

Only One to the Seas of the World

**PROJECT**

# MEET NEWS

Mitsubishi Marine Energy & Environment Technical Solution-System

07

7th Issue  
April 2015

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## First UEC50LSH-Eco Engine Completed

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Leading the Maritime Shipping Industry with the World's  
First LNG-Ready Ultra Large Container Vessel

[UASC]

Assistant Vice President, **Mohamed M. Zaitoun**

# The Daybreak.

UE Engines: Development of the Latest LSH Series Engine

# First UEC50LSH-Eco Engine Completed

## Development of the State-of-the-Art UEC50LSH-Eco Engine Completed

MHI-MME has been offering a lineup of UE engines with cylinder bores of between 33 cm and 85 cm through the existing LSH and LSE series. The engines, which have been installed in various types of ships, both small and large, have acquired a good reputation.

Meanwhile, the market needs of recent years have been diverse, with customers seeking greater fuel efficiency, optimization for slow steaming, reduced engine speeds and greater compliance with emissions standards.

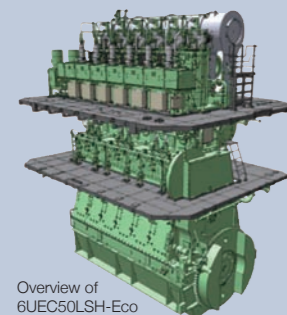
To meet such needs, MHI-MME had been developing a state-of-the-art engine that incorporates all of the advanced technologies that the company has nurtured over the years. The latest UE engine series was named UEC-LSH, with development of the first in the series – the UEC50LSH-Eco – finished and production of the first such engine, which order was received by Kobe Diesel Co., Ltd., an MHI-MME licensee, recently completed.

In designing the UEC50LSH-Eco engine, MHI-MME began considering principal particulars on the basis of thorough market research. As a result, the engine power output and speed were adjusted to those suitable for chemical tankers, handymax bulk carriers, supramax bulk carriers and medium range tankers. The principle particulars of the UEC50LSH-Eco are shown in Table 1.

The new engine shows, as a stand-alone unit, an improved fuel consumption rate as compared to the engines of competitors. Further fuel efficiency has been achieved through the enhanced propeller propulsion efficiency of long-stroke, low-speed engine operation.

## First UEC50LSH-Eco Engine Completed Ship Powered by the Engine Slated for Service in September 2015

Three orders for the UEC50LSH-Eco have already been received by Kobe Diesel Co., Ltd. as the main engine of chemical tankers. Shop testing of the first 6UEC50LSH-Eco was completed in March after undergoing verification test. Assessment and verification was carried out on such items as the engine's performance, reliability and vibration, and the engine was tweaked to an optimal stage before being delivered to the customer.



Overview of 6UEC50LSH-Eco

The tanker powered by this engine is slated to go into service in September 2015, and it is expected to exhibit the performance defined in its development concept. The concept will be incorporated into other engines that will follow the UEC50LSH-Eco, with MHI-MME and its licensees offering the LSE and LSH series engines.



First 6UEC50LSH-Eco engine

Table 1. Principal Particulars of the UEC50LSH-Eco Engine

Type		6UEC50LSH-Eco-C2
Cylinder bore	mm	500
Piston stroke	mm	2,300
Stroke / bore	—	4.60
Engine output	kW	10,680
Engine speed	min-1	108
Mean effective pressure	MPa	2.19
Fuel consumption rate	g/kWh	164
Weight	Ton	225

### Energy-saving and Environmentally-friendly

- Overwhelmingly low fuel consumption
- Slow-steaming capable
- New-concept electronically-controlled engine (Eco-engine)
- Cylinder oil reduction through the A-ECL oil lubrication system

### Easy Maintenance, High Reliability

- Extended maintenance intervals
- Proven, new-concept combustion chamber structure
- Engine diagnostic system available (option)

### Compact Engine for Versatile Rigging

- More compact than same-class competitor engines
- Wide rating settings (capable of a wide range of engine outputs and speeds)
- Low vibration (minimizes the need for additional antivibration measures)
- Reduced auxiliary engine bulk as compared to same-class competitor engines
- Reduced electronic-control related wiring and devices

