

March 2016

# ClassNK

## Annual Report

[English]



# The ClassNK Mission

ClassNK is dedicated to ensuring the safety of life and property at sea and protecting the marine environment. To achieve this mission ClassNK will:

- Deliver the highest quality classification services, by the highest quality personnel, while maintaining our totally independent third party, non-profit status.
- Develop relevant rules, guidances, and procedures, and conduct technical research and development to positively contribute to the maritime industry.
- Maintain and develop our global operations in line with the needs of our clients.

## Profile

Founded on 15 November 1899, Nippon Kaiji Kyokai, better known as ClassNK or simply NK, is a ship classification society dedicated to safeguarding life and property at sea and to protecting the marine environment. ClassNK provides a broad spectrum of services as an independent third party, non-profit organization, including survey & certification services, technical consulting services, and research & development activities. The principal work of the Society's expert technical staff is to conduct surveys of new and existing ships and other floating structures, including hull structures, propulsion systems, electrical and electronic systems, safety equipment, and cargo handling gear, among numerous other areas, to ensure their full compliance with classification rules developed by the Society. ClassNK also conducts a wide range of statutory surveys on behalf of more than 100 flag States around the world, as well as audits and registers ship safety & security management systems, quality, environmental and occupational health management systems, and seafarer training institutions.

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## Code of Ethics

In accordance with its mission to ensure the safety of life and property at sea and prevent the pollution of the marine environment, ClassNK has a duty to conduct its activities not only with respect for life and in observation of the law, but in accordance with social norms and commonly held principles. Bearing this in mind, ClassNK hereby established the following Code of Ethics.

### 1. The Mission of the Society

In order to fulfill its mission of ensuring the safety of life and property at sea and the security of ships, and preventing the pollution of the marine environment, as well as to provide clients with the best possible service, ClassNK shall operate in accordance with its Rules, as well as relevant international conventions, statutory regulations, flag administration requirements and other applicable standards.

The Society shall also make every effort to establish an organized system for conducting business, and shall strive not only to maintain that system, but to make continual improvements to that system in order to earn and maintain the trust of its customers and the society at large.

### 2. Independence, Impartiality and Integrity

ClassNK shall maintain its status as an independent organization and provide its services as an impartial third party.

All personnel of the Society shall work so as to bring neither disgrace to the Society's honor nor detriment to the Society's interests. Further, personnel of the Society shall not take action in the name of the Society, nor make use of their official title, except in the pursuit of their official duties.

All personnel of the Society shall remain free from any commercial, financial and other pressures which may affect their judgement on surveys and audits.

### 3. Confidentiality of Information

ClassNK shall recognize all certificates and survey records issued by the Society, as well as all relevant survey documents submitted by customers and all such information obtained by the Society as confidential information, and the contents and copies of such documents shall not be made available to other parties except as defined in the Rules of the Society, required by applicable legislation, court order, legal proceedings, adherence to Flag State requests, or by the Owner's authorization.

### 4. Implementation of Classification and Statutory Surveys

ClassNK shall conduct all surveys fairly and impartially and in strict accordance with the Rules of the Society and the requirements of the flag administration.

ClassNK shall not issue classification and statutory certificates and or other certificates or survey records, and shall not endorse such certificates, without performing the required surveys and/or fulfilling other stipulated requirements, accordingly.

### 5. Observance of Laws

ClassNK recognizes that it has a duty to society at large and shall execute all of its activities with respect to justice and impartiality, and shall strictly observe the law and social standards.

The management of ClassNK therefore recognize adherence to this Code of Ethics as part of the Society's mission, and shall not only ensure that all members of the Society's staff are made familiar with this Code, but shall also establish a system to ensure its effective application.

Further, in the event of a serious violation of this Code or the law, the management of ClassNK recognizes that it has the responsibility to investigate the cause of the violation and to take timely and appropriate corrective action in order to prevent the reoccurrence of such violations in the future.

## Message from Chairman and President



Welcome to the ClassNK Annual Report. I am Koichi Fujiwara, Chairman and President of ClassNK. Following my appointment as Chairman and President on 7 March 2016, I would like to take this opportunity to introduce myself and thank our stakeholders for their ongoing support of our activities at ClassNK.

ClassNK is dedicated to helping ensure the safety of life and property at sea, and protecting the marine environment. As part of that mission, we utilize our extensive experience in ship classification to provide a diverse range of services to the maritime industry across our strongly positioned service network. This ranges from surveys and audits conducted by highly qualified personnel, to rules and technical guidance reflecting the latest industry developments and innovative R&D projects which we carry out in response to emerging industry challenges.

2015 saw uneven economic growth worldwide which has adversely affected shipping markets and industries, creating an even more competitive business environment for classification societies.

Despite these turbulent market conditions, over the course of the 2015 another 830 vessels reaching almost 19 million gross tons were registered with the Society, bringing the total of the ClassNK registered fleet to over 240 million gross tons by year end, a testa-

**Koichi Fujiwara**

*Chairman and President*

ment to the high regard we receive for our core classification services. I would like to express my appreciation to all of our stakeholders and assure them that ClassNK will continue providing the highest quality technical services in line with the needs and expectations of the industry.

Safety continues to be a key driver behind our activities at ClassNK and in 2015 ClassNK developed rules for the structural strength of large container ships based on results from the Investigative Panel on Large Container-ship Safety, recommendations from the Ministry of Land, Infrastructure and Tourism's Committee on Large Container Ship Safety and IACS Unified Requirements on the structural safety of large containerships. ClassNK also developed a new set of technical rules to incorporate new IACS Common Structural Rules for Bulk Carriers and Oil Tankers (CSR BC&OT).

ClassNK also continued working to ensure smooth industry compliance with incoming environmental regulations. In 2015, ClassNK received two separate industry awards for its ballast water retrofit solution ClassNK-PEERLESS which was developed as a result of outcomes of our research and development in response to expected challenges surrounding entry of the ballast water management convention. ClassNK is committed to supporting the practical adoption of more environmental-

ly sustainable solutions, one example being LNG as a marine fuel. In 2015 the society registered Japan's first LNG-fueled tugboat, Sakigake, which is introduced in this report. ClassNK also issued Statements of Compliance (SoC) to ship recycling facilities in India, marking the first time the SoC has been issued to ship recycling facilities in South Asia, further highlighting ClassNK's commitments in ensuring the environmental sustainability of maritime operations.

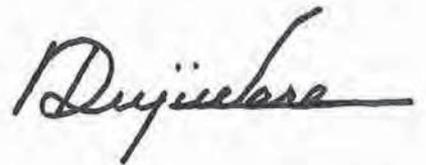
Underpinning the development of new services is our commitment to R&D through our Joint R&D with Industries and Academic Partners program first launched in 2009. In 2015, ClassNK successfully completed 46 joint projects as part of this program. This report will introduce some of the latest technological and software developments resulting from these projects.

The increased digitalization and connectivity of the maritime industry has opened up new markets for the use of big data from maritime operations. In December 2015, ClassNK established Ship Data Center in response to this trend, a subsidiary that will facilitate the utilization and analysis of big data gathered from ship operations.

The demand for the certification of management systems for quality, the environment, occupational health and safety and maritime education and training continues to increase

and in response ClassNK has been active in providing services in this area, including the verification of greenhouse gas inventories for shipping companies. ClassNK also continued to expand its presence in the renewable energy sector, supporting the development of renewable energy through the provision of its certification services and technical guidelines for renewable energy generation systems.

As I mentioned at the beginning of this message, March 2016 saw the reorganization of the Board of Directors at ClassNK. Under our new executive team, we will work to ensure stable operations and further enhance our corporate governance as required of an independent third-party organization so that the Society can continue contributing to the development of the maritime industry in the long term. We look forward to your continued support for our activities.



# 2015

## at a Glance



### ClassNK Register reaches more than 242 million gross tons and 9,190 vessels

- At the end of December 2015, the ClassNK register reached a total of 242,036,815 gross tons, marking the first time that the Register had exceeded 240 million gross tons.
- The size of ClassNK's register has grown every year since 1988, reaching 100 million gross tons registered in 1997 and a record breaking 200 million gross tons registered in mid-2012. Topping the 200 million mark was an important milestone in ClassNK's history, and marked the first time a classification society had achieved such a figure. In 2015, this increased further with 9,190 vessels totaling more than 240 million gross tons at year end.
- While the figure of shipbuilding is on the decrease, thanks to an increase in the number of existing vessels transferring from other classification societies to register with ClassNK, the Society's registered vessels has continued to rise.

# 18

Million GT

#### ClassNK Registers more than 18 Million Gross Tons

Over the course of 2015, 830 vessels totaling more than 18 million gross tons were newly added to the register.

# 46

Projects

#### ClassNK completes 46 Joint Research Projects

Since establishing its Joint R&D for Industry Program in 2009, ClassNK carries out a wide variety of joint R&D with industry partners each year. In 2015, ClassNK and its research partners completed 46 joint research projects as part of this program.

# 7

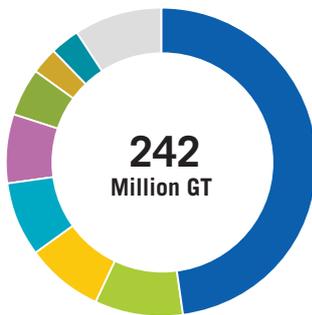
Guidelines

#### Publication of 7 New Guidelines

In 2015 ClassNK published the following guidelines. These guidelines are available to download via the Society's homepage after logging into "My Page."

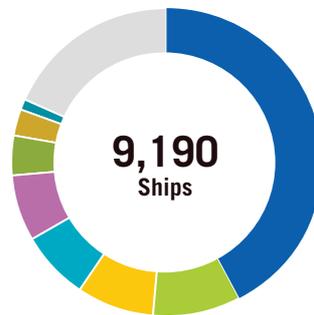
- Guidelines on Laser-Arc Hybrid Welding V.2
- Guidelines for Introducing Health, Safety and Environmental Management System
- Guidelines for Compressed Natural Gas Carriers
- Guidelines for Type Approval of Products for Marine Use for EU Mutual Recognition V.4
- Guidelines for Composite Propellers (Part on Manufacturing/Product Inspection)
- Guidelines for the Inventory of Hazardous Materials V.3
- Guidelines for Floating Offshore Facilities for LNG/LPG Production, Storage, Offloading and Regasification V.3

Breakdown of ClassNK Fleet by Flag

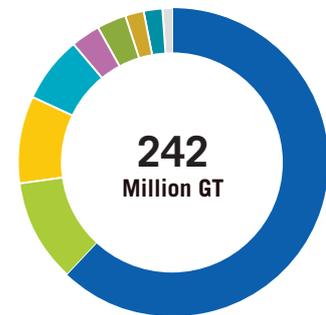


● Panama	48%	● Hong Kong	5%
● Liberia	9%	● Malta	3%
● Singapore	8%	● Bahamas	3%
● Japan	8%	● Other	9%
● Marshall Islands	7%		

Breakdown of ClassNK Fleet by Ship Type



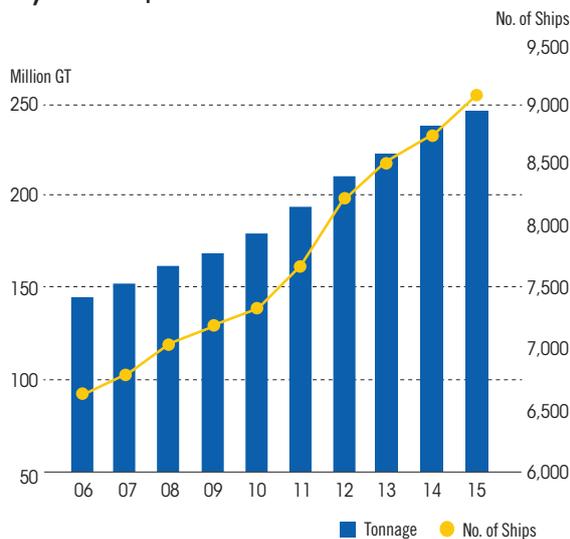
● Bulk Carrier	42%	● Vehicle Carrier	4%
● General Cargo	9%	● LPG Carrier	3%
● Oil Tanker	8%	● LNG Carrier	1%
● Chemical Carrier	7%	● Other	19%
● Container Carrier	7%		



● Bulk Carrier	62%	● General Cargo	3%
● Oil Tanker	11%	● LNG Carrier	2%
● Container Carrier	9%	● LPG Carrier	2%
● Vehicle Carrier	7%	● Other	1%
● Chemical Carrier	3%		

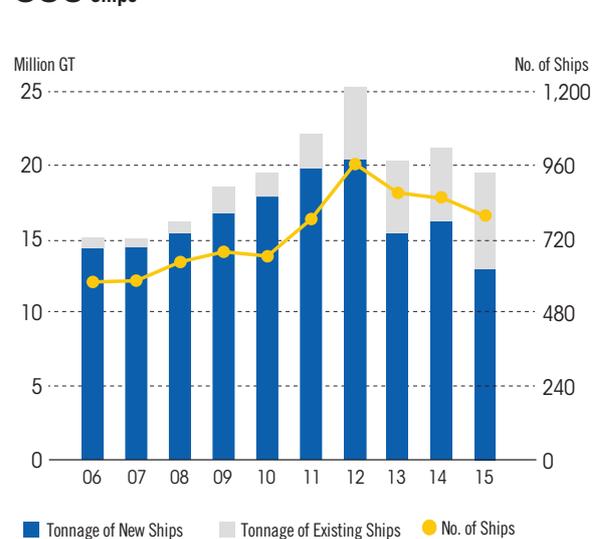
Total ClassNK Fleet

**242 Million GT**  
**9,190 Ships**



New Vessels Registered

**18.9 Million GT**  
**830 Ships**



# 2015

## at a Glance

### 13 Feb.

#### MOU with Singapore marks opening of new research center

ClassNK and the Maritime and Port Authority of Singapore (MPA) signed a memorandum of understanding (MOU) to promote research and development (R&D) and innovation in the maritime industry. ClassNK also established the ClassNK Global Research & Innovation Center (GRIC) in Singapore, ClassNK's first research center outside of Japan. The Center will support research and development in Asia as well as enhance ClassNK's presence in the renewable energy sector and wider maritime community.



### 27 Aug.

#### ClassNK registers Japan's first LNG-fuelled tugboat

ClassNK registered Japan's first LNG-fuelled tugboat Sakigake, which is powered by a Niigata 28AHX-DF dual-fuel engine which can run on either conventional diesel fuel or liquefied natural gas (LNG). ClassNK granted approval to the design of the 28AHX-DF dual-fuel engine in 2014.



**SAKIGAKE**  
272gt TUG built by KEIHIN DOCK CO., LTD. for NIPPON YUSEN KAISHA

### 28 Aug.

#### ClassNK conducts independent verification of Iino Marine Service's GHG emissions based on reasonable assurance

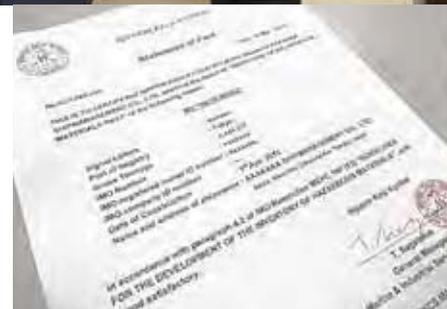
ClassNK carried out the independent third-party verification of Iino Marine Service's greenhouse gas (GHG) emissions inventory based on a reasonable level of assurance. ClassNK's verification was performed according to the requirements specified in ISO 14064 and under the observation of a registered accreditation body.



### Sep. / Dec.

#### ClassNK issues Hong Kong Convention Statements of Compliance to four ship recycling facilities in India

In September ClassNK issued Statements of Compliance (SoC) to R. L. Kalthia Ship Breaking Pvt. Ltd. and Priya Blue Industries Pvt. Ltd. in Gujarat, India, verifying that the facilities are in line with the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009. ClassNK went on to issue Statements of Compliance to Shree Ram Vessel Scrap Pvt. Ltd. and Leela Ship Recycling Pvt. Ltd. in December 2015. In total the Society has issued Statements of Compliance to four ship recycling facilities in China, one in Japan and four in India, totaling nine facilities.





## 2 Nov.

### ClassNK provides diesel ship engine for testing at NTU Marine Energy Test Bed

ClassNK provided a 1.5 megawatt diesel ship engine to facilitate research and development at Singapore-based Nanyang Technological University's (NTU) Maritime Energy Test Bed (METB) which NTU launched with support from ClassNK and Singapore Maritime Institute (SMI). The engine will facilitate joint research and development projects into the emission desulphurization process which are being led by industry members including Monohakobi Technology Institute (MTI) and NTU.

## Oct. / Nov.

### ClassNK-PEERLESS receives Innovation Award and IT Solutions Award

ClassNK-PEERLESS is a comprehensive and powerful design modeling software that utilizes high-precision 3D laser scanners in order to streamline the ballast water management system (BWMS) retrofit process. ClassNK-PEERLESS received the following awards in October and November 2015 respectively:

- The Innovation Award at Lloyd's List Asia Awards held on 28 October 2015
- IT Solutions Award at IBJ Awards held on 16 November 2015

## 7 Dec.

### ClassNK establishes Ship Data Center to accelerate Big Data use in the maritime industry

ClassNK established Ship Data Center Co., Ltd. in Tokyo, Japan, a wholly owned subsidiary that aims to support the utilization of data gathered from ship operations. The data collected by the Center will be strictly confidential and made accessible to stakeholders. By providing a database where consolidated data from ship operations can be stored and accessed at low cost, ClassNK aims to contribute to the wider use of big data throughout the maritime industry.

