

R&D and Intellectual Property Activities

We are pursuing development aimed at enhancing product competitiveness and expanding our businesses through close partnerships with operational headquarters and AKISHIMA LABORATORIES (MITSUI ZOSEN) INC.

Executive Officer
General Manager of Research & Development Headquarters
Yukinori Torii



Research and development

Initiatives in the Environment & Energy domain

In the field of ocean development and submersibles, we are developing a newly constructed floating production storage and offloading system (FPSO) vessel for marine oil and gas, which will make it possible to respond to requests for delivery in a short turnaround period. We are also working a medium-sized multi-gas carrier that transports various types of liquefied gas, dynamic positioning system (DPS) with redundancy that make it possible to respond to various customer needs, Remotely Operated Vehicle (ROV) for measuring the distribution of radioactive materials on the ocean floor, a system for producing methane hydrate under the ocean floor, and other systems and vessels.

In the field of renewable energy, we are developing floating and bottom-mounted off-shore wind power generation facilities, wave power generation facilities, and others. Furthermore, in the field of environmental plants, we are developing fermentation technologies which are compatible with diverse materials for the purpose of expanding the scope of application of biogas power generation technologies.

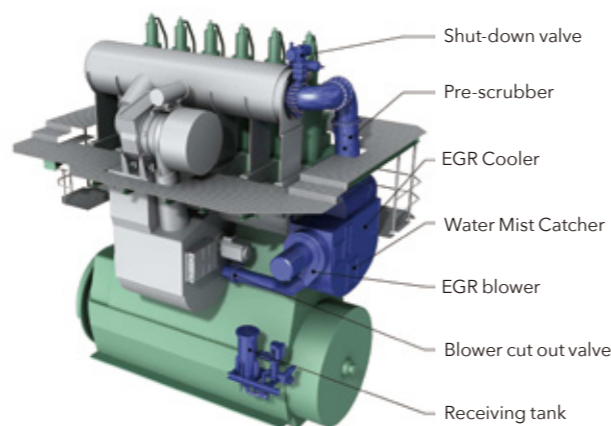
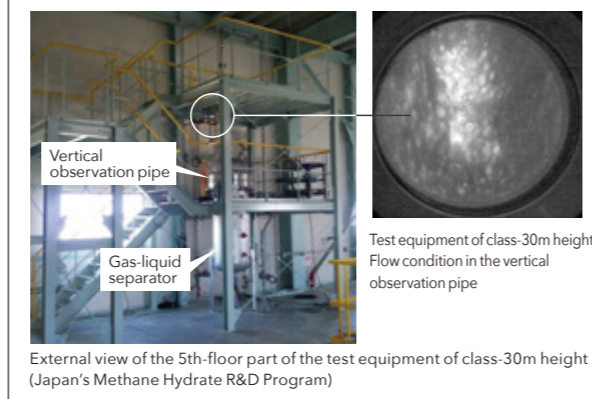
Initiatives in the Marine Logistics & Transportation domain

In the field of port cranes, we are tackling the development of low-profile container crane conformed to aeronautical height regulation with seismic isolator, which is located around the airport. Also we are developing light weight crane to minimize reinforcement of civil work for the existing quay, various technologies coped with terminal automation system, and other items.

In the field of merchant ships, we are developing new neo-series ships, or next-generation, environmentally friendly ships that reduce CO₂ emissions, and services of analyzing propulsive performance of ships in the commercial voyage. We are also working on technologies to improve the precision of the predictive calculation of flows done by using a computer (CFD) for highly efficient of ships.

In addition, in the field of two-stroke marine diesel engines

Development of system for producing methane hydrate under the ocean floor

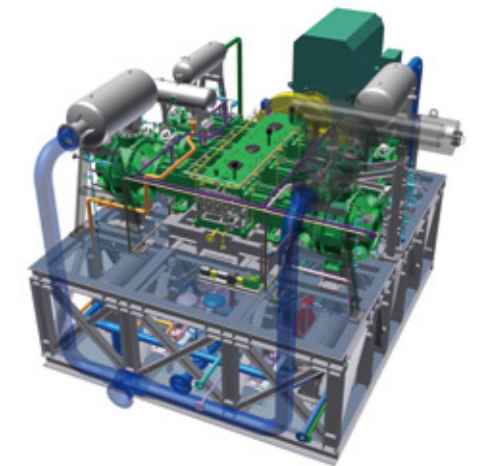


Integrated EGR layout for ME engine

we are developing exhaust gas recirculation (EGR) system to meet the current IMO NOx (Nitrogen Oxides) Tier III regulation. We are also working on a waste heat recovery system (THS) that uses hydraulic power and is capable of reducing fuel consumption and CO₂ emissions by up to 4%. In addition to these systems, we are developing an electronically-controlled dual fuel gas injection diesel engine (ME-GI) for liquefied natural gas (LNG) and ethane that allows for a significant reduction of sulfur oxide (SOx) and CO₂ emissions, fuel gas supply system (FGSS) for ME-GI, and an electronically-controlled dual fuel liquid gas injection engine (ME-LGI) for methanol and liquefied petroleum gas (LPG).

Initiatives in the Social & Industrial Infrastructure domain

We are developing radar inspection system for the maintenance of tunnels and roads, technologies for large-scale maintenance and repair of bridges, and other related technologies. In the field of industrial machinery, we are developing axial compressors for ASU (Air Separation Units) that compress air to separate oxygen and other elements from it.



FGSS high-pressure gas compressor for ME-GI

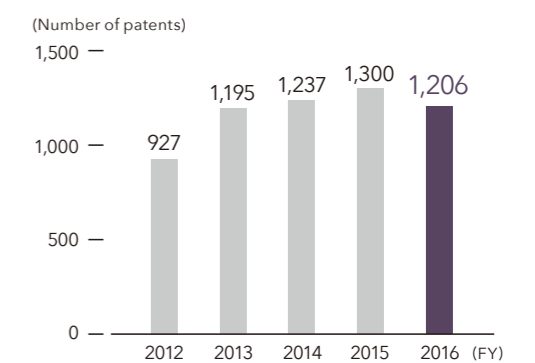
Intellectual properties

The basics of initiatives for intellectual property lie in securing a competitive edge for our businesses through the acquisition of intellectual property rights and their application. Intellectual Property Department and operational headquarters work together to promote the creation of intellectual property rights, such as inventions achieved through the development of products and technologies and trademarks attached to our products, and acquisition of rights over the properties and their application. The Legal Department, Intellectual Property Department, and related departments also work together to handle contracts and disputes with other companies regarding intellectual properties.

The intellectual property strategy cannot exist on its own, but must be implemented in an integrated manner with the business strategy and technological development strategy, forming the trinity strategy. While we are apt to feel that the rights are acquired as a result of achievements in technological development, we must fully consider how to acquire, protect, and apply technologies when we start developing a business or product. At MES, we always try to formulate and implement intellectual property strategy in this way.

In addition, in Japanese corporate society, where there is a tendency to avoid patent disputes, we have started to see a trend towards actively exercising intellectual property rights. This is believed to be the result of the great impact made by the progress of globalization. At the same time, however, it also reflects the fact that people are starting to have a greater awareness of how to apply these rights to gain profits. The importance of patent surveys and analysis, which aim to avoid infringing upon other companies' rights and exercise the intellectual property rights owned by MES, have been increasing, and we are taking measures to improve our capacity to conduct surveys.

Changes in the number of patents



Changes in the amount of R&D expenses

