Mitsui O.S.K. Lines

CORPORATE PROFILE

Developing the MOL Group into an excellent and resilient organization that leads the world shipping industry

Mitsui O.S.K. Lines, Ltd. (MOL) is a multimodal transport group that meets diverse transport needs with one of the world's largest merchant fleets and a comprehensive approach to safety.
To further contribute to economic growth, the MOL Group works toward its ideal on the global stage: becoming an excellent and resilient company that leads the worldwide shipping industry.

MOL Group Corporate Principles

As a multi-modal transport group, we will:

1. actively contribute to global economic growth and development, anticipating the needs of our customers and the challenges of this new era
2. strive to maximize corporate value through creativity, operating efficiency, and promotion of ethical and transparent management
3. nurture and protect the natural environment by maintaining the highest standards of operational safety and navigation


United Kingdom
Germany
Europe/Africa
Turkey
China
Korea
Japan
Japan
U.A.E.
India
Taiwan
Myanmar
Hong Kong
Thailand
Vietnam
Philippine
Malaysia
Singapore
Indonesia
Asia/Middle East/Oceania
Mozambique
South Africa
Australia
United States of America
North/Middle Americas
& the Caribbean
Mexico
South America
Chile
Brazil
: Head Office/Chief executive representative offices
: Chief country representative offices
: Group companies

In Every Phase of Operations, the Top Priority Is

Safety Management

The MOL Group Corporate Principles call for us to “nurture and protect the natural environment by maintaining the highest standards of operational safety and navigation.” Accordingly, we work toward constantly improving our service, while never letting up when it comes to enhanced safety management.

We have established the Safety Operations Headquarters, which shortens the distance between management and front-line employees at sea, and given our ship management organizations the responsibility and authority to establish safety management systems based on a bottom-up approach.

Safety management is a fundamental part of our business, essential not only to our growth as a corporation, but also in winning the trust of our customers and maintaining our reputation in society.

MOL regards enhancement of safe operation as the highest priority in all of its business activities, pressing ahead with initiatives aimed at recruiting and training highly skilled seafarers, improving risk assessment and management capabilities, and advancing the adoption of sophisticated information technology.

Forging Ahead to Become the World Leader in Safe Operation

MOL's comprehensive efforts to enhance operating safety include the Safety Operation Supporting Center (SOSC), which monitors the status of vessels 24 hours a day/365 days a year, and providing top-quality seafarer education at training centers around the world.

Safety Operation Supporting Center (SOSC)

With the motto "Never let the captain get isolated," the SOSC monitors the status of vessels around the clock, enabling them to respond appropriately to various risks involved in vessel operation, including external factors such as weather and sea conditions. Vessels at sea can count on the center for direct links to essential information such as weather updates, navigation warnings, and security alerts. Staffed by experienced MOL captains, the center serves as a comprehensive resource to support the safety of all MOL Group vessels.

Virtual Reality (VR) Takes Seafarer Training to a New Level

MOL is working to develop and introduce a system that uses virtual reality to simulate training scenarios that are difficult to replicate in real life to ensure more effective safety education. Introduction of the new system, which replicates the sense of touch, allows seafarers to use all five senses in their training experience, delivering a much greater degree of realism.

Snapback

Training scenario: Explosion inside an incinerator

MOL New Maritime Academy Opens in Philippines

Filipino seafarers play essential roles in MOL' s worldwide vessel operations, and they are becoming even more critical as safe-operation technology grows more sophisticated and requires more advanced skills. MOL will continue to recruit and train top-quality seafarers as it strives to remain a world leader in safe operation. In August 2018, the company teamed up with Magsaysay Maritime Corporation* to establish one of the world's best merchant marine academies in the Asia/Oceania region, representing a major initiative in its ongoing drive to ensure the highest level of safety in all phases of its business.

* MOL's partner.
MOL and MMC jointly established the manning company Magsaysay MOL Marine Inc. in 1997.

Academy main entrance

Training facility "Ship in Campus"

MOL Training Centers

MOL operates crew training centers in the Philippines, India, and other sites around the world to help us train and develop highly skilled crewmembers, who are indispensable for maintaining the safe operation of our vessels.

BRM/ERM Training
Bridge/Engine Room Resource Management

Seafarer training programs are designed to demonstrate the importance of teamwork and optimize the use of all resources (personnel/equipment/information, etc.) to achieve safe operation.

BRM training (navigation)

ERM training (engine)

'CADET' Training Program
[Cadet Actual Deployment for Education with Tutorial]

One of MOL's innovative programs provides training aboard actual vessels in service to develop work-ready officers through practical instruction. Under this program, dedicated instructors and cadets board a vessel together during in-service operation to conduct hands-on training. The goal is to give cadets a deeper understanding of MOL' s safe operation guidelines and help them learn and develop behaviors based on those guidelines, while providing individual coaching in small groups as part of an enhanced on-the-job training environment.

Trainees practice using the Electronic Chart Display and Information System (ECDIS) and a sea chart table.

Onboard training

OJT Instructors

Seasoned captains and chief engineers, who have received special training as instructors, board vessels to identify unsafe behavior that can be spotted only on site during vessel operation. This increases the effectiveness of crewmember education by providing on-site guidance and tips for improvement.

The Quest for Advanced Transport Technologies and a Cleaner Environment

Technology Development

In 2016, MOL launched the ISHIN NEXT ~MOL SMART SHIP PROJECT~, a new technology development project that builds on the success of the Senpaku ISHIN project announced in 2009. The company researches diverse needs and the latest technologies as it advances on two axes of technology development—support technologies for safer vessel operation and technologies to reduce the environmental impact of transport operations. It moves toward these objectives by verifying the specific, practical effects of new technologies that can enhance its economic competitiveness and increase its corporate value.
On April 1, 2018, MOL established the Technology Innovation Unit to promote innovation with new, cross-divisional ideas related to technology and ICT strategies including environmental protection.