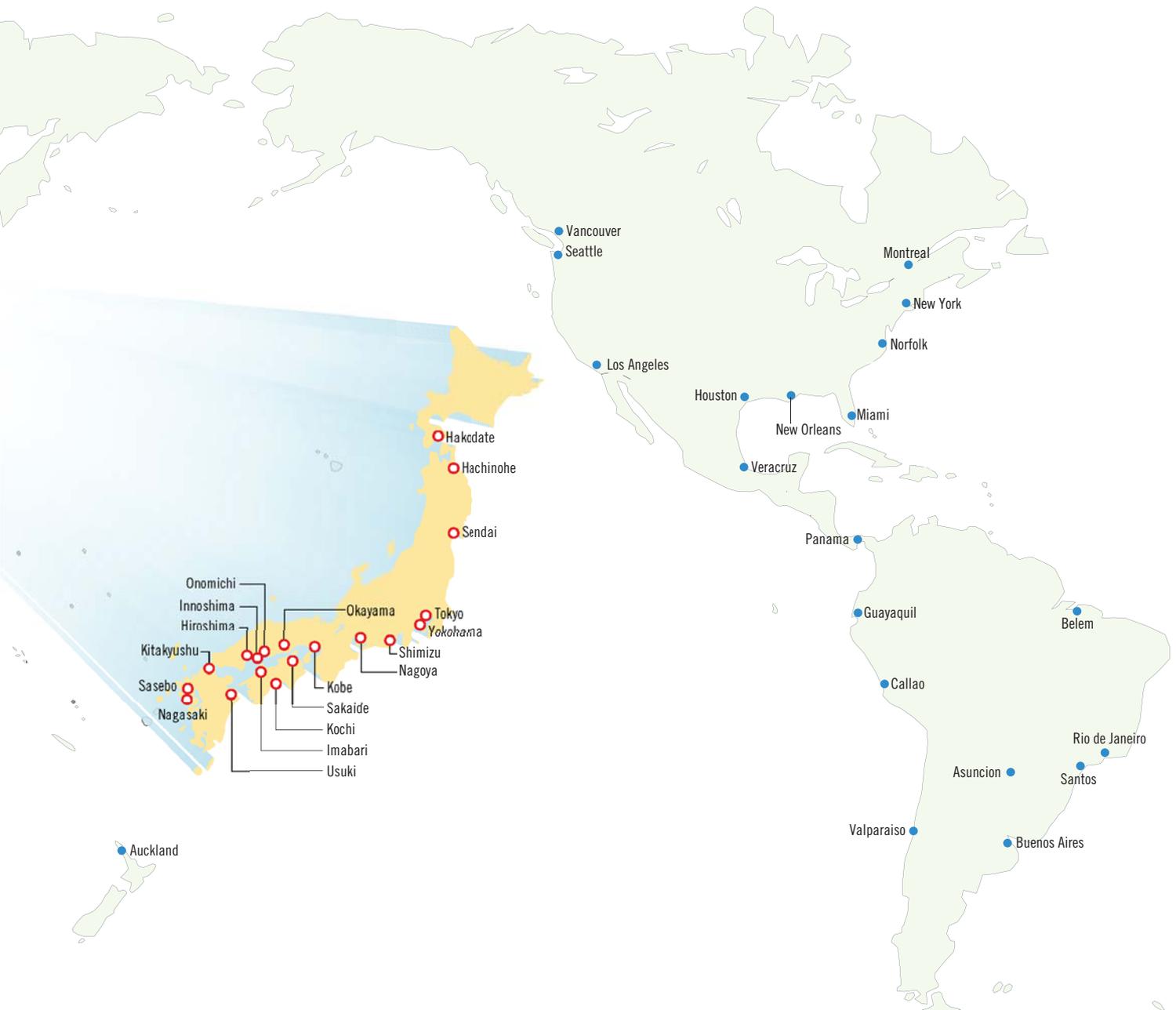


**New offices opened in 2015**

<b>Apr.</b>	<b>Cadiz, Spain</b>
<b>Aug.</b>	<b>Brunei</b>

**Plan Approval Centers**

Japan	ClassNK Head Office, Tokyo, Administration Center (Hull Department, Natural Resources and Energy Department, Machinery Department, Material and Equipment Department · EEDI Department)
Korea	Plan Approval Center, Busan
China	Plan Approval Center, Shanghai
Singapore	Plan Approval Center, Singapore
Turkey	Plan Approval Center, Istanbul
India	Plan Approval Center, Mumbai



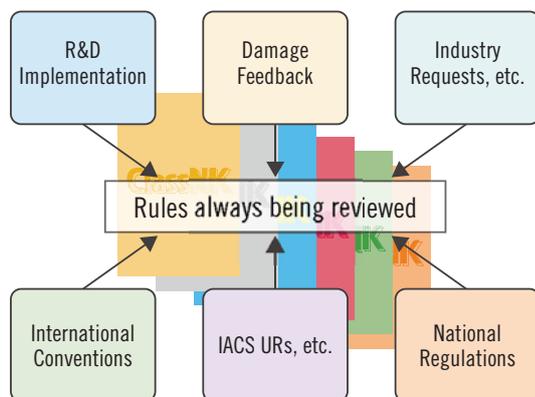
# ClassNK in Action

ClassNK maintains an ever expanding global service network of more than 128 survey offices and six plan approval centers in major port cities and shipbuilding regions around the world. In 2015, more than 18 million gross tons, or 830 ships were added to the ClassNK register.

## Establishment and Amendment of Technical Rules

ClassNK is constantly revising its Rules and Guidance in order to reflect requests from industry, the latest results from relevant research and development projects, feedback from damage investigations as well as changes made to relevant international conventions, International Association of Classification Societies (IACS) Unified Requirements (URs), national regulations, etc.

87 amendments were approved during 2015. This report will introduce some of the major amendments.



### Amendments Related to Structural Strength Requirements for Container Carriers

In response to a large container ship casualty in June 2013, ClassNK established “The Investigative Panel on Large Container Ship Safety”. The committee included shipbuilders, shipping companies, and people with relevant knowledge and experience, and its purpose was to investigate the possibility of casualty occurrence and the structural safety of large container carriers. The committee’s final report, including ClassNK’s action plan, was released in September 2014. The Japanese Ministry of Land, Infrastructure, Transport and Tourism (MLIT) also established its own committee in response to the same casualty, and released its recommendations in March 2015. In addition, IACS adopted two new URs related to the longitudinal strength, etc. of container ships in 2015.

ClassNK amended its independently developed requirements related to longitudinal strength, etc. to reflect its action plan and the MLIT recommendations and also amended Parts A, C, and M of its Rules and Guidance to incorporate the new IACS URs.

## A selection of newbuildings that registered with ClassNK in 2015



#### AMIS ELEGANCE

31,557gt BULK CARRIER built by KAWASAKI HEAVY INDUSTRIES, LTD. SHIP & OFFSHORE STRUCTURE COMPANY KOBE SHIPYARD for AMIS ELEGANCE S.A.



#### CEMTEX LEADER

46,935gt BULK CARRIER built by OSHIMA SHIPBUILDING CO., LTD. for U-MING MARINE TRANSPORT CORPORATION



#### CORINTHIAN

5,849gt LPG (PRESSURE) CARRIER built by MURAKAMI HIDE SHIPBUILDING CO., LTD. for FUJI IRON WORKS CO., LTD.

### Amendments Related to the Material Factors of Rolled Stainless Steel and Stainless Clad Steel Plates

In recent years, there has been considerable discussion regarding the possibility of using either duplex stainless steels or high tensile stainless steels, both of which have specified minimum proof stresses exceeding 355N/mm<sup>2</sup>, as the materials for the bulkheads between the cargo holds of chemical tankers instead of the stainless steels currently required to be used. In consideration of these new circumstances, the formulae for calculating material factors were revised to so that they can also be used for stainless steels whose specified minimum proof stresses exceed 355N/mm<sup>2</sup>. The material factors for stainless steels whose specified minimum proof stresses exceed 355N/mm<sup>2</sup> were determined based upon the results of high temperature tensile and fatigue tests for duplex stainless steel carried out as a part of a joint research project with relevant industries as well as the test results of other high tensile stainless steels. Accordingly, relevant requirements in Parts C and CS of the Rules and Guidance were amended based upon said results.

In addition to the above, it was also specified that separate fatigue strength and buckling strength analyses are required when high tensile steels are used and that such analyses are to be in accordance with the application location.

### Establishment of Common Structural Rules for Bulk Carriers and Oil Tankers

The IACS Common Structural Rules for Bulk Carriers (CSR-BC) and Common Structural Rules for Double Hull Oil Tankers (CSR-OT), which each entered into force in April 2006, were the result of a desire to harmonise the structural and technical rules for said ship types being applied by each IACS member society to eliminate variations and achieve consistency. In December 2013, IACS continued this harmonisation of its rules by adopting the Common Structural Rules for Bulk Carriers and Oil Tankers (CSR-BC & OT), which harmonises the technical requirements specified in both the CSR-BC and CSR-OT into a single set of rules. In response, ClassNK developed a new set of technical rules called Part CSR-B&T to incorporate the IACS CSR-BC & OT into the ClassNK Rules.

In addition to the above, amendments related to the following requirements were also approved during 2015:

- Propeller Shaft Condition Monitoring Systems
- Means of Escape from Machinery Control Rooms and Main Workshops
- Installation Positions of Fixed Hydrocarbon Gas Detection Systems
- Propeller Shaft and Stern Tube Shaft Surveys
- Welding Procedures and Related Specifications
- Scope of Application of Fire-resistant Cables
- Fire Safety Measures for Vehicle Carriers Transporting Motor Vehicles Powered by Compressed Hydrogen or Compressed Natural Gas

More specific details about all of the amendments made during 2015 are available on the “Rule Amendments for Technical Rules” page of the ClassNK website for ClassNK “MyPage” account holders. Please refer to the ClassNK website for more information on how to register for a “MyPage” account.



**ELLENITA**  
32,540gt BULK CARRIER built by TSUNEISHI HEAVY INDUSTRIES (CEBU), INC. for UM BULK AS



**EVER LYRIC**  
99,946gt CONTAINER CARRIER built by CSBC CORPORATION, TAIWAN, KAOHSIUNG SHIPYARD for EVERGREEN MARINE CORP. (TAIWAN) LTD.



**GENIUS SW**  
34,812gt BULK CARRIER built by ONOMICHI DOCKYARD CO., LTD. for SHIH WEI NAVIGATION CO., LTD.

## Class Surveys and Statutory Surveys

### Class Surveys

Over the course of the year, ClassNK surveyors carried out a total of 16,198 classification surveys around the world. Of these, 830 were initial surveys, and 15,368 were class maintenance surveys.

### Statutory Surveys

As of the end of 2015, ClassNK is authorized to carry out surveys and issue certificates in accordance with international conventions or domestic laws by more than 100 flag administrations around the world. In 2015, ClassNK carried out inspections and issued more than 34,000 statutory certificates based on these authorizations as follows:

- International Tonnage certificates: 962
- International Load Line certificates: 3,275
- SOLAS related certificates: 16,331
- MARPOL related certificates: 13,475
- Anti-fouling system certificates: 1,272

### ISM/ISPS Audits and MLC Inspections

Over the course of the year, ClassNK newly registered 72 companies and 921 ships in accordance with ISM requirements, bringing the total number of companies and vessels registered with ClassNK to 728 companies and 5,754 ships respectively. As of the end of 2015, ClassNK is authorized to conduct ISM audits on behalf of more than 80 Administrations. ClassNK registered 813 ships to ISPS Code requirements during the year, bringing the total number of ships registered with ClassNK to 5,085. ClassNK currently conducts ISPS audits on behalf of more than 60 Administrations. ClassNK registered 769 ships to MLC requirements during the year, bringing the total number of ships registered with ClassNK to 4,960. ClassNK currently conducts MLC inspections on behalf of more than 60 Administrations.

### New services for incoming regulations

Over the past few years, the IMO has adopted a number of new conventions to address environmental issues facing the maritime industry, including the Ballast Water Management Convention and the Ship Recycling Convention. ClassNK offers a wide variety of certification services to support owners' efforts to achieve compliance with new regulations. In 2015, ClassNK issued numerous certificates or statements of compliance in accordance with new Conventions, including the following:

- Ballast Water Management Systems: 388
- Ship Recycling Facility Plans: 4
- Inventory of Hazardous Materials: 193



**GLOBAL APOLLON**  
10,754gt OIL/CHEMICAL CARRIER built by HIGAKI SHIPBUILDING CO., LTD for ALAVANCA, INC



**HAMBURG HIGHWAY**  
75,206gt VEHICLES CARRIER built by SHIN KURUSHIMA DOCKYARD CO., LTD for AYAME MARINE CO., LTD.



**IOANNIS**  
93,511gt BULK CARRIER built by SUNDONG SHIPBUILDING & MARINE ENGINEERING CO., LTD. for Alcyon Shipping Company Ltd.

### Approval of manufacturers and service suppliers

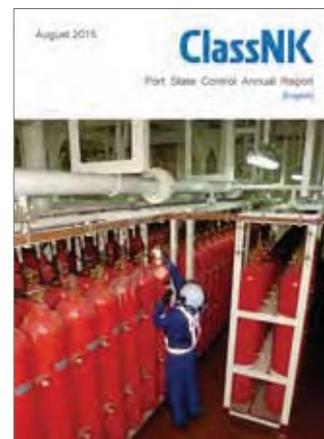
In addition to classification and convention related surveys, ClassNK also carries out audits and certifications for companies who provide testing and measurement services related class and equipment maintenance surveys. As part of these activities, ClassNK certified the following number of firms in 2015:

- Thickness measurements on ships: 28 (244)
- In-water survey of ships: 35 (245)
- Radio inspection services: 8 (345)
- Voyage Data Recorders (VDR): 11 (261)
- Maintenance of firefighting systems and equipment: 54 (270)
- Maintenance of life saving equipment and appliances: 31 (129)
- Tightness Testing of Hatches with Ultrasonic Equipment: 2 (15)
- Testing of Coating Systems: 0 (9)
- Services of Lifeboats, Launching Appliances and On-load Release Gear: 48 (163)

※ ( ) Indicates total number of certifications at year end.

### Port State Control (PSC)

As with previous years, the Society continues to work with the managers and owners of detained vessels to help improve ship conditions and increase safety awareness. To this end, the ClassNK Survey Operations Headquarters published its Annual Report on Port State Control 2015, a compilation and analysis of PSC related statistics for the previous year, and distributed it to ship owners, ship managers and other stakeholders. ClassNK also updated and released the checklist “Good Maintenance On Board Ships 2015” with the aim of helping to promote the maintenance and strengthen the management of such ships. In addition, high-ranking ClassNK staff visited key maritime authorities around the world, including the Italian Coastguard, Dienststelle Schiffssicherheit BG Verkehr (Germany PSC), United Kingdom Maritime and Coastguard Agency (UKMCA), Transport Canada (TC), United States Coast Guard (USCG), Maritime New Zealand, Australian Maritime Safety Authority (AMSA), China Maritime Safety Administration (CMSA) and Korea Ministry of Oceans and Fisheries (MOF) during the course of the year. ClassNK also sent representatives to bilateral China- Japan and Korea-Japan meetings to discuss inspection related matters and present on ClassNK efforts being taken to reduce the detention ratio of ClassNK classed ships.



**IRON SOUTHERN CROSS**  
132,587gt ORE CARRIER built by NAMURA SHIPBUILDING CO., LTD.  
IMARI WORKS



**JOLANDA**  
93,742gt BULK CARRIER built by HYUNDAI SAMHO HEAVY INDUSTRIES CO., LTD. for SAMPI SHIPHOLDING LTD



**JONG SHYN NO.8**  
13,043gt FLOATING DOCK built by Zhoushan Changhong International Shipyard Co., Ltd. for JONG SHYN SHIPBUILDING CORP

## Technical Services

### Condition Assessment Program (CAP)

During 2015, ClassNK issued Statements of Compliance to 42 vessels under its Condition Assessment Program (CAP). As of the end of 2015, the total number of Statements of Compliance issued by the Society for CAP stood at 423.

### Ballast Water Management Plan

During 2015, ClassNK issued certifications for 562 ballast water management plans bringing the total number of certifications issued by the Society to 7,431.

### Emergency Technical Assistance Service (ETAS)

ClassNK's Emergency Technical Assistance Service (ETAS) is on call 24/7 to support the owners and operators of ships registered for this service in ensuring the safety of their vessels and minimizing the environmental impact if disaster should strike. In 2015, this team was called into action for five incidents related to maritime casualties to provide technical support. In 2015, 118 vessels newly registered for the ETAS service, bringing the total number of vessels registered for the service to 1,308.

## Certification Services

ClassNK provides a broad range of certification services for quality, environmental, occupational health & safety and energy management systems in addition to verification for greenhouse gas (GHG) emissions inventories.

### Quality Management Systems – ISO 9001

In 2015, ClassNK certified a total of 44 organizations in line with ISO 9001, bringing the total number of organizations registered with the Society to 541.

### Environmental Management Systems – ISO 14001

In 2015, ClassNK certified a total of 15 organizations in line with ISO 14001, bringing the total number of organizations registered with the Society to 140.

### Occupational Health & Safety Management Systems – OHSAS 18001

In 2015, ClassNK certified a total of 8 organizations in line with OHSAS 18001, bringing the total number of organizations registered with the Society to 33.

### Energy Management Systems – ISO 50001

In 2015, ClassNK certified a total of 2 organizations in line with ISO 50001, bringing the total number of organizations registered with the Society to 5.

