Technical Review Special Edition: New Products and Technologies

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Welcome to the special edition of the MHI Technical Review featuring our new products and technologies.

Mitsubishi Heavy Industries, Ltd. (MHI) aims to grow as a corporation that contributes to the advancement of society and industry through our comprehensive and deployable state-of-the-art technologies and engineering capabilities, which are required in the global marketplace. In order to achieve this goal, we have been aggressively pursuing a major corporate transformation. Two years ago, we embarked on a series of measures such as accelerating our global business expansion and maximizing the powerful synergy of the MHI Group through the integration and reorganization of our businesses into four domains. As part of this transformation, MHI created a comprehensive research center by consolidating the five existing R&D centers. Research duties are performed by 10 departments organized based on field of technology. MHI looks to respond more swiftly and dynamically to the rapidly changing needs of society and to develop next-generation technologies and products by fully utilizing our comprehensive and proven technological capabilities. With our products and innovations, we aim to bolster our global competitiveness and make ongoing contributions to society.

As recent examples of this initiative, this special edition introduces 22 new products and technologies.

Starting with the energy and environment businesses, we discuss a service robot developed based on data obtained at the Fukushima Daiichi Nuclear Power Station, high-efficiency gas turbine technologies (advanced materials, manufacturing, combustion, heat transfer and blade tip timing measurement), material development for a 700°C-class A-USC boiler, non-destructive testing for thermal power plants and a wastewater spray dryer for desulfurization plants. Also described are a binary geothermal power plant, an SOFC-micro gas turbine hybrid system and a waste heat recovery system for marine vessels that utilizes low-temperature heat sources.

For the commercial aviation and transportation businesses, a CFD analysis method for the unsteady vortex flow that occurs at the trailing edge of propeller blades of vessels, a new carriage for the "Yurikamome" automated guideway transit system and a safety evaluation on the explosion-proofing of main wing fuel tanks in aircraft against lightning strikes are introduced.

For machinery, equipment and infrastructure businesses, a wall-mounted, high-capacity air conditioner that is compatible with global requirements and specifications, a high-efficiency heat pump system that uses sewage heat as a heat source, a turbo chiller equipped with low-GWP refrigerant and an overview of Mitsubishi Heavy Industries Machine Tool Co., Ltd., which began operations on October 1, 2015, are also introduced.

Lastly, innovation of design and development process using structural optimization technology, high-precision motion prediction based on large-scale multi-body dynamics simulation, transmutation reactions induced by deuterium permeation through nano-structured multilayer thin film, the stabilization of motion control systems with a rate limited actuator and flexible thin-film ultrasonic sensors with high temperature resistance are discussed.

We deeply appreciate your ongoing support and understanding in our quest.