Safe Operation

Forging Ahead to Become “the World Leader in Safe Operation”

CSR Targets in the Midterm Management Plan (FY2014 ~ FY2016)

Thoroughly implement safe operation and provide safe, secure, stable, high-quality services.

Supplying safe, secure and stable services is the basis for earning stakeholders’ trust and becoming their choice. By reminding ourselves once again that marine shipping is a social mission as it supports industries and the daily lives of people around the world, we will strive to supply high-quality services, which meet the requirements of the new era and contribute to the development of the world economy.

Opportunities and Risks

Opportunities

- Earn customers’ trust and create new business opportunities by accumulating a solid record of safe, secure, and reliable transport services.
- Increase competitiveness by meeting customer needs and continually enhancing the safety of our operations.

Risks

- Significant impact on society, the environment, and corporate management in the event of an incident.
- Loss of trust from customers and business opportunities due to incidents or decline in service quality.

Initiatives on “Safe Operation” in Value Chains




Recruiting seafarers | Ship construction | Cargo transport | Human resources development

Recruiting seafarers	Ship construction	Cargo transport	
3rd Year Program	MOL Safety Standards Specifications, MOL Standards	Safety Operation Supporting Center (SOSC)	Safety superintendent at loading/unloading operations
Establishment of a maritime academy	Cooperation with shipyards	Ship inspections targeting all in-service vessels	Fostering safety culture
		Thorough survey by inspectors with superior safety expertise	Human resources development
	Use of IoT / Big Data (ICT)		

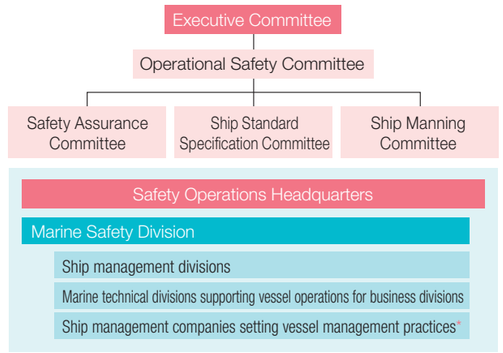
MOL’s Approaches

All land-based and ocean-going personnel are united in working to achieve our goals including “Four Zeroes.”

Safety Operation Management Structure

The MOL Operational Safety Committee, chaired by the president, meets bimonthly to deliberate basic policies, countermeasures, and other items related to secure and completely safe operation of MOL- and MOL Group-operated vessels, and makes decisions on safety related measures.

Committees Related to Safe Operation



* MOL Ship Management Co., Ltd., and MOL LNG Transport Co., Ltd.

Safety Cost-focus Management

A well-known oil spill occurred off Spain in 2002, which resulted in the spill of about 63,000 tons of heavy oil after the oil tanker Prestige suffered hull damage and sank. Victims’ claims totaled about 1 billion euros (about ¥140.0 billion). This is typical of a serious marine accident that results in significant damage to the environment.

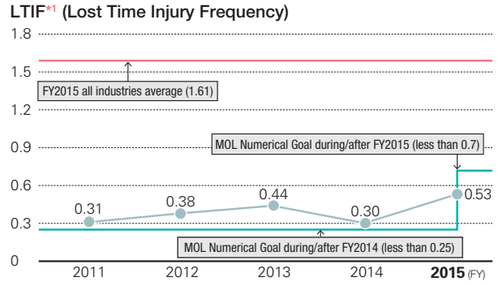
MOL established its unique “MOL Safety Standard Specifications (please refer to page 17 for details).” This includes the “Fail Safe” concept required to ensure safety even at the ship design and construction stages. This also includes additional installation of backup equipment and other devices that allow for emergency operations. Normally, specifications and estimates quoted from shipyards are based on the standard specifications, but MOL is committed to taking additional safety measures even though it increases vessel construction costs by 2% to 3%. This can add up to billions of yen, but all of MOL’s vessels offer the most advanced safety specifications.

Key Performance Indicators (KPIs)

MOL sets the following numerical goals including “Four Zeroes,” as objective indices to measure safety.