### Other Certification Services

ClassNK also provides certification services for the following fields:

- Maritime Education & Training
- Seafarer recruitment and placement services
- Clean Shipping Index
- HSE (Health, Safety & Environment systems)
- Road Traffic Safety Management Systems (ISO 39001)
- Verification of greenhouse gas assertions



**LNG JUROJIN**

136,739gt LNG CARRIER built by MITSUBISHI HEAVY INDUSTRIES SHIPBUILDING CO., LTD for LNG JUROJIN SHIPPING CORPORATION



**MACKINAC BRIDGE**

152,297gt CONTAINER CARRIER built by IMABARI SHIPBUILDING CO., LTD. HIROSHIMA SHIPYARD for SACHIKAWA KISEN Co., Ltd.



**NATORI**

7,390gt CONTAINER CARRIER built by KYOKUYO SHIPYARD CORPORATION for IMOTO LINES, LTD.

## Services for Renewable Energy Technologies

### Certification for Wind Energy Technologies

ClassNK provides certification for large and small wind turbines, and classification for floating offshore wind turbines in addition to certification for wind farm projects. In 2015, ClassNK provided one prototype certification for a large wind turbine and type certification for three small wind turbines bringing the total number of wind turbines certified by the Society to 13. Although there were no new registrations of floating offshore wind turbines in 2015, ClassNK continues to provide periodical surveys for floating wind turbines which are already classified by the Society.

### Certification for Marine Renewable Energy Technologies

ClassNK provides a variety of certification services for marine renewable energy technologies that utilize wave, tidal, ocean current and ocean thermal energy. In 2015 ClassNK released certification Guidelines for wave, tidal and ocean current energy converters and also began certification for demonstration marine renewable energy technologies.

### Marine Warranty Surveys

A Marine Warranty Survey (MWS) is the third party surveillance of marine operations which is often requested by insurance underwriters in order to ensure that offshore marine operations such as the installation and transportation of wind turbines and offshore sea structures, and the laying of cables etc. are being carried out safely and reliably. ClassNK is currently involved in ongoing discussions with offshore wind farm operators, insurers and reinsurers to devise marine warranty surveys that cater to specific geographical and environmental conditions found in Japan.



**NEXUS VICTORIA**  
40,976gt OIL CARRIER built by MINAMINIPPON SHIPBUILDING CO., LTD. OZAI PLANT for CATHERINE NAVIGATION S.A.



**OCEANIC PROGRESS**  
6,943gt CEMENT CARRIER built by FUKUOKA SHIPBUILDING CO., LTD. for PT. INDOBARUNA BULK TRANSPORT



**ULTRA DANIELA**  
34,748gt BULK CARRIER built by IMABARI SHIPBUILDING CO., LTD., JAPAN.

## Educational and Training Services

### ClassNK Academy

ClassNK Academy was established in 2009 to provide the necessary basic knowledge to those involved in the shipbuilding, maintenance and transport industries. ClassNK Academy has been held actively since then and more than 3,300 participants around the world took part in courses in 2015. Courses offered during 2015 included:

Courses Related to Newbuildings	»	<ul style="list-style-type: none"> <li>■ Classification Societies and Statutory Issues Course</li> <li>■ New Shipbuilding Course (Hull)</li> <li>■ New Shipbuilding Course (Machinery &amp; Electrical Installations)</li> <li>■ Material and Welding Course</li> </ul>
Courses Related to Existing Ships	»	<ul style="list-style-type: none"> <li>■ Damage (Hull) Course</li> <li>■ Damage (Machinery and Electrical Installations) Course</li> <li>■ Safety Equipment Course</li> <li>■ Port State Control (PSC) Course</li> </ul>
Courses Related to Ship Management	»	<ul style="list-style-type: none"> <li>■ Incident Investigation &amp; Analysis Course</li> <li>■ Risk Management Course</li> <li>■ ISM Internal Audits Course</li> </ul>

### ClassNK Technical Seminars

ClassNK holds technical seminars around the world to provide maritime experts with a wide-range of information about recent technology and technical findings in addition to the latest trends for Class rules. The technical seminars have a high degree of usability for the global maritime industry.

The following are just some of the presentations held by ClassNK at Technical Seminars in 2015:

#### ClassNK Summer Technical Seminars

- A Summary of NK Research and Development
- Results of Joint R&D for Industry Program
  - Safety Evaluation of Liquid Hydrogen Carrier
  - Development of Power Assist Sail
  - Research and Development into the application of emulsified fuel systems in marine diesel engines – Establishment of practical NO<sub>x</sub> and CO<sub>2</sub> abatement technologies
    - Investigation and evaluation test method into inorganic zinc coating systems
    - Research and development into the safety of lithium ion battery modules for marine propulsion systems
- Latest Trends on International Conventions

#### ClassNK Autumn Technical Seminars

- Amendments to Rules and Guidance
  - Establishment, Revision and Abolition of Rules
  - Amendments to Class Rules and Guidance for the Survey and Construction of Steel Ships
    - Hull and Materials
    - Engine and Electrical Installations
    - Equipment
    - Recent Topics on IACS Hull/Survey/Machinery/Environmental/Safety Panel
- Latest Trends on International Conventions
- Technical Topics
  - Improving Ship Fuel Efficiency and Latest Trends Changes following the introduction of EEDI and Latest Rule Amendments
  - LNG-fuelled Vessels
  - ClassNK Response to IGF Code



**SARITA NAREE**  
36,416gt BULK CARRIER built by TAIZHOU SANFU SHIP ENGINEERING CO., LTD. for PRECIOUS VENUS LTD.



**STARLITE PIONEER**  
2,682gt PASSENGER/RO-RO CARGO SHIP built by KEGOYA DOCK CO., LTD. for STARLITE FERRIES, INC.



**TAHARQA EOS**  
92,089gt ORE CARRIER built by STX OFFSHORE & SHIPBUILDING CO., LTD. for STELLA FAITH SHIPPING PTE. LIMITED

### Overseas Technical Seminars

ClassNK holds regular technical seminars around the world to provide in-depth information on incoming regulations, and introduce the latest technologies and technical findings to its clients and maritime stakeholders. The seminars aim to deliver practical information on a wide range of topics in line with the needs of each country.

The following are just some of the presentations that were carried out in 2015:

- Innovative IT Tools for a Sustainable Maritime World
- ClassNK Activities for the Safe Carriage of Cargoes which may Liquefy
- NOx/SOx Abatement Technologies

### PrimeManagement Seminars

ClassNK has been providing its integrated PrimeManagement System for management system certifications (ISO etc.), training course certification and certification for ISM Code among others since 2011. Over the course of 2014, PrimeManagement seminars were held in the Philippines and Vietnam. The following are just some of the presentations that were carried out in 2015:

- The Latest Information on STCW and Certification for Seafarer Education
- The Latest Information on MLC2006
- 2015 Amendments to ISO 9001 and ISO 14001

### Training upon requests of external organizations

In 2015, ClassNK conducted the following training upon the request of external organizations.

- The Society presented lectures on defective welding and welding quality to technical staff members new to the field of shipbuilding at the request of the Eastern Japan Training Center for Shipbuilding Skills.
- At the request of the Innoshima Technical Center, the Society presented lectures on "Case Studies of Ship Damage and Lessons Learned" to staff members at the Center.
- The Society presented on International Convention on Tonnage Measurement of Ships and Stability and Load Lines upon the request of the Philippines' Maritime Industry Authority (MARINA).
- ClassNK conducted lectures on the necessary knowledge and skills for design evaluation related to shipbuilding upon the request of the Japan Coast Guard.
- Following a request from Japan International Cooperation Agency (JICA), the Society presented lectures on the SOLAS and MARPOL conventions as well as on newbuilding surveys at the "Group Training Course in International Maritime Conventions and Ship Safety Inspection" held by the Ship Research Centre of Japan.
- The Society presented on ISO 9001 Internal Auditing upon the request of Niigata Shipbuilding & Repair Inc.
- The Society also presented on OHSAS18001 Internal Auditing upon the request of Mitsui Engineering & Shipbuilding Co., Ltd. Tamano Works.

### Internships

In response to requests from numerous universities ClassNK offered 25 internships to domestic and overseas students.

### Internal Auditor and Surveyor Training

ClassNK conducts regular training in order to ensure that its surveyors and auditors can provide services to meet the diversifying needs of its customers. ClassNK conducted the following training for surveyors and auditors in 2015.

- Surveyor Training
- Marine Management Systems Auditor Training
- Maritime Labor Inspector Training
- ISO Auditor Training

# ClassNK in Research

In order to fulfill its mission of protecting life, property at sea and the maritime environment, ClassNK carries out a wide variety of classification related research & development, as well as actively participating in joint development projects with industry partners to address the broad needs of the maritime industry.

## Joint R&D for Industry

ClassNK contributes to the development of the maritime industry by providing technical and financial support to innovative R&D based on proposals from maritime stakeholders. At the end of 2015, 240 projects had been completed as part of ClassNK's "Joint R&D for Industry Program" with approximately 100 further projects underway. In 2015 alone, 46 projects in a variety of different fields shown in the table to the right were completed, some of which are introduced below.

Category	Number
I. IoT & Eco-shipping	7
II. Technological innovation	5
III. Advanced ship design & eco-ship	15
IV. Offshore and Ocean Development	4
V. Countermeasures to new conventions and regulations	6
VI. Others	9

## IoT & Eco-shipping

### Research and development of advanced ship monitoring system "CMAXS LC-A" - Phase 3 -

#### Participants

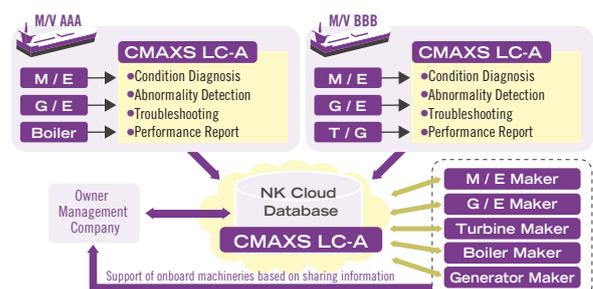
- Diesel United, Ltd.
- Japan Marine United Corporation

#### Objectives

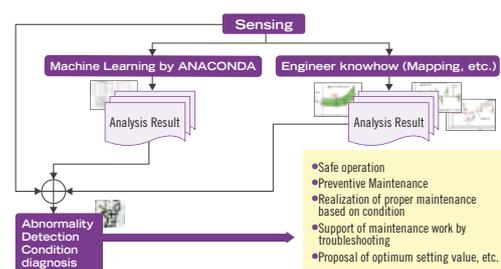
This project aimed to verify the benefits brought by ClassNK CMAXS LC-A, which is an automatic condition diagnosis and preventive maintenance support system integrated with IBM's machine learning algorithm, on board and to enhance its convenience.

#### Outcome

An advanced diagnosis method was developed and incorporated into CMAXS LC-A. Daihatsu Diesel Mfg. Co., Ltd. introduced the upgraded CMAXS LC-A for the maintenance management of engine generators. Moreover, ClassNK Consulting Service Co., Ltd., a wholly owned subsidiary of ClassNK, released CMAXS LC-A as their official service to support more shipowners in ship maintenance management.



CMAXS LC-A as integrated support platform



CMAXS LC-A analysis chart

## Research and development of ship condition monitoring system for Mitsui's MAN B&W engines: CMAXS e-GICSX.

### ■ Participants

- Mitsui Engineering & Shipbuilding Co., Ltd.
- MES Technoservice Co., Ltd.

### ■ Objectives

This project aimed to develop ClassNK CMAXS e-GICSX which analyzes the sensor data from onboard electronic devices and diagnoses the ship's condition automatically to prevent failures.

### ■ Outcome

CMAXS e-GICSX corresponding to Makita Corporation's small bore engines as well as Mitsui's large bore engines were developed and are currently being tested on board.

## Establishment and standardization of application platform for shipping data using onboard LAN.

### ■ Participants

- Japan Ship Machinery & Equipment Association
- Terasakielectric Co.,Ltd
- Monohakobi Technology Institute

### ■ Objectives

This project aimed to define the standard specification of the onboard data server which collects and stores a variety of sensor data into one place.

### ■ Outcome

Drafted specifications of onboard data and data server were adopted as ISO's NP (New work item Proposal). The Japan Ship Machinery & Equipment Associations's working group are continuing their efforts in the standardization of proposals which is expected to be achieved in 2018.



## Technological innovation

## Research and development of CFRP propeller

### ■ Participants

- Nakashima Propeller Co., Ltd.
- The University of Tokyo
- National Maritime Research Institute
- Nippon Yusen Kabushiki Kaisha
- Monohakobi Technology Institute
- Imabari Shipbuilding Co., LTD.

### ■ Objectives

This project aimed to research specifications of composite material applicable to ship propeller, develop the design process and verify the benefits in actual sea tests.

### ■ Outcome

As a result of material tests and full size tests, ClassNK granted approval for the design and manufacturing process of the CFRP propeller. The CFRP propeller was applied to 499GT-class chemical tanker which exhibited improvement in propulsive efficiency by 6% in actual sea tests.



CFRP propeller

## Research and development of accuracy evaluation system for curved shell plates

### ■ Participants

- The University of Tokyo
- SUMITOMO HEAVY INDUSTRIES MARINE & ENGINEERING Co.,Ltd.

### ■ Objectives

This project aimed to develop an automated thermal process guiding system which enables even unsophisticated workers to process delicately-curved shell plates constituting fore and aft hull accurately with less working load.

### ■ Outcome

A new process guiding system was developed to be able to compare the 3D shell plate model reproduced by laser scanner with a virtual wooden pattern representing designed curvature and output process instruction automatically and greatly reduced the working time for thermal processing.



Curved shell plate

## Research and development of wind resistance reduced containership

### ■ Participants

- MOL Techno-Trade, Ltd.
- Ouchi Ocean Consultant, Inc.
- Mitsui O.S.K. Lines, Ltd.
- Akishima Laboratories (Mitsui Zosen) Inc.
- TAIYO KOGYO CORPORATION
- School of Engineering, The University of Tokyo

### ■ Objectives

This project aims to develop windshield and optimum container arrangement on deck in order to reduce wind resistance and promote eco-shipping of containerships.

### ■ Outcome

A horseshoe-shaped windshield was developed and installed on the bow of MOL's containership and is currently under demonstration in the actual sea.



MOL MARVEL

## III Advanced ship design & eco-ship

### Research and development of comprehensive CAE (Computer Aided Engineering) automated modelling system for direct analysis of ship's constructive strength

#### ■ Participants

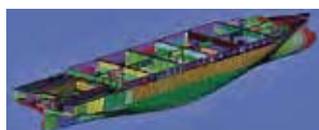
- Japan Marine United Corporation
- Imabari Shipbuilding Co., LTD.
- Oshima Shipbuilding Co., Ltd.
- TechnoStar Co.,Ltd.

#### ■ Objectives

This project aimed to develop a new modeling system capable of creating a geometric shape of a ship's overall / local structural model rapidly with ease and meshing and creating FE (Finite Element) model in accordance with rules.

#### ■ Outcome

An automated modeling system for the ship's overall / local structure including thin parts was developed to be applicable to the fundamental modeling in early phase and allowed design changes in middle phase.



FE model of overall structure

## IV Offshore and ocean development

### Research and development of small / medium scale GTL plant

#### ■ Participants

- Toyo Engineering Corporation
- MODEC, Inc.

#### ■ Objectives

This project aimed to apply a new chemical reactor, which has advantages of efficient heat transfer and rapid reaction, to LNG reforming and contribute to the development of smaller-sized while economically competitive GTL plant.

#### ■ Outcome

The reasonable, long-life and short delivery term reactor exhibited prescribed GTL performance through the demonstration tests. Conceptual designing and HAZID (Hazard Identification) was conducted on the FPSO mounted with the new GTL plant, and ClassNK granted AIP (Approval In Principle) to the new concept.



FPSO mounted with GTL plant

## Countermeasures to new conventions and regulations

### Research on practical application and operation of SCR

#### ■ Participants

- Daihatsu Diesel Mfg. Co., Ltd.
- Kawasaki Kisen Kaisha, Ltd
- Japan Marine United Corporation

#### ■ Objectives

This project aimed to clarify the remaining issues to be solved in the installation and operation of large-scale SCR system on board.

#### ■ Outcome

SCR for one generator engine was tested on a large containership for 1,834 hours without any significant troubles. The participants acquired knowledge and knowhow on the SCR operation including switching ON / OFF between inside / outside of ECA and urea water banking.



HANOI BRIDGE

#### ■ Hull resistance

- Development of biocide free super fuel saving antifouling paint
- Research, development, and ROI evaluation of a variety of energy saving techniques and devices for reducing CO<sub>2</sub> emissions from bulk carrier
- Development of ultra-low roughness hull painting system and friction prediction methodology for actual ships using surface roughness parameters
- Development and evaluation of technology for retrofitting air lubrication system on existing ships

#### ■ Engine efficiency and waste heat recovery

- Research and development of binary cycle power generation system to save energy and reduce GHG emissions from ships during slow steaming
- Demonstration of CO<sub>2</sub> and NOx reduction by electronic control and EGR system on low-speed 2-stroke marine diesel engines
- Development of twin shaft propulsion plant for LNG carrier
- Development of combined emission reduction system for marine main diesel engines

#### ■ Propulsive efficiency

- Development of energy saving CP Propeller and control system

#### ■ Propulsion plant

- Research and development of marine combined cycle systems
- Research and development of hybrid power supply system using LNG reformed fuel cells

#### ■ Fuel conversion

- Research and development of LNG fuel tank and fuel gas supply system for marine application
- Research and development of 2-stroke gas engine with low pressure gas injection
- Development of multi-fuel marine engine
- Development of eco-friendly engine system

#### ■ Operational efficiency

- Research and development of Smart Fleet Operation system
- Development of advanced navigation support system

#### ■ Renewable energy

- Development of wind/motor hybrid vessel "The Wind Challenger"

## Others

### National program for GHG reduction

ClassNK participated in "Research and Development on GHG Reduction Technology" (2009-2013), a program launched by Japan's Ministry of Land, Infrastructure, Transport and Tourism to support the development of a variety of innovative technologies. ClassNK is also participating in "Next Generation Maritime Environmental Technology Development Program" (2013-), also lead by the Ministry and is always contributing towards the reduction of GHG emissions in the maritime industry. The following are 19 projects from the "Next Generation Maritime Environmental Technology Program", categorized into seven fields. Details and results of these projects will be available once the program is completed.

