



ClassNIK

ANNUAL REPORT 2006

Nippon Kaiji Kyokai, also known as ClassNK or just "NK", is a ship classification society. The principal work of the Society's expert technical staff is to undertake surveys to ensure that the rules which it has developed are applied to newbuildings and existing ships, in order to ensure the safety of these vessels and the prevention of marine pollution. The rules cover not only hull structures, but also safety equipment, cargo handling gear, engines, machinery, and electrical and electronic systems, among others. At the end of December 2006, the Society had 6,636 ships totaling 144,438,721 gross tons on its Register. This figure represents approximately 21% of the world merchant fleet currently under class. Although based in Japan, where it has 21 offices, ClassNK has worldwide representation through a network of 77 exclusive surveyor sites in 42 countries and territories. ClassNK surveyors work in shipbuilding and repair yards and at ports across the globe, wherever they may be called upon to examine the condition of a ship, so that all of the Society's services are available worldwide. Nippon Kaiji Kyokai celebrated the 107th anniversary of its founding on 15 November 2006.

CONTENTS

Mission Statement	01
Chairman's Message	02
NK at a Glance	04
The year's key achievements, results and facts in figures, graphs, pictures, etc.	
NK in Action	06
NK in Research	24
NOBS: A New Design Approach to Ballast Water Management	26
NK in International Affairs	30
Service Network	34
NK in Committee	36
NK in Control	42
Regional Contacts	46

The NK Mission

ClassNK is dedicated to ensuring the safety of life and property at sea, and to preventing pollution of the marine environment.

To achieve this mission ClassNK will:

Focus on delivering the highest quality classification services, by the highest quality personnel while maintaining its totally independent third party, non-profit status.

Focus on the development of relevant rules, procedures and guidances, and maintain and develop its commitment to scientific and technological research, development, and education.

Maintain and develop its global operations in line with the needs of those using its services.

Chairman's Message



Welcome to the 2006 Nippon Kaiji Kyokai Annual report. Although 2006 was a year of contrasts in Japan and around the world, it was also a banner year for both the global maritime industry and ClassNK.

The economies of various countries in East Asia continued to maintain high levels of economic growth overall for the year exceeding 7%, with China leading the way at more than 10%, followed by India with a high growth rate of nearly 9%. The U.S. and Europe also continued to do well economically, while the recent economic expansion in Japan steadily continued to gain steam.

Buoyed by these economic conditions in Japan and overseas, the global

maritime industry enjoyed another year of unprecedented prosperity. Newbuilding activity reached some 18.1 million GT in Japan, 18.9 million GT in Korea, and about 7.7 million GT in China, with the global total reaching some 52.1 million GT for the year. This total significantly surpasses the past maximum record of 47 million GT attained the previous year, 2005, by more than 10%. These prosperous conditions enjoyed by the worldwide maritime industry also had a very favorable effect on the operations and business conditions of the Society, as well.

Some 14.3 million GT of newbuildings were registered to NK class last year, exceeding the previous maximum record of 12.4 million GT attained in 2005 by more than 15%. This represents more than 95% of the gross tonnage added to the NK register in 2006. Nearly 34% of the 543 vessels newly built to NK class during the year were built at yards outside Japan. All told, the Society had about 144.4 million GT of ships under class comprising some 21% of the total global commercial fleet as of the end of 2006.

Notable of the 580 ships entering NK class last year are the luxury passenger ship *Asuka II*, and the container carrier *Humber Bridge*, which is the first 8,000 TEU class container carrier ever to be built at a Japanese shipyard. In addition, the 313,992 dwt VLCC *ASIAN PROGRESS IV*, the largest ship to enter NK class in 2006, and the 173,541 dwt *C H S MAGNIFICENCE*, a double hull Cape size bulk carrier built to NK class, are representative of the tankers and bulk carriers added to the register during the year. These

ship types combined comprise some 70% of the ships under NK class in terms of gross tonnage.

Internationally, the Common Structural Rules (CSR) for oil tankers and bulk carriers developed by IACS came into effect in April 2006. The Society played a leading role in the development of these rules and has developed software based on these requirements that is used by numerous ship designers and builders in Japan and around the world in a host of bulker and tanker newbuilding projects. Further, performance standards for ballast tank coatings came into force on 8 December in line with a resolution by the IMO. The Society has been active in supporting these and similar initiatives and believes that they will help contribute significantly to raising the standard for safer ships and cleaner seas both now and in the future.

In addition to these favorable business conditions and results, the Society was most fortunate in that no ship under NK class was involved in any major class related casualty last year. Still, the mishaps that unfortunately do occur serve to highlight the essential need for every link in the chain of safety to maintain the highest levels of vigilance if the maritime industry is to attain the levels of operational safety and quality that are expected of it across the globe. This means that ClassNK, as one such stakeholder, must be ever vigilant in fulfilling its mission of ensuring the safety of life and property at sea and preventing pollution of the marine environment, and must also continually strive to find ever better ways of accomplishing these goals in partnership with other stakeholders in the maritime community around the world.

These times of prosperity offer both challenge and opportunity to the Society. On the one

hand, it means a greatly increased survey and audit workload for both the 14 plus million GT of newbuildings that are also expected to enter class in 2007 as well as class maintenance surveys and various audits and inspections for the more than 144 million GT of existing ships already on the register. The challenge is not only to maintain the high standards of service we have been able to achieve with the support of strong research and development programs, top-of-the-line IT systems and services, further enhanced survey network, and improved operational administration, but I also believe that the Society as a whole must continually make every effort to carry out all its activities even more effectively and efficiently as possible. Internally, this means enhancing the technical and human potential of NK, while externally, it means providing ever better quality service to our clients, so as to raise the integrity and good reputation of the Society to even higher levels as it strives to meet the needs of an ever-changing industry.

