

Jsmea News

Message from Chairman

New leadership lineup unveiled at 2021 annual general assembly



Mr. Kinoshita Shigeki delivers the message.

I assumed the chairmanship of the Japan Ship Machinery and Equipment Association (JSMEA) at its 56th general annual assembly. It is a tremendous honor for me. In light of the importance of the challenges we need to address, however, the weight of my responsibility as JSMEA chairman has once again made me fully determined.

I believe the big challenges that we need to tackle now are the enhancement of the ship machinery and equipment industry's international competitiveness, the revitalization of industrial activities and the development of human resources. To enhance our global competitiveness, in particular, it is important to enhance our capabilities of technological development. More precisely, the development of technologies for new-fuel engines and relevant plants to achieve GHG zero

emission targets and the practical realization of autonomous ships are among the major areas that the entire industry must work together in tackling.

The coronavirus pandemic has prevented us from attending overseas exhibitions and holding ship machinery and equipment seminars in other countries. We will, however, resume such activities to restart the promotion of Japan's capabilities of ship technologies to the global community. We will also need to continue innovative changes to make the maritime industry a more attractive place to work for young people.

The maritime industry is entering a phase of revolutionary change. To help the Japanese ship machinery and industry contribute to the global maritime industry, as such, we will work on our challenges one by one to look into the future. I strongly hope that all parties involved will continue to guide and support us in the days to come.

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New JSMEA leadership lineup



Seated, from left Mr. Kuzu Tomoo ; Vice-chairman, Mr. Kinoshita Kazuhiko ; Vice-chairman, Mr. Kinoshita Shigeki ; Chairman, Mr. Yamashita Yoshiro ; Vice-chairman, Mr. Hirose Masaru ; Vice-chairman
 Standing, from left Mr. Sonoda Toshihiko Managing director, Mr. Oda Masato ; Vice-chairman, Mr. Ando Noboru ; Executive managing director, Mr. Nakada Mitsuo ; Managing director

JSMEA signs cooperation deal with Wintermar

—Project to develop basic OSV designs—

The Japan Ship Machinery and Equipment Association (JSMEA) signed a deal with PT. Wintermar Offshore Marine Tbk. on Aug. 25, 2021 as part of a project that it is advancing to draft basic designs for offshore support vessels (OSVs). The agreement calls for JSMEA to provide Wintermar with designs completed in the project and other support, and the Indonesian shipowner to build OSVs from such designs.

Due to the coronavirus pandemic, a signing ceremony was held online. A JSMEA delegation was led by Mr. Kinoshita Shigeki, chairman, and included Mr. Yamashita Yoshiro, vice-chairman; Mr. Hirose Masaru, vice-chairman; Mr. Oda Masato, vice-chairman; Mr. Oda Shigeharu, leader of JSMEA's Offshore Development Review Board; and Mr. Someya Takaichi, technical advisor from the Shipbuilding Research Centre of Japan (SRC). On behalf of Wintermar, meanwhile, Mr. Sugiman Layanto, managing director, and Mr. Johnson Williang Sutjipto, former commissioner, participated in the online ceremony. It was live-streamed for many project members and other interested parties.

With help from Wintermar, which boasts a great deal of experience and an excellent business record in the offshore development business, 31 JSMEA members have worked together in the project, realizing the packaging of Japanese ship machinery and equipment products and completing OSV basic design drawings optimized for operation in Asia, the Middle East and other regions, JSMEA Chairman Kinoshita said in an address given at the beginning of the ceremony. When the construction of OSVs designed in this project is realized,

Wintermar will be satisfied with the reliability as well as energy-saving and eco-friendly features of Japanese ship machinery and equipment, and the extensive networks of after-sales services that the Japanese makers have in Asia and elsewhere, he added. The specifications of OSVs designed in the project are highly versatile to be fully applied to not only oil and gas development, but offshore wind power generation as well, Kinoshita continued, adding that he hopes they will be used even more widely in the future.

Wintermar has already adopted Japanese-made ship machinery and equipment products, Managing Director Sugiman replied, stressing that they are at levels that are high by global standards in terms of performance, quality, fuel efficiency and many other aspects. Although the Indonesian shipping company has so far done business mainly in the field of oil and gas development, he continued, it will, in the future, wait for opportunities in new markets, such as the offshore wind farm. His hope is that the deployment of high-specification OSVs will help Wintermar cultivate a new market. The agreement with JSMEA will further tighten their relations, Sugiman said, and Wintermar will work with JSMEA to complete the first unit from the project as soon as possible.

The contract requires both JSMEA and Wintermar to make utmost efforts to realize the construction of OSVs from the project and allow JSMEA to provide Wintermar with basic designs and other results of the project for free. It also stipulates that the intellectual properties of the designs and others that JSMEA gives to Wintermar

will be attributable to JSMEA and advises that Wintermar take appropriate care of such data and information.