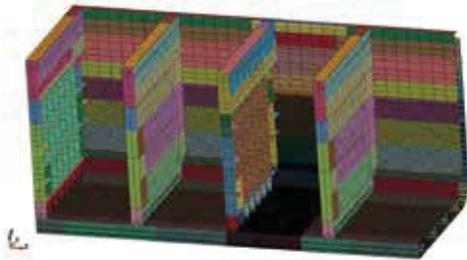
## Research and Development related to Ship Classification

ClassNK has carried out R&D related to the classification societies with the aim of improving rules and guidelines and expanding technical services. The outlines of the main R&D carried out in 2015 are as follows:

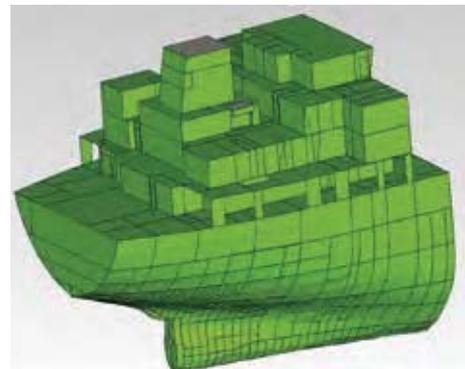
### Development of Rules for Structural Strength of Large Container Ships

As described in Amendments Related to Structural Strength Requirements on Page 11 of this Annual Report, based on the knowledge and results from the Investigative Panel on Large Container Ship Safety and recommendations from MLIT Committee on Large Container Ship Safety, ClassNK developed a simplified method for evaluating the ultimate strength of container ships directly considering the effect of the lateral loads such as bottom sea pressure, container loads and so on. The hull girder ultimate strength of a container ship in consideration of the effect of the lateral loads can be accurately estimated by the developed simplified method instead of the 3-hold model elasto-plastic analysis which requires considerable efforts. Furthermore quantitative investigations were carried out on the structural effect of the whipping (a hull girder vibration caused by wave impact loads).

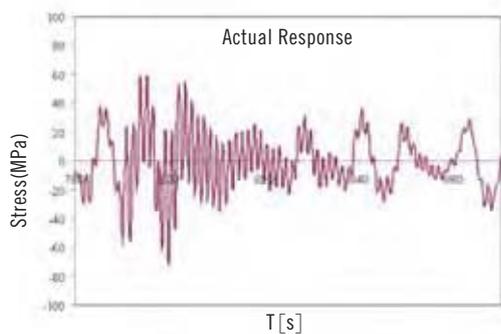
Based on these results, ClassNK developed the rules for the hull girder ultimate strength of container ships in consideration of the effects of the lateral loads and the whipping response, and the amendment of the relevant rules of container ships were carried out including the unified requirements of the International Association of Classification Societies (IACS) adopted in June 2015.



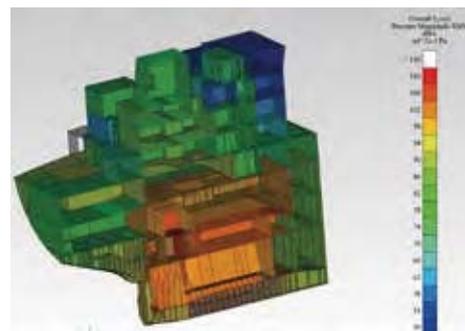
FE model for 3-hold model elasto-plastic analysis



Three dimension model for SEA method



Example of Whipping response (An example of full scale measurement)



An example of the noise prediction analysis (contour diagram of the noise distribution)

### Improvement of Noise Analysis Technology

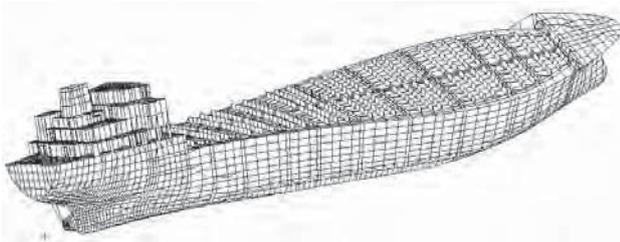
As IMO has revised the onboard noise code and relevant articles of the SOLAS, the level of onboard noise for vessels was tightened. It has therefore become more important to predict the noise level of accommodation spaces accurately in design stage.

Prediction of both air-borne sound and solid-borne sound are necessary for predicting onboard noise. Air-borne sound is usually predicted using a method for calculation of indoor sound in architectural acoustics. On the other hand, solid-borne sound is predicted by the Janssen method based on the full scale measurement data or SEA (Statistical Energy Analysis) method using 3D model. ClassNK conducted the research and investigation focusing on improvement of the accuracy of noise prediction of SEA method referring to results of onboard noise measurements full scale measurement and analysis results. Based on the research and investigation results, it will be planned to improve the accuracy of the noise prediction.

### Improvement of Vibration Analysis Technology

Related to the improvement of working environment on board, the interest for vibration, another environmental factor, is also getting increasing. Vibrations on ships cover a lot of aspects such as local structure vibration, accommodation vibration and hull girder vibration and so on, and it is difficult to take measures after completion of the building. Therefore it has become more important to estimate vibration risks properly in design stages.

Research and investigation were carried out aiming to improve the accuracy of vibration analysis in 2015 through comparisons of onboard vibration measurement results and analysis results of the eigenvalue analysis and the modal analysis (a response analysis) using whole ship FE models. Based on the results, it is planned to establish a highly accurate vibration analysis technology.



An example of eigenvalue analysis using a whole ship FE model

### Sponsorship and Support for R&D Institutes and Organizations

ClassNK provides financial and technical support for academic institutes and organizations conducting R&D in addition to collaborating with such organizations in various R&D projects.

University	Sponsored course
Graduate School of Frontier Sciences The University of Tokyo	Realization of Integrated Ocean Development and Utilization systems
Graduate School of Engineering The University of Tokyo	Next Generation of Offshore Wind Turbine System
University	Joint-established department
Faculty of Engineering The University of Kyushu	Department of Ocean Energy Resources

# ClassNK in International Affairs

ClassNK maintains active engagement with various organizations in the international maritime industry. ClassNK is an active member of the International Association of Classification Societies (IACS) and played a key role in the development of the Unified Requirements. ClassNK also maintains active dialogue with the International Maritime Organization (IMO) on behalf of the Japanese government or as a representative of IACS.

ClassNK has authorization from numerous flag states to carry out statutory surveys on their behalf which is a testament of the depth of trust that the Society has been able to build over its 116 year history.

## International Maritime Organization (IMO)

As one of its many important international activities, ClassNK contributes to the International Maritime Organization (IMO) on a wide range of technical issues. In 2015, the Society attended the IMO meetings listed to the right as part of the Japanese Government delegation or as a representative of the International Association of Classification Societies.

Information regarding decisions on amendments to Conventions at the major IMO meetings such as Maritime Safety Committee (MSC) and the Marine Environment Protection Committee (MEPC) are regularly provided to ClassNK clients via email and are also uploaded to the IMO International Convention Calendar on the ClassNK website.

2nd Session of the Sub-Committee on Pollution Prevention and Response
2nd Session of the Sub-Committee on Human Element, Training and Watchkeeping
2nd Session of the Sub-Committee on Ship Design and Construction
2nd Session of the Sub-Committee on Navigation, Communications and Search and Rescue
2nd Session of the Sub-Committee on Ship Systems and Equipment
68th Session of the Marine Environment Protection Committee
95th Session of the Maritime Safety Committee
2nd Session of the Sub-Committee on Implementation of IMO Instruments
Intersessional Meeting of the Working Group on Further Technical and Operational Measures for Enhancing Energy Efficiency
2nd Session of the Sub-Committee on Carriage of Cargoes and Containers



## International Association of Classification Societies (IACS)

Technical matters associated with the development and revision of Unified Requirements (UR) and Unified Interpretations (UI) are conducted by five Panels (Hull, Machinery, Safety, Environment and Survey) and the Project Teams under their control. In 2015, ClassNK staff served as the Chair of the Expert Group on IMO Goal Based Standards (GBS) and the Project Manager of the Project Team on Container Ship Safety. ClassNK, as the Chair of the Expert Group on IMO Goal Based Standards (GBS), led the activities on finalizing IACS Corrective Action Plans for IMO GBS Audit findings or communicating with IMO Secretariat and IMO GBS Audit Team for the smooth conduct of the audit.

In addition, ClassNK, as the Project Manager of the Project Team on Container Ship Safety, led the technical activities on the development of unified requirements of structural strength for container ships.

ClassNK participated in the following IACS meetings in 2015 listed below:

Council Meetings	Twice
General Policy Group Meetings	Twice
Steering Committee Meeting (Strategy of IACS)	Once
Quality Committee Meeting	Twice
Small Group Meeting (Quality Policy)	Once
Expert Group Meetings (GBS, EU, Cyber Systems, etc.)	13 times
Panel Meetings (Hull, Machinery, Safety, Environment, Survey)	9 times
Project Team Meetings (CSR Maintenance, etc.)	10 times
IACS/Industry Joint Working Group Meetings (EEDI)	Once
SCF Cross Industry Meeting	Twice



## Association of Asian Classification Societies (ACS)

The Association of Asian Classification Societies (ACS) was formed in 2010, following nearly two decades of informal meetings between its members.

In 2015, ClassNK led ACS technical activities by actively participating in WGs which were established as a result of the reformation of ACS organization structure. Furthermore, ClassNK also contributed to ACS independent Technical Seminar, and endeavored to strengthen the relations with Asian maritime organizations.

ClassNK participated in the following meetings in 2015:

11th Technical Management Group Meeting
1st Working Group on Environment Meeting
ACS Seminar on Shipping and Shipbuilding
12th Technical Management Group Meeting
23rd Executive Committee Meeting



## Authorization Granted to ClassNK

	TM	LL	SOLAS					MARPOL 73/78			
			SC	SE	SR	ISM	ISPS	I	II	IV	VI
Algeria	★	★	★	★	★		★	★	★		
Antigua and Barbuda	●	●	●	●	●	●	●	●	●	●	●
Argentina											
Aruba		★	★	★	★	★		★	★	★	
Australia	●	●	●	●	●			●	●	●	●
Bahamas	●	●	●	●	●	●	●	●	●	●	●
Bahrain	●	●	●	●	●	●	●	●	●	●	●
Bangladesh	●	●	●	★	★	●	●	●	●	●	●
Barbados	●	●	●	●	●	●	●	●	●	●	●
Belgium	★	●	●	★	★	★	★	★	●	●	●
Belize	●	●	●	●	●	●	●	●	●	●	●
Bermuda	●	●	●	●	●	★	★	●	●	●	●
Bolivia											
Brazil	●	●	●	●	●	●	●	●	●	●	●
British Virgin Islands	●	●	★	★	★	★		★		●	●
Brunei	●	●	●	●	●	●		●	●	●	●
Canada	★	★	★	★	★	★		★	★	★	★
Cape Verde	●	●	●	●	●	●		●	●	●	●
Cayman Is.	●	●	●	●	●	★	★	●	●	●	●
Chile	★	★	★	★	★	★	★	★	★	★	★
Comoros	●	●	●	●	●	★	★	●	●	●	●
Cook Islands	●	●	●	●	●	●	●	●	●	●	●
Curacao	★	★	★	★	★	★	★	★	★	★	★
Cyprus	●	●	●	●	●	★	●	●	●	●	●
Denmark	●	●	●	●	●	●	●	●	●	●	●
Djibouti	●	●	●	●	●			●	●		
Dominica	●	●	●	●	●	●	★	●	●	●	●
Dominican Republic	●	●	●	●	●			●	●		
Ecuador		★	★	★	★			★	★		
Egypt	★	●	★	★	★	★	★	★	★	★	★
Equatorial Guinea	●	●	●	●	●	★	●	●	●	●	
Fiji	●	●	●	●	●	●	●	●	●	●	●
Finland		★	★	★	★	★		★	★	★	★
Gambia	★	★	●	●	●	●	●	●	●	●	●
Georgia	●	●	●	●	●	●	●	●	●	●	●
Germany		★	★	★	★	★	★	★	★	★	★
Ghana	●	●	●	●	★			●		●	
Gibraltar	●	●	●	●	●	★	★	●	●	●	●
Greece	●	●	●	●	●	●	●	●	●	●	●
Honduras	●	●	●	●	●	●	●	●	●		
Hong Kong	●	●	●	●	●	●	●	●	●	●	●
Iceland	★	●	●	●	●	●		●	●		
India	★	★	★	★	★			★	★	★	★
Indonesia	★	★	★	★	★			★	★	★	★
Iraq		★	★	★	★						
Ireland		●	●	★	●	●	●	●	●	●	●
Isle of Man	●	●	●	●	●	★	★	●	●	●	●
Israel	●	●	●	★	★	★		★			●
Jamaica	●	●	●	●	●	●	●	●	●	●	●
Japan		●	●	●	●	●	★	★	★	★	★
Jordan	●	●	●	●	●	●	●	●	●	●	●
Kenya		●									
Kiribati	●	●	●	●	●	●	●	●	●	●	●
Kuwait	●	●	●	★	★	★	●	●	●	●	★
Lebanon	★	●	★	★	★	★	★	★	★	★	★
Liberia	●	●	●	●	●	●	★	●	●	●	●
Libya	★	★	★	★	★	★	★	★	★		
Lithuania	●	●	●	●	●	★	★	●	●	●	●

As of the end of 2015

	TM	LL	SOLAS					MARPOL 73/78				
			SC	SE	SR	ISM	ISPS	I	II	IV	VI	
Luxembourg	●	●	●	●	●	●	●	●	●	●	●	●
Madeira	●	●	●	●	●	●	●	●	●	●	●	●
Malaysia	●	●	●	●	●	●	●	●	●	●	●	●
Maldives	●	●	●	●	●	●		●				
Malta	★	★	★	★	★	★	★	★	★	★	★	★
Marshall Is.	●	●	●	●	●	●	●	●	●	●	●	●
Mauritius	●	●	●	●	●	●	●	●	●	●	●	●
Mexico						●						
Morocco		●										
Mozambique		●						●	●	●		
Myanmar	●	●	●	●	●	●	●	●	●	●	●	●
Namibia	●	●	●	●	●			●	●	●		
Netherlands	●	●	●	●	●	●	●	●	●	●	●	●
New Zealand	●	●	★	★	★			●	●	●		
Niue	●	●	●	●	●	●	●	●	●	●	●	●
Norway	●	●	●	●	●	●	●	●	●	●	●	●
Oman	●	●	●	●	●	●	●	●	●	●	●	●
Pakistan	●	●	●	★	★	★	●	●	●	●	●	●
Palau	●	●	●	●	●	●	●	●	●	●	●	●
Panama	●	●	●	●	●	●	★	●	●	●	●	●
Papua New Guinea	●	●	●	●	●			●				●
Paraguay						●						
Philippines	●	●	●	●	★	●	●	●	●			●
Portugal		★	★						★			
Qatar	●	●	●	●	●	●	●	●	●	●	●	●
Romania	●	●	●	●	●	★		●	●	●	●	●
Saudi Arabia	●	●	●	●	●	●	●	●	●	●	●	●
Serbia	●	●	●	●	●	●	●	●	●	●	●	●
Seychelles	●	●	●	●	●	●	●	●	●	●	●	●
Singapore	●	●	●	●	●	●	●	●	●	●	●	●
Solomon Is.	●	●	●	●	●							
South Africa	★	★	★			★	★	★	★	★	★	★
Sri Lanka	●	●	●	●	●			●				
St. Kitts and Nevis	●	●	●	●	●	●	●	●	●	●	●	●
St. Vincent and the Grenadines	●	●	●	●	●	★	★	●	●	●	●	●
Switzerland	●	●	●	●	●	●	●	●	●	●	●	●
Tanzania		●										
Thailand	★	★	★	★	★	★		★				
Tonga	●	●	●	●	●			●	●			
Tunisia		●	★					●				
Turkey	★	●	★	★	★	●	●	●	●	●	●	●
Tuvalu	●	●	●	●	●	●	●	●	●	●	●	●
UAE	●	●	●	●	●	●	●	●	●	●	●	●
Uganda		●										
UK (ACS)	●	●	●	●	●	★	★	●	●	●	●	●
Uruguay			★	★	★							
USA	●	●	●	●		●		●	●			●
Vanuatu	●	●	●	●	●	●	●	●	●	●	●	●
Venezuela												
Vietnam	★	★	★	★	★	★		★	★			
Yemen		●										

Abbreviations: ● -- Authority has been delegated. ★ -- Authority has been delegated subject to some conditions.