I invite you to read through the detailed reports presented herein that highlight the efforts of the more than 1,100 ClassNK personnel from various offices around the world as they dedicated themselves during the past year to ensuring the safety of life and property at sea and the protection of the marine environment. On behalf of all the management and staff of NK, I thank you most sincerely for helping to make 2006 the best year ever for the Society, and I look forward to working together with you more closely this coming year to achieve even more in 2007.



Kenji Ogawa
Chairman and President



NK at a Glance



(Left to right)
Executive Vice President Noboru Ueda
Managing Director Tateo Kaji
Chairman and President Kenji Ogawa
Managing Director Kazunori Yamanaka
Managing Director Fumio Imakita
Managing Director Hiroshige Kitada
Executive Vice President Yukio Tsudo

New Board

The Society announced changes to its Board of Directors in March 2006.

Executive Vice President M. Murakami and Managing Director T. Akahori retired, resulting in two new appointments. Mr. F. Imakita and Dr. H. Kitada were newly elected to the Board. The current members of the Board are shown in the above photo.

New Service Sites Established Overseas

As part of the Society's ongoing efforts to enhance its survey network in order to better meet the needs of our clients around the globe, two new sub-offices were established in the Americas last year. The Guayaquil Sub-Office was established in Guayaquil, Ecuador, on 1 April 2006 further expanding the NK survey network in South America, and the Miami Sub-Office was established in Miami, Florida in the U.S., on 1 May 2006 further expanding the NK survey network in North America. In addition, an Exclusive Surveyor was stationed at Newcastle, Northern Ireland (U.K.) on 1 January 2006 as a Local Area Representative under the jurisdiction of the ClassNK London Office, and a Local Area Representative was also newly established at

the city of Visakhapatnam under the jurisdiction of the Mumbai Office in India on 1 July 2006.

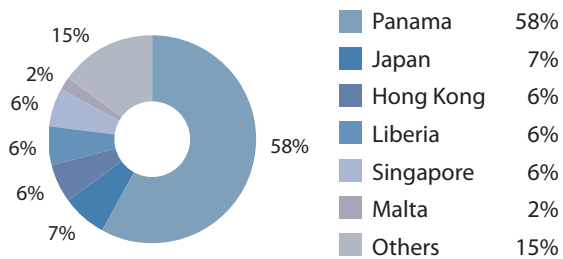
International Exhibitions

The Society participated in five major international maritime exhibitions in 2006:

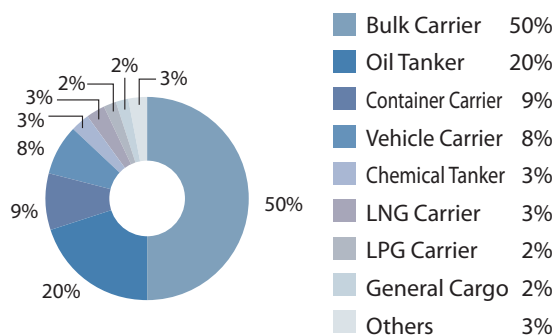
- VIETSHIP 2006 in Hanoi, Vietnam from 21 to 24 February
- CMA Shipping 2006 in Stamford, Connecticut in the U.S. from 20 to 22 March
- SEA JAPAN 2006 in Tokyo, Japan from 5 to 7 April
- POSIDONIA 2006 in Athens, Greece from 5 to 9 June
- GASTECH 2006 in Abu Dhabi, United Arab Emirates from 4 to 7 December

Record Newbuildings

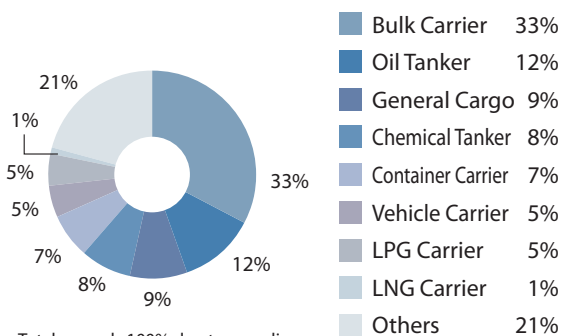
The number of newly built ships classed with the Society reached a total of 543 ships in 2006, surpassing the previous year's total by 28.1%, which saw 424 newbuildings added to the Register. The 14,295,666 gt of newbuildings classed in 2006 represents a 15.2% increase of over the 12,408,135 gt added in the previous year, and once again set a new record for the Society.



Breakdown of NK Fleet by Flag
(As of the end of 2006: Total 144.4 million gt)

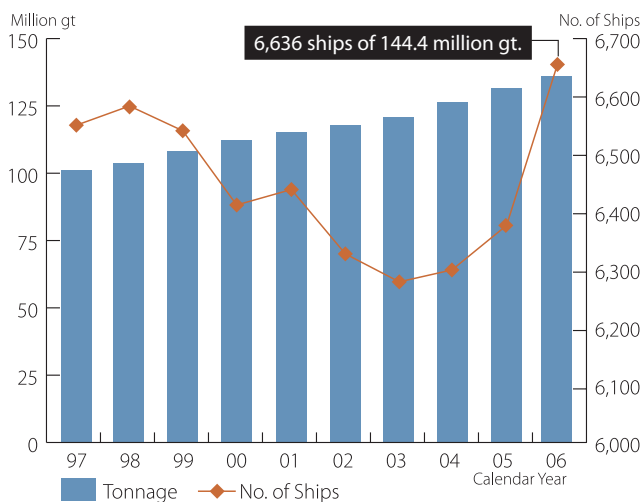


Breakdown of NK Fleet by Ship type: GT
(As of the end of 2006: Total 144.4 million gt)

