

Unrivaled on the World's Seas

PROJECT

MEET NEWS

Mitsubishi Marine Energy & Environment Technical Solution-System

20

20th Issue
Oct. 2021

Special Feature: Decarbonization Promotion Project

Delivery of the First Retractable Fin Stabilizer Assembled in China Completed

Marine Boilers Achieved 6,000 units Cumulative Delivery

Successful Turbine Operation – Cryogenic Power Generation System

Delivery of MET Turbochargers for the Main Engines (WinGD X-DF2.0iCER) of LNG-Fueled Car Carriers

Top Share in the World Achieved in Turbochargers for the Main Engines of Mega Containerships

Inspection of MET Turbocharger Gas Casing Lagging

Busan Office Information

Mitsubishi Heavy Industries Machinery Systems Consolidates Business Locations

Special Feature: Decarbonization Promotion Project

Project “MaTIS” Commences

Last time, in Issue 19 of MEET News, we announced that the Mitsubishi Heavy Industries Group had launched a joint project that integrates the state-of-the-art marine engineering technologies of Mitsubishi Shipbuilding (MHI-MSB) and the marine machinery technologies nurtured over the years by MHI Marine Machinery & Equipment (MHI-MME). The objective is to create and provide new solutions toward decarbonization of the maritime industry.



Marine Machinery



Marine Engineering

More than Marine Technology More than Integration More than Solutions

The joint project was named “MaTIS,” an acronym that stands for “Marine Technology, Integration & Solutions.” The project will involve activities for providing added value that will indeed be “integration and solutions.” MaTIS activities will include joint development and joint marketing. Through such activities and projects, MaTIS will contribute to promote and to make deep dive into decarbonization of global shipping through collaboration with other MHI Group green energy businesses and CO₂ reduction technologies and products.

Partnering with the Maersk’s Research Center for Zero Carbon Shipping

As one of the MaTIS activities, last year, we became a founding partner of the Maersk Mc-Kinney Møller Center for Zero Carbon Shipping, which carries out studies and research for the promotion of decarbonization of the maritime industry. In this issue, we will introduce some of the projects that we are involved in with the Center.



Maersk Mc-Kinney Møller Center for Zero Carbon Shipping logo mark

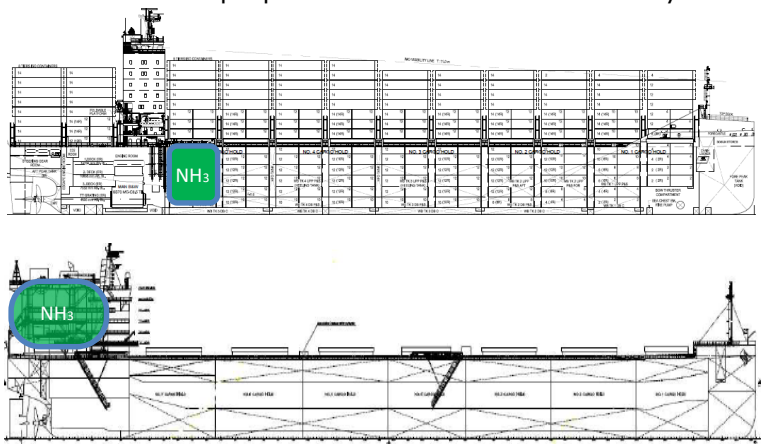
Ammonia Ship Safety Project

This is a project to develop guidelines for the safe use of ammonia (NH₃) as a maritime fuel. The project aims, through collaboration with the Lloyd's Register Group, for decarbonization of the maritime industry through the safe use of ammonia, for which there are great expectations as a long-term solution for maritime use. In addition to the MHI Group, other participants in this project include A.P. Møller-Maersk, MAN Energy Solutions, NYK Line, and Total S.A..

Green ammonia can be produced using green hydrogen (made from water electrolysis powered by renewable sources) and nitrogen. While it is a zero-carbon fuel, it is also extremely toxic as a fuel. That is why it is critical that guidelines for the use of ammonia as a safe, sustainable fuel are formulated after evaluating its risks for both people and the environment.

The maritime industry accounts for roughly 2.5% of the world's CO₂ emission amounts. As decarbonization efforts progress in other industries, there is a strong likelihood that the proportion of the maritime industry's CO₂ emissions will increase over the next few decades.