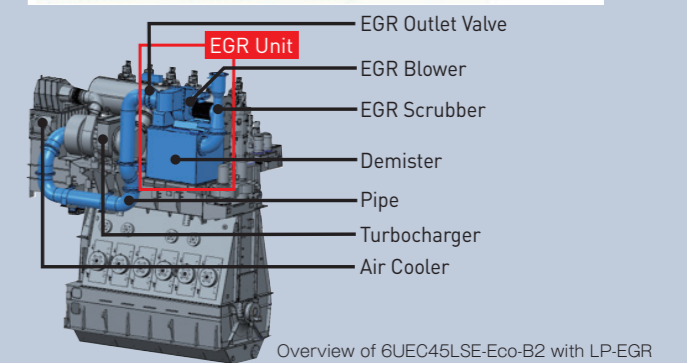
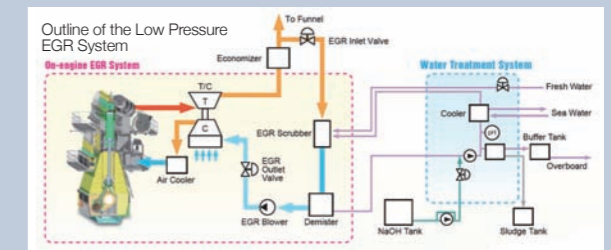
IMO NOx Tier III Compliant Technology

# Preparation for Onboard Test of Mitsubishi Low Pressure EGR System Steadily Underway

The Low Pressure EGR (Exhaust Gas Recirculation) System enables compliance with IMO NOx Tier III regulation, which will be applied to ships keel laid on or after January 1, 2016. By recirculating a part of the exhaust emitted by an engine, the generation of NOx is suppressed by changing the combustion conditions within the engine.

MHI-MME's EGR is a low-pressure EGR system that recirculates low-pressure exhaust from an engine turbocharger outlet to the turbocharger intake gas. Its advantage is that it keeps both initial and running costs lower than a high-pressure EGR system, which utilizes high-temperature high-pressure exhaust from a turbocharger intake.

MHI-MME is currently preparing for onboard test in collaboration with Shikishima Kisen K.K., Nippon Yusen Kabushiki Kaisha / NYK Bulk & Projects Carriers Ltd., The Hakodate Dock Co., Ltd. and Mitsubishi Kakoki Kaisha, Ltd. under the ClassNK's "Joint R&D for Industries and Academic Partners" scheme and utilizing an engine constructed by Kobe Diesel Co., Ltd. Optimization of the overall EGR system, including the water treatment system, will be carried out in addition to efforts to make the system more compact as well as to establish optimal operating parameters. Going forward, the plan is to obtain a NOx Tier III certification during shop test in April 2015. This will be followed by onboard test beginning in August, with long-term durability test commencing after the delivery.



## NEW LICENSEE CONTRACTED

MHI-MME Concludes License Agreement with

# Changzhou Zhonghai Marine Propeller Co., Ltd. of China



Signing ceremony

MHI-MME has granted licenses for a variety of marine machinery, such as 2-stroke low-speed engines, marine auxiliary boilers, marine turbines and steering gears, to Chinese companies. In response to Chinese marine market demand, the company recently concluded an agreement with Changzhou Zhonghai Marine Propeller Co., Ltd. ("CZZH"), a private Chinese marine propeller manufacturer, for the domestic manufacturing and marketing of MHI-MME marine propellers. The agreement was signed on October 21, 2014.

CZZH is an independent corporation with headquarters in the city of Changzhou in Jiangsu Province. After establishment in 1992, the company launched operations manufacturing ingots, shifting to propeller manufacturing in 2006. The company established a new plant in March 2014, and CZZH

currently has a propeller production capacity of nearly 5,000 tons per year.

The objective of this licensing agreement is to expand the reach of MHI-MME marine propellers in the Chinese market. MHI-MME's state-of-the-art propeller design has improved propulsion efficiency by 2% to 6% as compared to conventional propellers. The technology will be combined with CZZH's competitive manufacturing strengths to bring about synergy for the supply of MHI-MME propellers to China.

CZZH received its first order of MHI-MME licensed propeller in December 2014, shortly after concluding the license agreement. Shipment is scheduled for June 2015.

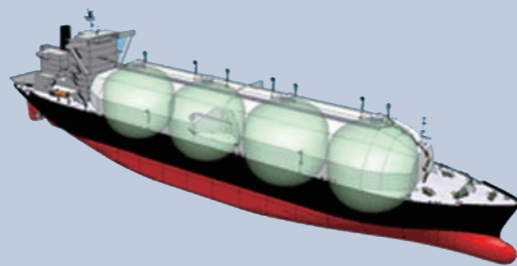
Starting with this order receipt for the first licensed propeller to be manufactured by CZZH, MHI-MME plans to maintain and develop a friendly collaborative relationship with CZZH with the aim of further recognition of MHI-MME and strengthening the Mitsubishi Marine Machinery & Engine brand in China.