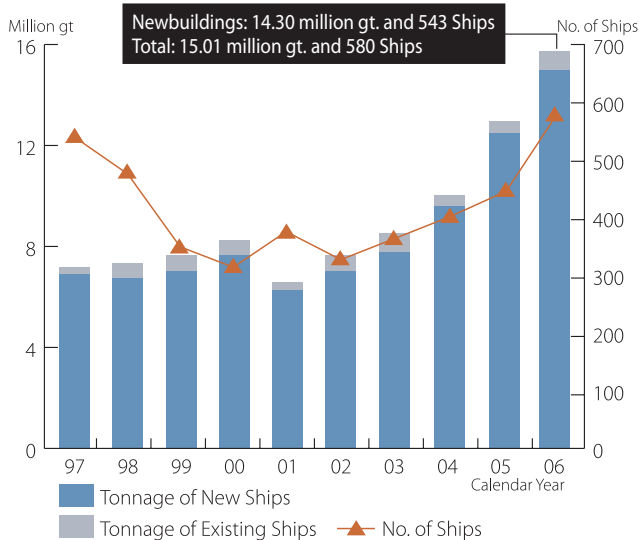


Total exceeds 100% due to rounding.

Breakdown of NK Fleet by Ship type: No. of Ships
(Total 6,636 ships)



ClassNK Fleet



GT and No. of Ships Newly Classed



VIETSHIP 2006 in Hanoi, Vietnam



CMA Shipping 2006 in the U.S.



SEA JAPAN 2006 in Tokyo, Japan



POSIDONIA 2006 in Athens, Greece



GASTECH 2006 in Abu Dhabi, UAE

NK in Action

ClassNK continued to expand and solidify its operations in 2006, classing more vessels than ever and expanding its international presence.



The Classed Fleet

The number of NK registered ships as of the end of December 2006 totaled 6,636, or 240 more than the total for 2005. The total gross tonnage of NK registered ships as of the end of December 2006 was 144,438,721 gt, up 9,945,728 gt over the total for the previous year. The average age of the NK fleet was 10.8 years.

Additions to the Register during the year numbered 580 ships with a cumulative gross tonnage of 15,009,709 gt, 125 ships and 1,967,723 gt more than were added during the previous year, both figures yet again setting new records for the Society. A total of 340 ships of 5,104,940 gt were withdrawn from the Register, 9 fewer than in 2005, representing 350,419 less gross tonnage than was "lost" in 2005. Of these, 78 vessels



SHIN-SHO

A 177,489 dwt bulk carrier built by Mitsui Engineering & Shipbuilding Co., Ltd., Chiba Shipyard for Sandigan Ship Services, Inc.



SEA PULL

A 177,533 dwt bulk carrier built by Mitsui Engineering & Shipbuilding Co., Ltd. Chiba Works for Hisamoto Kisen K.K.

were removed for noncompliance with NK rule requirements, 17 were scrapped, and the remaining ships were transferred to another classification society. As in 2005, these figures continue to highlight the trend towards comparatively fewer but ever-larger vessels on the NK Register over the last several years. The number of NK registered ships flagged outside Japan as of the end of December 2006 was 5,646 ships, or 85.1% of the total, and comprised a gross tonnage of 134,860,247 gt, or 93.4% of the Register. Their ports of registry were diverse, spanning some 66 nations and territories.

Newbuildings

At 543, the number of newly constructed vessels classed by the Society in 2006 increased 28% over the 424 of the previous year. The 14,295,666 gt of newbuildings classed represented an increase of 1,887,531 gt, or 15.2%, over the 12,408,135 gt added in the previous year, once again a record for the Society. In terms of the number of ships, these newbuildings represent 93.6% of the ships added to the Register and 95.2% of the additional gross tonnage. Of the 543 vessels newly built to NK class during 2006, 183 ships or 33.7% were built at yards outside Japan, up 47.6% from 2005.

Domestic Newbuilding Highlights

With 2006 a record year for newbuilding activity for the Society, it would be impossible to fairly and fully describe the activities of all 21 domestic offices in this report. However, below are some selected highlights from a number of NK's busiest offices.

Tokyo

The Tokyo Branch Office is one of the largest offices in NK's network in Japan. Although it mostly handles a vast number of in-service surveys, it also had its fair share of newbuilding surveys in 2006. This included the *SHIN-SHO*, a 177,489 dwt bulk carrier built by Mitsui Engineering & Shipbuilding Co., Ltd. Chiba Works for Sandigan Ship Services, Inc., and the *SEA PULL* - a 177,533 dwt bulk carrier also built at the same shipyard for Hisamoto Kisen K.K.

Nagoya

Nagoya is known for being one of the liveliest cities in Japan, especially in terms of economy. Representative of the currently booming activity in this region, Suzuki Shipyard Co., Ltd. began construction on the 1,888 dwt double hull tanker, *SANWA MARU*, for coastal service for Marukyo Kaiun K.K. and the Construction,

Transport and Technology Agency of Japan. Universal Shipbuilding Co., Tsu Shipyard built the 176,303 dwt bulk carrier, *GREAT NAVIGATOR*, for Cido Shipping (H.K.) Co., Limited, which is the largest vessel built at this yard. The Toyohashi Shipbuilding Co., Ltd. built the 39,782 dwt container carrier, *KOTA KAMIL*, under contract to Shin Kurushima Dockyard Co., Ltd for Pacific International Lines (Private) Limited. The ship boasts an operational speed of 22 knots and a top speed during trials of more than 25 knots, making it the fastest ship built to date in this location.

Kobe

Kobe is famous for its beautiful night view. Many ships are built in this region. Notable of these last year was the *JANESIA ASPHALT IV*, a 4,317 dwt asphalt carrier built by the Awaji Works of Kurinoura Dockyard Co., Ltd. for Nissho Odyssey Ship Management Pte Ltd.