By utilizing the knowledge that we have accumulated through the MHI Group's experience in ammonia carriers and ammonia production plants, sharing knowledge with project partners, and combining it with efforts toward the resolution of issues, the MHI Group hopes to help accelerate the speed with which the safe use of ammonia as an alternative maritime fuel can be introduced. We will contribute to the further development of the maritime shipping industry as well as the reduction of its environmental footprint, which is a global issue.



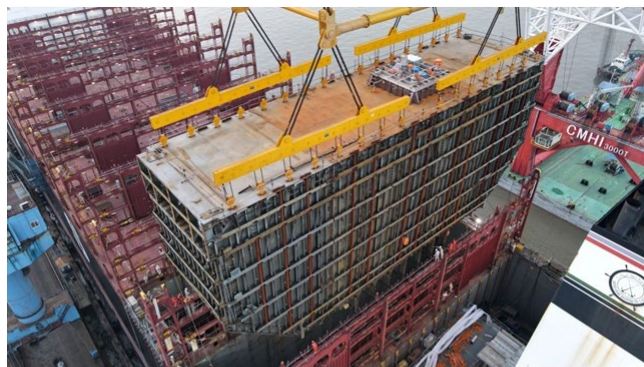
Fuel Conversion Optionality Study Project

This is a project for assessing the technical, financial, and environmental potential of converting existing vessels to zero carbon fuels. Other organizations participating in this study in addition to the MHI Group are A.P. Møller-Maersk, the American Bureau of Shipping, MAN Energy Solutions, NYK Line, Seaspan Corporation, Mitsui & Co., and Total S.A. Clarifying the roadmap to convert existing vessels fueled by fossil fuels to zero carbon fuels and bringing the challenges to the surface can lead to the reduction of vessel investment risks.

In addition to making technical reviews of the safety aspects related to decarbonization retrofits into ammonia, methanol and other next-generation fuel vessels or to the application of onboard carbon capture and storage, the project will also carry out financial evaluations, including conversion, technological investments, and fuel costs in addition to associated operating costs. There will also be environmental assessment that will cover the GHG reduction potential over the vessel lifecycle.

The MHI Group will leverage the technologies and expertise related to vessels, marine engines and marine machinery, which it has accumulated over the years. Through efforts made in collaboration with other partner companies to overcome issues, we will speed up the development of the fuel-supply and exhaust gas treatment systems that are needed for using alternate fuels.

By providing maritime solutions to the market, we will commit ourselves to the achievement of decarbonization of shipping and contribute to environmental load reduction on a global scale.



FIN STABILIZER DELIVERY

Delivery of the First Retractable Fin Stabilizer Assembled in China Completed

In July this year, MHI-MME completed the shipment and delivery to China Merchants Jinling Shipyard (Weihai) Co., Ltd., of the first retractable fin stabilizer (MR-3) for which assembly and operational construction were carried out in China.

Key components such as the fin, hydraulic unit, mechanical apparatus, and control assembly, which had been manufactured in Japan, were assembled to the fin box manufactured in China. The assembly and operational construction prior to shipment were handled by Jiangsu Masada Heavy Industries Co., Ltd., our partner (licensee) in China for MHI-MME steering gear. We used the good relationship that we had forged with them to establish a new scheme for producing fin stabilizers in China.

The establishment of a new production base for retractable fin stabilizers in China, in addition to our existing production base in Japan, will enable us to strengthen our retractable fin stabilizer sales negotiations for ROPAX, RORO, and other vessels manufactured by overseas shipyards, not only in China but also in Europe and elsewhere. Furthermore, we will also lead this move to sales promotions for large size fin stabilizers and the expansion of sales going forward.



Fin stabilizer assembly operation scene

BOILER DELIVERY

Marine Boilers Achieved 6,000 units Cumulative Delivery

MHI-MME reached total 6,000 units cumulative delivery of marine boiler on August 24 at shipment of MAC-B type auxiliary boilers for VLCCs being built at the Namura Shipyard.

Marine boiler is one of MHI-MME's major product in the business portfolio and it has more than 130 years history, starting with producing a scotch boiler in 1885.

MAC-B type auxiliary boiler with two drum-water tube type design has been produced since 1983 and total 2,275 units have been installed mainly for tankers over the past 40 years along with good reputation for its easy-to-inspect, easy-to-maintain structure and excellent durability features.