1) JSMEA's project for developing basic OSV designs

In the OSV market, basic designs made in Europe on the assumption that European machinery and equipment products are used, and that OSVs are operated in inclement meteorological and hydrographical conditions in the North Sea and other waters are a de facto standard. This standard is working as a barrier against the Japanese shipbuilding and ship machinery and equipment industries. For shipowners in Asia and other regions where meteorological and hydrographical conditions are milder, as such, OSVs produced from basic designs from Europe creates several challenges, which are, for example, specifications and costs that are too high. For these reasons, JSMEA began making efforts with support from Wintermar, with which it had already built cordial relations. JSMEA was at that time determined to take the initiative in changing the status quo of the offshore development market dominated by European and American manufacturers. To this end, it would draw basic designs, assuming that Japanese-made machinery and equipment would be adopted that offer the high reliability and energy-saving features fostered in the construction of general commercial vessels. The JSMEA was, then, assisted by the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) of Japan, and advanced the project to develop basic OSV designs for three years from 2018. To draft the designs, specifically, the JSMEA set up an in-house unit to encourage the 31 members, which had agreed with the project's goals, to exchange views. The unit was presided over by Mr. Yasuo Tanaka, senior fellow from Monohakobi Technology Institute Co., Ltd. (MTI). Specific business activities were consigned

to the SRC. In January 2020, OSVs designed in the project received an approval in principle (AIP) from the American Bureau of Shipping (ABS).

2) Specifications and other features of OSVs designed in the project

Weighing 2,700 gross tons and being capable of carrying a crew of up to 60, they will be midsize multipurpose OSVs. Their hull will suit mild meteorological and hydrographical conditions in Asia and other regions as well as shallow waters. They will be exclusively outfitted with highly reliable, eco-friendly Japanese machinery and equipment. The machinery and equipment for the OSVs will be provided in eight packages. Global networks of after-sales services by Japanese manufacturers will be available. They have already obtained an AIP from the ABS at the stage where concepts were still designed.

3) 31 JSMEA members participating in the project

16 members contributing to the packaging of projects: BEMAC Corporation; Daihatsu Diesel Mfg. Co., Ltd.; Ibuki Kogyo Co., Ltd.; IHI Power Systems Co., Ltd.; Kashiwa Co., Ltd.; Manabe Zoki Co., Ltd.; Miura Co., Ltd.; Nakashima Propeller Co., Ltd.; Naniwa Pump Manufacturing Co., Ltd.; Nishishiba Electric Co., Ltd.; Nippon Hakuyo Electronics, Ltd.; Semco Ltd.; Taiyo Electric Co., Ltd.; Tokyo Keiki Inc.; Ushio Reinetsu Co., Ltd.; and Yanmar Power Technology Co., Ltd.

15 other members: Chugoku Marine Paints, Ltd.; Coast Corporation; Furuno Electric Co., Ltd.; Hien Electric Industries, Ltd.; Hisaka Works, Ltd.; HSN Kikai Kogyo Co., Ltd.; Japan Radio Co., Ltd.; Kamome Propeller Co., Ltd.; Nippon Paint Marine Coatings Co., Ltd.; Nittoseiko Co., Ltd.; Sasakura Engineering Co., Ltd.; Taiko Kikai Industries Co., Ltd.; Teramoto Iron Works Co., Ltd.; Terasaki Electric Co., Ltd. and Volcano Co., Ltd.



Mr. Sugiman Layanto (left on the monitor), Mr. Johnson Williang Sutjipto (right on the monitor) and Mr. Kinoshita Shigeki (at the desk)



Mr. Sugiman Layanto (left on the monitor), Mr. Johnson Williang Sutjipto (right on the monitor), Mr. Kinoshita Shigeki (left by the desk), Mr. Hirose Masaru (center by the desk) and Mr. Ando Noboru, executive managing director, JSMEA (right by the desk)

DAIHATSU

OSAKA GAS Daigas Group

Open up the potential of DF engines [LPG Reformer]

The Daihatsu LPG reformer converts LPG to an LNG-equivalent gas that enables marine engines to provide equivalent operating performance and environmental performance as when using LNG as

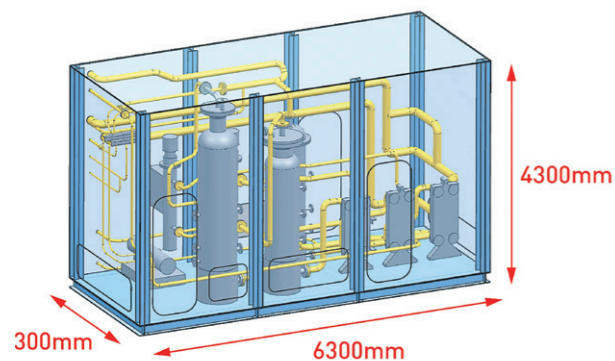
a fuel. Reformed gas can be supplied directly to a Daihatsu dual-fuel engine. Daihatsu developed the LPG reformer jointly with Osaka Gas Co., Ltd.