CZZH plant

# Mitsubishi Heavy Industries Completes Development of Next-generation LNG Carrier “Sayaringo STaGE”

MHI-MME to Supply the Main Turbine, Main Boiler, Auxiliary Boiler and Exhaust Gas Economizer for the UST to be Installed on the Ship



Mitsubishi Heavy Industries recently completed development of the “Sayaringo STaGE.” The next-generation twin-screw LNG delivers much higher performance with fuel saving of over 20%, including better propulsion efficiency, as compared with the existing state-of-the-art single screw LNG carrier, Sayaendo / UST.

STaGE is an acronym for Steam Turbine and Gas Engine. It is a next-generation propulsion plant for large 180K Class twin-screw LNG carriers. The portside is powered by an Ultra Steam Turbine plant (UST), which is a reheat-regenerative steam turbine plant, while the starboard side is powered by a dual-fuel diesel engine (DFDE). The UST-DFDE hybrid propulsion system allows the waste heat from the exhaust gas and jacket water of the DFDE to be used for feed-water heating and as auxiliary steam. It improves the efficiency of turbine plants and achieves higher economy performance.

What is more, the number of engine cylinders is half that of twin-screw DFDE ships. This decreases the DFDE’s maintenance costs as well as lubricating and pilot oil (marine gas oil), also by about half.

There is also greater freedom in fuel selection. The propulsion system can be fired by gas in all operating modes including “harbor” mode, and even in “port” operation.

Sayaringo STaGE will be put to service for the Cameron LNG Project in the U.S. It is attracting much attention as a carrier that accomplishes the safe and efficient transport of shale gas.

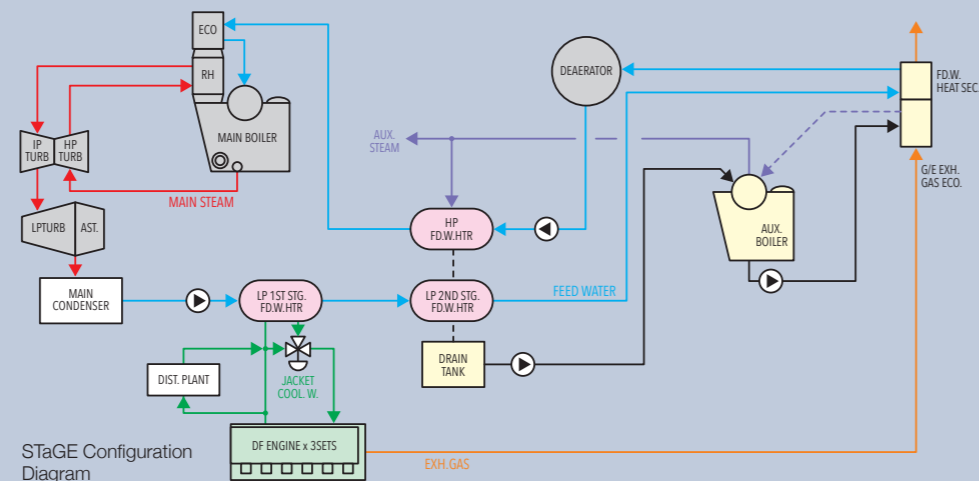
MHI-MME is supposed to supply the main turbine, main boiler, auxiliary boiler and exhaust gas economizer for the UST to be installed on the Sayaringo STaGE.

**[MR21-II Main Turbine (Portside Screw) (1Unit)]**  
The MR21-II UST turbine is the optimized model of UST geared toward STaGE, and the downsizing is achieved while retaining all the state-of-the-art performance enhancing technology of the existing UST turbine (MR36-II) for single-screw UST ships. It is a compact, higher performance UST turbine to which further improvement has been introduced with the proven design and reliability of the existing UST turbines.

**[MBR-1E Main Boiler (1Unit)]**  
The MBR-1E UST boiler, which is optimized for a maximum evaporation rate of 40 tons per hour, has been adopted with the further fuel efficiency achieved through STaGE. The high-temperature high-pressure boiler (10MPa class) features steam conditions comparable to those on conventional UST ships, and a reheater that reheats exhaust from the high pressure turbine is installed at the boiler outlet.

**[MAC-30BF Auxiliary Boiler (1Unit)]**  
The MAC-30BF auxiliary boiler comes fully equipped with a mixed-fuel combustion burner for treating the boil-off gas unique to LNG ships. It is a low-pressure boiler (2MPa) that can safely treat all boil-off gas released by LNG tanks. It can also be used as a steam separator for the DFDE exhaust gas economizer. It can be used to reheat exhaust gas if the DFDE load is low and there is not enough steam coming from the exhaust gas economizer.

**[Exhaust Gas Economizer]**  
The exhaust gas economizer recovers waste heat from the DFDE. It consists of two blocks, with the high-pressure evaporation block closest to the high-temperature gas, followed by the feed-water heating block. The saturated steam from the high-pressure evaporation block uses the auxiliary boiler as a steam separator and goes to the auxiliary steam system. Meanwhile, condensate is reheated by the feed-water heating block and sent to the deaerator.



