

Business Segment Overview

Research & Development

We will contribute to enhancing the competitiveness of the Mitsui E&S Group's core products with technologies for design and manufacturing innovations.

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Research and development

To achieve the Mitsui E&S Group 2025 Vision, we make development efforts aimed at enhancing product competitiveness and expanding our businesses in the domains of Environment & Energy, Marine Logistics & Transportation, and Social & Industrial Infrastructure.

Our Action 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 (noah-FPSO) vessel for marine oil and gas, which will make it possible to respond to requests for delivery in a short turnaround period, and autonomous ship operation technologies. We are deepening the development efforts with the aim of putting them into practical use. We are implementing a joint research project in Team KUROSHIO, a team of eight organizations including the University of Tokyo, for the development concerning ultra-wide area high-speed seabed mapping. This project is now in its second year. Team KUROSHIO is the only team from Japan that has passed Round 1 and advanced to the final round in the international competition of mapping technologies (XPRIZE). We are also working on the development of a methane hydrate production system under the seabed. In the field of renewable energy, we are developing facilities including bottom-mounted offshore wind power generation facilities. In environmental plants, we are developing fermentation technologies 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. We have also developed a facility that generates power by using unused waste heat from medium- and small-sized waste incinerators.



Joint research project advanced to the final round in the international competition of ultra-wide area high-speed seabed mapping (XPRIZE).

Our Action Initiatives in the Marine Logistics & Transportation domain

In the field of port cranes, developments of quay cranes and container yard cranes with remote and automatic control are being made. In addition, container terminal automation systems are also being developed. In merchant ships, we are developing new neo-series merchant ships, we are developing new neo-series ships, or next-generation, environmentally friendly ships that reduce CO₂ emissions. We are also developing a route recommendation system that considers weather and sea conditions and services including those of analyzing the propulsive performance of ships on commercial voyages, using ship-land communication technology. In addition, we are proceeding with joint R&D activities for developing the technological concept of an autonomous ship with six organizations including the National Institute of



Container terminal automation system

Maritime, Port and Aviation Technology. These activities are aimed at achieving a safe, secure, efficient marine transportation system by introducing technologies for automatic and autonomous ship operations.

In the field of two-stroke marine diesel engines, we developed the high-pressure EGR that meets the current IMO Tire III emission regulation for NO_x (Nitrogen Oxides). We also launched dual fuel engines (ME-GI) with liquefied natural gas (LNG) and the same types of engines with ethane (ME-GIE) and methanol (ME-LGIM). A dual fuel engine with liquefied petroleum gas (ME-LGIP) is now under development. Those engines can comply with SO_x (sulfur oxides) emission regulations. The high-pressure LNG pump for fuel gas supply to ME-GI engines is introduced for LNG fueled ships.



An engine for large ships equipped with high-pressure EGR

Our Action Initiatives in the Social & Industrial Infrastructure domain

We are developing a radar inspection system for the maintenance of transportation infrastructure such as tunnels and roads, and also technologies for large-scale repair of bridges. In the field of industrial machinery, we are working on development of a new co-generation system with natural gas, which improves the energy efficiency of power generation and can spread distributed power supplies. The technologies of IoT are being introduced to increase the productivity in our factories and to operate machine tools efficiently.

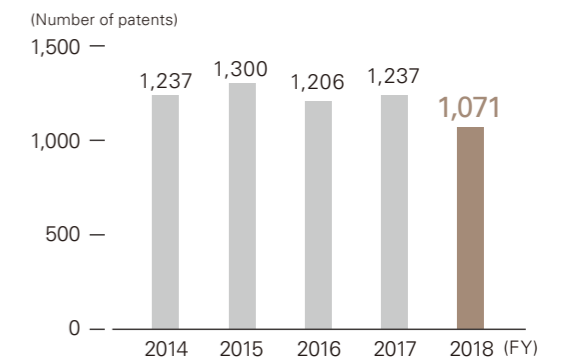


Tunnel Lining Scanning Car "Tunnel Catcher 3"

Intellectual properties

The basics of initiatives for intellectual property lie in securing competitive advantages for our businesses through the acquisition of intellectual property rights and the use of them. The R&D and IP Sect. and operational companies work together to promote the creation of intellectual property rights, such as inventions achieved through the development of products and technologies and trademarks affixed to our products, and the acquisition of rights over the properties and the use of them. The Legal Department, R&D and IP Sect., 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 a trinity of strategies. 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 Mitsui E&S, 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 use these rights to gain profits. The importance of patent search and analysis, which aim to avoid infringing upon other companies' rights and exercise the intellectual property rights owned by Mitsui E&S, have been increasing, and we are taking measures to improve our capacity to conduct searches.

The number of patents



The amount of R&D expenses