1. **Reforms LPG to an LNG-equivalent gas.**
2. **Reformed LPG can be supplied directly to Daihatsu dual-fuel engine.**
3. **Provides operating performance and environmental performance equivalent to LNG.**

Comparison as a marine engine fuels

	Liquid fuel		Gas fuel		
	HFO	LNG (Methane)	LPG (Propane)		
Fuel quality	—	Uniform quality around the world	Uniform quality around the world		
Fuel supply points	—	Exists around the world	Existing fuel supply facilities can be used. Existing small vessels can be used as barges.		
Handling	—	Easy	Caution required (Extremely low temperature)		Relatively easy
Lower heating value (Liquid)	MJ/kg	40.4	50		46.4
	MJ/m ³	40.0	21.3		27.0
Density (Liquid)	kg/m ³	991	426		585
Boiling point	°C	< 60	-161.5		-42.1
Boil-off gas	—	No	Yes (Tank insulation required)		Suppressible by pressurization under ordinary temperature (Tank insulation not required)
Tank capacity	—	(Reference)	Approx. 2.0 times		Approx. 1.5 times
Tank installation space	—	(Reference)	Approx. 3.0 times		Approx. 2.5 times
Combustion method	—	Diesel	GI (Gas Injection)	Lean combustion	LGI (Liquid Gas Injection) LPG reformer Direct firing
Supply gas pressure	—	—	Approx. 30MPa	0.6~1.6MPa	Approx. 60MPa 0.6~1.6MPa 0.6~1.6MPa
CO ₂ reduction	—	(Reference)	Approx. 23% reduction	Approx. 23% reduction	Approx. 15~20% reduction Approx. 15~20% reduction Approx. 15~20% reduction
NO _x emission compliance (Tier III)	—	Required (SCR or EGR)	Required (SCR or EGR)	Not required	Required (SCR or EGR) Not required Not required
SO _x emission compliance	—	Required (Scrubber)	Not required	Not required	Not required Not required Not required
Note	—	—	—	—	— Output 50% or lower

Approx. size [4.0 MW]



Reformed gas

- **Methane [CH₄]:** 70% or higher
- **Methane number:** 100 or higher

Main reactions that take place in the reforming reactor

• Steam reforming reaction	$C_3H_8 + 3H_2O \rightarrow 3CO + 7H_2$
• CO transforming conversion, reaction	$CO + H_2O \rightarrow CO_2 + H_2$
• Methanation reaction	$CO + 3H_2 \rightarrow CH_4 + H_2O$
	$CO_2 + 4H_2 \rightarrow CH_4 + 2H_2O$