Okayama

Initial production of the Mitsui MAN B&W 12K98ME electronic controlled fuel injection and exhaust valve type engine was launched on 24 July 2006 at the Tamano Works of Mitsui Engineering and Shipbuilding Co., Ltd. This engine was built for IHI Marine

United's *HUMBER BRIDGE*, noted under Hiroshima below.

Onomichi

Shipyards in the Onomichi had a busy year in 2006, as well. The Innoshima Shipyard of Naikai Zosen Corporation built the *HELENE S*, a 32,878 dwt, 2,529 TEU container carrier for H. Schepers Bereederungs GmbH & Co. KG. It was the first container carrier to be built by the yard in about twenty years. Kambara Shipyard built its first vessel to NK class, the 428 dwt tug, *HUB GAZELLE*, for Steel Hub Co., Ltd., while Suzuki Shipyard of Koike Shipbuilding built the *BANDAI II*, a 2,645 dwt chemical tanker for Saehan Marine Service Co., Ltd. This was the first chemical tanker to be built by the shipbuilder.

Hiroshima

IHI Marine United Inc. Kure Shipyard built the 99,214 dwt container carrier, *HUMBER BRIDGE*, for "K" Line Ship Management Co., Ltd. The ship is the largest container carrier ever constructed at a Japanese shipyard and is capable of transporting 8,000 TEU. The ship is the first of eight vessels of the same series scheduled to be constructed at same shipyard. Another notable newly built addition to NK class in 2006 from Hiroshima is the *KIHO*, a 300,866 dwt VLCC built by



JANESIA ASPHALT IV
A 4,317 dwt asphalt carrier built by Kurinoura Dockyard Co., Ltd., Awaji Works for Nissho Odyssey Ship Management Pte Ltd.



HUMBER BRIDGE
A 99,214 dwt container carrier built by IHI Marine United Inc. Kure Shipyard. for "K" Line Ship Management Co., Ltd.



HOKUREN MARU NO. 2

A 6,598 dwt ro-ro cargo/vehicles carrier built by Imabari Shipbuilding Co., Ltd. for Kawasaki Kinkai Kisen Kaisha, Ltd.



IBRI LNG

A 77,282 dwt LNG carrier built by Mitsubishi Heavy Industries, Ltd., Nagasaki Shipyard & Machinery Works and managed by Oman Ship Management Company S.A.O.C.

IHI Marine United Inc. Kure Shipyard for Nippon Oil Tanker Corporation. The vessel is world's first VLCC mounted with an electronically controlled type diesel engine, DU-Wartsila 7RT-flex84T-D.

Sakaide

The Sakaide Branch had a particularly busy year registering some 57 newly delivered ships to NK class during 2006, the most in the past five years. Of particular note was the delivery of the NK classed 80,889 dwt, 145,000m³ capacity LNG carrier *LNG DREAM*, built at the Sakaide Shipyard of Kawasaki Shipbuilding Corporation. A notable feature of this tanker is the gigantic 40 meter by 20 meter beautifully artistic murals painted on the covers of the ship's four independent nearly 45 meter diameter spherical tanks. Another notable ship newly built to NK class during the year was the *STAR FIRST*, a totally newly designed 13,202 dwt reefer cargo carrier built by Shikoku Dockyard Co., Ltd. for Nissen Kaiun Co., Ltd. The 30,401 dwt ro-ro cargo/vehicle carrier, *KUWANA*, was built by Shin Kochijyuko Co., Ltd. for Hachiuma Steamship Co., Ltd. This vessel has four deck cranes onboard.

Imabari

Imabari is a city where numerous shipbuilding, shipping, and ship-related industries are concentrated close together. In recent years, Imabari City has published their own Maritime City Concept with the aim of utilizing the ocean related history, culture, industry, and other special aspects of the Imabari region in order to become a city of which its citizens can be particularly proud. Many vessels have been built in this region. Noteworthy new additions to NK class last year are the *HOKUREN MARU*, a 6,597 dwt RO-RO cargo/vehicles carrier, and the *HOKUREN MARU NO. 2*, a 6,598 dwt RO-RO cargo/vehicles carrier. Both vessels were built by Imabari Shipbuilding Co., Ltd. for Kawasaki Kinkai Kisen Kaisha, Ltd.

Nagasaki

Nagasaki is another key shipbuilding region in Japan. Representative of new building activity in 2006, Mitsubishi Heavy Industries, Ltd. Nagasaki Shipyard & Machinery Works built the *IBRI LNG*, a 77,282 dwt, 145,173m³ capacity LNG carrier for Oman Ship Management Company S.A.O.C.

Overseas Newbuilding Highlights

NK has a network of 78 exclusive surveyor offices across the globe outside Japan. This expanding network also plays a major role in supporting NK's growing presence around the world. This includes newbuilding survey activity overseas. A brief summary is presented here of some of the newbuilding and other highlights for representative offices overseas during the year.

Argentina

The Buenos Aires Office in Argentina oversaw the construction of the *MADRISA* a 27,112 dwt bulk carrier. This is the fourth in a series of five sister ships contracted to local shipyard Astilleros Rio Santiago, and was built for Madrisa Shipping Company Limited. The office has also been conducting newbuilding surveys fifth bulk carrier in the series, which is expected to be delivered in 2008. The office also surveyed four of a series of twelve river barges built by S.A.B.B. S.A. Shipyard of Argentina for Paraguayan owner Nevemar S.A.