In order to accumulate further boiler deliveries and obtaining customer satisfaction, MHI-MME becomes more proactive in boiler business and, as examples of recent activity, has enhanced dual fuel fired boilers line up from small boilers to large boilers for offshore applications, launched the cylindrical type 25 t/h ~ 35 t/h oil-fired boilers, and strengthened relationship with Chinese licensee, CSSC Jiujiang Boiler Co., Ltd., as a subcontractor especially in Korean market.



6000th Boiler MAC-B Type

Successful Turbine Operation – Cryogenic Power Generation System

MHI-MME delivered a turbine for demonstration test of cryogenic power generation system for FSRU (Note 1) named as “Cryo-Powered Regas system” developed by Mitsui O.S.K. Lines, Ltd. (“MOL”) and Daewoo Shipbuilding & Marine Engineering Co., Ltd. (“DSME”) and confirmed its successful running at DSME’s Okpo shipyard.

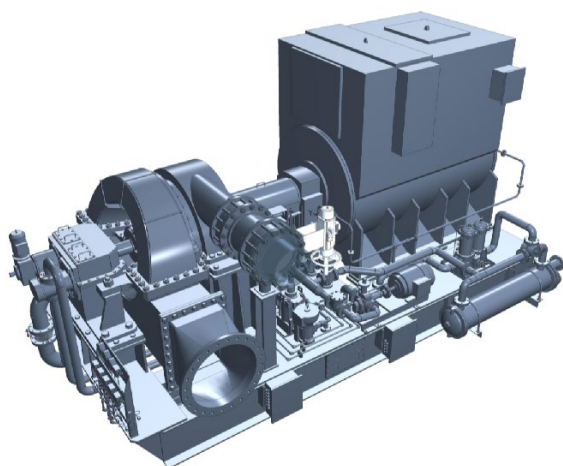
The role of an FSRU is to regasify -160°C liquified natural gas (LNG) through heat exchange. In the past, LNG’s cold energy had not been utilized in FSRUs and was released. By installing the “Cryo-Powered Regas” System, such cold energy will be transferred to another heating medium, and the generated steam will be sent to a turbine to generate electricity, which results in reducing FSRU’s fuel consumption and CO_2 emissions.

A small-scale version of the “Cryo-Powered Regas” system was built in DSME’s R&D premises. The turbine generator used in this system was designed and constructed by MHI-MME specifically for the system. Through this test, MOL and DSME verified that the system could successfully generate electricity up to its rated capacity. The result of this demonstration test confirms that through the utilization of the “Cryo-Powered Regas” System, fuel consumption and CO_2 emissions of new generation FSRUs can be reduced by 50% at maximum rated regas flow rate (Note 2) compared to conventional existing FSRUs.

Power generation by recovering waste energy including LNG latent heat in its regasification process is regarded as one of prospective measure to improve energy efficiency and realize low -carbon society, and MHI-MME proactively enhances its energy saving solution portfolio for marine use and contributes to further achievement of a low-carbon society.

(Note 1) Floating Storage Regasification Unit. A floating facility for storing and regasifying LNG, which is then pressurized and piped ashore.

(Note 2) Equivalent to 500 mmscfd (million standard cubic feet per day)



Turbine Generator external view



Cryo-Powered Regas logo

Delivery of MET Turbochargers for the Main Engines (WinGD X-DF2.0iCER) of LNG-Fueled Car Carriers

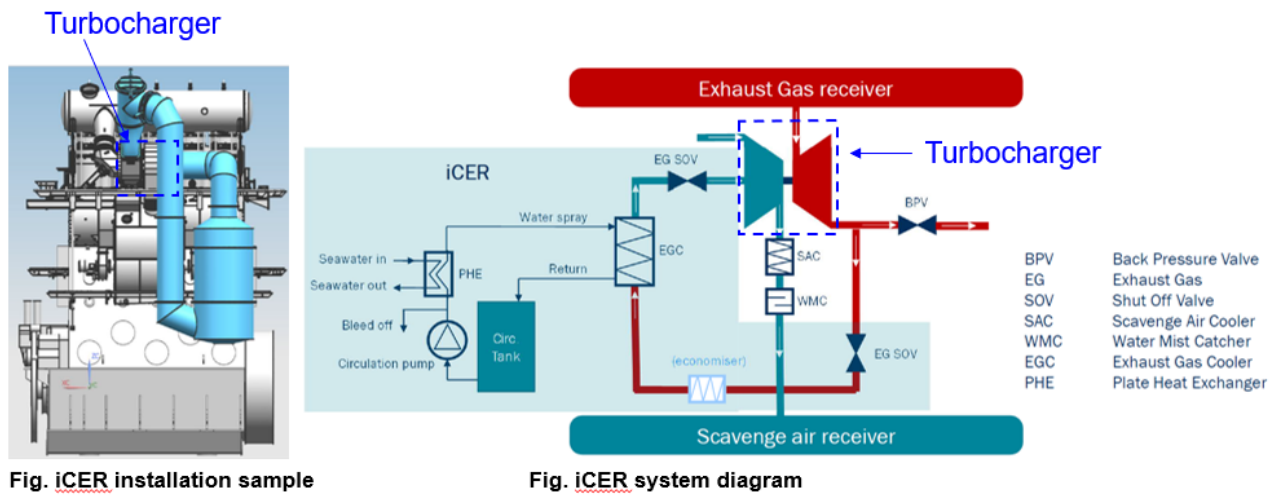
MHI-MME will be delivering MET71MB Turbochargers for the main engines of four NYK Line LNG-fueled pure car and truck carriers (PCTC) being constructed by China Merchants Jinling Shipyard (Nanjing) Co. Ltd.