## USER CONFERENCE HELD

### User Conferences Held

in Singapore, Imabari and Tokyo

MHI-MME holds user conferences around the world as opportunities to directly hear customers’ views. The second user conference in Singapore was held in 2014. The conference was well received, with booths set up for individual consultations in addition to the presentations.

In Japan, many customers visited user conferences held in Imabari (February 2015) and Tokyo (March 2015), where the latest maintenance and inspection services were introduced in addition to other topics.



## Contributing to Safe Operations and Environmental Protection through High Technological Capabilities Leading the Maritime Shipping Industry with the World’s First LNG-Ready Ultra Large Container Vessel



### [UASC] Mr. Mohamed Zaitoun

Interviewee: Mohamed M. Zaitoun, Assistant Vice President, New Building Technical Projects, United Arab Shipping Company S.A.G. (UASC)  
Interviewer: Tomoo Kuzu, Vice President, Head of Business Development, Mitsubishi Heavy Industries Marine Machinery & Engine Co., Ltd.

— Today, we would like to ask you some questions about the LNG-ready container vessel that is owned and operated by the United Arab Shipping Company (UASC). But first, can you tell us about your background in the maritime shipping industry?

that I was involved in as a member of new-building teams were for eight 7,000 TEU container ships built by Hyundai Heavy Industries. Later, I was involved as team leader in the construction of nine 13,500 TEU container ships built by Samsung Heavy Industries. That means I have been involved in new build projects for a total of 17 vessels in the past. I am currently serving as the head of new building team for the construction of an 18,000 TEU container ship and a 15,000 TEU container ship.

**M. Zaitoun:** I see this interview as symbolic of the excellent business relationship that UASC and MHI-MME have been enjoying for many years.

As for my professional background, I have been working at UASC as an engineer for 27 years now. My primary duties are in the construction of new vessels. Recent new-building projects

In recent years, UASC has been increasing the size of its fleet significantly. As we do so, we have placed great value on the concept that it is none other



Mr. Mohamed Zaitoun



**The World’s First LNG-Ready Ultra Large Container Vessel Built Energy Efficiency Design Index (EEDI) Values that Are Significantly Below the EEDI Limit Achieved through Installation of a Waste Heat Recovery System (Mitsubishi Energy Recovery System)**

## Manufacturers and Suppliers Are “Partners” Goals Presented at Workshops Deliberations Draw Out the Best of the Best

than high technological capabilities that allow contributions to be made to safe operations and environmental protection. Monitoring the state-of-the-art technology installed in our vessels makes more cost efficient operations possible.

—It’s just as you say. In relation to your last comment, I’d like to ask you about the world’s first LNG-ready ultra large container vessel.

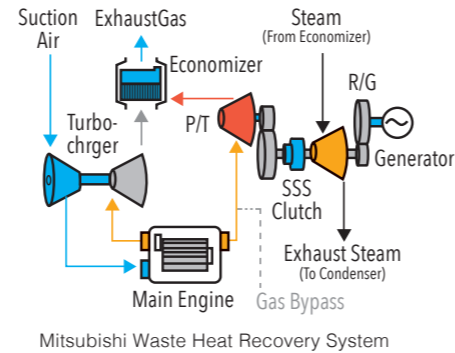
The naming ceremony for the MV Sajir, the first LNG-ready ultra large container vessel in the world, was held in November 2014 at Hyundai Heavy Industries. Our executives were also invited to the ceremony, for which we would like to thank you again.

The Sajir is a 15,000 TEU container ship. Your company’s new-building program calls for a total of 17 new vessels to be built—six 18,000 TEU container ships and eleven 15,000 TEU container ships—and this includes the Sajir. I understand that state-of-the-art technology is being incorporated in these new builds so as to enable cost-efficient operations and reduced

environmental footprints. In particular, you announced that the Sajir achieved a phenomenal EEDI value that is 50 percent lower than IMO 2025 requirements. However, calculations based on the Sajir’s exhaust heat recovery plan show that the container ship actually achieves an EEDI value that is more than 60% below IMO 2025 requirements. Is this not the case?

**M. Zaitoun:** You are absolutely correct. The decision was made by order of the CEO to understate the number. The important thing is that our vessel passes the EEDI requirements. This is because that is what attests to the fact that UASC is a shipping company that is taking the initiative in lowering environmental footprints.

It is an indisputable truth that the MHI-MME’s waste heat recovery system plays a major role in the achievement of the value mentioned. Being able to reduce the Sajir’s EEDI values to this extent through the mobilization of high technological capabilities was realization of our management philosophy.