TM: International Tonnage Certificate (1969)  
 LL: International Load Line Certificate  
 SC: Cargo Ship Safety Construction Certificate  
 SE: Cargo Ship Safety Equipment Certificate  
 SR: Cargo Ship Safety Radio Certificate  
 ISM: International Safety Management Code  
 ISPS: International Ship and Port Facility Security Code  
 I, II, IV, VI: MARPOL Annex I, II, IV, VI

# Organization

## ClassNK in Committee

### BRAZIL TECHNICAL COMMITTEE

Chairman	Paulo Roberto Neves Bezerra	Shipping	Vale S.A.
Members	Rosalvo S. Sales Jr.	Director / Business Development & Strategic Planning	Amec KROMAV
	Alexandre Canhetti	Director	ECOVIX
	Carlos José Dias	Marine Affairs / Vetting Manager	Empresa de Navegação Elcano S.A.
	Frederico Mithio Horigome	Industrial Design Manager	Enseada Industria Naval S/A
	Michel P. Andrade	Engineering Manager	Estaleiro Atlântico Sul
	Hiroshi Nishioka	Executive Director Engineering	IHI do Brasil Representações Ltda.
	Takuya Fujita	Senior Staff Officer Project Division	Kawasaki Heavy Industries, Ltd.
	Soichiro Inoue	Vice-President	Mitsubishi Indústrias Pesadas do Brasil Ltda.
	Renato Albuquerque Vinhas	LNG Shipping Operational Coordinator Gas & Energy	PETROBRAS
	Paulo Afonso da Cruz Silva	Vetting Manager	PETROBRAS
	Ricardo B. Portella	Deputy Director / Basic Design Division	Projemar
	Bertoldo Gancz	Director	Rio Nave Serviços Navais Ltda.
	Toshihiko Tsutsumi	President	SIGMAX
	Milton Gonçalves	General Technical Manager - PROMEF	TRANSPETRO
	Atul Sethi	Country Manager	UP OFFSHORE

### BRITISH COMMITTEE

Chairman	Michael G. Parker	Chairman	CMA CGM (UK) Holdings Limited
Members	Douglas W. Lang	Managing Director	Anglo-Eastern (UK) Ltd.
	Christopher Bailey	Vice President Operations	BP Shipping Limited
	Sunil Malhotra	Chief Operating Officer	British Marine Plc
	Roine Ahlquist	Managing Director	Eastern Pacific Shipping (UK) Ltd.
	Epaminondas G. E. Embiricos	Chairman	Embricos Shipbrokers Ltd.
	Philip D Atkinson	Technical Director	Graig Shipping Plc
	Lars T Uglund	CEO	LT Uglund Management Ltd.
	Danny Ungar	Managing Director	Ray Shipping Ltd.
	Adri R. Postema	General Manager	Shipping and Maritime Technology & Innovation
	Michael K. Drayton	Former Chairman	Shell International Trading and Shipping Company Ltd
	John Kerr	Operations Director	The Baltic Exchange
	George Cowan	Director Technical	V. Ships UK Limited
			Zodiac Maritime Ltd.

### CHILE TECHNICAL COMMITTEE

Chairman	Angel Canessa T.	Head of Planning, Controlling and Engineering	Southern Shipmanagement (Chile) Ltda.
Members	Rosauro Segovia Montenegro	Technical Manager	Chile National Shipowners' Association
	Gonzalo Araya Gajardo	Chief of Maritime Inspections Services	DIRECTEMAR
	Santiago Tapia Carvajal	Fleet Technical Manager	Empremar S.A.
	Francisco Lopez	Fleet Senior General Manager	Humboldt Shipmanagement
	Luis Bauerle	Head Of LPG & Dry Cargo Fleet	
	Hugo Barra	Fleet Manager	Naviera Chilena del Pacifico S.A.
	Carlos Contreras Muñoz	General Manager	SOCIBER
	Ramon Gatica O.	Fleet Head Manager	Sociedad Nacional Maritima S.A.
	Pablo E. Caceres	Deputy Fleet Manager	Southern Shipmanagement (Chile) Ltda.
	Mogens Møllerup	Towage Division	Sudamericana Agencias Aereas y Maritimas S.A.
	Carlos Bastías Nercelles	Senior General Manager / Head of Handysize Operations	Ultrabulk
		Operations Manager	Ultratug Ltda.

### CHINA COMMITTEE

Chairman	Sun Jiakang	Executive Vice President	China Ocean Shipping (Group) Company (COSCO)
Members	Li Tian Bao	Board Chairman	Bohai Shipbuilding Heavy Industry Co., Ltd.
	Wang Yongliang	President	Chengxi Shipyard Co., Ltd.
	Tao Jian	Secretary to the Board	China CSSC Holdings Limited
	Gao Yongjun	Manager	Fleet Planning Dept. Strategic Planning Div.
	Zhao Zhanjun	President	China Ocean Shipping (Group) Company (COSCO)
	Li Zhong	President	China Ship Design & Research Center Co., Ltd.
	Xu Ziqiu	Assistant President	Party Secretary Secretary of Discipline Inspection Commission
	Lv Yibin	Assistant General Manager	China Ship News
	Dong Qiang	Chairman	China Shipbuilding Industry Corporation
	Xu Xing	Deputy Director	China Shipping Industry Co., Ltd. (CIC)
	Hou Liping	Deputy Managing Director	China State Shipbuilding Corporation
	Li Rong	General Manager	Ship & Ocean Engineering Dept.
			China State Shipbuilding Corporation
			COSCO Container Lines Co., Ltd.
			COSCO Shipyard Group Co., Ltd.

Members	<p>Li Cheng Jian Cao Sun Xing Tao Henry Chiang Liu Shi Bao Yang Jian Ming Han Cheng Min Wang Hong Liu Gang Zhao Xianfu Franco Tian Liu Nan Liu Jianfeng Xu Junfeng Li Zhen Ren Le Tian</p>	<p>Vice President Senior VP President President Vice President Managing Director President Chairman General Manager General Manager General Consultant Managing Director Chief Technics Engineer CEO / President Assistant President Deputy General Manager</p>	<p>Dalian Shipbuilding Industry Co., Ltd. Far East Horizon Limited Fortune Ocean Shipping Limited Greathorse Group Hebei Ocean Shipping Co., Ltd. Jiangsu Ocean Shipping Company Ltd. Nantong COSCO KHI Ship Engineering Co., Ltd. Penglai Zhongbai Jinglu Ship Industry Co., Ltd. Safargo Shipping Pte. Ltd. Shandong Shipping Corporation Shanghai Anrita Shipping Co., Ltd. Shanghai Bestway Marine Engineering Design Co., Ltd Shanghai Waigaoqiao Shipbuilding Co., Ltd. Sinochem Shipping Co., Ltd. (Shanghai) Sinotrans &amp; CSC Holdings Co., Ltd. Yangzijiang Shipbuilding Group Ltd.</p>
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**CHINA TECHNICAL COMMITTEE**

Chairman Members	<p>Zhao Zhanjun JP Chen Tian Zhengjun</p> <p>Bi Jianyi Wang Xinquan Zhang Lelong</p> <p>Bai Yu Gang</p> <p>Wang Guorong Cai Deqing Zhan Shuming Jiang Jiazhong Li Dong Zhao Jin Wen</p> <p>Yang Wei Zan Chen Yu Wang Wei Bin Mai Rong Zhi</p> <p>Lou Dan Ping Zheng Shijun Hu Keyi Zhang Leshan Peter Chen Jin Qiang Sun Zhenglin Xiong Cheng Gen Chen Xiangwang Masanobu Harada</p> <p>Wang Rongliang Li Yanjie Deng Wenpeng</p> <p>Ren Jian Wang Dong Yu Hong Bin</p> <p>Fu Jian Shen Xiaodong Zhao Peicong Wang Gang - yi</p> <p>Chang Hua Ming Tao Ying Gao Fu Quan Guan Qing Hui Liu Renjie</p> <p>Zhao Ye Xiao Sen Yuan Yang Chun Yang Yifeng Gao Yunqiang Yan Jun Du Cheng Zhong</p>	<p>President Technical Director Technical Director</p> <p>Chief Engineer / Senior Research Engineer General Manager Assistant Manager Fleet Planning Department, Strategic Planning Division Vice Chief Engineer / Director of Project Development Senior Naval Architect Managing Director / Senior Chief Engineer General Manager / Shore Industry Division Chief Engineer Vice Director General Manager General Manager / Senior Chief Engineer Safety &amp; Technical Division Deputy Technical Director / Senior Engineer General Manager Deputy General Manager / Ship Management Division Assistant President / Vice Chief Engineer Technical Center Manager Director Deputy Chief Technical Officer Vice General Manager / Transportation Business Unit Technical Director / Technology &amp; Market Development Technical Director Deputy General Manager Deputy Director / Merchant Ship Department Managing Director General Manager General Manager Vice President Senior General Manager of Central Technical Div. General Manager General Engineer Vice General Manager / Chief Engineer Certified Safety Engineer Technology Director / Senior Engineer General Manager General Manager</p> <p>Vice General Manager General Manager Deputy General Manager / Chief Engineer Deputy Chief Engineer / Director / Naval Architect R&amp;D Department Deputy Managing Director / Senior Chief Engineer Chief Engineer / Senior Engineer Managing Director / Senior Engineer Deputy Managing Director Deputy General Manager / Chief / Engineer</p> <p>CTO Vice President Director / Vice General Manager President Deputy General Manager Vice Chief Engineer / General Manager of Offshore Deputy General Manager</p>	<p>China Ship Design &amp; Research Center Co., Ltd. Asia Maritime Pacific Avic International Holding Corporation Avic-Dingheng Shipbuilding Co., Ltd. Bohai Shipbuilding Heavy Industry Co., Ltd. China Cosco Bulk Shipping (Group) Co, Ltd. China Ocean Shipping (Group) Company</p> <p>China Ship Design &amp; Research Center Co., Ltd.</p> <p>COSCO Bulk Carrier Co., Ltd. COSCO Container Lines Co., Ltd. COSCO Shipyard Group Co., Ltd. CSC Jinling Shipyard Dalian Chun An Ship Management Co., Ltd. Dalian Ocean Shipping Company</p> <p>Dalian Shipbuilding Industry Co., Ltd. Dalian Tiger Shipping Ltd. Guangzhou Ocean Shipping Co., Ltd. Guangzhou Shipyard International Co., Ltd.</p> <p>Hudong-Zhonghua Shipbuilding (Group) Co., Ltd. International Far Eastern Leasing Co., Ltd. Jiangnan Shipyard (Group) Co., Ltd. Jiangsu Hantong Ship Heavy Industry Co., Ltd. Jiangsu Ocean Shipping Co., Ltd. Marine Design &amp; Research Institute of China (MARIC) Millennium Maritime Service Co., Ltd Nanjing Dongze Shipyard Co., Ltd. Nanjing Ocean Shipping Co., Ltd. Nantong COSCO KHI Ship Engineering Co., Ltd.</p> <p>Noble Great Shipping Co., Ltd Qingdao Beihai Shipbuilding Heavy Industry Co., Ltd Qingdao Winning International Ships Management Co., Ltd.</p> <p>Qingshan Shipyard of SINOTRANS &amp; CSC SBICO Sainty Marine Design Corporation Ltd. Sea Carrier Shipping Co., Ltd. Dalian Sea Carrier Co., Ltd. Shandong Shipping Corporation Shanghai Costamare Ship Management Co., Ltd. Shanghai Hai Hua Shipping Co., Ltd. Shanghai Merchant Ship Design &amp; Research Institute, CSSC</p> <p>Shanghai Ocean Shipping Co., Ltd. Shanghai Waigaoqiao Shipbuilding Co., Ltd. Shanhaiguan New Shipbuilding Industry Co., Ltd Shenzhen Ocean Shipping Co., Ltd. Sinochem Shipping Co., Ltd. (Hainan) Aoxing Ship Management (Shanghai) Ltd. Sinopacific Shipbuilding Group Co., Ltd. SITC Shipping Group Taizhou Kouan Shipbuilding Co., Ltd. Taizhou Sanfu Ship Engineering Co., Ltd. Tianjin Xingang Shipbuilding Heavy Industry Co., Ltd. Wuchang Shipbuilding Industry Co., Ltd. Yangzijiang Shipbuilding Group Ltd.</p>
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## DANISH TECHNICAL COMMITTEE

Chairman	Jørgen Juncher Jensen	Professor Maritime Engineering Fluid Mechanics, Coastal and Maritime Engineering Department of Mechanical Engineering	Technical University of Denmark
Members	Nikolaj Andersen Erik Møller Lars Robert Pedersen Erik Ankjær Carlsen Per Winther Christensen Lars Christiansen Søren Roschmann Niels Bjørn L. Mortensen Thomas S. Knudsen Per Sønderstrup	Vice President / Head of Vessel Management Head of Technical Projects / Technical Projects Deputy Secretary General Vice President / Head of Clipper Fleet Management Deputy Technical Director  Head of Technical Department Director / Head of Regulatory Affairs CEO Head of Regulation, EMBA Maritime Regulation and Manning Ministry of Business & Growth Vice President, Technical	A/S Dampskibsselskabet TORM Axis Offshore A/S BIMCO Clipper Fleet Management A/S Danish Shipowners' Association Hansen Maritime Agency J. Lauritzen Bulkers Maersk Maritime Technology MAN Diesel & Turbo Danish Maritime Authority
	Svend Anthonen		Team Tankers

## GREEK COMMITTEE

Chairman	Charalambos N. Mylonas	Chairman	Transmed Shipping Ltd.
Members	Markos A. Nomikos	Director	A. M. Nomikos Transworld Maritime Agencies S.A.
	Nicolas Hadjoannou		Alassia NewShips Management Inc.
	Diamantis J. Angelakis		Anbros Maritime S.A.
	Tatiana V. Petalas		Carras (Hellas) S.A.
	Michael D. Chandris	Chairman	Chandris (Hellas) Inc.
	Antonios D. Faraklas	Managing Director	Chartworld Shipping Corporation
	Andreas N. Hadjiyiannis		Cyprus Maritime Co., Ltd.
	Semiramis Palios	Head of Technical Operations & Crew Mechanical Engineer & Naval Architect President	Diana Shipping Services S.A.
	Dimitrios S. Tsolakis		DST Shipping Inc.
	Philipos A. Efstathiou		Efnav Company Ltd.
	Aristidis A. Efstathiou		Efnav Company Ltd.
	Aristides Th. Efstathiou		Efshipping Co SA
	Anna G. Dracopoulos	Director	Empros Lines Shipping Co. SP. S.A.
	Ghikas J. Goumas	Director	Equinox Maritime Ltd.
	Kriton Lendoudis	Managing Director	Evalend Shipping Co. S.A.
	Nicolas A. Frangistas	Chief Executive Officer	Franco Compania Naviera S.A.
	George Fidakis	Chairman	Globus Maritime Ltd.
	Michael E. Veniamis	Director	Golden Union Shipping Co. S.A.
	N. D. Leventakis	Managing Director	Grecomar Shipping Agency Ltd
	Panagiotis Christodoulatos	Managing Director	Ikaros Shipping & Brokerage Co., Ltd.
	Dimitri-Frank Saracakis	Group CEO	Ionic Shipping Group
	John Kairis		K.B. Shipping Company Ltd.
	Valentios Valentis	Managing Director	Konkar Shipping Agencies S.A.
	Constantinos D. Krontiras	Director	Kristen Marine S.A.
	Dimitris Z. Kritsas	President	Kritsas Shipping S.A.
	Alexis Kondilis	Director	Larus S.A.
	Panagiotis C. Laskaridis	Managing Director	Laskaridis Shipping Co. Ltd.
	George J. Souravlas	CEO	Load Line Marine S.A.
	Diamantis P. Diamantides	Managing Director	Marmaras Navigation Ltd.
	Dionysios Dellaportas	General Manager	Meadway Shipping & Trading Inc.
	Theodore P. Angelopoulos		Metrostar Management Corp.
	Babis O. Ziogas	Managing Director	MFS Shipmanagement
	Angeliki Frangou	Chairman of the Board and Chief Executive Officer	Navios Maritime Holdings Inc.
	Basil E. L. Mavroleon		Niovis Shipping Co. S.A.
	Michael Bodouroglou	Chairman & CEO	Paragon Shipping Inc.
	Ted Petropoulos	Chairman	Petrofin Ship Management Inc.
	Albert Frangoulis		S. Frangoulis (Ship Management) Ltd.
	Dimitris M. Marinos		Seastar Chartering Ltd.
	Dimitris E. Patrikios	General Manager	Springfield Shipping Co. Panama S.A.
	Harry N. Vafias	President-Chief Executive Officer	StealthGas Inc.
	George S. Livanos	Chairman	Sun Enterprises Ltd.
	Thanos Papadopoulos	Managing Director	TEO Shipping Corporation
	Panagiotis N. Tsakos	President	Tsakos Shipping & Trading S.A.
	Michael M. Scufalos	Managing Director	Union Commercial Inc.
	I. Kehagias	F.I.C.S.	White Sea Navigation S.A.
	Ori Angel	Managing Director	XT Management Ltd.
	Diamandis J. Caloghiros	Managing Director	Z & G Halcoussis Co., Ltd.