Striving for Success with the Wind Challenger Project

The Wind Challenger Project is a joint industry-government-academia program looking at the adoption of huge extendable hard sails on large cargo ships, with the goal of significantly reducing energy consumption, with a corresponding reduction in CO_2 emissions.
MOL and Oshima Shipbuilding Co., Ltd. jointly spearhead the Wind Challenger Project, aiming to speed up the development process, and in October 2019, obtained Approval In Principle (AIP) from Nippon Kaiji Kyokai (ClassNK) for the design of a hard sail system.
The project team is working on the detailed design, targeting delivery of the first vessel in fiscal year 2022.

World's Largest LNG Bunker Vessel GAS AGILITY

The world's largest LNG bunker vessel, the GAS AGILITY, which was delivered at Hudong Zhonghua Shipbuilding (Group) Co., Ltd. in April 2020, has started LNG Bunkering operation to the world's largest 23,000 TEU LNG-fueled containership, the CMA CGM JACQUES SAADE, owned by CMA CGM at Rotterdam Port on November 13, 2020. Construction of this LNG bunker vessel was spurred by International Maritime Organization (IMO) 2020 regulations to reduce sulfur oxide (SOx) emissions from the engines of merchant vessels. The use of LNG fuel will also reduce vessels' emissions of nitrogen oxide (NOx), carbon dioxide (CO_2), and particulate matter (PM). This can reduce the environmental impact of vessel operation and significantly improve air quality, especially in coastal areas and port cities. The vessel features a Mark III membrane tank from GTT of France, which helps reduce boil-off gas (gas that vaporizes in the tank during transport). It is designed to re-liquefy boil-off gas as well as use LNG as fuel. Furthermore, in regions besides Northern Europe, we will launch 12,000m^3- and 18,600m^3-class LNG bunker vessels in 2021 to serve Singapore and ports in the Mediterranean Sea. The LNG bunker vessel serving the Mediterranean is designed to supply various types of ships including containerships, tankers, ferries, and large-scale cruise ships.

The GAS AGILITY
Photo courtesy: Port of Rotterdam

Demonstration of ship-to-ship loading operation with an LNG-fueled containership

Redesigned, Refined Propeller Boss Cap Fins (PBCF)

~ Meeting Higher Needs for Environmental Protection by Enhancing Energy-saving Performance ~

Propeller Boss Cap Fins (PBCF) have already been adopted on more than 3,400 vessels all over the world. MOL, Akishima Laboratories (Mitsui Zosen) Inc., and MOL Techno-Trade, Ltd. have jointly developed an upgraded PBCF that offers even greater energy-saving effects. The new design enhances propeller thrust and reduces torque thanks to refinements in fin shape and height. Tests of the new PBCF on vessels in service confirmed an energy savings of around 5% compared to sister vessels not equipped with PBCF. The new PBCF design has already been patented around the world.
PBCF testing also confirmed a noise reduction of 3 to 6 decibels in a specific underwater frequency range by reducing cavitation (the formation/extinction of bubbles). As a result, the PBCF was selected by the Port of Vancouver (Canada)'s EcoAction Program for reducing cavitation and underwater noise that can negatively impact whales and other marine mammals.

Initiatives to Realize Autonomous Ships

Under the banner of "Trouble-free Operation with AI," MOL, relying on its accumulated marine engineering knowledge and the latest ICT technology, started developing new technologies with the goal of reducing accidents due to human errors, while reducing the seafarers' workload.
MOL has focused on developing technology for high-stress situations facing seafarers, such as navigating in congested sea lanes. Examples of that are the development of an autonomous avoidance navigation algorithm that prevents collisions with other vessels and obstacles, as well as an autonomous berthing and un-berthing system.
These technologies help MOL seafarers achieve safer operation by ensuring proper "recognition, judgment and maneuver."

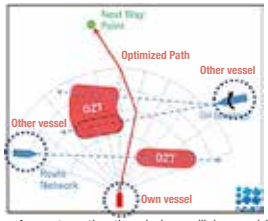


Image of a route estimation during collision avoidance maneuver to avoid an other vessel obstacle zone (OZT) area (Courtesy: National Maritime Research Institute)
※Joint study with MOL Marine Co., Ltd., National Maritime Research Institute of National Institute of Maritime, Port and Aviation Technology, and Tokyo University of Marine Science and Technology

Technology for supporting ship operation during port arrival and departure
(Development of autonomous berthing and un-berthing technology)
※Project partners: Tokyo University of Marine Science and Technology, Mitsui E&S Shipbuilding Co., Ltd., Akishima Laboratories (Mitsui Zosen) Inc.

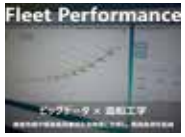
'FOCUS' Project

Under the banner "Stress Free Operation with Big Data Analysis," MOL launched the Fleet Optimal Control Unified System (FOCUS) project in October 2018, and since then has steadily released several related applications.
In addition, NAPA Ltd., a software company specializing in ships design as well as the development of navigational support systems, joined the FOCUS development organization.
MOL, by cooperating and gathering knowledge from four firms including NAPA, Mitsui E&S Shipbuilding Co., Ltd., and Weathernews Inc, proactively develops stress-free solutions for its fleet by using and applying big data technology.

- **March 2019: Release of FOCUS Project Part I "Fleet Viewer" application aimed at enhancing ship management**
- **February 2020: Release of FOCUS Project Part II "Fleet Performance" application aimed at analyzing fleet performance in actual operation**

"Fleet Viewer" is an application that enables the optimal use of the nearly 10,000 sensing data items collected at unmatched high frequency (1-minute intervals) onboard the company's ships. This data can be used to determine a vessel's operational status. Including information about the status of the ship's equipment, the position of the vessel, ocean and weather conditions, and so on. The application enables not only seafarers onboard, but also the ship management superintendents on shore, to monitor a vessel's status as well as benefit from outside experts' knowledge and expertise.