—Could we consider it, then, that the waste heat recovery system delivered by MHI-MME served an important role in the achievement of this groundbreaking performance value?

**M. Zaitoun:** There is no mistake about that. With the waste heat recovery system delivered by your company at the head of the list, the results mentioned were enabled through the collective know-how of companies with their differing histories and experience in their respective fields—namely, MAN Diesel & Turbo, Alfa Laval Alborg and Siemens, Kongsburg as well as the shipyard HHI and other equipment manufacturers.

We believe that such superb performance was drawn out as a result of the optimal combination of the aforementioned and MHI-MME played an important role to coordinate.

—Thank you very much for such wonderful words of praise.

Various companies came together in this project through the many workshops you led. I believe that in the background of the success of this project was your company’s skill in bringing multiple companies together to work like a

single factory through these workshops and making them function with extreme efficiency. Can you tell me the secret behind your success?

**M. Zaitoun:** In workshops, it is important that clear objectives are first established, and that those involved are all thoroughly familiarized with these objectives. This is followed by consideration of specifications for achievement of these objectives and goals. Of importance is that partners are brought into the workshops from the very beginning and discussions are carried out repeatedly in order to draw out results.

The companies that we select as our partners are suppliers and manufacturers that are highly recognized for their wealth of experience and superb track record. We sit at the same table as one and work together toward fulfillment of the same objective. It is only through such methods that a win-win relationship can be built.

For example, in the workshop to determine the specifications for the waste heat recovery system to be utilized on the Sajir, the precondition that we presented was “steaming at 13 knots.”

Of course, under ordinary circumstances, waste heat recovery systems do not operate during slow steaming at 13 knots. However, we wanted everyone there to recognize how far we were at that point in time from our goal. So, we purposely did not mention the engine load. Instead, we presented only the steaming speed to advance discussions. In other words, we communicated a message regarding our intention—that we wanted to operate the waste heat recovery system efficiently in a wide range of speeds, from slow steaming to operating at full speed.

As a result, a vessel with reduced fuel consumption at all speeds, from slow steaming to full speed operation, was

born. Although I cannot talk about specific amounts in regards to fuel and CO<sub>2</sub> reduction, what I can say is that they are remarkable amounts.



—How wonderful. Now, another characteristic of the Sajir is the long service life design of 25 years of more in navigating the Atlantic Ocean—the first for your company. The intent of this, too, is reduction of environmental footprints, isn’t it?

**M. Zaitoun:** The new-building team held repeated discussions to determine the long-service-life based specifications. We achieved it by making the hull structure one that is higher than the standard. This also leads to safer operation of the vessel.

—UASC received the Seatrade Global Performer Award in 2014. Can you tell us where your company is heading as a global container vessel company?

**M. Zaitoun:** I can’t go into much detail here, but my personal opinion is that we will continue expanding the business.

I think that we will be able to achieve a good position in the industry through construction of the 17 container vessels currently on order.

—We look forward to seeing it realized. As my last question, I’d like to ask you your thoughts regarding the future of IMO Tier III standards and fuel. Also, what kind of significance will they have for UASC, which already possesses an LNG-ready vessel?

**M. Zaitoun:** This is a very complex issue. First, there is the 2020 low-sulfur fuel regulation. Although its commencement may be postponed to 2025, in any case, ship operators and maritime shipping companies will have to rethink their strategies.

Another element is that the EU is promoting low-sulfur fuel regulations. Emission Control Areas (ECA) are becoming more extensive, with many countries now starting to apply it. With the trend moving toward low-sulfur fuel, shipping companies have to comply with regulations while also increasing economic efficiency. However, neither rules nor timing has been determined. With this said, shipping companies will have to eventually remodel their ships. It is in this respect that we already own an LNG-ready vessel.

We believe that taking action that looks ahead into the future will enable us to achieve a good position within the industry.

—That your company made your 15,000 TEU and 18,000 TEU container vessels LNG-ready ships attests to your foresight.

Thank you very much for this interview.



**Becoming One of the Global Container Vessel Companies of the World  
Contributing to Environmental Protection through  
High-Efficiency, Safe Operations that Lead the Industry**

Mitsubishi Heavy Industries Marine Machinery & Engine Co., Ltd.'s

## After-Sales Service Framework

MHI-MME has an after-sales service framework with an extensive worldwide reach. Services are provided around the world through the Mitsubishi Heavy Industries Group global network and Authorized Repair Agents (ARA), ensuring a reliable system through which customers can receive swift and appropriate services wherever they may be in the world. In particular, the service proposals reflect the know-how and experience that Mitsubishi Heavy Industries has accumulated through its history of over 130 years. MHI-MME can provide diverse services that meet every customer need.