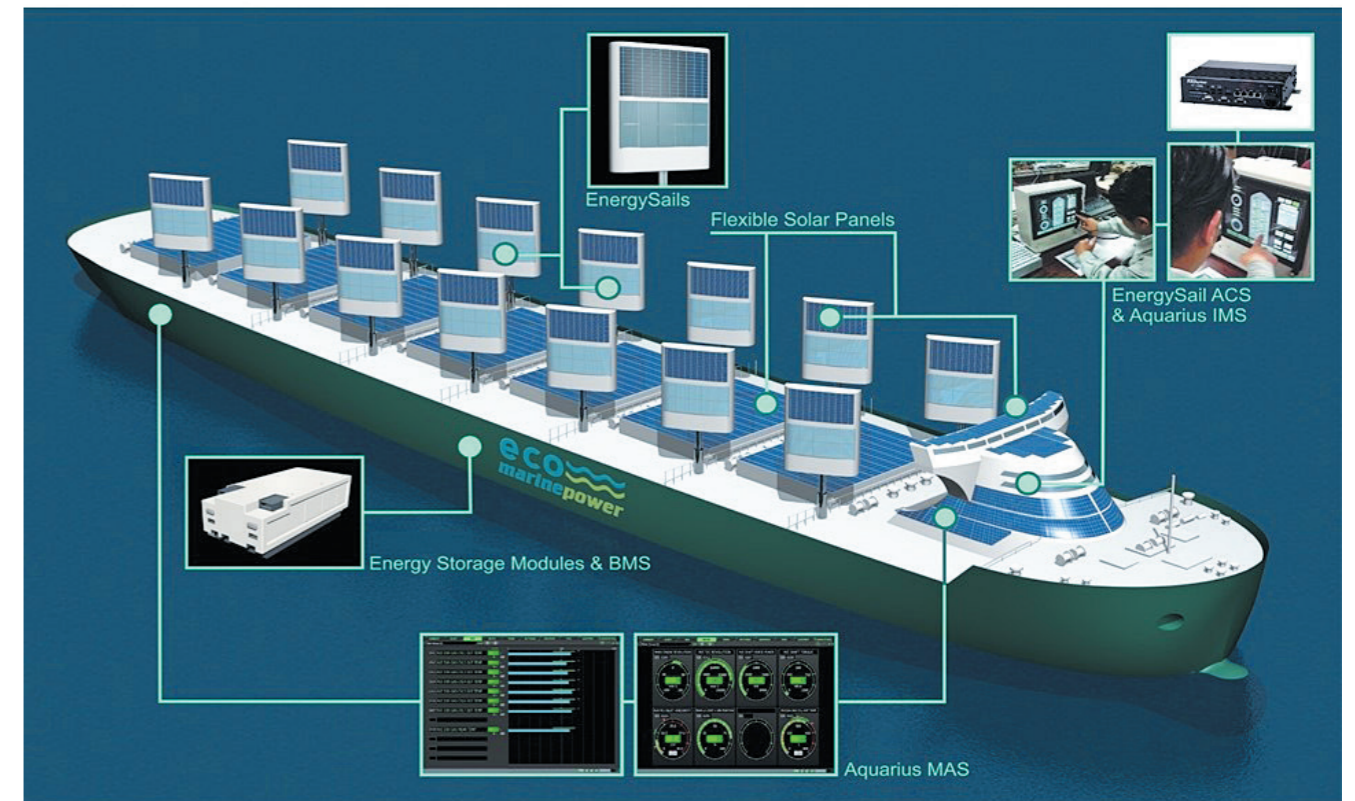
eco marinepower

Approval in Principle for Renewable Energy System for Ships with Rigid Sails and Solar Power

In a significant step towards the realization of a zero-emission power and propulsion solution for shipping, Eco Marine Power is pleased to announce in May 2021 it was granted Approval in Principle (AiP) by ClassNK of Japan (Nippon Kaiji Kyokai) for its Renewable Energy System for Ships - "Aquarius Marine Renewable Energy with EnergySail". Included in the scope of the AiP certification were two main sub-systems:

- The EnergySail®: a rigid sail type wind-assisted propulsion system that includes the sail structure, driving system and automated control system.
- Aquarius Marine Solar Power: an energy management system to utilize solar power that includes photovoltaic (PV) modules, batteries, electrical system and control system.

Aquarius MRE® – Zero Emission Power and Propulsion



eco marinepower

TERAMOTO IRON WORKS

FB FURUKAWA BATTERY

KEI system

The rigid sails are based on EMP's EnergySail® technology and these renewable energy devices can even be used when a ship is at anchor or in harbour. The Aquarius Marine Solar Power sub-

system was recently installed on-board a bulker & a project to install the system onto another ship is underway.

DAIHATSU

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eco marinepower

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Making the future potential with the "Low Speed 4 Stroke Engine".

In the propulsion system, the propeller speed in general should be in a certain range to meet the characteristic between the propeller speed and the power. As for the main propulsion used for the coastal ships, medium speed 4 stroke diesel engines have mostly been used worldwide. These main diesel engines are coupled with propeller through a reduction gearbox. In contrast, HANSHIN developed the diesel engines having lower speed than those of medium speed engines, thereby the engines can directly be coupled with propeller without reduction gearbox.

"Low Speed 4 Stroke Diesel Engine" has following benefits compared with the medium speed engines such as:

- Higher reliability and lower lifetime cost, due to the lower speed of the engine itself as well as no need of reduction gearbox
- Higher thermal efficiency because of the longer stroke and larger combustion space

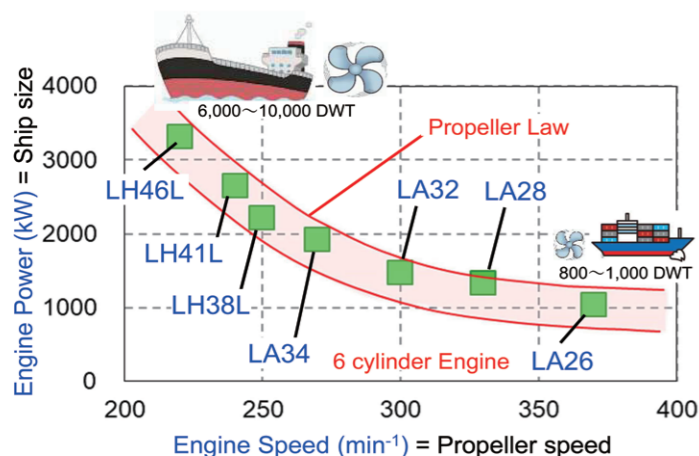
Thanks to these benefits, HANSHIN "Low Speed 4 Stroke Diesel Engines" are widely used in the Far East Asia.

In the medium speed engine series, it generally increases the number of cylinders, keeping the same engine speed, in case higher power is

required. In this case, propeller speed should be lowered along to the relation between the power and the propeller speed. Therefore, the reduction ratio of the engine speed versus the propeller speed should be larger. On the contrary, "Low Speed 4 Stroke Diesel Engine" is able to directly coupled with propeller without reduction gearbox, aiming simpler construction and thereby securing higher reliability. However, in this engine, in case higher power is required, cylinder diameter should be enlarged together with lowering engine speed in relation to the required power and the engine speed. When designing to increase the dimensions of the main parts proportionally according to the cylinder diameter (i.e. design in similar figures), the same combustion pressure of all engine type makes the same stress on the main components of all engine type. That is just the reason why the "Low Speed 4 Stroke Engine" is more reliable and durable than the medium speed engine.