"Fleet Viewer" application aimed at enhancing ship management



"Fleet Performance" application aimed at analyzing fleet performance in actual operation

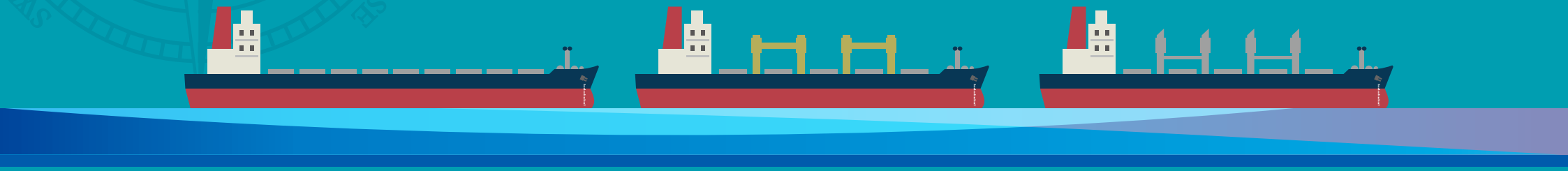
"Fleet Performance" makes full use of the vessel's high-frequency collected sensor data and analyzes it using Mitsui E&S Shipbuilding's knowledge.
This application helps monitor a ship's environmental performance and maintenance needs by grasping its sailing performance in consideration of wave action and wind during actual operation and fouling of the hull and propellers.
By eliminating the impact of waves and wind on the vessel and determining its true performance, the application allows the user to compare the real propulsion performance of various vessels, as well as verify the effectiveness of implemented energy-saving equipment.

- **Engine trouble prediction and diagnostic application "Fleet Guardian"**

MOL is moving forward with a joint study of a next-generation engine trouble prediction and diagnostic application, which aims to eliminate vessel downtime using big data analysis and human-friendly Explainable AI (XAI). The partnership comprised of four companies—MOL, ClassNK Consulting Service Co., Ltd., IHI Power Systems Co., Ltd., and Mitsui E&S Machinery Co., Ltd.—brings together both users and manufacturers, enhances the accuracy of the system itself, and gives seafarers a more accurate understanding of changes in the status of onboard equipment.
MOL also engaged in joint research to develop a main engine digital twin model with the National Maritime Research Institute (NMRI). The digital twin helps estimate the engine's operational status and its degree of deterioration with greater accuracy. Such valuable information will be used to improve the engine trouble prediction and diagnosis system.

Moving Resources on a Global Scale with the World's Largest Fleet

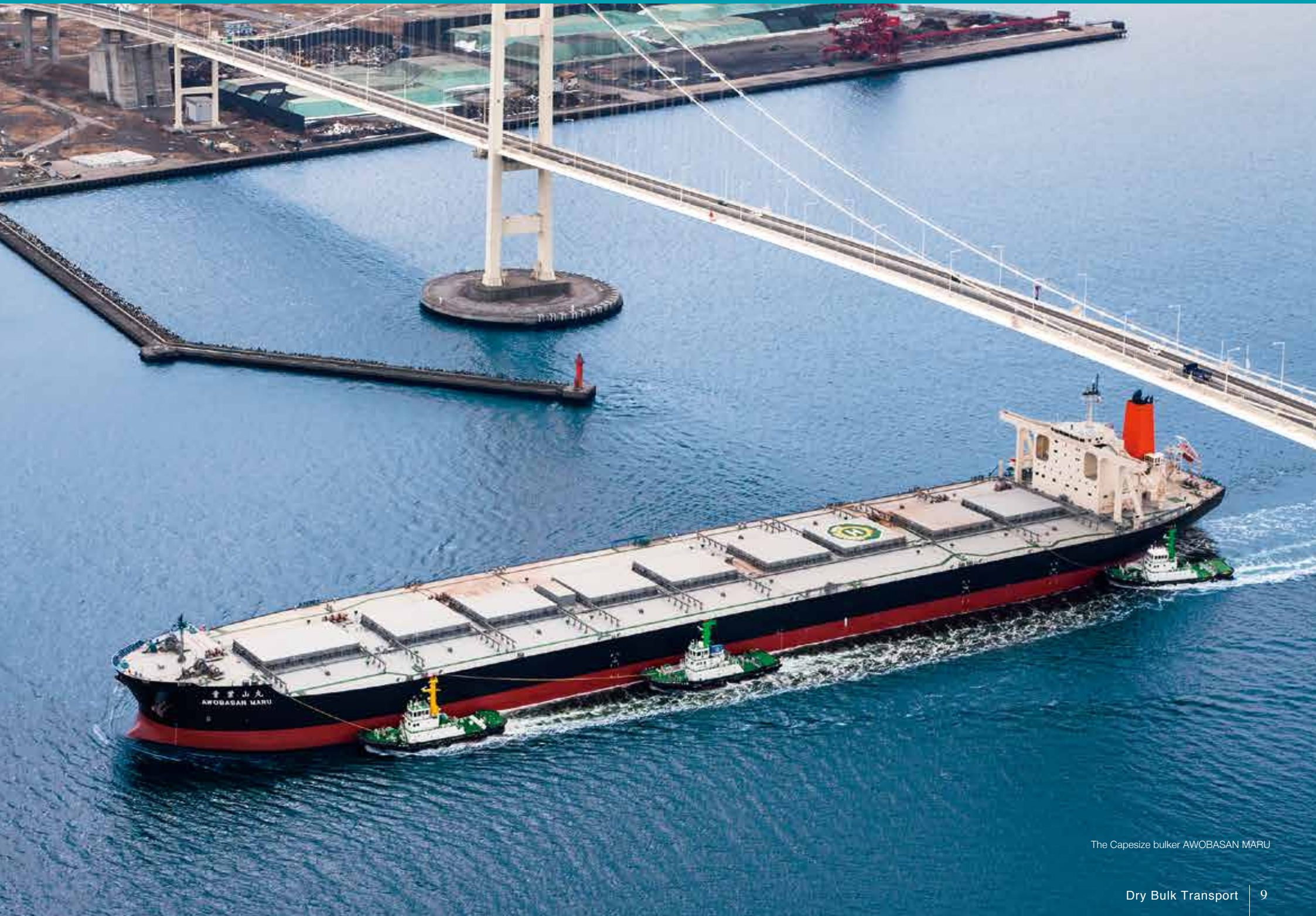
Dry Bulker Transport



Dry bulk cargoes range widely from raw materials such as iron ore, coal, wood chips, and biomass fuels to intermediate commodities and products such as fertilizers, grain, cement, salt, and steel products. The MOL Group fleet transports these vital commodities not only to Japan, which relies heavily on imports, but to markets around the world as well. Global dry bulker transport plays an active role in economic growth and the shift toward an international division of labor.