The newbuild LNG-fueled PCTCs will be powered by the Winterthur Gas & Diesel (WinGD) 7X62DF2.1 low-pressure dual fuel engines built by CSSC-MES Diesel & Co., Ltd. (CMD), which is the first engine in the world to which X-DF2.0 technology with iCER (Intelligent Control by Exhaust Recycling) will be applied.



NYK Line's LNG-fueled PCTC

We developed a turbocharger for iCER that can deal with the liquid droplets and fuel residue that may come in from the intake side. The turbocharger is scheduled for delivery to CMD sequentially from December 2021. Going forward, we will contribute to the construction of vessels with a small environmental footprint through the provision of turbochargers that can respond to fuel conversion and meet advances in engine technology.



Reference Source : <https://www.wingd.com/en/>

MET TURBOCHARGER WORLD MARKET SHARE

Top Share in the World Achieved in Turbochargers for the Main Engines of Mega Containerships

MET turbochargers achieved the global top share in terms of the number of mega containerships (11,000 TEU or greater) ordered in 2021 with MET turbochargers installed for main engines. There has been a sharp increase in the building and maintenance of containerships due to such factors as the surge in consumer spending arising from people staying at home and spending. MHI-MME and our licensees are repeatedly receiving orders for large turbochargers to be installed on main engines. Of the 166 mega containerships (11,000 TEU or greater) ordered in 2021, decisions have already been made to install MET turbochargers on 73 vessels, with informal decisions to do so made for another 31 vessels. That brings the total secured to 104 vessels, or a share of 63%. (Note) We believe that the growth in the share of MET turbochargers among mega containerships is attributable to the following reasons. 1) MHI-MME offered turbochargers that addressed the technical challenges associated with fuel conversion and new engines. 2) In accordance with the growth in engine output resulting from the increasing size of containerships, we launched the MET90MB and the MET-MBII series. 3) We are maintaining good relationships with our customers through the after-sales services we offer after ships become operational. We will continue our efforts and will aim to achieve the top global share in all types of ships.

(Note) Source: MHI-MME survey as of the end of August 2021.



MET83MB turbocharger

Recommendation for Further Safe Operations: Inspection of MET Turbocharger Gas Casing Lagging

Gas casing laggings become degraded over time. If the hot surface of a casing becomes exposed due to breakage and other damage to the lagging, oil can adhere and create the risk of smoking or fire.

Such deterioration and risks may be pointed out during port state control and other safety inspections.

Periodic inspection and replacement as needed are recommended for the early discovery of the degrading of the lagging and appropriate replacement for the protection of crew members, as this can lead to safe operations.

The installation of the lagging for radial turbocharger models (MET-SRC series) can be carried out easily with a single touch and does not require the use of tools.

Please feel free to contact us (met-service@mhi.com) or the authorized repair agent (ARA) closest to you for further details.