① “Four Zeroes” (zero serious marine incidents, zero oil pollution, zero fatal accidents, and zero cargo damage)
② Less than 0.25 (till FY2014), Less than 0.70 (from FY2015) LTIF (Lost Time Injury Frequency)*1
③ Less than 24 hours of downtime per ship per year*2
④ Less than 1.00 incidents per ship per year that require stopping the ship.*3

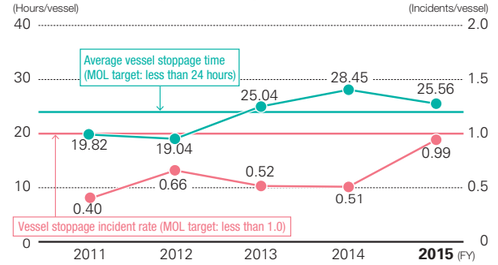
LTIF*1 (Lost Time Injury Frequency)



MOL LTIF

*1. Conventionally, occupational injuries and illnesses that forced seafarers to disembark vessels were counted. But starting in FY2015, the total includes cases in which seafarers did not have to disembark, but were unable to return to work, including light duty.
Reference: Overall industry average (2015): 1.61, water transportation industry: 1.23, transportation machinery and equipment manufacturing industry: 0.41
(source: Ministry of Health, Labour and Welfare “Outline of 2015 Survey on Industrial Accidents”)

Average Vessel Stoppage Time*2, and Percentage of Incidents Resulting in Stoppage*3



Average vessel stoppage time (hours/vessels/year) (left)
Number of incidents causing vessel stoppage (incidents/vessels/year) (right)
*2. Annual incident-related stoppage hours per vessel
*3. Annual number of incidents per vessel resulting in vessel stoppage

Incident Aboard MOL Ferry *Sunflower Daisetsu*

In FY2015, a serious marine incident and workplace fatality occurred on an MOL Group-operated vessel, so the group did not achieve “Four Zeroes.”

(Outline of Incident)

On July 31, 2015, an accidental fire broke out on the vehicle deck of the ferry *Sunflower Daisetsu* operated by MOL Ferry Co., Ltd., resulting in the death of a crewmember who was fighting the fire.

(Prevention of Reoccurrence)

To prevent the reoccurrence of such an incident, MOL Ferry installed additional firefighting equipment and facilities and provided a more practical firefighting plan. Upon the approval of the proper authorities, the vessel returned to service on February 3, 2016. It continues to conduct periodic firefighting training and is sharing its firefighting plan and safety measures with other group companies.

Initiatives on Safe Operation During Ship Construction

In cooperation with shipowners and shipbuilding companies, MOL continually strives to maintain and improve the quality of all operated vessels.

MOL Safety Standard Specifications

With the goal of effectively maintaining the safety of our operated vessels, MOL formulated the first edition of the MOL Safety Standard Specifications in the aftermath of serious marine incidents in 2006, and since then has been revising it accordingly. Serious incidents such as collisions and groundings, fires, sinking and loss of hull stability, oil spills, and other environmental pollution can have a huge impact on both society at large and the group's profitability, not to mention the loss of trust from customers and other stakeholders. In FY2016, we decided to expand the scope of the specifications to include workplace accidents.

MOL Standards systematically compile knowledge and expertise—gained through many years of experience in ship operation—related to ① countermeasures for issues such as inferior quality oil, which inhibits ship operation, ② maintenance procedures, and ③ policies and practices that contribute to life saving, security, and environmental protection, after technical and economic analysis.

Some of these countermeasures are as follows.

Countermeasure 1: MOL Integrated Bridge

The bridge is the nerve center of a merchant ship. MOL has adopted the "integrated bridge" approach, which clarifies the bridge position of officers on duty and ensures their traffic flow and communication lines by integrating instruments and gauges in one central location. In addition, they can obtain updates on ever-changing conditions surrounding the vessel more quickly than with a standard bridge layout, allowing them to make swifter, better decisions regarding vessel operating safety.

① Officers can see 360° around the vessel, enhancing visual watch-keeping.
② Traffic flow and communication lines of the officers on duty can be secured without inhibiting the forward visibility of the helmsman. Everyone on duty – the captain, pilots, and officers can independently operate and monitor nautical gauges and instruments, strengthening Bridge Resource Management (BRM)(*).
③ Integration of nautical gauges and instruments also allows their wiring to be integrated. This helps prevent a reoccurrence of a past incident in which wires to nautical instruments burned out.

(*) Bridge Resource Management (BRM)
BRM prevents human errors or remedies the effects of those errors at an early stage. The concept is based on making the best use of human resources (captain, officers, and other crewmembers on deck) and resources such as information available on the bridge.