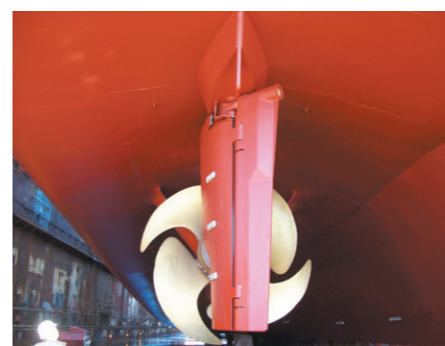
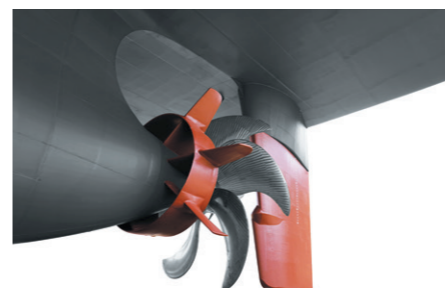
Making the future

For the next low carbon future, HANSHIN have already developed the "Low Speed 4 stroke GAS engine." This engine will be next generation of the main engine which inherits the design concept of Low Speed 4 Stroke Diesel Engines.



HANSHIN G30 GAS Engine

The merger of Nakashima Propeller and Becker Marine Systems makes it possible for more efficient combined propulsion system



Nakashima Propeller Co., Ltd. (Headquarters: Okayama City, Okayama Prefecture, President: Takayoshi Nakashima, hereinafter "Nakashima Propeller") has acquired shares of Becker Marine Systems GmbH (Headquarters: Hamburg, Germany, hereinafter "BMS"), Germany-based Marine Equipment Manufacturer.

Nakashima Propeller, as a comprehensive manufacturer of marine propulsion equipment, handling every type of propeller, thrusters, electric propulsion systems, control-pitch propellers, energy saving devices such as eco-cap.

BMS has focused on the development, production and sales of various high-performance Rudders such as Becker Flap Rudder and TLKSR® (Twisted Leading Edge Rudder), Becker Mewis Duct® and Becker Twisted FIN(BTF) with excellent energy saving performance, including those for vessels in service. Also, they are now actively working on advanced development that will reduce burden on the environment in vessels, such as the development of their own main Marine-Battery System and wind power propulsion system.

Nowadays, in the shipbuilding and maritime industry, the demand for environmental consideration, such as reducing greenhouse gas (GHG) emission, is increasing worldwide. Therefore, in the long term, various efforts are being made with aiming zero GHG emissions.

Under these circumstances BMS and Nakashima Propeller reached a common understanding to expand our products and services in a new framework by leveraging the strengths of both companies in order to meet the sophisticated and diversified needs of customers. We have finally reached an agreement of acquisition.

In the future, while responding for the changes in the shipping industries, we would like to increase the added value of our products, strengthen our business for vessels in service, and further expand our overseas business by taking advantageous of our strength.





Innovative Solutions for Marine Environmental Regulations

The China & Japan Marine Industries Ltd. has started handling the following solutions for environmental regulation measures such as GHG reduction in the maritime industry.

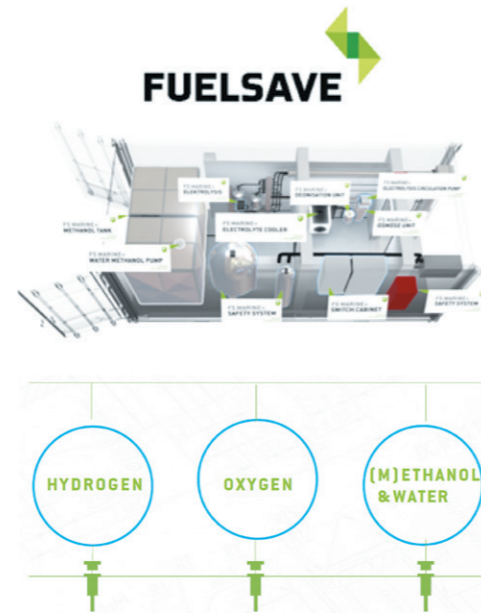
FUELSAVE's (Germany) marine fuel reduction system (FS MARINE+) using water methanol and hydrogen gas as the agents can help reduce fuel consumption and thus the CO² emission can be reduced likewise.

With the effect of the water methanol which helps cool the cylinder and increase the air mass, and the effect of the hydrogen which helps increase the combustion temperature and make the ignition take place earlier, the same energy input/output will be maintained whilst less primary fuel is being used.

FS MARINE+ can bring economic benefits as fuel consumption can be reduced by about 25%, maintenance costs by about 50%, and the lubrication replacement frequency by about 2/3.

In regard to the impact on the environment, with FS MARINE+ CO² is reduced by about 8-15%, PM by about 40%, SOx by about 10-20%, NOx by about 30-80%, and black carbon by about 33%.

Up until today, FUELSAVE has signed contracts for 8 vessels with 4 stroke engines and is planning to conduct a pilot test for 2 stroke engines around the beginning of next year.