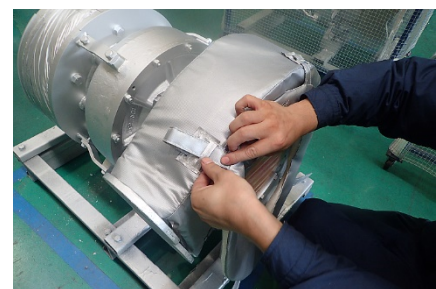
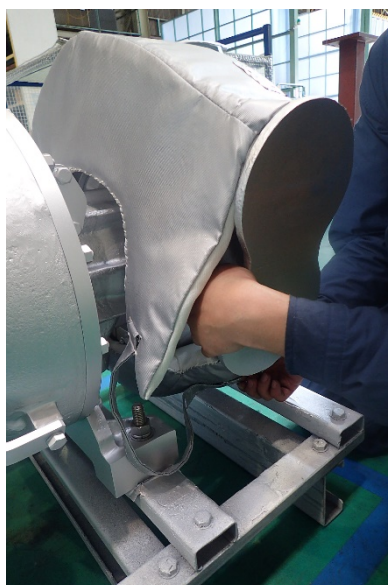
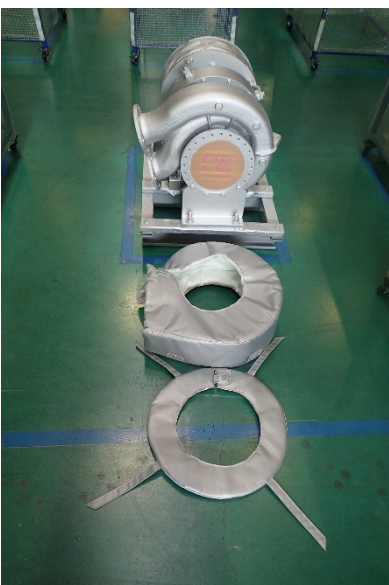
Degrading Example



The turbocharger is still being used with no lagging after its removal due to degrading

Using a casing with no lagging creates the risk of smoking or fire if lubricating oil or fuel oil adheres to the casing.

Recommendation: Inspection and replacement with a genuine product



Installation is extremely easy and **requires no tools**.

*Please carry out the inspection or replacement with the engine off and after it has cooled down.



Busan Office

MH Power Systems Korea. Ltd. (Busan office)

Address : 16F, Centum Science Park B/D,
79 Centum Jungang-ro, Haeundae-gu,
Busan, 48058, Korea
TEL: +82-51-442-5901
Mobile: +82-10-4483-2616
FAX: +82-51-462-7317

Greetings from Seokcheol Kim, Incoming Assistant General Manager:

I assumed my post at the Busan Office in South Korea in August this year as the successor to Mr. Makino, the previous manager. I joined MHI-MME in May 2011 and have been engaged in dealing with South Korean two-stroke engine customers as well as providing licensing-related support.

There is a large number of marine engines and ships built in South Korea, and the country is a strategic market for our products, with a large volume of the licensed production of MET turbochargers.

Because I am from South Korea, I will make the most of this posting in my home country and serve as a bridge between our customers in South Korea and MHI-MME products. I will leverage the business experience I have accumulated up to now. I will give my utmost to provide assistance to our customers and obtain their satisfaction, such as by utilizing my technical knowledge.

Greetings from Satoshi Makino, Manger

I completed my three-year posting to the Busan Office at the end of July this year and will be returning to MHI-MME.

Due to the rage of the COVID-19 pandemic since 2020, our lifestyles, including the way we work, underwent great change. There may have been instances in which our customers were inconvenienced, but I would like to thank everyone for their immense support and cooperation.

After returning to Japan, I will be involved in the design of turbochargers. I will commit my efforts to designing better products while making the most of what I learned and experienced in South Korea. I look forward to your continued patronage of MHI-MME and my successor here in Busan.

DECK CRANE & DECK MACHINERY INFORMATION

Mitsubishi Heavy Industries Machinery Systems Consolidates Business Locations

In April 2019, Mitsubishi Heavy Industries Machinery Systems (MHI-MS) consolidated the production site of deck cranes to Jiangsu Masada Heavy Industries Co, Ltd., (Nantong City, Jiangsu Province, China), shifting to a system of supplying products through engineering. With this systemic shift, the design, manufacturing control, sales, and services functions have been consolidated from Shimonoseki to the MHI-MS head office in Kobe, Japan.

MHI-MS possesses a wide-ranging product portfolio and technological capabilities, including testing devices, printing and packaging machinery, food and packaging machinery, and traffic management systems. With this consolidation, MHI-MS will make the most of synergies with other products and promote the utilization of IoT and the development of green products, thereby speeding up the creation of next-generation products.

For inquiries, contact: Mitsubishi Heavy Industries Marine Machinery & Equipment Co., Ltd.



S-SERIES



S-SERIES CONNECTED