

# Machinery

While aiming for business growth by expanding our product lineup we will strengthen the LSS\* business of the whole Group as a stable revenue base.

\*Lifecycle Solution Service

Mitsui E&S Machinery Co., Ltd.  
President and Representative Director  
**Takeyuki Takahashi**



### [ Environment Recognition and Challenges ]

Threats include rising material and equipment costs against pressure to lower product prices due to stagnant ship prices on the back of prolonged excess capacity. The challenge for us is the need to expand new products.

### [ Opportunities and Our Strengths ]

Our strengths include automation technology, environmental technology, repair and reinforcement technology, radar exploration technology as well as a solid track record in marine and industrial machinery, and advanced after-sales services using IoT and AI. We will continue to respond to demand for ships which meet tighter shipping regulations, demand for renewing aging social infrastructure, and demand for port cranes, particularly in emerging countries.

## Business Environment and Performance

With regard to marine diesel engines, the demand-supply gap for shipping tonnage has yet to be eliminated and the environment for receiving new orders continues to be tough due to rising material and equipment costs. However, production volume increased to 164 engines at 3,890,000 horsepower, achieving cumulative production of 100 million horsepower in June 2018.

In industrial machinery, an order was received for two blast furnace blowers and one top pressure recovery turbine for a steelworks in India, where there is remarkable growth in crude steel production. In addition, we have developed a new 1,000kW class small gas turbine, receiving an order for the first unit in March 2019 with an eye towards increasing sales in the future.

As for cranes, this fiscal year we received orders for large-scale projects in Indonesia and in the South American country of Ecuador, as demand for container cranes remained steady in emerging countries such as Southeast Asia and

Africa. But amount of orders received decreased due to implementation delay of other large-scale overseas projects.

In social infrastructure, orders were strong particularly for new bridges and seismic upgrading of bridges for highway companies. Orders received and net sales increased in the LSS business, centered on after-sales services (Life-cycle Solution Service and Customer Oriented Service) due to steadily increasing orders for diesel parts, an increase in the number of inquiries for periodic inspections and repair work on industrial machinery for steelworks and oil refineries, and due to the relocation and dismantling of existing cranes accompanying the construction of new container cranes, and repair work so that cranes can continue to operate smoothly.

As a result of the above, orders received for the current fiscal year were ¥185.3 billion, on par with the previous fiscal year. Net sales increased ¥5,201 million (up 2.9%) to ¥186.9 billion, and operating income decreased ¥1.1 billion (down 9.9%) to ¥10.2 billion.

## Business Revival Plan

The business environment is still experiencing a slow recovery in ship prices, and it is expected there will be strong pressure to reduce product prices overall. Under these circumstances and along with expanding our lineup of high-value-added products, we will continue to reduce costs and streamline business processes, including in design, aiming to improve both operating income and increase orders. For the whole Group, we will strengthen the LSS business following customer products throughout the lifecycle, pushing on with expanding our stable revenue base.

In terms of initiatives in each business, we are moving forwards with expanding our production facilities in marine diesel engines due to the growing interest in fuel diversification mainly for gas fuels in response to SOx regulations and greenhouse gas reduction measures, in addition to the sudden increase in inquiries for engines that need to comply with Tier III NOx regulations. As for industrial machinery, in addition to expected replacement demand in the high growth period of the domestic market, demand is expected for blast furnace blowers and top pressure recovery turbines for steel-related facilities in India where they have a government-backed goal of tripling crude steel production in 2025. Inquiries for reciprocating compressors in petroleum refinery equipment are also increasing so we will strengthen our

response to these.

Regarding cranes, seizing Southeast Asia as an important market, we continue to receive orders in the Philippines, Vietnam, Cambodia and other countries in the region based on our wealth of experience delivering results in Malaysia, etc., and we are also steadily increasing our track record in Indonesia where they have plans to become a maritime nation. Production of crane parts has started at PT. MES Machinery Indonesia, an overseas production base established on Batam Island in Indonesia in March 2018, and, in the future, we plan to manufacture whole yard cranes for containers, expanding our production facilities, such as machining equipment.

With regard to social infrastructure, along with focusing on projects such as replacing floor slabs for bridges, etc., we are expanding our business by utilizing our uniquely developed radar exploration technology, a tool for assessing the degradation and damage of tunnels, roads and bridges, etc. Furthermore, remote-controlled robots used in harsh environments, such as in decommissioning work, are now also at a practical level, so much so that a demonstration room will be set up in Tamano with an eye towards expanding our sales activities widely in the future, not just for decommissioning work.

### TOPICS

## Succeeded in a joint development of the world's first highly radiation-resistant decommissioning robot using sensorless control technology (A1000SL series)



The world's first robot for decommissioning work (A1000SL series), which uses sensorless control technology with a resistance to radiation more than double that of previous models, was jointly developed with German company Wälischmiller Engineering.

This robot series aims to achieve a radiation dose target of 10kGy/hour with a total dose value at 2MGy for decommissioning the Fukushima Daiichi Nuclear Power Station. After around three years of development efforts, Mitsui E&S Machinery and Wälischmiller Engineering succeeded in improving the radiation resistance of all the parts of the robot, developing a control system that does not require a position sensor (sensorless control system). The radiation resistance has been doubled from the previous 1MGy to 2MGy and the number of wires needed for each unit has been halved.

### <Features of the A1000SL series>

Can be applied to a variety of uses in decommissioning work, easily adaptable to specification changes. In July 2019, we set up a remote systems demonstration room for decommissioning work, showing what the robots, including the A1000SL series, can do when it comes to decommissioning work.



A manipulator for HD06 decommissioning