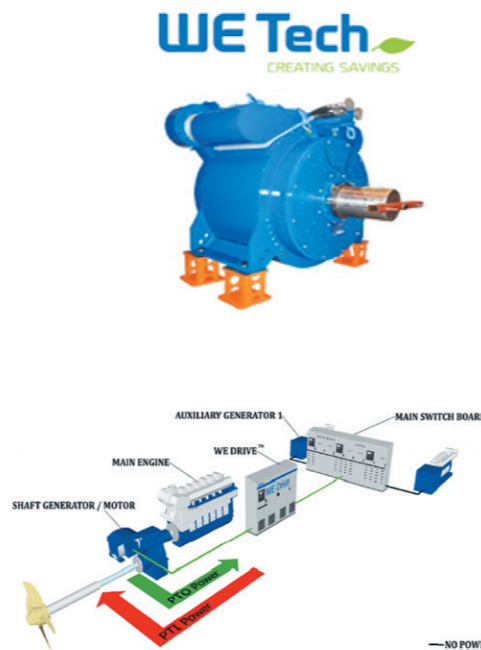


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WE Tech's (Finland) shaft generator is a highly efficient direct drive system that uses a permanent magnetic motor.

WE Tech's shaft generator solution provides up to 5% better efficiency compared with Electrically Excited Synchronous Generator (EESG). WE Tech's shaft generator solution can be used for the following applications:

- In Power Take out (PTO) mode during normal sailing, the shaft generator is providing electrical power via the frequency drive to the vessel electrical network
- In Power Take in (PTI) mode, the shaft generator is operated as an electric motor which is controlled by the frequency drive and can be used for Take Me Home/Away operations (the Main Engine is disconnected from the propeller shaft) or can be used for an additional boost by providing additional torque to the propeller alongside the Main Engine.
- A DC-Link power distribution switchboard can be added for heavy consumers such as bow thrusters and cargo pumps and can also have an energy storage system connected to the DC-Link which can provide an energy reserve that is used for peak-shaving, spinning reserve and black-out prevention.

WE Tech has received orders for 87 ships as of 2021/7. Recent projects include new build LNG and LPG carriers in China and Korea.



BILGE DISCHARGE MONITOR BDM-FT1000

Environmental pollution has gone on a global scale, reinforcement of environmental conservation, the monitoring with severer standard was expected worldwide.

Our new "BILGE DISCHARGE MONITOR" can record various data & change, such as condition of pump, bilge water separator, ship location, oil contents, automatic stopping device (3-way valve), discharge rate.

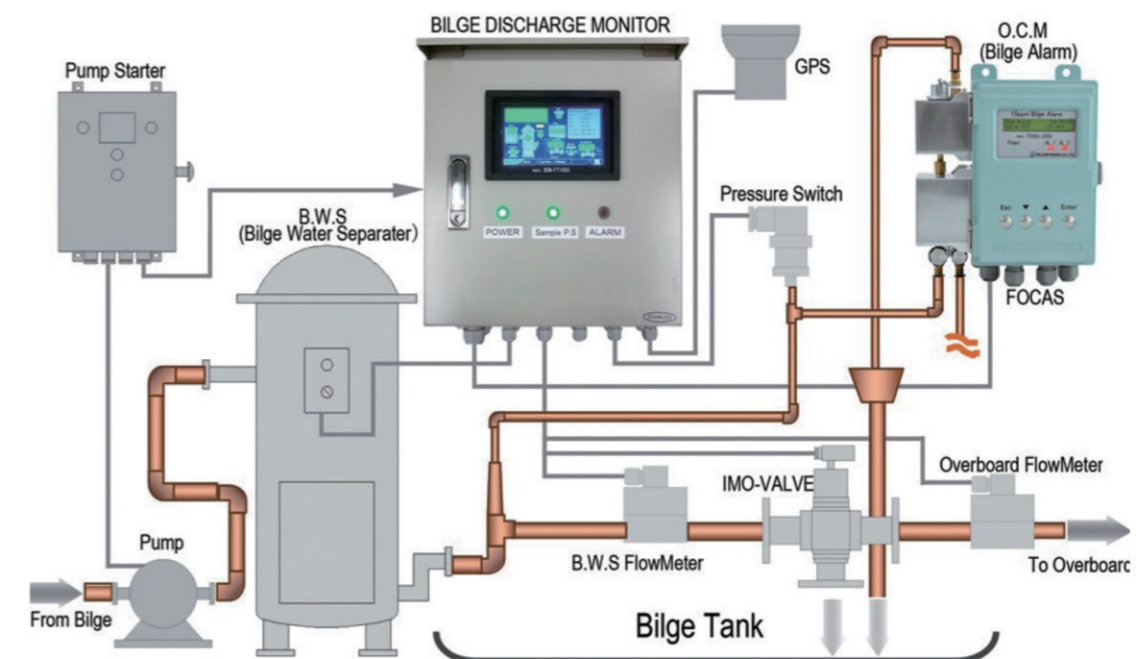
Our visualized monitor is tamper proof in accordance with MARPOL regulations, and is able to reinforce in monitoring, such as, record management of proper operation, and preventing unauthorized discharge. (From oil major requirement)



Feature

- Various operating condition can be visually checked on LCD screen (pump operation, separator operation, ship location, oil contents, auto-discharge valve (3-way valve), discharge rate).
- Simple operation on the LCD screen for touch panel.
- GPS, bilge monitor, 3-way valve, and flow meters are linked & monitored. This works as a tamper proof.
- Easy to prove the proper operation to PSC inspectors.
- Reliable design. In case of emergency, possible to change to emergency mode and conduct a conventional operation acc. to I.M.O. requirement.
- Record electric data about bilge discharge monitoring.
- The system data can be used as a supplement against human error, typo-error or injustice in the oil record book.
- Saved data is stored at internal memory and can be checked any time.
- Internal memory can save for three years.*
- Past operating record can be shown as a chart, easy to check performance.