Featured in this issue is MHI-MME's after-sales service proposals, with services introduced under the themes of "Operating Cost Reduction" and "Reliability Improvement." We have included service proposals that reflect the needs of the operating trends of recent years and can have an immediate beneficial effect.

If there are any services that interest you, please feel free to inquire with the MHI-MME service base closest to you, or send us an e-mail at [info\\_meet@mhi-mme.com](mailto:info_meet@mhi-mme.com).

## Reinforced Global Service Network

MHI-MME employees are stationed at major overseas offices in London, Singapore, Busan, Shanghai and Los Angeles. In April 2014, we implemented a further reinforcement of our service framework by increasing the number of employees in London, Singapore and Los Angeles. Please visit the MHI-MME website's After-Sales Services page (<http://www.mhi-mme.com/services>) for the latest list of MHI-MME service bases and details regarding our partners.



## Crew Training Programs

Enhancing the skills of crews is essential to ensure the stable operation of ships. MHI-MME offers various training programs for our customers' crews, helping them acquire the skills needed to respond swiftly and accurately in the event that a problem should arise while a ship is at sea. Please inquire with us for further details regarding individual training programs.

### ■ UE Engines (Kobe)

- [Example: Field training that includes classroom lectures]
- Machine-parts training (Basic course / Applied course) (5days)
  - Eco-system training (3days)



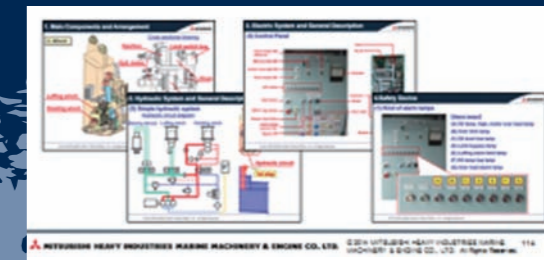
### ■ MET Turbochargers (Nagasaki)

- [Example: Field training that includes classroom lectures]
- Standard training (Overhauling) (3days)
  - Rotor balancing training (1 day)



### ■ Deck Cranes (Shimonoseki)

- [Example: Training carried out on-site at ship owner and management company offices]
- Basic training on general technology (classroom lecture)
  - Maintenance and troubleshooting training (classroom lecture)



## Proposals

## ■ UE Engines

## Operating Cost Reduction

## [A-ECL (Advanced Electronically Controlled Lubricating) System]

This is a system that efficiently lubricates the piston ring-pack during piston upstroke. It enables the reduction of cylinder oil consumption. During slow steaming in particular, the A-ECL system achieves a reduction of the cylinder oil feed rate through Pme control. This system can be retrofitted on an in-service ship.

## Operating Cost Reduction

## [SIP Mechtronic]

This is a system that electronically controls the Swirl Injection Principle (SIP) cylinder lubrication system on in-service ships. Like the A-ECL system above, it is a retrofit that realizes a reduction of the cylinder oil feed rate through Pme control, particularly during slow steaming.

## Reliability Improvement

## [Inconel-welded Piston Crowns]

Inconel is welded on to piston crowns to improve corrosion resistance. The speed of wear damage can be expected to be slowed down by about 40% over conventional piston crowns.

## Reliability Improvement

## [Piping for Scavenging Drain Oil Collection]

It becomes possible to collect scavenging drain oil from each pipe by retrofitting the piping with a three-way cock for drain sampling. The state of an engine can also be monitored by using a steel dust meter to check the ferric content of scavenging drain oil on a regular basis.



## ■ MET Turbochargers



## Operating Cost Reduction

## [VTI Turbochargers]

Fuel consumption can be reduced by retrofitting a conventional gas inlet casing & nozzle to VTI type (gas inlet casing with butterfly valve /corresponding nozzle) in order to make the gas flow area smaller and increase the scavenging pressure.

## Operating Cost Reduction

## [Turbocharger Cut-out]

This is an operation method for an engine with two or more turbochargers in which one of the turbochargers is cut-out during slow steaming operation. Scavenging pressure is increased, improving fuel consumption.