China

ClassNK has eight exclusive surveyor offices in the China region. The regional office in Shanghai in particular had a very busy year in 2006. This included the delivery of eight newbuildings and related plan approvals for these vessels: five Handysize bulk carriers (both single and double hulled), one pure car carrier (5,000 vehicle capacity), one product tanker, and one 9,000 dwt mega block carrier. Notable of these vessels are the *COS ORCHID*, a 55,539 dwt bulk carrier built by Nantong COSCO KHI Engineering Co., Ltd. for COSCO (Singapore) Pte. Ltd., and the *S&B-MO*, a 9,330 dwt general cargo (hull block) carrier built by Hangzhou Dongfeng Shipbuilding Co., Ltd.

for Sea Plus Management Co., Ltd. of Pusan, Korea. This was the first vessel built by the shipyard to NK class using the Nantong Yahua Shipbuilding facility. The Office also oversaw the construction of the 7,496 dwt oil carrier *SPRING*, built by Zhengjiang SOPO Shipbuilding Co., Ltd. for Equatorial Marine Fuel Management Services Pte. Ltd. as the first vessel built by this shipyard to NK class. The main drawings were approved by the NK Singapore Office.

The Guangzhou Office also had a busy year with the construction of two oil tankers: the 9,466 dwt *EPISODE*, built by Guangzhou Hangtong Shipbuilding and Shipping Co., Ltd. for owner HL Maritrans Pte., Ltd., and the 9,480 dwt *EAGER*, built by Guangzhou Hangtong Shipbuilding and Shipping Co., Ltd. for owner HL Seascope Pte., Ltd. The Dalian Office oversaw the construction of the *C H S MAGNIFICENCE*, a 173,541 dwt double hull Cape size bulk carrier built by Bohai Shipbuilding Heavy Industry Co., Ltd. for Whole World Shipping Limited. This ship is the fourth vessel in a series of eight double hull Cape size bulk carriers begun in 2004 as the first project in China of its type built to NK class.



NYK VEGA
A 94,000 dwt container carrier built by Hyundai Heavy Industries Co., Ltd. for NYK Shipmanagement PTE. Ltd.



JOSCO STAR

A 12,820 dwt container carrier built by Dae Sun Shipbuilding & Engineering Co., Ltd. for Jiangsu Ocean Shipping Co., Ltd.



STADT SOLINGEN

A 50,223 dwt bulk carrier built by PT PAL Indonesia for Reederei M. Lauterjung GmbH.

Vietnam

Notable newbuildings constructed under the supervision of the Haiphong Office and Ho Chi Minh Sub-Office during the year include the *GRACE CASABLANCA*, a 8,703 dwt general cargo / lumber carrier built by Ben Kien Shipbuilding for Kaho Shipping Company Limited as the first ship built by the yard for Japanese owner, Hirai Line Co., Ltd.; the *VIEN DONG 5*, a 6,509 dwt general cargo ship built by Saigon Shipbuilding Industry Company (SSIC) for owner Vietnam Sea Transport and Chartering Company (VIETRANSCHART), notable for being the first ship built by SSIC to NK class; and the *SUN ISLAND*, a 10,959 dwt general cargo ship built by Bach Dang Shipyard for Pana Star Line S.A.

Korea

In Korea, where NK has offices in Busan, Seoul, and Ulsan, Hyundai Heavy Industries Co., Ltd. built the *NYK VEGA*, a 94,000 dwt container carrier, for NYK Shipmanagement Pte. Ltd. This vessel was the first of a new series of container ships with a capacity of 8,100 TEU. In addition, Dae Sun Shipbuilding & Engineering Co., Ltd. built the *JOSCO STAR*, a 12,820 dwt container carrier, for Jiangsu Ocean Shipping Co., Ltd. Hyundai Heavy Industries Co., Ltd. also

built the *GRANVILLE BRIDGE*, a 71,326 dwt container carrier, for Doun Kisen Co., Ltd.

The Philippines

Tsuneishi Heavy Industries (Cebu), Inc. built the *PACIFIC GUARDIAN*, a 52,525 dwt bulk carrier, for MK Shipmanagement Co., Ltd. In addition, the yard also built the *MEDI LISBON*, a 58,710 dwt bulk carrier, for Fukujin Kisen Co., Ltd. This is the fourth sister ship in a series of 58K type bulk carriers.

Singapore

Three 32,937 dwt container carriers were built for Wan Hai Lines Ltd, with the NK Class Notation (PS-DA & FA) (PSCM) at Jurong Shipyard Limited: the *Wan Hai 312*, the *Wan Hai 313*, and the *Wan Hai 315*.

Indonesia

In Indonesia, where NK has offices in Jakarta, Batam, Surabaya, and Balikpapan, PT. PAL Indonesia built the *STADT SOLINGEN*, a 50,223 dwt bulk carrier, for Reederei M, Lauterjung GmbH. This vessel was the first ship for the owner. Moreover, PT. Palma Progress Shipyard built the *LAUTAN 09*, a 197 dwt tug boat, for PT. Layar Lintas Java. The ship was one of the most produced of this type.

Survey Activities and Approvals

The Society had a busy year last year carrying out, on average, more than 1,000 surveys and inspections each month. In Japan, a total of 3,392 class maintenance surveys were carried out, while in other areas 9,493 class maintenance surveys are carried out for a grand total of 12,885 class maintenance surveys.

In 2006, sixteen radio service companies were approved around the world bringing to

214 the total number of companies approved by the end of 2006.

In 2006, other newly approved firms totaled:

1. in-water survey of ships: 10
2. thickness measurements on ships: 22
3. surveys and maintenance of fire exiting equipment and systems: 14
4. service on life saving appliances: 5
5. voyage data recorders: 32

Material and equipment approvals during the year are summarized in the following table.