GREEK TECHNICAL COMMITTEE

Chairman	Members		
	Marios Stafilopatis		Byzantine Maritime Corporation
	P. E. Antonelos	General Manager	A. M. Nomikos Transworld Maritime Agencies S.A.
	Dimitris Andreadakis	Deputy Technical Manager	Allseas Marine SA
	Christos C. Hadjigeorgiou	Managing Director	Almi Marine Management S.A.
	Dimitrios Athanasoglou	Technical Manager	Anbros Maritime S.A.
	Haris G. Giantzikis	Technical Manager	Arcadia Shipmanagement Co. Ltd
	Amir Geva	Managing Director	ASM Maritime
	Nikolaos A. Ioannou	Managing Director	Benelux Overseas Inc.
	George Laou	Technical Director	Cardiff Marine
	Demetrios Koukoulas	General Manager / Technical Management Services Dry Division	Cardiff Marine Inc.
	George Kourelis	General Manager / Technical Management Services Tanker Division	Cardiff Marine Inc.
	Eleftherios A. Belessis	Technical Operations Manager	Carras (Hellas) S.A.
	Dionisios Kourouklis	Director Marine Operations	Chandris (Hellas) Inc.
	Vassilis A. Sarris	Fleet Manager	Chartworld Shipping Corp.
	George H. Paschalis	Technical Manager	Chian Spirit Maritime Enterprises Inc.
	Antonios Giantsis	Technical Manager	Cyprus Sea Lines Co. Ltd.
	George Kotsyfis	Technical Manager	Diana Shipping Services S.A.
	George Alexandridis	Naval Architect & Marine Engineer, Technical Coordinator	Dynacom Tankers Management Ltd
	Dimitrios A. Alifragis	General Manager	E. Nomikos Corp.
	Pantelis Chondros	Technical Manager	Efnav Company Ltd.
	Costas Petsas	Technical Manager	Empros Lines
	Leontios Pitaoulis	Technical Manager	Equinox Maritime Ltd.
	Leonidas S. Zogopoulos	Technical Manager	Eurobulk Ltd.
	Stefanos Georgiou	Technical Manager / Tankers Division Director	European Navigation Inc.
	Dimitrios J. Fafalios	Chief Executive Officer	Fafalios Shipping S.A.
	Dimitrios Theodoropoulos	Technical Manager	Franco Compania Naviera S.A.
	Christoforos E. Andreadis	Director (New Buildings)	Golden Union Shipping Co. S.A.
	Manolis Koutlakis	Fleet Director	Grecomar Shipping Agency Ltd
	Constantinos Tourlos	Technical Manager	Grecomar Shipping Agency Ltd
	Anastasios Kalogiannis	Technical Manager	Iolcos Hellenic Maritime Enterprises Co. Ltd.
	Demitris Vlassopoulos	Technical Manager	Ionic Shipping (Mgt) Inc.
	Dion Theodorou	Managing Director	Konkar Shipping
	Takis Koutris	Technical Manager	Kristar Marine S.A.
	Theodosios Varelzlis	Technical Director	Kritsas Shipping S.A.
	Nick Argyros	Technical Manager	Laskaridis Shipping Co. Ltd.
	Yannis Voulgaris	Technical Manager	Load Line Marine S.A.
	Kostas Symeonidis	Technical Manager	Lydia Mar Shipping Co. S.A.
	Michael D. Kapsorachis	Technical Director	Marine Trust Ltd.
	Theodoros Pavlidis	Technical Director	Metrostar Management Corp
	Stavros Daniolos	Senior Vice President – Technical Director	Minerva Marine Inc.
	Nikolaos Balalis	Technical Director	Navios Tankers Management Inc.
	Costas Mitropoulos	Naval Architect & Marine Engineer	NEDA MARITIME AGENCY Co Ltd
	Evangelos D. Laliotis	Managing Director & Technical Manager	Niovis Shipping Co. S.A.
	Paraskevas Koutsoukos	Chief Operating Officer	Paradise Navigation S.A.
	John N. Ioannidis	Technical Director	Pavimar S.A.
	Miltos Synefias	Technical Manager	Pleiades Shipping Agents S.A.
	Frantzeskos D. Kontos	Managing Director	Prime Tanker Management
	George Hatzivasiliou	Technical Manager	Quintana Ship Management Ltd.
	Elias A. Galanopoulos	Managing Director	Regal Mare Inc
	Michael Anagnostou	Technical Manager	Roswell Tankers Corp.
	Achilleas Avlonitis	Technical Manager	S. Frangoulis (Ship Management) LTD
	Konstantinos Galanis	Technical Manager	Seanergy Maritime Holdings Corp.
	Dimitris C. Makris	Technical Manager	Springfield Shipping Co. Panama S.A.
	Apostolos P. Gavalas	Technical Manager	Starmarine Management Inc.
	Diamantis Andriotis	Technical Manager	Stealth Maritime Corporation S.A.
	Vassilios I. Peponis	Naval Architect & Marine Engineer, NTUA Director of Marine Operations	Sun Enterprises Ltd.
	Dimitrios A. Heliotis	Technical Director / Chief Operating Officer	Target Marine S.A.
	Theo G. Baltatzis	General Manager	Technomar Shipping Inc
	Efstathios M. Vazaios	Technical Manager / DPA	TEO Shipping Corporation
	Vasileios Lampropoulos	Technical Department Manager	Thenamaris Ships Management Inc.
	Nikolaos Arvanitakis	Technical Manager	Transmed Shipping Ltd.
	C. Dean Tseretopoulos	Naval Architect-Marine Engineer, MBA	Triple Tee International Ltd.
	Savvas D. Papadatos	Mechanical Engineer	Tsakos Shipping and Trading S.A.
	Stylianos Smyrlakis	Special Projects & Claims Manager	TST International S.A.
	Constantinos M. Metaxas	Naval Architect - Marine Engineer / Fleet Director	Union Commercial Incorporated
	Sofoklis Silyridis	Technical Manager	Vantage Shipping Lines S.A.
	Takis Koutouras	Technical Manager	Z & G HALCOUSSIS Co. Ltd.

## HONG KONG COMMITTEE

Chairman	Sabrina S. M. Chao	Chairman	Wah Kwong Maritime Transport Holdings Limited
Members	Y. Q. Huang	Vice President	China Merchants Energy Shipping Co., Ltd.
	Chen Xin Chuan	Managing Director	COSCO (H.K.) SHIPPING CO., LTD
	Robert Alexander Ho	President	Fairmont Shipping (HK) Ltd. & Affiliates
	Andrew Y. Chen	Chairman & Managing Director	Grand Seatrade Shipping Company Ltd.
	Arthur Bowring	Managing Director	Hong Kong Shipowners Association
	Frank W. K. Tsao	Group Chairman	IMC Group of Companies
	C. H. Lee	Deputy General Manager / Fleet Manager	Island Navigation Corporation International Ltd.
	Jack Hsu	Managing Director	Oak Maritime (Hong Kong) Inc. Limited
	Kwai Sze Hoi	Chairman & President	Ocean Longevity Shipping and Management Co., Ltd.
	Chanakya Kocherla	Chief Technical Officer	Pacific Basin Shipping (HK) Ltd.
	Lothair M. F. Lam	Director / Vice President	Parakou Shipping Ltd.
	M. T. Yung	Director / General Manager / Shipping Division	Patt Manfield & Co., Ltd.
	Peter Cheng	Managing Director	Peter Cheng Naval Architect & Marine Consultant Ltd.
	Li Hua	Executive Director / General Manager	Sinotrans Shipping Limited
	Kenneth K.W. Lo	Chairman	Teh-Hu Cargocean Management Co., Ltd.
	Edward S. C. Cheng	Chairman	Unique Shipping (H.K.) Ltd.
	Pradeep Ranjan	Managing Director	Univan Ship Management Limited
	Wellington Koo	Executive Director	Valles Steamship Co., Ltd.
	David Price	Managing Director	Wallem Shipmanagement Ltd.

## HONG KONG TECHNICAL COMMITTEE

Chairman	Peter Cheng	Managing Director	Peter Cheng Naval Architect & Marine Consultant Ltd.
Members	Marcel Liedts	Chief Operating Officer	Anglo-Eastern Group
	Alok Roy	Fleet Director	Bernhard Schulte Shipmanagement (Hong Kong) Limited Partnership
	Aluri Rama Krishna	Fleet Manager	Chellaram Shipping (Hong Kong) Ltd.
	Liu Yi Fan	Deputy General Manager / Senior Engineer	China Shipping (H. K.) Marine Co., Ltd.
	Chen Xin Chuan	Deputy Managing Director	COSCO (H.K.) SHIPPING CO., LTD.
	Kishore S. Rajvanshy	Managing Director	Fleet Management Limited
	Lau Pong Sze	Managing Director	Gold Bridge Shipping Ltd.
	Y. H. Shum	Director	Goldbeam International Ltd.
	Zhang Shiwei	Deputy General Manager	Hong Kong Ming Wah Shipping Co., Ltd.
	Li Kwok Hung	Managing Director	IMC Shipping and Offshore Tech Services Pte. Ltd.
	Vipin Sachdeva	Vice President / Fleet	KC Maritime Ltd.
	Pan Zhong Shan	Director & General Manager	Lihai International Shipping Limited
	Kenji Yamada	General Manager / Ship Management Division	New Asian Shipping Company, Limited
	Haruki Aono	Executive Director	Northstar Ship Management Ltd.
	James S. C. Tai	General Manager -cum- Technical Director	Orient Overseas Container Line Ltd.
	Harshavardhan Bhawe	Fleet Management Department	Pacific Basin Shipping (HK) Limited
	Kenneth Koo	Technical Manager	Tai Chong Cheang Steamship Co. (H.K.) Ltd.
	Anil Arora	Group Chairman & Chief Executive Officer	Unique Shipping (H.K.) Limited
	W. L. Hung	Head of Ship Management & Projects	Wah Kwong Ship Management (Hong Kong) Limited
		General Manager	

## INDIAN COMMITTEE

Chairman	K. M. Sheth	Chairman	The Great Eastern Shipping Co. Ltd.
Vice Chairman	R. L. Pai	Consultant	-Energy, Infrastructure, Logistics, Maritime
Members	V. K. Sood	Advisor (Shipping)	
	H. Ansari	Visiting Professor (Insurance)	
	Ashok K. Srivastava	Chief Executive Officer	Arcadia Shipping Ltd.
	A. K. Bahl	President (Shipping)	British Marine Plc
	Ashok V. Chowgule	Executive Director	Chowgule and Company Private Limited
	K. Subramaniam	Chairman & Managing Director	Cochin Shipyard Limited
	Ajithkumar Sukumaran	Dy. Chief Surveyor cum Senior Dy. Director General(Tech)	Directorate General of Shipping
	Satish Kumar	Managing Director	Dockendale Ship Management (India) Pvt. Ltd.
	A. R. Ramakrishnan	Managing Director	Essar Shipping Limited
	M. P. Dhanuka	Executive Director / Technical & Marketing	GEE Limited
	Umesh C. Grover	Chief Executive Officer	Indian National Shipowners' Association
	Dilip Mehrotra	Secretary	IOMOU Secretariat / GOA
	Atul J. Agarwal	Managing Director	Mercator Limited
	S. Govindrajan	Managing Director	Progressive Shipping Consultancy Services (PVT) Ltd.
	Antony Prince	President	Smart Engineering and Design Solutions Ltd.
	Arun Kumar Gupta	Chairman & Managing Director	The Shipping Corporation of India Ltd.
	Sujata Naik Tolani	Chairperson	Tolani Shipping Company Limited

**INDIAN TECHNICAL COMMITTEE**

Chairman	R. L. Pai	Consultant	-Energy, Infrastructure, Logistics, Maritime
Members	K. Mantry	Vice President - Projects / Naval Architect	ABG Shipyard Ltd.
	Ashok Kumar Sharma	Senior Superintendent - Training	Anglo-Eastern Maritime Training Centre
	Pradeep Bajpai	Fleet Director	Bernhard Schulte Shipmanagement (India) Private Limited
	Sunny Thomas	Director Technical & Operations	Cochin Shipyard Limited
	Dileep Krishnan	Associate Professor & Consultant	Department of Ship Technology
	D. V. Abeysinghe	General Manager (Projects & Engineering)	Cochin University of Science and Technology (CUSAT)
	B. N. Singh	General Manager	Colombo Dockyard PLC
	Rajeev Nayyar	Chief Executive Officer	Dockendale Ship Management (India) Pvt. Ltd.
	Ranjit Singh	Chief Technical Officer	Essar Oilfields Limited
	Brahma Mall	Vice President	Sea Transportation Business / Essar Shipping Limited
	S. C. Misra	Professor / Ex-Director	Fleet Management India Pvt. Ltd.
	R. B. Urikouth	Vice President (Commercial Ship Building)	Indian Maritime University (IMU)
	Sudhish Nair	DPA	Larsen & Toubro Limited
	S. M. Rai	Director (Technical)	Medallion Marine Private Limited
	Maneesh Jha	Vice Principal	Indian National Shipowners' Association
	Hariraj P.	General Manager	Samundra Institute of Maritime Studies
	H. S. Swaminathan	Director	Smart Engineering and Design Solutions Ltd.
	Ajoy Chatterjee	Principal & Head	Synergy Maritime Private Limited
	David Birwadkar	Vice President - Fleet Management	The Great Eastern Institute of Maritime Studies
	Indra Nath Bose	General Manager - Quality, Safety & Training	The Great Eastern Shipping Co. Ltd.(GESCO)
	Virendra Gharat	Director (Technical)	The Great Eastern Shipping Co. Ltd.(GESCO)
			Tolani Shipping Company Limited

**INDONESIA COMMITTEE**

Chairman	Widihardja Tanudjaja	Advisor	PT. Berlian Laju Tanker Tbk
Members	Antonius W. Sumarlin	Ex-President Director of PT Humpuss Intermoda Transportasi Tbk	
	Carmelita Hartoto	Chairman	Indonesian National Shipowners' Association
	Kevin Wong	President Director	PT Buana Listya Tama Tbk
	Ir. Tjahjono Roesdianto	Director	PT Daya Radar Utama
	Riry Syeried Jetta	CEO	PT Dok Dan Perkapalan Surabaya
	Theo Lekatompessy	President	PT Humpuss Intermoda Transportasi Tbk
	Krisman Bahar	President Director	PT Indobaruna Bulk Transport
	Asmari Herry	Director	PT Samudera Indonesia, Tbk.
	Praditya Nirtara	President Director	PT. Adnyana
	Stephen Layarda	Managing Director	PT. Alpha Pacific Lines
	Kasim Arifin	President Director	PT. Bumi Perkasa Bahtera
	Amir Gunawan	President Director	PT. Daya Radar Utama
	Yance Gunawan	President Director	PT. Dumas Tanjung Perak Shipyard
	Hendrato	General Manager / Liner Division	PT. Gesuri Lloyd
	H. Soenarto	President Director	PT. Gurita Lintas Samudera
	Joeswanto Karijodimedjo	President Director	PT. Janata Marina Indah
	Henry Djuhari	President Director	PT. Meranti Maritime
	Frank Menaro	Fleet Director	PT. Meratus Line
	M. Firmansyah Arifin	President Director	PT. PAL Indonesia
	Benny Winarto	President Director & CEO	PT. Pelayaran Caraka Tirta Perkasa
	Ganny Zheng	Director	PT. Pelayaran Tirtamas Express
	Rachmat Koentjoro	Managing Director	PT. Tanto Intim Line
	Johnson W. Sutjipto	Commissioner	PT. Wintermar Offshore Marine Tbk
	Sahattua P. Simatupang	Director of Marine Safety and Seafarers	Republic of Indonesia
	Handara A. Utomo	Director of General of Sea Transportation	
		Chief Operating Officer	Soechi Lines

**KOREA COMMITTEE**

Members	Sung-Geun Lee	Executive Vice President / CTO	Daewoo Shipbuilding & Marine Engineering Co., Ltd.
	Suh, Myung-Chun	Vice Chairman	Dong Young Shipping Co., Ltd.
	Lee Hwan-Ku	Senior Executive Vice President	Heung-A Shipping Co., Ltd.
	Hyon-Soo Bong	President & CEO	HHIC-TMS Co., Ltd.
	Yoon Moon-Kyoon	Senior Executive Vice President	Hyundai Heavy Industries Co., Ltd.
	Hwan-Goo Kang	Chief Operating Officer / Shipbuilding Division	
	G. J. Ha	President & CEO	Hyundai Mipo Dockyard Co., Ltd.
	Chang Hee Yoon	CEO	Hyundai Samho Heavy Industries Co., Ltd.
	Jin Bang Lee	Chairman	KSS Line Ltd.
	Sangbok Lee	Chairman	Overseas Shipping Corporation
	You-Sik Kim	Representative Director / President	Pan Continental Shipping Co., Ltd.
	J. H. Chung	Vice Chairman & CEO	Pan Ocean Co., Ltd.
	Doo-Chan Chang	Vice President / Commercial Ship Marketing	Samsung Heavy Industries Co., Ltd.
	Chung Tae-Soon	Advisor	Sea Explorers of Korea
	Seog-Hwan Kang	Chairman	Sinokor Merchant Marine Co., Ltd.
		Chief Operating Officer	SK Shipping Co., Ltd.