Countermeasure 2: Introduction of Iridium Satellite Mobile Phones

MOL verified the effectiveness of iridium satellite mobile phones as a backup to existing telecommunication equipment when an engine room fire resulted in an electric power outage on an MOL Group-managed vessel. MOL Safety Standard Specifications now call for iridium satellite mobile phones for telecommunications backup to ensure smooth communication in case of an emergency. The company decided to retrofit existing vessels with iridium satellite mobile phones in addition to installing them on newbuilding vessels.

Working Closely with Shipyards

There are three shipbuilding supervisors' duties at a shipyard: ① quality management, ② process control, and ③ Health, Safety and Environment (HSE) management.

Quality management verifies that shipyards reliably meet required specifications that contribute to safe operation, rules for each ship type, and other requirements.

Health, Safety and Environment (HSE) management ensures the safety of employees onboard, for example, establishing safety rules prohibiting crewmembers from entering an enclosed space alone, or requiring them to must warn each other when they encounter unsafe behavior onboard.

MOL assigns two to three personnel – marine engineers from the group company and MOL engineering personnel – to the shipyard during the construction of a vessel. They work on-site at the shipyard for one to two years from the initial stage (about a month after steel cutting) to the completion of the vessel.

Initiatives on Safe Operation During Cargo Transport ①

24/7/365 Support from the Safety Operation Supporting Center (SOSC)

Strong Determination to Safe Operation

Four serious marine incidents occurred in 2006. After those incidents, MOL thoroughly investigated the causes, and in 2007, we established the SOSC, with the motto "Never let the captain get isolated." The MOL Group executives and employees working together, took the lessons learned from those incidents to heart, and developed measures "forging ahead to become the world leader in safe operation."

Risks Are Present Everywhere in the World

Our group vessels navigate the oceans of the world. Not only in bad weather situations such as winter storms, hurricanes and typhoons, and frozen river port, but also in places like the Middle East and Ukraine, where political situations can be volatile, we must always be ready to take appropriate measures. We also go where there is a chance of piracy. In other words, we must appropriately address myriad situations on a daily basis.

Global warming is upon us, and that serves to increase the power of tropical depressions – winds are stronger and accompanying rains are fiercer, so the linkage between vessels and shore becomes even more important. In addition, ship-to-shore cooperation becomes more crucial as deteriorating international conditions require greater preparation against possible pirate or terrorist attacks.

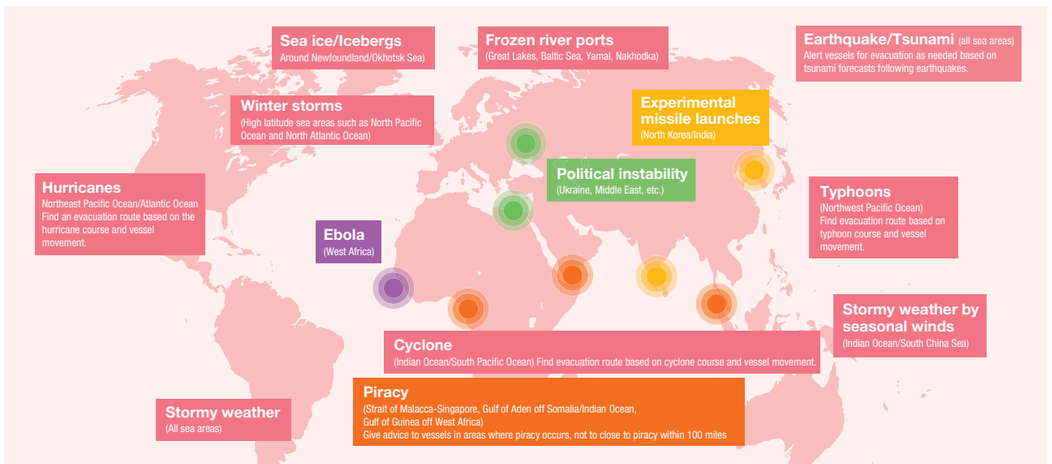
Our SOSC grasps these risks in real time, confirming that communications between vessels, ship management companies, marine technical teams, and personnel responsible for vessel operation is clear and constant. The SOSC's motto is "Never let the captain get isolated," and its initiatives are built on that premise. There are always two people on watch at the SOSC, one of whom must have experience as a captain of a vessel. Information on weather, reports from overseas media, and other things that might have something to bear on vessels under way is gathered. Thus, the SOSC is always ready to offer timely information and advice, and help prevent serious accidents before they happen.