Summary of Material and Equipment Approvals		
Category	Item	Volume / Change in Number
Material	Rolled Steel	4,289,576 tons
	Cast/Forged Products	129,867
Machinery and Marine Equipment	Main Engines	2,264
	Boilers	750
	Deck Machinery	2,927
	Engine Room Machinery	28,269
	Anchors	1,434
	Chains	10,430
Freight Containers	Cooling Machine Units	544

Notably, the Society received numerous applications for approval of the manufacturing process for TMCP steel. TMCP is a process originated in Japan that makes it possible to produce high strength plates

characterized by high toughness and good weldability. It is also expected that TMCP will become more pervasive due to growing demand in shipbuilding.



MIRACULOUS ACE

A 19,381 dwt vehicles carrier built by Imabari Shipbuilding Co., Ltd. Marugame Headquarters for Mitsui O.S.K. Lines Ltd.



SHAMROCK

A 52,385 dwt bulk carrier built by Tsuneishi Heavy Industries (CEBU) Inc. for "ORION" BULKERS GmbH & Co. KG.



SPLENDIKS

A 203,233 dwt bulk carrier built by Universal Shipbuilding Corporation, Tsu Shipyard for Nissen Kaiun Co., Ltd.



OBELIX

A 1,290 dwt (1,520 m³) liquefied gas carrier (PRESS/LOW-T) built by Higaki Shipbuilding (Tank: Izumi Steel Works, Ltd.) for Kobe Senpaku Kaisha

PSC Activities

The number of PSC related surveys and inspections conducted by flag states has been increasing recently at ports around the world. The ClassNK Survey Department recorded and analyzed the issues identified by various PSC regimes and published its *Annual Report on Port State Control 2005* in order to improve the quality of NK vessels and the management systems of ship management companies. The ClassNK publication *GOOD MAINTENANCE ONBOARD SHIPS* was also updated to include amendments to international conventions and has been posted on the NK website. Moreover, in addition to visits to AMSA, Maritime NZ, the USCG, and Canada CG to share ideas, ClassNK also sent delegates to bilateral China-Japan and Korea-Japan meetings on maritime inspection related matters and introduced our activities as part of efforts to further reduce the detention ratio of NK classed ships by PSC.

Technical Services

During 2006, the Society issued Statements of Compliance to 34 vessels under the CAP or Condition Assessment Program, while Statements of Compliance were also issued for the anti-fouling systems of 815 ships,

and for the ballast water management plans of to 1,511 ships. Thus, the total number of Statements of Compliance issued as of the end of 2006 for each type of service was 129 ships, 2,447 ships, and 1,611 ships, respectively.

NK also issues both International Air Pollution Prevention Certificates as well as Engine International Air Pollution Prevention Certificates (EIAPP) on behalf of Flag States certifying compliance with MARPOL 73/78 Annex VI. NK also issues voluntary EIAPP Statements of Compliance upon owner request. In 2006, the Society issued 3,173 EIAPP Certificates in accordance with the NOx Technical Code, and 205 EIAPP Statements of Compliance.

The number of vessels registered in the ClassNK Emergency Technical Assistance Service (ETAS) increased dramatically with the coming into force of Regulation 37.4 in MARPOL Annex I (from 1 January 2007) and the requirement for a "Vessel Response Plan" to be kept onboard announced by the USCG in February 2005.

By the end of 2006, a total of 733 vessels were registered for ETAS, including 367 vessels newly registered in 2006. This total includes 632 oil tankers (including chemical

tankers), 40 bulk carriers, 14 LPG carriers, and 47 other assorted vessels for 142 different owners around the world.

Appropriate attention to preservation of the environment is very important in the areas of ship recycling and the re-use of materials and equipment. In December 2003 the IMO adopted “IMO Guidelines on Ship Recycling (Res. A 962(23))”, and vessels that meet the requirements in terms of controlling and managing hazardous materials onboard are eligible for what is known as a “Green Passport”. During 2006, NK issued statements of compliance for the “Green Passport” for the *VINCENT THOMAS BRIDGE* and *VANCOUVER BRIDGE* built by Hyundai Heavy Industries, as well as for the *CLIPPER SUFFOLK* and *UNITED TREASURE* built by Tsuneishi Corporation of Japan.

PrimeShip-SHAFT

As ships become ever larger in size, propeller shafts have tended to become stiffer and hull structures are more likely to deform as they push size and design limitations. This has been reported as being a notable factor in recent cases of alignment related main bearing damage seen in some ships with large differences in draft, such as oil tankers and bulk carriers. Variations in current shafting design practices among architects can also be a potential factor that could contribute to shafting alignment related problems as design limits are approached. ClassNK has carried out intensive research to address these and related areas of concern and released the English version of *THE GUIDELINES ON SHAFTING ALIGNMENT* in 2006, reflecting the Society’s wealth of experience and latest research achievements in this field. The *Guidelines* are a cornerstone of the Society’s PrimeShip-SHAFT service. Optimized positions for shaft bearings can be calculated using the new formulas presented in these *Guidelines*.



TOWADA

A 305,801 dwt oil carrier built by Mitsubishi Heavy Industries, Ltd. Nagasaki Shipyard & Machinery Works for Taiheiyo Kaiun Co., Ltd.



KIHO

A 300,866 dwt VLCC built by IHI Marine United Inc. Kure Shipyard for Iino Kaiun Co., Ltd.



ASIAN PROGRESS IV
A 313,992 dwt VLCC built by
Kawasaki Shipbuilding Corporation, Sakaide Shipyard
for MOL Tankship Management (ASIA) Pte. Ltd.



GAS DREAM
A 5,352 dwt LPG carrier (PRESSURE) built by
Shitanoe Shipbuilding Co., Ltd.
for KSS Line Ltd.