**KOREA TECHNICAL COMMITTEE**

Chairman	Jeom Kee Paik	Professor	Department of Naval Architecture and Ocean Engineering Pusan National University
Members	Jae Il, Bae	Director / Technology Head Office	Dae Sun Shipbuilding & Engineering Co., Ltd.
	Je-Hyook Woo	Vice President / Structure Design Division Leader	Daewoo Shipbuilding & Marine Engineering Co., Ltd.
	Sun-Taek Lee	Director / Integrated Design Team	Daewoo Shipbuilding & Marine Engineering Co., Ltd.
	ManSoo Kim	President & CEO	DSEC Co., Ltd.
	Jongman Jo	Vice President / Fleet Management / Group Director	Eusu ShipManagement Co., Ltd.
	Sung-Ryool Kim	Managing Director / Engineering Ship Sales Team2	Hanjin Heavy Industries & Construction Co., Ltd.
	Park, Kun-Woo	Deputy Managing Director / Design Division	HHIC-TMS Co., Ltd.
	Hakjoon Park	Senior Vice President / Ship Design Office Shipbuilding Division	Hyundai Heavy Industries Co., Ltd.
	Kim, Hyung Kwan	Vice President / Naval Architect Initial Design Office / Shipbuilding Division	Hyundai Heavy Industries Co., Ltd.
	Taeg-Gyu Lee	President	Hyundai Ocean Service Co., Ltd.
	Kim Tae-Wook	Senior Vice President / Head of Design Office	Hyundai Samho Heavy Industries Co., Ltd.
	Jae Deog, Go	Managing Director / Fleet Division	KLC SM Co., Ltd.
	Choi, Jae-Sung	Professor / Division of Marine Engineering	College of Maritime Sciences Korea Maritime and Ocean University
	Seung-Woo, Lee	Managing Director Marine Affairs Management Department	KSS Line Ltd.
Yongsuk Suh	Vice President / Central Research Institute	Samsung Heavy Industries Co., Ltd.	
Hangdok (Harry), CHO	Vice President / Head of Fleet Management Division (D.P)	SK Shipping Co., Ltd.	
Seontae Son	Managing Director / Head of Engineering Division	SPP Shipbuilding Co., Ltd.	
Myeong-Su Kim	Senior Vice President / PO Ship Management Division	STX Marine Service Co., Ltd.	
Jeong-Keun YOUN	Vice President / Chief Technology Officer Outfitting Design Division	STX Offshore & Shipbuilding Co., Ltd.	
Sung-Kwang SHIN	General Manager / Hull Design Dept.	STX Offshore & Shipbuilding Co., Ltd.	
Jae-Woo Son	Senior Vice President / Technical Division	Sungdong Shipbuilding & Marine Engineering Co., Ltd.	

**LATIN AMERICAN COMMITTEE**

Members	Ricardo Vahia Alves de Souza	Director of Engineering	Amec KROMAV
	Akira Itaki	Presidente	Astillero Tsuneishi Paraguay S.A.
	Javier Reyes Conde	Operations Manager of Marine Services	Blue Marine Technology Group
	Carlos H. Rodiño	General Manager	CIE S.A.
	Godofredo Vergara	Director	Consignataria San Miguel S.A. de C.V.
	Bartolome Carrera Santiago	Owner	Desarrollo Naviero Mexicano, S.A. de C.V.
	Danilo Moreno Oleas	General Manager	EP FLOPEC
	Marcelo de Mendonça Abreu	Engineering Manager - DRU Project	Estaleiro Atlântico Sul
	Cristian Widow	Deputy General Manager	Humboldt Shipmanagement
	Masao Nakayama	President	K Line Peru S.A.C
	José Luiz Nunes Ruiz	Principal Engineer	London Offshore Consultants Brasil Ltda.
	Ricardo dos Santos	Director	Navemar S.A.
	Ricardo Menezes	Operation and New Building Director	Ocean Pact
	Agenor Cesar Junqueira Leite	Advisor of Engineering Division	PETROBRAS
	Vladimir Contreras	Ingeniero Naval	Petróleos de Venezuela S.A.
	Tomazo Garzia Neto	President	Projemar
	Roberto Hetz Vorpahl	Chief Executive Officer	Sociedad Nacional Maritima S.A.
	Angel Canessa T.	Head of Planning, Controlling and Engineering	Southern Shipmanagement (Chile) Ltda.
	Eduardo Balzarette	Business Development Director	TANDANOR S.A.C.I. y N.
	Paul Casanova Claros	General Manager	Transgas Empresa Naviera
Elizio Araujo Neto	Executive Manager	Transpetro	
Ruben Galindo Villanueva	Technical and Fleet Managing Director	Transportacion Maritima Mexicana S.A. de C.V.	
Alejandro Peluffo	Manager - Shipowning Division	TMM Group	
Nelson Luiz Coelho Alves	Shipping Engineering General Manager	Ultrapetrol S.A. Vale S.A.	

## MALAYSIAN COMMITTEE

Chairman	Nordin Mat Yusoff	Chairman	Malaysia Shipowner's Association
Members	Azmi Bin Ahmad	Group Managing Director/CEO	Alam Maritim Resources Berhad
	Thomas Ng Chin Keuan	Executive Director	Coastal Contracts Bhd.
	Abdul Hak B. Md. Amin	Managing Director	E.A. Technique(M) Berhad
	Billy Tan Gim Hoe	Chairman	Ecoship Sendirian Berhad
	David Tan	Managing Director	Everise Maritime Sdn. Bhd.
	Johari Mohd Noh	Managing Director	Gagasan Carriers Sdn Bhd
	Seri Halim Bin Mohammad	Executive Chairman and Managing Director	Halim Mazmin Bhd.
	Bernard Ling	Managing Director	Highline Shipping Sdn. Bhd.
	Elias Kadir	President	Keretapi Tanah Melayu Berhad
	Khoo Chin Yew	Managing Director	Orkim Sdn Bhd
	Azaharuddin Osman	Chief Executive Officer	Petronas Maritime Services Sdn. Bhd.
	Lawrence Wong	General Manager	Sarawak Land Shipyard Sdn. Bhd.
	Lim Piak Wah	Executive Director	Serudong Shipping Sdn. Bhd.
	Vincent Ling Lu Yew	Director	Shin Yang Shipyard Sdn. Bhd.
	Lau Nai Hoh	Group C.E.O. / Group M.D.	Tuong Aik Shipyard Sdn. Bhd.
	Paal Gunnulfsen	Regional Manager WSM Asia	Wilhelmsen Ship Management Sdn. Bhd.

## MIDDLE EAST TECHNICAL COMMITTEE

Chairman	Jitendra Misra	Managing Director	Emarat Maritime
Vice Chairman	Ali A. Shehab	Deputy C.E.O. Fleet Operations	Kuwait Oil Tanker Company S.A.K.
Members	Haakon Johnsen	Senior Vice President (Operations)	ADNATCO-NGSCO
	Mohammed El Sayed Ahmed	CEO	Al Bedaya Consultancy & Marine Survey
	A. Ramamurty	Director	Arka Global Marine Services L.L.C.
	M.R. Iliati	President & CEO	DeepSea OFFSHORE International
	V. V. N. Reddy	Fleet Manager	Dockendale Ship Management DMC CO
	Ali AlSuwaidi	Vice President	Drydocks World
	Benny K. Alex	Business Development, Commercial & Project Management	Emarat Maritime
	Sheel Cabral	General Manager (New Buildings & Tech. Services)	Gulf Petrochem DMCC
	Abdul Hayee	Technical Manager - Shipping	Gulf Stolt Ship Management
	David P. Pereira	Fleet Manager	Inter Global Shipping Limited
	Anil Cariappa	Technical Director	International Tanker Management Limited
	Jamil Al-Ali	Manager / Fleet New Building Project Group	Kuwait Oil Tanker Company S.A.K.
	Rahul Kapoor	Planning Manager	MUR Shipping DMC CO
	Masanori Hayashi	General Manager (FleetA) / Technical Department	Oman Ship Management Company
	Zaheer Babar Qureshi	Executive Director (Ship Management)	Pakistan National Shipping Corporation
	Rostom Merzouki	Technical Superintendent	Qatar Gas Transport Company Ltd. (NAKILAT)
	Medjahed Benkablia	Senior Fleet Technical Superintendent	Qatargas Operating Company Limited
	Gamal Fekry	CEO	Red Sea Marine DMCC
	Naushad Azad	General Manager	Red Sea Marine Services Co. Ltd.
	Senthil Kumar	Managing Director	Silver Star Ship Management
	A. Mansourzadeh	G. M. Technical	Simatech Shipping L. L. C.
	Abdulaziz A. Sabri	Fleet Operations Manager	Vela International Marine Limited
	N. V. K. Nambiar	Technical Manager	Warm Seas

## NORTH AMERICAN COMMITTEE

Members	John Calicchio	Chairman	Apex Bulk Carriers LLC
	John D. Noonan	Chief Executive Officer	BLT Chembulk Group
	Inderjeet S. Aulakh	VP Shipping Operations	Dole Reefership Marine Services, Ltd.
	Osami Maeyama	President / C.O.O.	Dowa Line America Co., Ltd.
	Ramesh Bhat	Technical Director	Eagle Shipping International (USA) LLC
	Calvin W. S. Cheng	Chairman	Eastmark Associates, Inc.
	Byron M. Sugahara	President	Fairfield-Maxwell Services, Ltd.
	Charles Leung	Senior Vice President	Fairmont Shipping (Canada) Limited
	Thomas H. Paterson	Vice President / Owned Fleet & Business Development	Fednav Limited
	Michael M. Lee	Senior Advisor	Foremost Maritime Company LLC
	Hans Christian Jensen	President	Harvest Shipping
	Ibrahim Mazman	President	Med Brokerage & Management Corp.
	Shunji Sasada	President	Navios Corporation
	Ronald W. Tursi	President	Roymar Ship Management Inc.
	Yariv Zghoul	President & Chief Operating Officer	SeaChange Maritime LLC
	Rob Grool	President, Fleet Management	Seaspan Ship Management Ltd.

## PHILIPPINE COMMITTEE

Chairman	Arben E. Santos	President & CEO	Southwest Maritime Group of Companies
Members	Doris Magsaysay Ho	President & Chief Executive Officer	A. Magsaysay Inc.
	Roy R. Alampay	Vice President for Operations & General Manager	Baliwag Navigation, Inc.
	Rogelio A. Torres	Vice-President / Traffic & Operations	Eastern Shipping Lines, Inc.
	Ahn, Jin Kyu	President	HHIC-Phil
	Geok Seng Tan	General Manager	Keppel Batangas Shipyard (A division of Keppel Philippines Marine, Inc.)
	Teodoro G. Bernardino	President	Loadstar International Shipping, Inc.
	Maximo Q Mejia Jr.	Administrator	Department of Transportation & Communications Maritime Industry Authority
	Edgardo G. Lacson	President	MIS Maritime Corporation
	Eduardo U. Manese	President	Philippine-Japan Manning Consultative Council, Inc.
	Thomas A. Tan	President	SMC Shipping and Lighterage Corporation
Fausto C. Tiu	Executive Vice President	Solid Shipping Lines Corporation	
Alfonso G. Cusi	President	StarLite Ferries Inc.	
Akihiko Mishima	President	Tsuneishi Heavy Industries (Cebu), Inc.	

## SINGAPORE COMMITTEE

Chairman	Aloysius Seow	Chief Operating Officer	Ocean Tankers (Pte) Ltd.
Members	Kenneth A Glenn	President	APL Co. Pte Ltd.
	Yasuhiro Katsuyama	Managing Director	Diamond Star Shipping Pte. Ltd.
	Rajdeep Singh	Technical Director	Eastern Pacific Shipping Pte. Ltd.
	B. S. Teeka	Managing Director	Executive Ship Management Pte Ltd
	Lim Sim Keat	Managing Director / Dry Transport Logistics Division	IMC Industrial Group
	Tong Chong Heong	Senior Advisor	Keppel Offshore & Marine Ltd
	Tomomaru Kuroyanagi	Managing Director	Kumiai Navigation (Pte) Ltd
	Andrew Tan	Chief Executive	Maritime and Port Authority of Singapore
	Kazutomi Uchida	President	MMSL Pte. Ltd.
	Satoshi Aizaki	Managing Director - President	OMC Shipping Pte. Ltd.
	Kuok Khoon Kuan	Executive Chairman	Pacific Carriers Limited
	Teo Cho Keng	Senior Executive Director / Technical Division	Pacific International Lines (Pte) Ltd.
	Wong Weng Sun	President & C.E.O.	Sembcorp Marine Ltd
	John Chia	Executive Vice President	United Ocean Ship Management Pte Ltd.
	Sun Xiushun	President	Winning International Group Pte Ltd

## SINGAPORE TECHNICAL COMMITTEE

Chairman	Tey Yoh Huat	Adjunct Senior Research Fellow	Centre for Maritime Studies National University of Singapore
Members	Robert Sumantri	Director	Altus Logistics Pte. Ltd.
	J. Orson Lobo	Deputy Managing Director	Anglo-Eastern Shipmanagement (Singapore) Pte Ltd
	Shaj U. Thayil	Global Head / Technical Services	APL
	Avinash Kadam	Corporate Director / Fleet Management	Bernhard Schulte Shipmanagement (Singapore) Pte Ltd.
	Kapil Berry	Manager for Maintenance and Project	BW Fleet Management Pte Ltd
	Toh Ho Tay	Rigs / Offshore	Clarksons Platou Offshore (Asia) Pte. Ltd.
	Harcharan Singh	Technical Manager / Technical Support Services	Eastern Pacific Shipping Pte. Ltd.
	Ajay K. Chaudhry	Director	Fleet Ship Management Pte Ltd
	Lim Teck Cheng	Chief Executive	Hong Lam Marine Pte Ltd.
	Wong Sin Futt	Director / Newbuildings / CEng FIMarEST	IMC Shipping and Offshore Tech Services Pte Ltd.
	B. N. Prasad	Executive Director	IS Container Pte. Ltd.
	Seow Tan Hong	Senior General Manager / Engineering Department	Jurong Shipyard Pte Ltd
	Iwane Ogawara	Chief Engineer / Managing Director	"K" Line Ship Management (Singapore) Pte Ltd
	Chor How Jat	Managing Director	Keppel Shipyard Limited
	Vijay Rangroo	Managing Director	M. T. M. Ship Management Pte. Ltd.
	Cheam Yeow Cheng	Director	Marco Polo Shipyard Pte Ltd
	Mark Lim Yew Guan	2 Deputy Director (Shipping)	Maritime and Port Authority of Singapore
	Toshihiko Ota	Managing Director	MOL Tankship Management (Asia) Pte Ltd
	Arun Ahluwalia	Fleet Director, Technical	MSI Ship Management Pte Ltd.
	Chris Kirton	Managing Director	Norstar Ship Management Pte Ltd
	Hemant Pathania	Managing Director / Chief Operating Officer	NYK SHIPMANAGEMENT PTE LTD
	Wong See Tuang Johnny	Senior Manager / Technical Department	Ocean Tankers (Pte) Ltd.
	Lim Tau Kok	Director	PACC Ship Managers Pte Ltd
	Panneer Selvam	General Manager / Technical Division	Pacific International Lines (Pte) Ltd
	Charles Jan Scharffetter	CEO Maritime Services	Rickmers Shipmanagement (Singapore) Pte. Ltd.
	Govinder Singh Chopra	Director	SeaTech Solutions International (S) Pte Ltd
	Francis Chin	Chief Operating Officer	Stellar Shipmanagement Services Pte Ltd
	Sanjeev K Namath	New Projects and R&D	Synergy Marine Pte. Ltd.
	Vinay Gupta	Managing Director	Union Marine Management Services Pte Ltd.
	Naresh Chand	Managing Director	United Ocean Ship Management Pte Ltd.
Calum S Hume	Technical Director - Asia & ME	V. Ships Asia Group Pte Ltd	

**TAIWAN COMMITTEE**

Chairman	Loh Yao-fon	Adviser	Evergreen Group
	Steve Lee	Chairman	China Steel Express Corporation
Members	J. Z. Fang	CEO	CPC Corporation, Taiwan
	Robert Lai	Chairman	CSBC Corporation, Taiwan
	Der-Hsiung Chen	President	Deryoung Maritime Co., S.A.
	Shang-Wen Liao	President	Ph. D. Leeds. U.K.
	HSIEH Chih-chien	Vice Group Chairman	Eastern Media International Corporation
	Akihiro Nagahara	Chairman	Evergreen Group
	B. C. Tsai	Chairman	First Steamship Co., Ltd.
	Bill M. H. Huang	Chairman	Franbo Lines Corp.
	Harvey Chiu	Chairman	Glory Navigation Co., Ltd.
	Chiou, Rey-Bin	Chairman	Hsin Chien Marine Co., Ltd.
	Jimmy C. Hsiao	Chairman	Kuang Ming Shipping Corp.
	J. D. Lan	Director & President	Mingtai Navigation Co., Ltd.
	Fritz Chen	Chairman / CEO	Shih Wei Navigation Co., Ltd.
	Fred C. P. Tsai	Chairman	Sincere Industrial Corporation
	Kenneth Lee	Chairman & CEO	Sincere Navigation Corporation
	Hrong-Nain Lin	President	T.V.L. Business Group
	Alan Shieh	President	Ta Tong Marine Co., Ltd.
	I. Y. Chang	Chairman	Ta-Ho Maritime Corporation
	Nobu Su	C.E.O.	Taiwan Navigation Co., Ltd.
	C. K. Ong	President	TMT Co., Ltd.
	Lin Ching Chih	Chairman	U-Ming Marine Transport Corporation
	Glenn K. L. Chan	President	Unison Marine Corporation
	Chen, Po Ting	Chairman	United Ocean Shipping S. A.
	James Lan	Chairman	Wan Hai Lines Ltd.
	Hermann Yu	President	Wisdom Marine Lines S.A.
			Yang Ming Marine Transport Corp.