Gathering Information
(Overseas media, or international information agencies*2, Maritime security information companies on piracies, etc.)

*2 International information agencies: IMB Piracy Reporting Centre, UK Marine Trade Operations, North Atlantic Treaty Organization

0:00
2:00
4:00
6:00 Inform internal divisions of the operating conditions of vessels steaming in the Indian Ocean or the Persian Gulf. (7:00)
8:00 Watch coming on apprised of current situation (8:00)

10:00
12:00 Video conference with the Weathernews. Confirming the conditions surrounding vessels that might need warnings. (12:00)
14:00 Broadcast information on rough weather areas around the world as well as coastal storm areas. (15:00)
16:00
18:00 Broadcast information on typhoon to vessels in harbors/ports and under way. (0:00, 6:00, 12:00, 18:00)
Watch coming on apprised of current situation (19:00)
20:00
22:00 Video conference with the Weathernews. Confirm observation of vessels that need warning. (22:00)
24:00



Initiatives on Safe Operation During Cargo Transport ②

Ship Inspection Activities Targeting All Operated Vessels

MOL conducts periodic ship inspections, based on our unique safety standards, targeting all group-operated vessels, regardless of whether they are owned or chartered. These inspections verify that the vessels are properly maintained and can operate safely.

With chartered vessels, we communicate closely with the shipowners and assigned ship management companies, to make sure they have a full understanding of the safety standards we require. We also cooperate with them to pursue safety measures while building mutually trusting relationships.

Thorough Investigation by Highly Skilled Ship Inspectors

A team of two ship inspectors, who have a thorough knowledge of MOL's safety standards through onboard experience as a captain or chief engineer, visit ships in person and conduct a detailed investigation based on a checklist of about 500 items, such as qualifications and career experience of crewmembers, records of the hull's maintenance status, and engine inspection and maintenance records.

If they spot an unsafe condition, they make sure the vessel and concerned ship management company take appropriate corrective measures so the ship meets MOL's strict safety standards.

Their completed report, which covers the entire inspection and is illustrated with photographs, is circulated among relevant divisions including the responsible business division. Thus, the quality of the vessel is confirmed. In case of charter vessels, the shipowner receives any corrective guidance through the business division. This consistent, professional approach ensures the safety of both owned and chartered ships.

Safety Supervision during Loading/Unloading

MOL assigns captains or former captains to supervise the safety of loading/unloading operations in port. They arrange communication between the foreign crewmembers and terminal (port), and offer guidance for crewmembers to improve their unloading/loading skills. They maintain and improve the quality of operations, ensuring safety at every step.

Fostering a Culture of Safety

Safety Campaign

MOL launches a biannual Safety Campaign with a different theme each time, during which executives and employees conduct an extensive series of visits to MOL-operated vessels and exchange information and opinions about ways to prevent incidents. Proposals and ideas gained through this campaign are shared throughout the MOL Group and among group-operated vessels to further enhance the group's safe-operation structure. Since FY2014, the theme of the Safety Campaign is "Behavior Based Safety (BBS)*." And starting in FY2015, we provide background information on recent incidents and near miss cases, and hold discussions about measures to eradicate incidents caused by overconfidence that stems from complacency and carelessness. Land-based executives and employees also think about what goes into each onboard task and the role and importance of safe operation. In these ways, we strive to build company-wide safety awareness and create a sense of unity among all executives and employees, whether they work on shore or at sea.

Safety Campaign Attendance in total (unit: persons)

FY2013	FY2014	FY2015
584	464	780

* Behavior Based Safety (BBS) is the concept that increases "safe behavior" and ensures the safety of the vessel by thinking of background factors when people select "safe behavior" or "unsafe behavior" and working on the factors behind the selection process.

Safety Conference

As a part of the MOL Group's measures to ensure safe operation, we have held Safety Conferences every year since 2007. In February and March 2016, Safety Conferences were held in Tokyo, Manila, Croatia, and India and attended by 540 crewmembers who were on leave. They actively exchanged opinions during presentations and group discussions focusing on two main themes: "lessons from incidents" and "preventing the occurrence of onboard fires."