## Operating Cost Reduction

## [Hybrid Turbochargers]

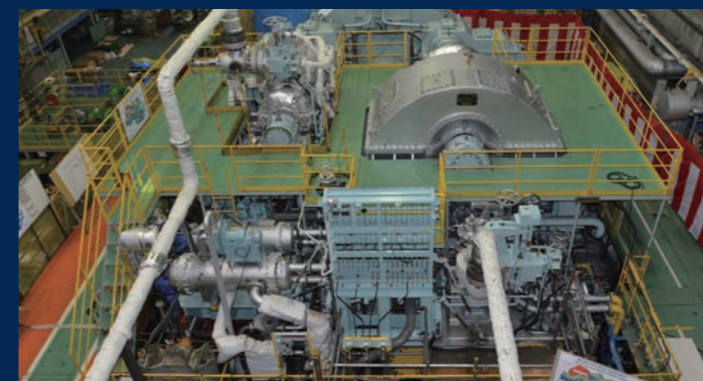
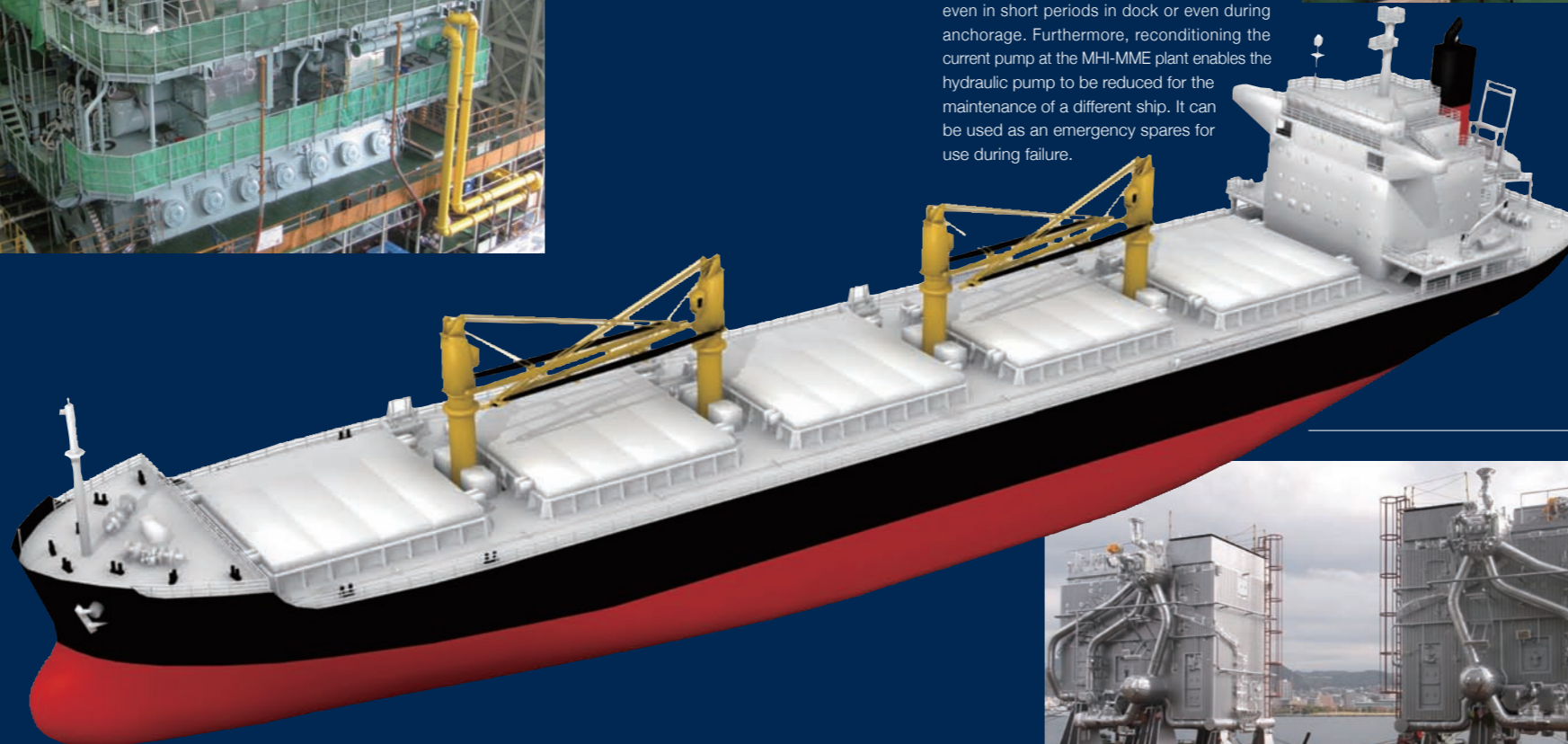
This is an MET turbocharger with a built-in high speed electric generator in the turbocharger silencer. Like conventional turbochargers, it can send supercharged air to the engine while also supplying all necessary power during ship operation through exhaust gas energy. Furthermore, operating this power generator as an electric motor during low-load operation provides more air to the engine in place of the auxiliary blower. The power required at this time is smaller than during auxiliary blower operation, resulting in high efficiency.