MOL's dry bulker fleet, the largest in the world, offers stable transport service to meet various customer needs with a full lineup of general-purpose bulk carriers that can transport a wide variety of cargoes and specialized carriers designed and constructed to meet the specific characteristics of different cargoes and conditions at loading and discharging ports. We also have a wide range of versatile bulkers from small to large size, flexibly meeting various trades around the world and providing high-quality transport services.

Looking to the future, MOL is taking a proactive stance in researching and developing next-generation bunkering vessels, fueled by LNG—which is much more environment friendly than conventional heavy oil—in response to stricter international regulations on exhaust emissions from merchant ships.



The Capesize bulker AWOBASAN MARU

The Wood chip carrier SOUTHERN TREASURE

Dry Bulkers Designed for Specific Needs

There are various sizes and types of dry bulkers according to the volume of cargo to be transported and facilities at ports of call.

Capesize bulkers, the largest dry bulkers in service, can transport various cargoes including iron ore and coal. They got the name “Capesize” because they could not pass through the Panama Canal before its expansion in 2016 and had to travel between the Atlantic and Pacific oceans via the Cape of Good Hope. Among Capesize vessels, the largest class is called very large ore carriers (VLOCs). Overall, these ships are massive, designed to maximize their capacity to load and transport iron ore, which has a high specific gravity, but the holds are narrow to boost the efficiency of loading and discharging.

Panamax bulkers are the largest ships capable of transiting the pre-expansion Panama Canal. They measure up to 900ft (about 274m) long and 106ft (about 32m) wide. They are well suited to transport grain shipped from ports on the Gulf of Mexico to Asia through the Panama Canal, as do Handymax bulkers.

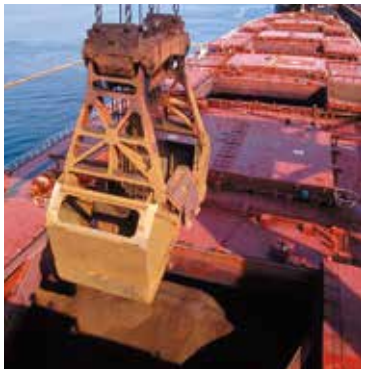
Handymax and Handysize bulkers are equipped with loading/unloading equipment, allowing them to load and discharge cargo at ports that do not have their own facilities. The “Handy” in their names refers to the convenience of being able to load and unload at virtually any port. These bulkers transport a variety of dry bulk cargoes such as grain, minor metals, and steel products, in smaller lots than Capesize and Panamax bulkers.

The MOL Group also operates other various specialized bulkers such as woodchip carriers, cement carriers, and heavyweight product carriers.


Loading wood chips


Loading coal


Loading steel products


Unloading cargo from a Capesize bulker

Handymax bulker DYNA CRANE

Dry Bulker Sizes

The size used for each service is determined by the transport lot requested by the customer, which depends on various factors such as the volume of cargo to be transported, restrictions at the ports of call, and so on, and the optimal size is selected to meet the lot. Transport lots show a rough trend according to the type of cargo.
The chart at right shows standard combinations of cargo and hull design.


The Wood chip carrier SOUTHERN STAR

Size Category and Main Transport Cargoes

	Iron ore	Coal	Major grain cargoes (wheat, corn, beans)	Minor bulk cargoes (minerals, metals, agricultural products, fertilizers, steel products, wood chips, etc.)
Capesize 100K dwt -	↕	↕		
Panamax 65-100K dwt	↕	↕	↕	↕
Handymax 40-65K dwt		↕	↕	↕
Handysize 10-40K dwt			↕	↕

* dwt: Deadweight tonnage *Other combinations of size and cargo are possible on a voyage-by-voyage basis.

A Proven Track Record in Contributing to a Stable Energy Supply

Energy Transport

As global demand for energy diversifies, MOL is developing its energy transport business on a worldwide scale, backed by the world's largest fleet, a track record of success, and decades of know-how. Focusing on enhancing the quality of the fleet and providing world-class seafarer education and training, the company contributes to a stable worldwide energy supply with a comprehensive safety system that covers both hardware and software aspects in energy transport including liquefied natural gas (LNG), which requires advanced technological capabilities.

MOL is also moving aggressively into offshore businesses such as floating storage and regasification units (FSRUs) and floating production, storage, and offloading units (FPSOs), taking a proactive approach to developing these businesses, drawing upon its abundant track record in energy transport.

The VLCC KAZUSA

The TARANAKI SUN, world's first methanol carrier equipped with the main engine that uses methanol as fuel

Tankers

The Liquefied Cargo Transport Expert

MOL's fleet includes very large crude oil carriers (VLCCs) of more than 200,000 DWT and smaller vessels called Aframax tankers, contributing to the stable delivery of crude oil all around the world. The fleet also has various types of vessels that meet specific cargo characteristics — product tankers that transport refined petroleum products such as gas oils, naphtha, and gasoline, chemical tankers that transport liquid chemical products, and methanol carriers.

Methanol is drawing attention as an environmentally friendly fuel that can reduce nitrogen oxide (NOx) and sulfur oxide (SOx) emissions. Ahead of other companies, MOL is constantly adapting cutting-edge technology such as dual-fuel engines capable of running on either methanol or fuel oil.

To optimize customer service and provide safe and efficient transport, MOL integrates its high-level expertise in crude oil and petroleum transport with group ship management companies that specialize in tanker operation. In addition, we provide specialized seafarer education and training for tanker operation and cargo loading and discharging at our training centers, and have developed a practical training system in which apprentice crewmembers actually serve aboard a tanker.


The very large tanker EAGLE TRADER


The product tanker GARNET EXPRESS

MOL's first ice-breaking LNG carrier, VLADIMIR RUSANOV

LNG Carriers

Aiming at Stable Transport of Emerging Clean Energy Resources

Demand for liquefied natural gas (LNG) has been increasing as an environmentally friendly, clean energy source. MOL has accumulated considerable expertise in this field since 1983, when we first participated in LNG transport, and is proud to be in the forefront of LNG carrier ownership, management, and operation. In 2018, we became the first Asian shipping company to operate an ice-breaking LNG carrier for the Yamal LNG project, and pioneered the Northern Sea Route, moving ahead with our cutting-edge initiatives.