Audit and Registration of ISM Code and ISPS Code related Systems

The Society is also very active in the conduct of ISM Code and ISPS Code related audits as a Recognized Organization on behalf of various Flag Administrations. During 2006 NK audited and issued DOCs to 19 newly registered companies in accordance with ISM Code requirements bringing the total to 573 companies. SMCs were issued to 628 newly registered ships while 525 vessels were deregistered in 2006, bringing the total

number of vessels registered with the Society to 4,299 as of the end of 2006. NK currently has ISM Authorizations from 61 countries.

Last year, 533 ships were newly registered to ISPS Code requirements with 412 vessels deregistered, bringing the total number of ships registered with the Society to 3,481 as of the end of 2006. NK currently has ISPS Authorizations from 44 countries. A breakdown of the number of vessels registered by Flag as of the end of 2006 is shown in the following table.

Number of ISPS Code Registered Ships			
Flag	Number of Ships	Flag	Number of Ships
BAHAMAS	86	MARSHALL ISLANDS	59
BELIZE	2	MYANMAR	3
BERMUDA	3	NETHERLANDS ANTILLES	3
CAYMAN ISLANDS	2	PANAMA	2,080
CYPRUS	85	PHILIPPINES	68
DOMINICAN REPUBLIC	3	SAUDI ARABIA	3
GEORGIA	3	SINGAPORE	260
GREECE	34	ST. VINCENT AND THE GRENADINES	41
HONG KONG, CHINA	228	SWITZERLAND	3
JAPAN	142	THAILAND	61
LEBANON	1	TURKEY	46
LIBERIA	108	UNITED ARAB EMIRATES	2
MALAYSIA	3	VANUATU	24
MALTA	128		
		Total:	3,481

(As of end of 2006)

Assessment and Registration of ISO 9001 Quality and 14001 Environmental Systems

Another vital service offered by NK is the assessment and registration of quality systems based on the ISO 9001 series of quality standards, as well as the assessment and registration of environmental management systems based on the ISO 14001 standard.

A total of 21 organizations were newly registered to the ISO 9001 standard in 2006 bringing the total to 371, while 12 organizations were newly registered to the ISO 14001 standard during the year bringing the total to 94. A breakdown of these totals as of the end of 2006 is detailed in the following table.

ISO Standard based Registrations (QMS / EMS)		
Scope of Activities	Number of Registered	
	Quality Management Systems	Environmental Management Systems
Articles of paper and paperboard	2	
Chemicals, chemical products and fibers	2	1
Rubber and plastic products	10	
Basic metals and fabricated metal products	65	7
Machinery and equipment	109	24
Electrical and optical equipment	31	7
Shipbuilding	47	12
Building and civil engineering	4	
Water transport, Cargo handling and storage, and Other supporting transport activities	75	38
Real estate services	1	1
Technical testing and analysis, and Labor recruitment and provision of personnel (including crew manning)	22	
Adult and other education (including crew training)	3	1
Sewage and refuse disposal, sanitation and similar activities		3
Total:	371	94

(As of end of 2006)



SANKO JUPITER

A 32,936 dwt bulk carrier built by Kanda Shipbuilding Co., Ltd. for Sanko Ship Management Co., Ltd.



MOL PACE

A 72,968 dwt container carrier built by Koyo Dockyard Co., Ltd.



KOTA KARIM

A 39,763 dwt container carrier built by Shin Kurushima Dockyard Co., Ltd. for Pacific International Lines (Private) Limited.



SHIMANAMI STAR

A 28,447 dwt bulk/log carrier built by Shimanami Shipyard Co., Ltd. for Evalend Shipping Co., S.A.

Cooperative Technical Development

The Society actively participates in a variety of technical development projects with a range of outside organizations in government and industry. A number of these projects are ongoing in nature, such as the floating production, storage and offloading (FPSO) system development project to produce, store, and offload natural gas hydrate (NGH) at sea, being undertaken in cooperation with Mitsui Engineering & Shipbuilding Co., Ltd., the National Maritime Research Institute, and Ocean Engineering Research, Inc. (with support provided by the Ocean Policy Research Foundation). The Society also actively cooperates with Mitsubishi Heavy Industries and NYK LNG Shipmanagement Ltd. in the development of a state-of-the-art hull fatigue strength analysis method for LNG carriers known as Total Life Assessment. ClassNK has also been actively involved in the development and testing of a Super Eco-Ship (SES) as part of national R&D project in cooperation with government and industry. The goal of the project is to design and construct a next-generation coastal ship for domestic service in Japan capable of highly efficient sea transport that also reduces loads on both labor and the environment. The ship design incorporates an optimized “buttock-

flow” hull form, a super marine gas turbine (SMGT), and an electrically driven contra-rotating propeller pod. Construction of an actual ship using the SES design began in April 2006 to NK class. The Society will also be playing an active role in assessing the effectiveness of the various control systems and other functions designed to enhance operational efficiency and reduce labor onboard.

Another notable project in which the Society has played an active role is the Non Ballast Water Ships (NOBS) project undertaken in cooperation with the Shipbuilding Research Institute of Japan, Mitsubishi Heavy Industries, Ltd., and IHI Marine United Inc. A special article appears later in this report introducing this project.