Beach Cleanup at Kashima-nada Beach

This year marks 10 years since the grounding of the MOL-operated Giant Step in 2006. To prevent the memories and lessons of this incident from fading with time, MOL Group executives and employees meet every year at Kashima-nada beach, where the incident occurred, and conduct a beach cleanup. In 2015, 86 people participated in the cleanup activity.

Captain's Comment

When training my crewmembers, I put special emphasis on the concept of BBS: "Think Twice" that your behavior is correct; and do not depart from prescribed procedures to save time or work.

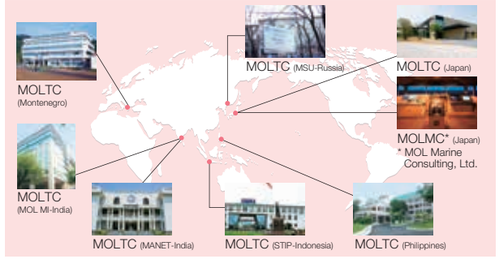
Prasanth.M.E.Manuel
Captain

Multinational, Diversified Seafarers Hone MOL Seamanship, to Address Any Situation

Human Resources Development

In order to achieve safe operation, we must have highly qualified crewmembers, which means recruiting and developing the very best people we can find. MOL employs the best personnel, regardless of nationality, and gives them the high level of education and training required to cultivate high morale, technical skills, and knowledge. The MOL Training Center provides not only the basic skills necessary for vessel operation, but also operational techniques specific to ship types. Thus, the center holds a wide variety of training programs from theoretical studies in the classroom to practical training that uses actual equipment and various types of simulators.

Training Highly Competent Crewmembers on a Global Scale (MOL Training Centers)



Crewmembers Receiving Instruction at MOL Training Centers (unit: persons)

	2013	2014	2015
The Philippines	7,983	8,511	6,114
India	3,004	2,067	1,405
Europe	508	1,046	1,035

In addition, MOL has introduced its unique systems such as "Cadet Actual Development for Education with Tutorial (CADET Training)," a practical training program aboard its-operated vessels, and the "OJT Instructor System," in which experienced captains and chief engineers go aboard a vessel and provide direct advice and instruction. These are just a few of our initiatives to hone the seamanship skills of mariners throughout the MOL Group.

We also plan to open a new marine university, MOL Magsaysay Maritime Academy Inc., in Dasmariñas City, the Philippines, in June 2018.

[Please refer to P.37-38 for details on MOL Magsaysay Maritime Academy Inc.]

Yamal LNG Project

MOL supports groundbreaking development to meet the world's continually expanding demand for energy, contributing to the world with our advanced transport services. In May 2016, construction of our first vessel for the Yamal LNG project (and the fifth overall to serve the project) started at the Okpo shipyard of Daewoo Shipbuilding & Marine Engineering Co., Ltd.in Korea. The first vessel built for the project will be delivered in early 2017, and then undergo an ice-breaking performance test in the Kara Sea in Russia, in the presence of all the shipping companies participating in the project. After it is confirmed that the vessel can safely navigate the Arctic Ocean, it will start transport service.

CG provided by Daewoo Shipbuilding & Marine Engineering Co., Ltd.

The Yamal LNG terminal faces the Kara Sea, which completely freezes during the winter. The average temperature is about minus 30ºC in winter, and in some situations dips below minus 40ºC. Our crewmembers are the most critical link in ensuring safe operation, so it is important to develop an environment where they can fully demonstrate their skills and abilities under a harsh natural environment. Our ship management company in London will play the main role, while cooperating with ship management companies working with other shipping lines involved. We are currently evaluating the operational risks.

[Please refer to the website for details of the YAMAL LNG project.]
http://www.mol.co.jp/csr-e/safety/yamal/index.hetml

Steel cutting

A Message from Director General, Safety Operations Headquarter

In the same way that a food company must absolutely never sell unsafe food to its customers, an ocean shipping company must never provide its customers with service that is not safe. That would be completely unforgivable. However, it is difficult to accurately predict the kinds of crises that may occur due to natural causes or other vessels. No matter how carefully we operate these huge vessels and all their machinery, something can break or malfunction.

Our initiatives are patient efforts with the long-term goal of eradicating any incidents, but many of them are not immediately linked to results. Thus, there are many days in which we must regret the occurrence and reoccurrence of incidents or trouble that we could have been able to avoid. There are still many things to do to create a true "safety culture."

Masaaki Nemoto
Senior Managing Executive Officer,
Director General,
Safety Operations Headquarter