuum carburizing furnaces, and vacuum vapor degreaser. In addition to supplying equipment, IHI itself maintains a heat treatment processing business.

We supply PVD/PACVD coating equipment using plasma technologies and are engaged in state-of-the-art thinfilm coating and surface-treatment business, where we developed the MSCoating™, an innovative technology that uses an electrode discharge process.



Vacuum thermal treatment furnace



Vacuum carburizing furnace



PVD / PACVD coating equipment



Vacuum degreaser



CVD coating equipment (Ionbond Bernex™ CVD)



Job Coating Service

### Main Products

- Advanced material manufacturing equipment
- Vacuum thermal treatment equipment
- Thin film and surface treatment equipment
- MSCoating™
- Heat treatment and coating services

## Steelmaking Equipment

IHI provides steelmakers with advanced blast furnaces, coke ovens, and sinter plants that contribute to the safe, economic, and environmentally friendly production of the steel products that enhance modern living. Our strip caster, the world's first successful commercial process for direct casting of carbon steel sheet production, is a low-cost, space- and energy-saving process that reduces carbon dioxide emissions.



Blast furnace (© NIPPON STEEL & SUMITOMO METAL CORPORATION)

### Main Products

- Industrial furnaces
- Strip casters

## Rubber & Film Molding Equipment

Our calender lines are used to manufacture plastic films and rubber sheets for tires. IHI continues to build on its strong record in this business around the world.

We contribute to productivity improvements through our state-of-the-art high-precision thickness control technology and automation technologies.



Calender for plastics



7-Roll calender  
(the world's biggest calender for rigid film production)



Creel autoloading system

### Main Products

- Rubber and film molding equipment (calender)

## Logistics Systems

IHI pioneered and is a leading company in numerous areas of logistics such as automated storage and retrieval system (ASRS), transportation system, and sorting systems. Our ASRS can be used at temperatures as low as -60°C, or store hazardous materials. We also provide transportation system for clean rooms. These systems are used in logistics, food, and chemical industries. We draw on our expertise to provide comprehensive logistics solutions.



Automated storage/retrieval system for freezers



High-speed picking and storage system "Shuttle and Server"



Air floating conveyor for large FPD panels

### Main Products

- Automated material handling systems in clean room
- Storage systems
- Transportation systems
- Sorting / picking systems



Automated guided vehicle (AGV)

## Pulp & Paper Machinery

IHI is Japan's premier maker of pulp and paper manufacturing machinery, supplying papermakers with the largest and fastest paper-making and paper-coating machines. We have an unmatched record overseas as well as in Japan.



Paper machine

### Main Products

- Pulp & paper machinery

## FA Systems for the Automobile Industry

Automated press lines are essential for the high-speed forming of automobile bodies and chassis. Our factory automation systems, including high-speed panel transfer system (V-feeder), FOL & EOL, electric power re-generating servo cushion and automatic die change system contribute to the improvement of productivity for automakers.



Between-press panel high-speed conveyor (V feeder)



Large tandem press line with V-feeder

### Main Products

- Between-press panel high-speed conveyor (V feeder)

## Agricultural Machineries, Small Industrial Engines, and Civil Facilities and Products

IHI supports agriculture with machinery for cultivating, fertilizing, seeding, harvesting, and other tasks. Our lawn maintenance machines, grass cutters, and campus greening equipment help maintain landscapes and lawns at an array of sports facilities. They include golf courses, soccer, baseball, and athletic fields, and racecourses. Our equipment is also utilized heavily at schools, parks, riverbanks, and homes. Our products serve in hospitals, clinics, nursing homes, hotels, restaurants, airports, train stations, and factories. We manufacture ozone deodorizers and disinfectors, accommodating rising demand for deodorization, sanitization, dust removal, and cleaning applications.

### Main Products

- Agricultural machines
- Lawn maintenance machines
- Ozone deodorizers / ozone disinfectors
- High-temperature heating system
- Diesel engines



Tractor



Round baler



Small diesel engine (N4L DI-TA)



Endoscope sterilizer

## Grid Scale Energy Storage System

IHI provides turnkey solutions for grid scale energy storage system, centered on its ESWare suite of advanced control systems.