MOL manages its LNG carriers through six companies around the globe, in Tokyo, London, Hong Kong, Jakarta, Muscat (Oman), and Arzew (Algeria), maintaining safe operation with advanced transport technologies and highly skilled personnel.

MOL owns and operates liquefied petroleum gas (LPG) tankers, and in 2016, building upon our extensive experience and know-how acquired in both the LNG carrier and LPG carrier fields, we began operating the world's first very large ethane carrier in a strategic tie-up with Reliance Industries Limited in India.

MOL continually strives to provide safe, reliable ocean transport services to meet demand for liquefied gas, a sector where we anticipate robust growth in the future.

The LNG carrier LNG PIONEER

The world's first very large ethane carrier ETHANE CRYSTAL

The MOL FSRU CHALLENGER, delivered in October 2017

Offshore Business

Broadening Our Horizons with Challenging New Offshore Business Projects

MOL takes a proactive stance in the offshore business, where we anticipate further growth, by using the experience accumulated in LNG carrier and tanker operation. Floating production, storage and offloading (FPSO) units and floating storage and regasification units (FSRUs), which use a vessel moored in a specific place rather than transporting resources from one place to another, are typical of MOL's offshore business.

The company entered the FPSO business in 2010, and now participates in nine projects off the coast of Brazil, one off Ghana, and one off Mexico. Furthermore, in 2014 we entered the shuttle tanker business, which involves transporting crude oil from FPSOs to onshore oil refineries, in 2016, we made our first foray into the subsea support business, which includes installation, maintenance, repair, and decommissioning of subsea equipment, in 2017, we entered the renewable energy business through involvement in a company that operates turbine installation vessels, and in 2020, we signed a charter contract for service operation vessels (SOVs) at offshore wind farms.

MOL is also the first Asian shipping company to take delivery of an FSRU, which is currently in operation in Turkey, and is slated to enter service under a long-term contract in Hong Kong starting in 2021. In Indonesia, plans are underway for an FSRU that will be integrated with a large-scale LNG-fired thermal plant, and another project is slated to start in India in 2021. Most recently, MOL began working toward commercialization of Germany's first offshore LNG receiving terminal with Uniper S.E., a major gas and electric power company in Europe.

And in 2019, based on our accumulated experience and track record in LNG carrier and FSRU operation, MOL and Karpowership of Turkey jointly started an LNG powership business combining an FSRU and powership. Following the first powership project in Mozambique, East Africa, we have taken a proactive approach to developing our offshore business.


FPSO CIDADE DE CARAGUATATUBA MV27
(Photo courtesy: MODEC, Inc.)

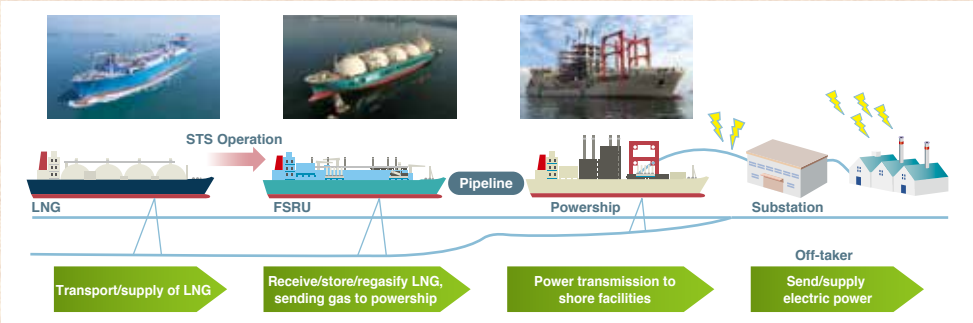

Subsea Support Vessel SKANDI SANTOS

MOL's New Initiatives

Start of World's 1st LNG Powership under KARMOL Unified Brand

~ MOL and Karpowership Develop LNG Powership Business in Mozambique ~

In March 2019, MOL—Asia's largest FSRU operator—and Karpower International B.V. of Turkey (Karpowership)—the world's largest powership operator—agreed to collaborate in the LNG-to-powership business under the brand name "KARMOL."
KARMOL' s LNG-to-powership business is combination of FSRUs and powerships. LNG is regasified on the FSRU and sent to the powership, where electricity is generated. The LNG-to-powership business generates electricity with a much lower investment compared to power plant infrastructure on land and can be online much more quickly. This offers a flexible and cost-competitive solution to electric power needs. In addition, powerships have a much lower environmental impact than conventional heavy oil-fired power plants.



As the first project of in the KARMOL partnership, in August 2019, we announced the joint operation of the world's first LNG-to-powership business in Mozambique and joint ownership and operation of the FSRU and powership. The power generated will be supplied to Mozambique's national electric power company, Electricidade de Moçambique (EDM), via shore power transmission facilities. In Nacala, the site of the project, the powership is currently running on heavy oil, but following the agreement with EDM, it will shift to LNG fuel after the FRSU arrives. KARMOL's LNG-to-powership solution will bring a stable supply of electricity to people in Mozambique, where demand for affordable electricity is growing along with rapid economic growth, and will become an important facility using LNG produced domestically in Mozambique. MOL and Karpowership combine their respective know-how and continually offer proposals in the LNG-to-powership business, which has excellent cost competitiveness and can be applied worldwide.


FSRU


Powership

Developing 'Asia's 1st SOV Business'

~ Asia's 1st Service Operation Vessel Time Charterer and Shipbuilding Contract for Wind Farms in Taiwan ~

MOL is involved the first service operation vessel (SOV) business in Asia through Ta San Shang Marine Co. Ltd., a joint venture with Ta Tong Marine (TTM), MOL's longtime business partner in Taiwan.
In April 2020, Ta San Shang Marine signed a charter contract for the SOV with Ørsted Taiwan Limited, a wholly owned subsidiary of Ørsted A/S in Denmark, and with VARD Singapore Pte. Ltd, a wholly owned subsidiary of VARD Group A/S in Norway, to build the new vessel that will serve under the contract.
SOVs, specially designed to support the maintenance of offshore wind farms, are utilized mainly in Europe, which is a center of the offshore windfarm industry, and are expected to be used in Taiwan and other parts of Asia in step with the expansion of offshore windfarms. The SOV is slated to be delivered at Vard Vung Tau (a VARD subsidiary shipyard in Vietnam) during the first half of 2022. Then, it will provide maintenance support operations for the Greater Changhua Wind farms under development by Ørsted, for a term with an extension option to 20 years.
MOL is taking a step forward into new business domains in the "Environment and Emission-free Businesses," a groupwide effort to further enhance our initiatives on reducing environmental impact by drawing upon our business experience and marine engineering know-how accumulated in Taiwan with Ta Tong Marine, while building a relationship with Ørsted A/S, the world's largest operator in offshore wind power business.