* In standard use.



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The technology of Gas/Oil simultaneous mixed combustion for more than 40 years

40 years' experience on Marine-use Dual Fuel combustion

VOLCANO Co., Ltd. has 93 years' history for various material combustion. Especially on Gas/Oil simultaneous mixed combustion, VOLCANO is providing Marine-use Dual Fuel (DF) combustion products for more than 40 years.

As of September 2021 when VOLCANO celebrated its 93th anniversary, VOLCANO has **the sales record of Gas/Oil simultaneous mixed combustion DF burners for 269 vessels.** DF boiler-burners for LNG fueled vessels (Pure car and track carriers, LNG bunkering ships, Suezmax tankers, Aframax tankers, Container carriers and Ferries) have been provided to 63 vessels and DF boiler-burners for LNG carriers or Off-shore plants(FPSO, FSO and FSRU) have been provided to 206 vessels.

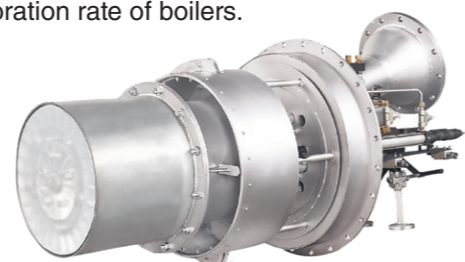
Methane as GHG, main content of LNG

The technology to utilize LNG as marine fuel for GHG reduction measure will have been developed for decades to 2050 as one of the bridging technologies between conventional fuel and new generation fuel i.e. hydrogen or ammonia. On LNG fuel utilization, it is essential how to treat methane content in natural gas safely. Methane (CH₄), whose big impact to Global warming is positioned as next to carbon dioxide (CO₂) is one of GHGs. The methane emission sources are various, i.e. a marsh, a paddy field, livestock, natural gas production or biomass combustion. 90% content of Marine fuel LNG is methane and **methane's global warming potential (GWP) value is said as 25 times as carbon-dioxide's.**

Combustion of gas is one of important methods to treat methane content in gas eco-consciously and safely. How to combust various composition of gas continuously is a key technology for eco-conscious combustion of gas method. **VOLCANO's technology can combust any composition of gas from LNG fuel tank consisting of flammable gas and inert gas.** The two kinds of equipment to solve serious methane-treatment-problem as GHG control are showed as the followings, which are the **DF burner** and the **gas combustion unit (GCU)** especially of compact/mid-sized.

DF burner for boiler

VOLCANO Gas/Oil simultaneous mixed combustion DF burner for boiler can be used as a boiler-burner for generating steam, and also as a GCU for safe BOG treatment. VOLCANO DF burners covers from 1t/h to 70t/h as evaporation rate of boilers.



Gas/Oil simultaneous mixed combustion DF burner "SFFGII"

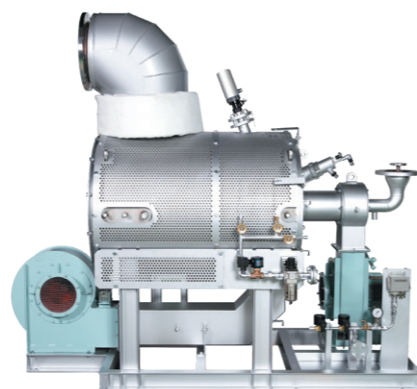


Gas/Oil simultaneous mixed combustion DF burner "Vignis"



Gas combustion unit (GCU)

VOLCANO gas combustion units "MECS-GCU" are provided for smaller size LNG fueled vessels. The gas burner of "MECS-GCU" was developed by following **VOLCANO's technology/experience on DF burners and the land-use low NOx burners.** When the GCU combusts boil off gas (BOG), the BOG including inert gas to reach the status of 100% inert gas can be stably combusted by gas/oil mixed combustion.



Gas combustion units "MECS-GCU"



YDK Technologies Creating the Future with "Measuring"

The new YDK embarks on a new voyage.

From October 1, 2020, we started "YDK Technologies, Co., Ltd.", a new company name, celebrating its 60th anniversary. While inheriting the company's history and traditions, we will continue to develop the technologies that we have cultivated and deliver optimal solutions, as a partner trusted by our customers.

YDK helps safe navigation by its gyrocompass, autopilot, and electromagnetic log.

YDK contributes to safe navigation and energy saving of ships by designing, producing, and selling various navigation equipment such as gyro compass, autopilot, and electromagnetic log.