## ■ Steering Gears

## Reliability Improvement

## [Hydraulic Pump Exchange / Shore-based Maintenance]

Hydraulic pumps are at the heart of a steering gear. Maintenance is essential as aging deterioration of the sliding component can not be avoided. Exchanging the pump makes it possible to reduce the number of hours worked onboard a ship. Maintenance can be carried out even in short periods in dock or even during anchorage. Furthermore, reconditioning the current pump at the MHI-MME plant enables the hydraulic pump to be reduced for the maintenance of a different ship. It can be used as an emergency spares for use during failure.



## ■ Propellers

## Operating Cost Reduction

## [MAP Mark-W Retrofitting]

The Mitsubishi Advanced Propeller (MAP) Mark-W propeller can reduce fuel consumption through optimization to the slow steaming specifications being adopted in recent years by many ships. Propellers that are optimized for 100%MCR are installed when ships are built. These propellers are not optimal for slow-steaming under restricted main engine output. As one example, limiting the output of propellers, designed for 100% MCR when the ship was built, to between 85% and 50% MCR, and by exchanging them with the MAP Mark-W, which have been designed with a new design point, improvement in propeller efficiency (i.e. reduction of fuel consumption) of up to 10% can be expected. Furthermore, MHI-MME will purchase the propellers currently installed to help reduce initial cost.



## ■ Boilers

## Reliability Improvement

## [LSDO Remodeling]

Modification of combustion equipment, control system, etc. enables safe operation in Emission Control Areas even when using low-sulfur fuel with a significantly low sulfur content of less than 0.10%. MHI-MME has enough experiences of the modification of the main and auxiliary boilers for more than 350 vessels.

## ■ Turbines

## Reliability Improvement

## [Updating Remotely Controlled Equipment]

Electrical components such as computers and power-supply equipment are used in turbine remote-control system. MHI-MME recommends exchanging them with the advanced version in order to avoid malfunctions resulting from parts wear-down caused by aging deterioration or the failure of discontinued parts.

# News from MHI-MME Offices Abroad



(MHIA)

Mitsubishi Heavy Industries America, Inc.(MHIA)

Los Angeles Office

Business Development Group, Marine Machinery

**Takeshi TSUJI**, Group Manager

The MHIA Los Angeles Office is MHI-MME's first North American base of operations. It serves as the point of contact for customers in North and South America for all MHI-MME products and after-sales services. The Los Angeles Office is also involved in co-development, with Calnetix Technologies in the U.S. as its partner.

Our operations with Calnetix include the testing and improvement of MET hybrid turbochargers that have already been commercialized and the joint development of electro-assist MET turbochargers that are specialized for turbocharger assist functions, and Organic Rankine Cycle (ORC systems).

The Los Angeles Office is directly involved in the birth of MEET products that realize today's economic and ecological needs.

The use of our products is not yet widespread in North and South America, so each day is a

new challenge for us in terms of both business and engineering.

The office is located close to LAX, so it is very conveniently located for going on business trips within the U.S. as well as overseas. All eleven of us at the office are working hard every day under the bright blue skies and towering palm trees of Southern California, while focusing on responding swiftly to our customers.

Please feel free to contact us regarding any MHI-MME product, not just those mentioned above.



Los Angeles



MHIA Los Angeles Office staff  
(Group Manager Tsuji pictured in center)

## TOP MESSAGE

### Message from the President and CEO



**Kazuo Soma**

The unexpected, drastic fall in crude oil and bunker oil prices been continuing of late; perhaps it is an effect of the dramatic development of shale extraction technology or of international political dynamics. I am hopeful that the benefits of lower fuel costs and increased demand for the transport of crude oil and other payloads will help boost the business climate for the whole industry, including shipping, shipbuilding and maritime machinery.

Meanwhile, there is universal consensus among industries and even nations that, from the perspective of the long-term outlook for energy as well as protection of the global environment, we must continue to keep energy efficiency and environmental friendliness a part of our initiatives. MHI-MME has been consistently promoting such efforts with force through Project MEET.

The UEC50LSH diesel engine introduced in this issue of MEET News is a model with a completely new design—the first in a while for

MHI-MME. In designing this engine, we emphasized the ease of production in addition to further fuel efficiency and environmental friendliness. Going forward, we will reflect the assessment of this engine by our customers and licensees to make the UEC50LSH an engine that will win even greater confidence from all.

Ultra Steam Turbine Plants (UST; a highly efficient, reheating steam type marine turbine) for LNG carriers, which were introduced in our last issue, have already been installed on four LNG carriers and are exhibiting the desired high energy-saving performance. The USTs that serve as propulsion plants, which save further energy, on ships with twin-screw hybrid propulsion have also seen market acceptance, with many orders being received.

Please look forward to further Project MEET initiatives from MHI-MME.