**TAIWAN TECHNICAL COMMITTEE**

Chairman	Chiang Shou-hsing	Senior Vice President / Shipbuilding Dept.	Evergreen Marine Corp. (Taiwan) Ltd.
		Engineering Div.	
Members	Guo I-Lung	Chairman / President	Biggin Shipping Corporation
	C.R. Chao	Vice President	China Steel Express Corporation
	W. M. Wang	Section Manager / Marine Technique & Safety Section	CPC Corporation, Taiwan
	Frank Foung-Tang Lin	Storage & Transportation Department	
	Chih-Peng Tsai	Director / Department of Design	CSBC Corporation, Taiwan
	Michael L. Y. Pan	Assistance to President	Deryoung Maritime Co., S.A.
	Yeh Ching-rong	Executive Vice President	Eastern Media International Corporation
		Deputy Senior Vice President	Evergreen Marine Corp. (Taiwan) Ltd.
	Chia-Yen, Wu	Maintenance Dept., Engineering Div.	
	William Wu	Vice President / Eng. & Supply Dept.	First Steamship Co., Ltd.
	Tony C. T. Hsueh	President	Franbo Lines Corp.
	W. K. Wu	Manager of Marine Department	Glory Navigation Co., Ltd.
	Clark Wu	Manager / Technical Dept.	Hsin Chien Marine Co., Ltd.
		Assistant Vice President	Kuang Ming Shipping Corp.
	C. K. Lin	Labor Safety & Health Department	
	You-Yen Ho	Vice President / Engineering / Operation Department	Mingtai Navigation Co., Ltd.
	Gerald Tsai	Vice President / Marine Department	Shih Wei Navigation Co., Ltd.
	Young Perng-Terng	General Manager / Technical Department	Sincere Industrial Corporation
	Yu Ko Yuan	Chief Engineer	Ta Tong Marine Co., Ltd.
	Hao Yuan Chang	Associate Manager / Marine Department	Ta-Ho Maritime Corporation
	Chen Teng	Deputy General Manager / Marine Department	Taiwan Navigation Co., Ltd.
	Robert Y. P. Kao	Special Assistant to Chairman / Ship Management Dept.	TVL Marine Company Limited
	Peter W. D. Ho	Senior Vice President	U-Ming Marine Transport Corporation
	Sanders Jong	Consultant / Technical Department	Unison Marine Corp.
	Jyh-Tyng Shyu	Vice President / Engineering Division	Wan Hai Lines Ltd.
	Jackie Ho	Chief Technical Officer / Technical Department	Wisdom Marine Group
		Vice President / Engineering Department	Marine Technology Group
			Yang Ming Marine Transport Corp.

**THAI COMMITTEE**

Chairman	Sutep Tranantasin	Executive Vice President	Regional Container Lines Public Co., Ltd.
Members	Warawan Nganthavee	Managing Director	Asian Marine Services Public Co., Ltd.
	Bhumindr Harinsuit	Managing Director	Bhureemas Navee Co., Ltd.
	Suparuak Potchanant	Operation Director	ES Offshore and Marine Engineering (Thailand) Co., Ltd.
	Vivek Dwivedi	Sr. Vice President / Regional Head (Asia-Pacific)	Gulf Petrochem Group
	Wirat Chanasit	Managing Director	Italthai Marine Ltd.
	Chanet Phenjati	President	Jutha Maritime Public Co., Ltd.
	Win Zaw	President	Lizstar Group of Companies
	Nat Chubchai	Deputy Director General	Marine Department
	Winn Pe	Managing Director / Inland Water Transport	Ministry of Transport, Union of Myanmar
	Maung Maung Oo	Director General / Department of Marine Administration	Ministry of Transport, Union of Myanmar
	Wynn Pe	Managing Director	Myanma Five Star Line
	Kyi Soe	Managing Director	Myanma Shipyards
	Suraphon Meesathien	Vice President	Nathalin Co., Ltd.
	Jaipal Mansukhani	Director	Precious Shipping Public Co., Ltd.
	Kraiyaist Intarapanich	Vice President / Internatinal Chartering Department	PTT Public Company Limited
	Voravit Visitkijakarn	Managing Director	Sang Thai Shipping Co., Ltd.
	Surachai Lerpichayayotin	Marine Fleet Director	Siam Lucky Marine Company Limited
	Nitas Krongvanitchayakul	Managing Director	Thaioil Marine Co., Ltd.
	Yodchai Ratanachiwakorn	Director, Marine Operations	Thoresen & Co., (Bangkok) Ltd.
	Louis - Frederic Sachs	Director - Marine Group	Tipco Asphalt Public Company Limited
	Teruo Kondo	Chief Production Manager	Unithai Shipyard & Engineering Ltd.

**TURKISH COMMITTEE**

Chairman	Yalcin Sabanci	Chairman	YA-SA Holding S.A.
Members	Özgür AKSOY	General Manager & Board Member	AKMAR HOLDING S.A.
	Ali Umur	President	Aktif Shipping
	Kenan S. Sumra	Company Manager	Anadoluhisari Tankercilik A.S.
	Ali İbrahim Kontaytekin	General Manager	ARKAS DENZCILIK VE NAKLIYAT A.Ş.
	Erhan Bayraktar	Board Member/CEO	Bayraktar Shipping Group
	Derya Sabaz	Board of Directors Member	Beşiktaş Group
	Gönç Beyli	Vice Chairman BoD	Beykim Petrolcülük Gemi İşletmeciliği San. Ve Tic.A.Ş.
	Hasan Pehlivan	Consultant	BORA Shipping Industry & Trading Co. Inc.
	A. İker MEŞES	Board Member	CARETTA SHIP MANAGEMENT & CHARTERING TRADE INC.
	Engin Özcelik	General Manager / Board Member	CEBI Maritime & Trading SA
	İdil Baran	Director	CerBa Group of Companies
	Esref Cerrahoglu	Chairman	Cerrahgil A.S.
	Serra Cerrahoglu	Vice Chairman	Cerrahgil Group of Companies
	H. Bülent Şener	Chairman	Delta Marine Engineering and Computer Trading CO.
	Serdar Akcali	Managing Director	Denak Ship Management & Agency
	Ö. Faruk Miras	Member of Board	Diler Shipping and Trading Inc.
	Cihan Ergenc	Chairman	ER Denizcilik Sanayi Nak. Ve Tic. A. S.
	Oktay ERCAN	Owner	GAMMA SHIPPING & FOREIGN TRADE LTD.
	Sadan Kaptanoglu	Owner	H.I. Kaptanoglu Shipping Group
	Bayram Yusuf Aslan	President and CEO	ICDAS Group of Companies
	Bedri Ince	Chairman	Ince Shipping and Trading Co. Inc.
	Tamer Kiran	Chairman	Kiran Group of Shipping Companies
	Mecit Çetinkaya	Owner	Mecit Çetinkaya Shipping, Transport, Marketing Ind.& Trade Co. Ltd.
	Tufan Süslüer	General Manager	Nemtas Denizcilik
	G. Osman Küçükertan	General Manager	Omsan Denizcilik A.Ş.
	Tahir Sarioğlu	President	Sarioğlu Shipping ve Turizm Limited Sirketi
	Emir Sohtorik	Chairman	Semih Sohtorik Management & Agency Inc.
	Atilla Çiftçigüzeli	Chief of Executive Committee	SNR HOLDING
	Orkun Kalkavan	Executive Board Member	Turkon Holding
	Baris Kiziltas	General Manager / DPA	Vera Shipping
	Ilhan Sabanci	Board Member	YA-SA Shipping Industry & Trading S.A.
	Emirhan Sabanci	Board Member	YA-SA Tanker and Transportation S.A.

TURKISH TECHNICAL COMMITTEE

Chairman	M. Erbil Özkaya	General Coordinator	YA-SA Holding S.A.
Members	H. Umut Çınar	General Manager	Active Shipping & Management Pte Ltd
	Enis Öztürk	DPA	Akmar Holding S.A.
	Saim Gökçen	Technical Manager	Aksay Denizcilik ve Ticaret A.Ş.
	Erkan Dereli	Owner	ALIAGA DENİZCİLİK
	Kenan S. Sumra	Company Manager	Anadoluhisari Tankercilik A.Ş.
	Levent Demiriz	Operation Manager	ARKAS Denizcilik
	Erdal CAGILTI	Manager	Aruna Shipping Ltd., Corp.
	Murat Duman	Technical Manager	Aydın Deniz İşletmeciliği A.Ş.
	Mehmet Gülakdeniz	DPA	Bayraktar Shipping Group
	Sarper Kara	Technical Manager	Besiktas Group
	Tolga TEKİN	Technical Manager	Beyaz Denizcilik Ltd.Şti.
	Burak Meriç	DPA	Beykim Petrolçülük Gemi İşletmeciliği San. ve Tic. A.Ş.
	Ahmet Taymez	Manager	CARETTA Gemi İşletmeciliği ve Kiralama Ticaret A.Ş.
	Mustafa Bahar	Technical Manager	Cebi Denizcilik AS
	Süleyman Vural	Fleet Manager	Ceren Denizcilik
	S. Dirim Şener	Department Manager / Planning Department	Delta Marine Engineering and Computer Trading Co.
	Şemsettin Özyapar	Technical Manager	Denak Ship Management & Agency
	M.Şahin Akkaya	DPA / Safety and Quality Manager	Desan Deniz Nakliyat ve Sanayi A.Ş.
	Taşkin Çilli	CEO, Member of Board	Desan Deniz İnşaat San. A.Ş.
	Ergun Köker	Regional Manager, Marketing Department (Ship Repairs)	Gemak Gemi İnşaat San. ve Tic. A.Ş.
	Erhan Menten	Technical ADM	Gemiciler Denizcilik
	Mehmet Cebeci	Bulk Fleet Manager	Genel Denizcilik Nakliyatı A.Ş.
	Nurettin Kuş	General Manager	Greenfleet Ship Management
	Ş.Şenol Üngür	Technical Superintendent	Güngen Maritime
	Türker Yalıtır	General Manager	Hat-San Shipyard
	Çağdaş Gürol	Project Officer	İçdaşÇelik Enerji Tersane ve Ulaşım San. A.Ş.
	Mustafa Terzi	Coordinator	İce Tanker
	Serdar Özkaya	Technical Manager	IDÇ Denizcilik Sanayi ve Ticaret A.Ş.
	A. Yaşar Canca	Technical Manager - DPA	Ince Shipping & Trading Co., Inc.
	Ertan GÜNERLER	Technical Manager	İNCİ Ship Management Limited Company
	Emre Uyanık	Technical Manager	İskenderun Ship Management
	Burak ORUÇ	Deputy General Manager / DPA	Kaptanoglu Holding
	Mustafa Dulgır	Operation Manager	Manta Shipping Ltd.
	Şenol Memiş	Technical Manager	Mardas & Mardeniz & Kardeniz Group of Companies
	Fatih Sıcaküz	Technical Manager	Nemtaş Shipping
	Murat Ata Çevik	Technical Department Manager	Pasifik Ship Management & Trading
	Mahmut Ünsal	Advisor	POLARMARINE Ship Management Group of Companies
	M. Cumhuri Kuter	General Manager	Sedef Shipbuilding Inc.
	Mehmet Başoğlu	General Manager	Semih Sohtorik Management & Agency Inc.
	Hakan Erzurumlu	Fleet Manager	Şener Petrol Denizcilik Tic.A.Ş.
	Yavus Büyükyüksel	Fleet Manager	TGM Ship Management an Agency Ltd. Co.
	Ender Keskin	General Manager	Transal Denizcilik
	Ali H. Doğanlı	Technical Manager	VERA SHIPPING
	Mehmet Kayhan	General Manager / Bulk Carriers	YA-SA Shipmanagement and Trading S.A.
	Tulga ZENGİN	Technical Manager	YA-SA Shipping Industry and Trading S.A.
	Cem Yücer	General Manager	YA-SA Tanker and Transportation S.A.
	Mustafa Karaduman	Technical Manager	YA-SA Tanker and Transportation S.A.

## ClassNK in Control (as of the end of 2015)

Officer			
Councillors	Akimitsu Ashida Takashi Uyeno Yasumi Kudo Katsuyuki Sugimoto Zenshichi Akasaka Yasuhiko Katoh Kazuo Tsukuda Sho Minami Makoto Satani Hiroshi Shima Masakazu Nakanishi Shinji Hayama Masafumi Yasutomi Koichiro Yoshida	Counselor Chairman & President Chairman, Chairman Corporate Officer Executive Adviser President Chairman, Representative Director Senior Executive Adviser Company CEO Former Executive Consultant Senior Adviser, Member of the Board Former Chairman Professor Emeritus Chairman Professor Emeritus Professor Emeritus Former Commandant Professor Emeritus Attorney-at-Law, Professor Emeritus Operating Officer, General Manager of Planning Department	Mitsui O.S.K. Lines, Ltd. Uyeno Transtech Ltd. Nippon Yusen Kabushiki Kaisha Iino Kaiun Kaisha, Ltd. Akasaka Diesels Limited Mitsui Engineering & Shipbuilding Co., Ltd. Mitsubishi Heavy Industries, Ltd. Oshima Shipbuilding Co., Ltd. JX Nippon Oil & Energy Corporation NIPPON STEEL & SUMIKIN TEXENG.CO.,LTD. Japanese Hull Insurers' Union The University of Tokyo Tokyo Metro Co., Ltd. The University of Tokyo The University of Tokyo Japan Coast Guard Yokohama National University The University of Tokyo Nippon Kaiji Kyokai
Councilor Appointment Committee	Shinji Hayama Tsutomu Aihara Hiroshi Itagaki Seichi Ochiai Michio Takagi	Chairman and President Executive Vice President Executive Vice President Executive Vice President Executive Vice President Managing Executive Officer Representative Director and Vice President, Planning & Administration Division Professor Emeritus Executive Officer General Manager, Engineering Division, Ship & Offshore Structure Company Former Commandant	Nippon Kaiji Kyokai Nippon Kaiji Kyokai Nippon Kaiji Kyokai Nippon Kaiji Kyokai Nippon Kaiji Kyokai Kawasaki Kisen Kaisha, Ltd. Japan Marine United Corporation
Directors	Noboru Ueda Yasushi Nakamura Koichi Fujiwara Tetsushi Agata Tetsuya Kinoshita Shunichi Arisaka Yoshio Otagaki  Hideomi Otsubo Yoshikazu Kawagoe Kazuya Kobayashi	Professor Emeritus Executive Officer General Manager, Engineering Division, Ship & Offshore Structure Company Former Commandant Counsellor Emeritus Senior Managing Corporate Officer Professor Emeritus	The University of Tokyo Mitsui O.S.K. Lines, Ltd. Kawasaki Heavy Industries, Ltd.
Auditors	Tsutomu Aihara Yasuhide Sakinaga Yasuo Tanaka Yuzuru Fujita	Operating Officer, General Manager of Planning Department Chairman and President Executive Vice President Executive Vice President Executive Vice President Executive Vice President Managing Executive Officer Representative Director and Vice President, Planning & Administration Division Professor Emeritus Executive Officer General Manager, Engineering Division, Ship & Offshore Structure Company Former Commandant Counsellor Emeritus Senior Managing Corporate Officer Professor Emeritus	Japan Coast Guard Kawasaki Kisen Kaisha, Ltd. Nippon Yusen Kabushiki Kaisha The University of Tokyo
Technical Committee			
Chairman	Hideomi Otsubo	Professor Emeritus	The University of Tokyo
Vice Chairman	Toshiharu Nomoto	Professor Emeritus	The University of Tokyo
Members	Noboru Ueda Yasushi Nakamura Tetsuya Kinoshita Shunichi Arisaka Hisahiro Oshima Yoshikazu Kawagoe Kaneo Kuboyama Yasuo Tanaka Naoki Ueda  Kazuo Kasai Atsushi Komura  Norihsa Fukuda  Atsushi Majima  Kozo Yasuda  Hisayuki Yamada  Akihiro Shimizu  Yuji Nomiya  Osamu Matsumoto  Teruo Yamaura  Hiroshi Itagaki Shinji Hayama Koichiro Yoshida	Chairman and President Executive Vice President Executive Vice President Managing Executive Officer Director, Managing Executive Officer Executive Officer Director, Senior Vice President Senior Managing Corporate Officer Senior Chief Engineer, Shipbuilding & Ocean Development, Commercial Aviation & Transportation Systems Director Basic & Hull Designing Division Senior Manager of Initial Design Department, Engineering Division, Ship & Offshore Structure Company Director and Managing Executive Officer, General Manager, Ship & Ocean Project Hq. Director, Acting Chief General Manager, Business & Technical Development Division Executive Officer, Shipbuilding Division, General Manager of Design Department Technical Executive General Manager, Strategy Planning Dept. Ship & Offshore Division Forging, Casting & Pressure Vessel Dept. / General Manager General Manager, Head of Div. Plate Technology Div. Plate Unit Division General Manager, Steel Casting & Forging Division, Iron & Steel Business Executive Assistant, General Manager of Plate Business Planning Department Professor Emeritus Professor Emeritus Professor Emeritus	Nippon Kaiji Kyokai Nippon Kaiji Kyokai Nippon Kaiji Kyokai Kawasaki Kisen Kaisha, Ltd. Iino Kaiun Kaisha, Ltd. Mitsui O.S.K. Lines, Ltd. JX Ocean Co., Ltd Nippon Yusen Kabushiki Kaisha Mitsubishi Heavy Industries, Ltd.  Imabari Shipbuilding Co., Ltd. Kawasaki Heavy Industries, Ltd. Mitsui Engineering & Shipbuilding Co., Ltd. Sumitomo Heavy Industries Marine & Engineering Co., Ltd. Sasebo Heavy Industries Co., Ltd. Japan Marine United Corporation The Japan Steel Works, Ltd. NIPPON STEEL & SUMITOMO METAL CORPORATION Kobe Steel, Ltd. JFE Steel Corporation Yokohama National University The University of Tokyo The University of Tokyo