Exterior of a service operation vessel (image)

Building an LNG Bunkering Vessel

~ Signing Deal for Long-term Charter Contract for LNG Bunkering Vessel with Singapore State Energy Company Pavilion Gas ~

MOL has been building Asia's largest (12,000m^3-class) LNG bunkering vessel in Singapore, the world's largest fuel supply port.
In February 2019, the company signed a long-term charter contract for the LNG bunkering vessel with Singapore's state energy company Pavilion Gas Pte Ltd. (PGPL). The vessel will be delivered to PGPL in 2021 and go into service as Singapore's second LNG bunkering vessel.
In addition, MOL signed long-term charter contracts with Total Marine Fuels Global Solutions in February 2018 and December 2019 for two 18,600m^3-class LNG bunkering vessels, which will be the world's largest. The first will go into service in Northern Europe and the second in France, as that nation's first large-scale LNG bunkering vessel.
Demand for LNG as a vessel fuel is expected to grow globally due to tighter regulations on emissions of sulfur oxide (SOx). With the aim of reducing the shipping industry's environmental impact, MOL continually moves ahead with projects to develop an LNG fuel supply infrastructure and increase the use of LNG bunkering vessels.

Supplying LNG fuel to containership (image)

Meeting Diversified Transport Needs with Advanced Networks and High-quality Services

Product Transport

Worldwide cargo traffic has continued to grow along with the progress of economic globalization, including the growth of emerging countries and the shift of manufacturing plants to overseas locations. MOL transports a broad range of products, from industrial products to general consumer goods and automobiles, with a service network that covers the globe.
In our car carrier operations, we offer services that precisely meet the diversified transport needs and distribution patterns of today's automobile manufacturers. MOL, as a pioneer with a half century of success, provides comprehensive, top-quality, local market-oriented services such as land transport, coastal shipping, and terminal operation. In the containership field, Ocean Network Express (ONE), which was created through the integration of three Japanese shipping companies' container shipping businesses, started its services in April 2018. It offers an enhanced level of service with one of the world's largest fleets and an extensive network of calling ports. In addition, MOL provides extensive logistics services, drawing upon its ocean shipping know-how and specialized group companies to meet diversified logistics needs.

The first ship of the next-generation car carrier FLEXIE series, BELUGA ACE

Car carrier DUGONG ACE

Car Carriers

Always a Pioneer in Automobile Transport

In 1965, MOL launched the first car carrier to meet the needs of Japan's burgeoning automobile export trade. Since then, as a pioneer in automobile transport, we have offered continual improvements in the safety and reliability of our car carrier service with a group fleet of 100 vessels, in step with the market's globalization.

The capacity of the first PCCs was about 1,200 automobiles. Today's pure car and truck carriers (PCTCs) accommodate all types of vehicles, from passenger cars to construction machinery. PCTCs can transport 6,800 standard passenger cars at once. In addition, MOL takes a proactive stance in reducing the environmental impact of its vessels, adopting designs that limit the effects of wind resistance and introducing solar power generation systems.

MOL-operated car carriers are known by their flagship name "ACE," which instantly identifies these ships as MOL carriers and links them to our proud history of technological innovation and environmental friendliness. The unified brand MOL Auto Carrier Express (MOL ACE) now sets the stage to build on this tradition as we strive to expand in global markets under this brand.

MOL ACE
Auto Carrier Express

MOL ACE (MOL Auto Carrier Express)

Ferry SUNFLOWER SATSUMA

Ferries & Coastal RoRo Ships

A Lifeline for Logistics in Japan

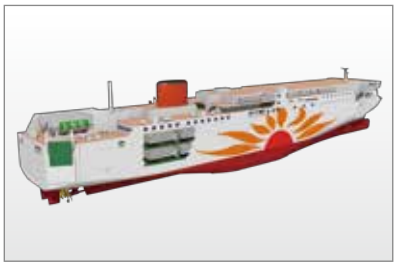
Ferries are especially well-suited for transporting large volumes of goods over long distances, and play an indispensable role in linking Japan's major markets and transporting industrial raw materials and products, foodstuffs, and more. We have developed a nationwide service network in Japan, from Tomakomai (Hokkaido) in the north, to Shibushi (Kagoshima) in the south. The role of our group ferry and coastal Roll-on/Roll-off vessel businesses is gaining more importance while involved in Japan's "modal shift," which contributes to reducing the environmental impact of land transport.

Offering 'Casual Cruise' Trips

Over 1.1 million passengers use MOL Group ferries every year. These modern vessels feature various types of cabins and a full lineup of public spaces such as restaurants, a Japanese-style Grand Bath, and viewing decks. The MOL Group offers high-quality "casual cruises," which allow everyone to enjoy a cruise trip with a relaxed atmosphere. In addition, MOL has ordered Japan's first two LNG-fueled ferries, which are slated for launch on the Beppu-Osaka route sequentially from end 2022 to early 2023. This will reduce CO_2 emissions by 20% compared to current ferries, meeting customers' needs while also achieving outstanding environmental performance.

Roll-on/Roll-off ship BUZEN

Ferry SUNFLOWER FURANO



LNG-fueled ferry (image)

Suite

Dog run

Containership ONE COMMITMENT

TraPac Los Angeles Terminal (U.S.)

Containerships

Ocean Network Express (ONE)

Ocean Network Express (ONE) was established by integrating the container liner businesses of MOL, Nippon Yusen Kaisha (NYK), and Kawasaki Kisen Kaisha (“K” Line) and commenced service in April 2018. The total fleet capacity after the integration is 1.56 million TEUs, the world’s sixth largest (as of June 2020). ONE operates 212 containerships, including 31 super-large ships in the 20,000TEU class, among the world’s largest a broad-ranging network in over 120 countries all over the world.

