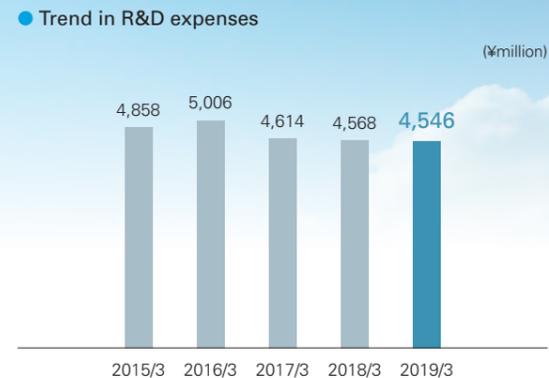


Research & Development

To achieve the Mitsui E&S Group 2025 Vision, we are working on developments to strengthen our product competitiveness and expand our business in the fields of Environment & Energy, Marine Logistics & Transportation, and Social & Industrial Infrastructure.



Environment & Energy

In order to make the offshore wind power generation business into a new business field, we are developing our own floating dock mooring system that will take advantage of our floating facilities and mooring technology. We are also carrying out research to apply the technologies built up so far in the field of ocean development to the development of ocean mineral resources and energy resources. As a part of this development, along with participating in research and development studies conducted by the government on technologies to recover shallow methane hydrate, in order for us to establish mining technologies, we have started working with MHWirth GmbH, a German company that provides industry-leading seabed drilling technology and services all over the world.

TOPICS

Utilizing the technology of the ocean autonomous surface vehicle (ASV) that can be used for seabed surveys and handling hazardous materials, we participated as a joint research team, Team KUROSHIO, on ultra-wide area high-speed seabed mapping technology, competing for the international Shell Ocean Discovery XPRIZE. In the final round held in December 2018 off the coast of Greece, we succeeded in obtaining a wide range of data on the ocean floor and finished runners-up in the competition.



Team KUROSHIO

Marine Logistics & Transportation

We are continuously developing new types of ship and energy-saving technologies in order to maintain and improve the Groups' specialist energy-saving strengths with regards to ships. In 2018, we developed the "neo87BC", an 87,000-ton post-Panamax bulk carrier that conforms to the Harmonized Common Structure Rules (H-CSR), putting it into the market. We have also participated in three Ministry of Land, Infrastructure, Transport and Tourism projects, including the autonomous vessel demonstration project to achieve a safe, secure and efficient marine transportation system through the introduction of automatic and autonomous navigation technology for ships, focusing on demonstration tests using actual ships. In the marine diesel engines industry, we started smart factory fundamental technology development to improve productivity by utilizing information and communication technology (ICT). We aim to eradicate overburden (muri),



Auto pier docking and undocking
Aiming for the practical use of auto pier docking technology for ships (You can watch video of the auto pier docking demonstration test)

https://www.mes.co.jp/press/2019/0711_001277.html

unevenness (mura), and waste (muda) processes and operations by improving efficiencies in the Group's supply chain. We also joined the Internet of Ships Open Platform (IoS-OP) for sharing and utilizing big data related to ship operations in the domestic marine industry, working to improve the environment for sharing and using big data in addition to remote diagnosis services and preventive maintenance services.

In the field of port cranes, a test Transtainer® (container transfer crane) and a 100 meter long testing area have been set up at Oita Works with operations having been started in October 2018. At the same time as automating new terminals and doing checks and testing for remote access and automation of existing cranes, we are building a total solutions package that connects different types of software including systems that operate and manage automated terminal equipment.



The Transtainer® and test area used for development work

Social & Industrial Infrastructure

In the field of social infrastructure, we have developed an electromechanical manipulator jointly with a German special manufacturer of manipulators for nuclear power, that employs the world's first sensorless control technology for decommissioning work which has a radiation resistance more than double that of conventional nuclear power manipulators. A remote system demonstration room has been set up at Tamano Works to strengthen and expand the remote control systems business. We are also working on the development of radar exploration technology for surveys and inspections as well as technology for large-scale bridge repairs in order to meet the needs for maintenance and repairs associated with aging transport infrastructure (tunnels, roads, bridges, etc.).



The remote system demonstration room



Tunnel Lining Scanning Car "Tunnel Catcher 3"

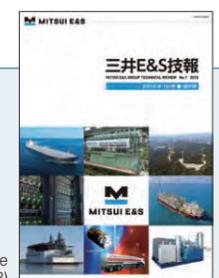
Mitsui E&S is working on the development of production, analysis, and AI technologies as its fundamental technologies across the Group. In production technology, we are improving productivity through technologies such as welding automation, automatic production plan creation, and 3D digital measurement. We are also visualizing processes using IoT, improving capacity utilization rates, and saving manpower. In analysis technology, we are providing design support through advances in coupled analysis that combines structural analysis, fluid analysis, and mechanism analysis. In addition to this, we are aiming to increase the added value of products through AI image recognition technology that utilizes open software.

TOPICS

Publication of Mitsui E&S Group Technical Review

In continuing with the tradition of the Mitsui Engineering & Shipbuilding Technical Review, the Mitsui E&S Technical Review, launched in 2018, introduces technology trends and case studies of companies in the Mitsui E&S Group. Since then, a printed version of the Mitsui E&S Technical Review (published once a year) is being published in tandem with the online version found on the Group's official website.

<https://www.mes.co.jp/solution/research/>



The first issue
(Published in October 2018)