- (1) Analysis: Evaluating project profitability before project deployment and optimizing system configuration
- (2) Control: Managing systems in real time in line with customer requests and optimization directives
- (3) Optimization: Formulating operational strategies to optimize profitability based on past operational results and weather, load, and other forecasts



Grid scale energy storage system

### Applications

- Peak shifting and shaving
- Renewable integration
- Frequency regulation
- Backup power sources



ESWare™ -ES/analyzer

# Aero Engine, Space & Defense Business Area

## Aero Engines

IHI is Japan's leading maker of jet engines, with a market share of between 60% and 70%. We are the primary contractor and manufacturer for aircraft engines used by the Ministry of Defense. We collaborate in international projects to develop and supply large and small engines for all types of civilian aircraft. We have leveraged our experience and manufacturing technologies to provide maintenance for all types of engines. We are considered Asia's core maintenance center. To meet the growing demand for eco-friendly engines and fulfill our corporate responsibility, we are developing next-generation engines that draw on our advanced technologies.

### Main Products

- Turbofan engines
- Turboshift engines
- Turbojet engines
- Turboprop engines
- Jet engine maintenance
- Jet engine test cells
- Jet engine parts



PW1100G-JM turbofan engine



GEnx™ turbofan engine



GE90 turbofan engine



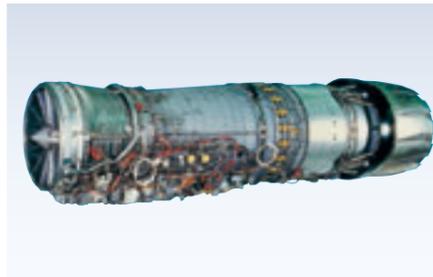
V2500 turbofan engine



CF34 turbofan engine



Aero Engine Maintenance



F110 turbofan engine



Aircraft photo from Ministry of Defense website



F7-10 turbofan engine



F3 turbofan engine



T700 turboshaft engine



Jet engine parts

## Rocket Systems & Space Exploration

IHI has participated in Japan's space development effort from the outset. We have applied our cryogenic-pump and turbomachinery and other technologies to develop and manufacture the turbopumps and gas-jet systems crucial to successful rocket launches. Our involvement in Japan's space program expanded significantly in 2000, when we acquired Nissan Motor's Aerospace Division, a pioneer in solid-fuel rocket development in Japan. We play an important role in developing and constructing the Exposed Facilities of the KIBO Japanese Experiment Module, which is a part of the International Space Station program. We support experiments in space by supplying experimental systems needed for cooperative international projects.

### Main Products

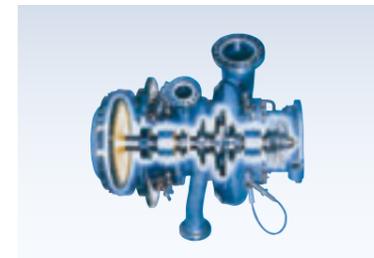
- Rocket
- Rocket propulsion systems
- Rocket control systems
- Satellite propulsion systems
- Satellite control systems
- Equipment for utilization of space environment
- Space station-related equipment
- Ground test facilities
- Ground support facilities



H-IIA Launch Vehicle (© JAXA)



Epsilon Launch Vehicle (© JAXA)



Liquid oxygen turbopump for the H-IIA rocket LE-7A engine



Liquid hydrogen turbopump for the H-IIA rocket LE-7A engine



22N thruster

500N apogee engine

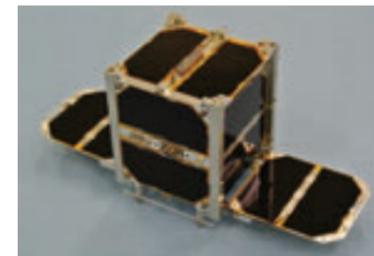
Development of bipropellant liquid apogee engine, etc., used to obtain geostationary orbit



International Space Station (© JAXA/NASA)



Development of HTV propulsion system and exposed palette (HTV: H-II Transfer Vehicle) (© JAXA/NASA)



CubeSat (Ultra-small satellite) 'WE WISH' engineering model (for demonstrative equipment)



SRB-A Ground Combustion Test (© JAXA)



i-Ball™

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