Terminal

Owned-operated Terminals Play a Key Role in Container Transport Value Chain

The MOL Group not only operates container terminals in five ports-Tokyo, Yokohama, Nagoya, Osaka, and Kobe, but also offers cargo handling services for car carriers and other cargo ships in Japan as part of our comprehensive approach to the terminal business. The group also operates container terminals in seven ports overseas (three in the U.S., two in Vietnam, one in Thailand, and one in the Netherlands).

The MOL Group promotes automated and hybrid operation of cargo handling at its facilities, striving to ensure safe, efficient, and environmentally friendly operations.

MOL Logistics office and warehouse in the Netherlands

Services

Logistics Services

Rotterdam World Gateway
(The Netherlands)

Tokyo International Container Terminal

Tan Cang Cai Mep International Container Terminal (Vietnam)

Total Logistics Services Bring together Group-wide Networks

MOL's logistics network has expanded to 239 locations in 123 cities in 26 countries around the world. We offer a wide variety of services such as air and ocean freight forwarding, trucking, customs clearance, warehousing, inspection, heavyweight and oversized cargo transport, and buyers' consolidation, by taking advantage of the distinctive logistics services of our group companies such as the MOL Logistics Group, UTOC Corporation, and MOL Consolidation Service. In recent years, we have pressed ahead with group-wide initiatives to expand our networks and enhance our services in regions such as Southeast Asia and Africa, where we anticipate strong economic growth in the future.
MOL Logistics has proactively developed its businesses in emerging countries, and opened the Dubai representative desk in 2019. In the same year, the company also concluded a new agency contract in Saudi Arabia, and one in Bangladesh in 2020.
Furthermore, MOL is expanding its NVOCC business as the key to the group's general cargo transport business under MOL Worldwide Logistics Ltd., which serves as the group's NVOCC headquarters.
MOL strives to meet customer needs and continually aims to be the first company that comes to mind when customers think of a total logistics partner.

Air cargo loading operation

Heavyweight Cargo Transport under the 'MOL Project & Heavy Cargo' Brand

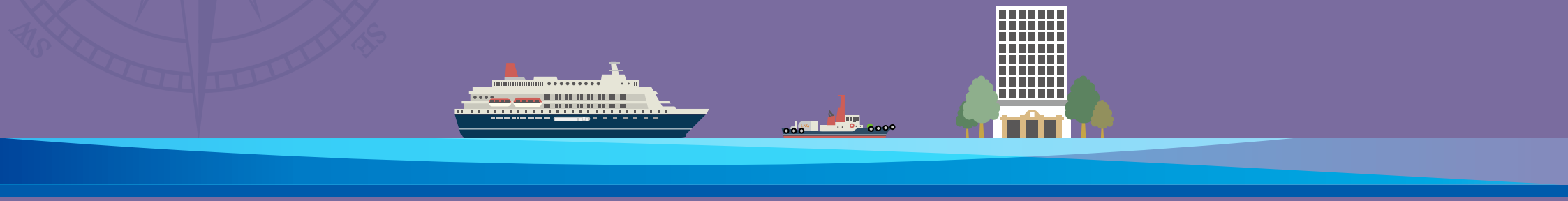
In 2015, MOL established "MOL Project & Heavy Cargo" as a unified brand to meet a broad range of needs in heavyweight and oversized cargo transport. We provide not only optimal transport, which covers various ship types, but also one-stop services including vanning, coastal and land transport, customs clearance, assembly, and installation. Since 2019, we have been focusing on providing logistics services for wind power projects and held joint exhibits such as the Wind Expo with group companies in this regard. Furthermore, we have developed a new cradle called the MOL COILPORTER® as an innovative means of handling heavyweight steel coils, and started marketing and expanding sales from 2020.

Transport of steel coils using MOL COILPORTER®

Land transport of a windmill blade

Various Associated Businesses Build upon Our Strength in Ocean Shipping

Associated Businesses



MOL has accumulated an immense storehouse of know-how centered on ocean shipping, drawing upon over 130 years of history and tradition.
Our expertise encompasses not only ocean shipping-related businesses such as tugboat operation, land transport, warehousing, and maritime consulting services, but also travel, office building leasing, and property management, as well as finance, trading, insurance, ICT systems, supporting a national oil stockpiling project, sales of nautical charts, and more.
Our associated businesses are the fruits of the MOL spirit: “Creating business from business.”

Luxurious Comfort with Sincere Hospitality

Cruise ship NIPPON MARU

Mitsui O.S.K. Passenger Lines, Ltd. (MOPAS) offers a broad lineup of cruises aboard the NIPPON MARU, from casual overnight jaunts to cruises all over Japan and overseas cruises with a variety of themes and ports of call.

MOPAS cruise guests can experience the relaxation of life at sea, and of course superb seasonal and local cuisine. This epicurean relaxation harkens back to our century of experience in pampering our passengers.

In commemoration of the 30th anniversary of the NIPPON MARU's services in September 2020, it underwent a renovation lasting about 50 days in the spring of that year. Passengers can enjoy more comfort and options with the new NIPPON MARU while enjoying the fine tradition of cruise travel.

Safely Escorting Large Vessels, Ships Loaded with Hazardous Cargoes

LNG-fueled tugboat ISHIN

The MOL Group's tugboat business supports vessels in arriving and leaving port, berthing and unberthing, avoiding hazards, and other operations.

In recent years, as LNG has gained wider adoption as a clean energy source, transport volume of energy resources centering on LNG has shown a steady increase. New LNG terminals have gone into service one after another, and increasing LNG vessel traffic underscores the need for enhancements in tugboat operation capacity, from the standpoints of both quality and quantity.

Through a group company, MOL is working to precisely address these needs, and help protect the environment by introducing new types of tugboats including the first LNG-fueled ISHIN in western Japan, working to develop the fleet. At the same time, we are striving to improve the maintenance of equipment and instruments and upgrade the skills of crewmembers with enhanced safety training with the goal of efficient, accident-free operation.