Also, we participate in the research of automatic vessels which are being put into practice, since autopilot is responsible for steering (or controlling ships).

YDK is environmentally friendly with its green products.

YDK contributes to fuel-saving by its green products such as BNAAC (Batch Noise Adaptive Autopilot) and E-Course PILOT. Also, paperless course recorder is new digital-type course recorder, which is eco-friendly by eliminating the use of chart paper and recording pen consumables.

Global service networks

YDK Technologies sells and services its products all over the world, directly through sales offices and service agents in Japan, or through our many service stations in major port cities outside Japan.



YDK Techs "GREEN" PRODUCTS



FUEL SAVING
BNAAC
PT500 Upgrade



MORE FUEL SAVING
E-Course Pilot
PT500 Upgrade



RUNNING COST SAVING
Paper-less Course Recorder



NEXT GENERATION
PT900
BNAAC in it



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JSMEA participates OTC 2021

The Japan Ship Machinery and Equipment Association (JSMEA) attended the Offshore Technology Conference (OTC) 2021 in Houston, Texas on Aug. 16-19, 2021, with financial support from The Nippon Foundation. It was its eighth participation in the OTC since 2013. Last year, due to the coronavirus pandemic, the OTC, one of the world's greatest events for the offshore energy resource development business, was cancelled.

At the OTC 2021, JSMEA set up a Japan Pavilion together with six partners, including three affiliated companies: Daihatsu Diesel Mfg. Co., Ltd.; Fuji Trading Co., Ltd. and Mitsubishi Heavy Industries America, Inc. The others were oil development company INPEX Corporation, research institute the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) and classification society Nippon Kaiji Kyokai (ClassNK). They showcased Japanese-manufactured offshore development-related products and exchanged information with visitors of the pavilion from around the world engaged in the offshore oil and gas exploitation business. At the OTC 2021, a basic design for a Japan Pavilion was adopted for the first time to promote products and services under a unified brand image. It was the first time for JSMEA to take part in an overseas exhibition since the coronavirus began exercising an overwhelming impact in December 2019. However, parties from Japan refrained from traveling to the U.S. Instead, staff members of the Japan External Trade Organization (JETRO)'s Houston office as well as local representatives and other employees of the delegation members took their places.

The numbers of visitors and exhibitors at the OTC 2021 both appeared to be much smaller. Taking into consideration that it was held amid the COVID-19 crisis, however, the organizer decided that it was inappropriate to compare it with previous conferences and, therefore, not to announce specific numerical data. The OTC 2019, as a side note, welcomed 59,200 visitors and hosted 2,300 exhibitors from 100 countries and regions. Roughly estimating, there were some 520 exhibitors at the OTC 2021, about a quarter of the number from last time.

The OTC had previously been held at three locations—the main hall, the arena hall and the outdoor venue—but at the OTC 2021, only the main hall was used, where relevant proceedings were carried out on a smaller scale. The OTC 2021 was organized in a

hybrid way for the first time, meaning that it hosted participants and welcomed guests both locally and online.

With a smaller number of leading energy and engineering companies holding exhibitions this year, more small and midsize businesses who normally cannot have booths in the main hall were permitted to exhibit next to major players. In addition to Japan, other national pavilions were set up by Brazil, France, Italy and others, but the pavilions of regular attendees, such as China and South Korea, were smaller.

At the venue, technical sessions were also given in a hybrid style, where there were many speakers and listeners attending them online. Discussions were held mainly on carbon neutrality-related subjects, such as energy shifts and carbon footprints. They were heavily tinged with recent hot topics. At the sessions, representatives from Royal Dutch Shell plc., Equinor ASA and other energy giants delivered presentations. Although indicating that it is necessary to continue to produce oil and gas in the future, they said they will regard net-zero emissions as a new business opportunity and make aggressive investment in the development of decarbonization and carbon capture, usage and storage (CCUS) technologies; wind- and wave-power generation and other renewable energy; hydrogen regeneration; and others.

JSMEA took part in an overseas exhibition for the first time in a year and eight months. In a global trend of decarbonization, it strongly felt that the offshore energy development market and the organization of the OTC are both reaching a turning point.

About the OTC 2021

Official title: Offshore Technology Conference 2021

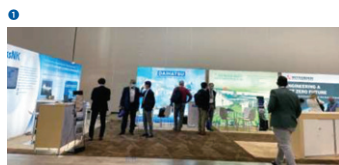
Dates: Monday-Thursday, Aug. 16-19, 2021

Venue: NRG Park

About the Japan Pavilion

Location: Booth No. 3041 (main hall)

Members: three JSMEA members—Daihatsu Diesel Mfg., Co. Ltd.; Fuji Trading Co. Ltd.; and Mitsubishi Heavy Industries America, Inc.—and three others engaged in offshore energy development—INPEX Corporation, Japan Agency for Marine-Earth Science and Technology (JAMSTEC) and Nippon Kaiji Kyokai (ClassNK)



- 1 The Japan Pavilion
- 2 The Japan Pavilion
- 3 The OTC venue and an announcement on the Japan Pavilion



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