Ocean Shipping Opens up a Wide Variety of Business Fields

Daibiru Honkan Building lobby (interior)

Shin-Daibiru Building

Our real estate subsidiary Daibiru Corporation owns and leases 30 office and commercial buildings and hotels in urban subcenters of Tokyo, Osaka, and Sapporo. We are constantly looking for ways to create a more comfortable business environment by meeting various tenant needs and proactively taking initiatives on extensive renovation of older buildings. Daibiru also owns office buildings in Ho Chi Minh City and Hanoi, Vietnam, and new office buildings were completed in Sydney, Australia in 2020. Looking to new markets overseas, the company has been leveraging the building management expertise it has accumulated in Japan.

As our trading business, MOL Techno-Trade, Ltd. sells bunker oil and lubricants, various equipment and instruments, materials, parts and components, and telecommunication equipment for vessels. The company also focus on sales of environment-friendly products such as Propeller Boss Cap Fins (PBCF), which improve propulsion efficiency of vessels' screws, ballast water treatment systems, plastic waste compactors, and products to support safe operation using ICT.

PBCF

The History of MOL

1878

- The iron-hulled steamer HIDEYOSHII MARU begins ocean transport of Miike coal from Kuchinotsu (Japan) to Shanghai.

1884

- Osaka Shosen Kaisha (OSK Line) is founded.

1930

- The high-speed cargo ship KINAI MARU is launched, and covers the Yokohama-New York route in 25 days and 17.5 hours, well below the industry average of 35 days.

1939

- The ARGENTINA MARU and BRASIL MARU are built and launched as cargo/-passenger liners on the South America route. These vessels represent the state-of-the-art in Japanese shipbuilding at the time.

1942

- Mitsui & Co. spins off its shipping department to create Mitsui Steamship Co., Ltd.

1961

- The world's first automated ship, the KINKASAN MARU, with an engine room operated entirely from the bridge, is delivered. Automation reduces the number of seafarers from 52 to 38.

1964

- Japan's shipping industry undergoes a major consolidation, with mergers creating six companies – Mitsui O.S.K. Lines, Ltd. (MOL) by a merger of OSK Line and Mitsui Steamship, Japan Line, Ltd. (JL) by a merger of Nitto Shosen and Daido Kaiun, and Yamashita-Shinnihon Steamship Co., Ltd. (YSL) by a merger of Yamashita Kisen and Shinnihon Kisen.

1965

- Japan's first specialized car carrier, the OPPAMA MARU, is launched.

1968

- MOL, JL, and YSL launch the full containerships AMERICA MARU, JAPAN ACE, and KASHU MARU, respectively, on the Japan-California route.

1984

- The LNG carrier SENSHU MARU is launched.

1989

- Japan's first full-fledged cruise ship, the FUJI MARU, is launched, ushering in the era of leisure cruises in Japan.
- Navix Line is established by the merger of JL and YSL.

1990

- The cruise ship NIPPON MARU is launched.

1993

- Crew training school is established in Manila.

1995

- Container route service through a strategic international tie-up, called The Global Alliance (TGA), begins.
- The first double hull very large crude carrier (VLCC), the ATLANTIC LIBERTY, is delivered.

1999

- New Mitsui O.S.K. merger of MOL and

2

- M
St

Lines is established by the Navix Line.

000

OL Environmental Policy atements are issued.

2003

- All departments at the Head Office and MOL-operated vessels acquire ISO14001.

2009

- Next-generation vessel concept Senpaku ISHIN project announced.

2010

- New MOL Technology Research Center opens.

2013

- CADET Training Program is launched.

2014

- 130th Anniversary.

2016

- The methanol carriers, TARANAKI SUN and two other vessels are delivered. These vessels are equipped with dual-fuel engines that can run on methanol and heavy oil.

- World's first large-size ethane carrier, the ETHANE CRYSTAL, is delivered.
- "Senpaku ISHIN NEXT~MOL SMART SHIP PROJECT~" is launched.

2018 Part 1

- The first in the FLEXIE series of next-generation car carriers, the BELUGA ACE, is delivered. The series wins the Good Design Award 2018.

- Container shipping joint venture, Ocean Network Express (ONE) starts business operation.
- MOL ice-breaking LNG carrier transports cargo by sailing eastwards (via the Bering Strait) along the Northern Sea Route from Yamal Peninsula, Russia.

2001

- MOL Group Corporate Principles are established.

2007

- Safety Operation Supporting Center is established in the Head Office.
- MOL Group logo mark is introduced.

MOL

- One of the world's largest iron ore carriers, the BRASIL MARU, is delivered.

2012

- The hybrid car carrier, the EMERALD ACE, is delivered.

2015

- The LNG carrier, the PAPUA, is delivered. This is the initial vessel in a project undertaken by MOL as the first overseas shipping company to build vessels in China.

2017

- One of the world's largest containerships, the MOL TRIUMPH, is launched.

- World's largest FSRU, the MOL FSRU CHALLENGER, is delivered.

2018 Part 2

- New MOL Magsaysay Maritime Academy in the Philippines opens.

- MOL issues "MOL Blue Ocean Environmental Bonds," Japan's first green bonds aimed at individual investors.

2019

- The LNG-fueled tugboat, ISHIN is delivered.
- The car carrier BELUGA ACE receives the Ship of the Year 2018 award and ferries SUNFLOWER SATSUMA and KIRISHIMA are honored in the large passenger ship sector.
- MOL establishes a joint venture to develop and promote the spread of zero-emission electrically powered vessels.
- "Wind Challenger" design acquires preliminary approval.

MOL CHART

Our Values

Challenge

Innovate through insight

Proactively develop business opportunities by staying ahead of the curve.
Encourage innovation for the further growth of the company.

Honesty

Do the right thing

Make compliance the top priority.
Ensure that actions comply with social norms and the highest ethical standards.

Accountability

Commit to acting with a sense of ownership

Tackle tasks with a sense of ownership and in cooperation with stakeholders.

Reliability

Gain the trust of customers

Provide the highest level of safety and service.

Teamwork

Build a strong team

Encourage open communication with mutual respect.
Share knowledge, experience, expertise, and skills, and foster the next generation.

MOL Mitsui O.S.K. Lines

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