NK Quality System Assessments

Last year was a busy year for ClassNK as it underwent a range of audits conducted by various external entities to assess the operations and quality system of the Society. These included an IACS QSCS (Quality System Certification Scheme) Annual Audit conducted at the Head Office and four locations overseas based on the IACS QSCS. Vertical Contract Audits were also carried out on the surveys of 14 ships. In addition,

SGS (Société Générale de Surveillance) surveillance and RvA (Raad voor Accreditatie) audits was also conducted at the Head Office and numerous NK locations during the year. External government audits included an audit of the Shanghai Office by the MCA (Maritime Coast Guard Agency of the U.K.), as well as audits by the Japanese Government of various offices in Japan, by the Greek Government at the Piraeus Office, by the Dutch Government at the Rotterdam Office, and by the Turkish Government at the Istanbul Office. The Society was also audited by EMSA (European Maritime Safety Agency) in early October last year and covered the NK Head Office and three other locations. While certain areas were noted for improvement in each of these audits, the quality system overall was found to be working well overall to achieve the quality goals of the Society. These audits, combined with internal audits carried out of NK locations throughout the year, reflect the Society's dedicated and continuous efforts to achieve its 2006 Quality Objectives of establishing an effective and carefully monitored organization based survey system, improving the capabilities and competency of each individual employee, and providing service of ever-higher quality.

Training

ClassNK actively engages in a host of training activities both inside and outside the Society. These range from training surveyors within the Society to providing internships and other forms of outside cooperative support to help meet maritime training needs. Some of the more notable programs are briefly introduced below.

ISM Auditor Training

The ISM Auditor course was carried out for 11 persons in Japan, and the same course was also carried out at the Singapore Office and the London Office for a total of 23 persons. As a result, the total number of ClassNK exclusive surveyors who have attended the ISM Auditor Training Course since its commencement in 1994 to the end of 2006 is now 568.

Maritime Security Auditor Training

As was the case in 2005, MSA Training Courses were held both inside and outside of Japan for a total of 51 persons at the NK Head Office, the Singapore Office, as well as the New York Office. Since its inception in 2004, a total of 335 persons



DELZOUKRE

A 53,630 dwt bulk carrier built by Yangzhou Dayang Shipbuilding Co., Ltd. for Meadway Shipping and Trading Inc.



GUANGZHOU HIGHWAY

A 15,301 dwt vehicles carrier built by Kawasaki Shipbuilding Corporation for Kawasaki Kisen Kaisha, Ltd.



OMNI ASTRID

A 639 dwt tug/anchor handling vessel built by Bonafile Shipbuilders & Repairs SDN BHD for Omni Power SDN. BHD.



GAIA CELERIS

A 229,045 dwt ore carrier built by Namura Shipbuilding Co., Ltd. Imari Works for MMS Co., Ltd.

have attended the course. In Singapore, three surveyors also attended the course from the Maritime Industry Authority (MARINA) of the Philippines.

Training for the Appointment of Surveyors

Survey training was provided for a total of 80 surveyors in 2006, including new graduates joining NK during the year. Practical, hands-on training courses were also conducted onboard the *Seiunmaru*, a training ship of the National Institute for Sea Training, and on marine engines at Yanmar Co. Ltd. for newly appointed surveyors of the Society.

Cooperation with Training Centers for the Development of Shipbuilding Skills

A major issue currently facing the maritime industry is the ability to adequately fill personnel development and staffing needs to replace the aging workforce. As part of efforts to address this concern, Training Centers for the Development of Shipbuilding Skills have been established in different parts of Japan under the auspices of the Japan Foundation with support by the Japanese Ministry of Land, Infrastructure, and Transport (MLIT). A new Training Center was established in Nagasaki in 2006 as part of these efforts. The general manager of the ClassNK Nagasaki Branch serves as an advisor to the Training Center

from NK. This Center is the fifth such Training Center to be opened in Japan following the establishment of similar training centers in Innoshima, Imabari, Oita, and Yokohama.

Lecture at Eastern Japan Training Center for Shipbuilding Skills

In addition to cooperating with Training Centers as noted above, NK also dispatched an instructor to give a lecture to 40 persons engaged in shipbuilding following a request from the Eastern Japan Training Center for Shipbuilding Skills.

Lecture at Marine Technical College of Japan

Instructors from the Society also gave classes on the ISM Code and ISPS Code to foreign trainees attending the Marine Technical College in Japan at the request of the College. Known as "Kaigi Daigakko", it is the only governmental institute of vocational training for mariners that is under the direct control of the Ministry of Land, Infrastructure and Transport. The goal of the college is to provide education training in technical knowledge and skills as well as to carry out practical research for the technological development of the mercantile marine fleet in Japan.

Internship Training Program

Internship training programs were conducted

at the NK Head Office during the year for a total of 11 graduate students from Osaka University, Osaka Prefecture University, Kumamoto University, Tokai University, Tokyo University of Marine Science and Technology, Hiroshima University, as well as Yokohama National University.

International Co-operation

Training on classification surveys during construction for two Vietnam Register exclusive surveyors was carried out at the ClassNK Shanghai Office at the request of VR.

Following a request from Japan International Cooperation Agency (JICA), lectures on the SOLAS and MARPOL conventions were given at the “Group Training Course in International Maritime Conventions and Ship Safety Inspection” held by the Ship Research Centre of Japan (SRC).

In addition, classes on the SOLAS and MARPOL conventions were also given at the request of the Tokyo MOU Secretariat at the “16th Basic Training Course for Port State Control Officers in the Asia-Pacific Region” held by the Tokyo MOU.

The Society also gave classes at a training course for PSC inspectors on SOLAS II-2 and chemical carriers following a request from the Maritime Safety Administration of the People's Republic of China.

The Rules

Since the core of a ship classification society's technical credibility is its rules, ClassNK constantly reviews and updates its the many technical Rules, Regulations and Guidance on a regular basis. In addition to keeping the rules up to date with constantly changing statutory requirements, the Society also focuses on revising its rules to incorporate the latest results of its research and development activities. A representative list of the numerous areas revised in the technical Rules and Guidance by the Society during 2006 is presented below.

1) Rules and Guidance for the Survey and Construction of Steel Ships

- (1) New Parts related to IACS CSRs for Bulk Carriers and Double Hull Oil Tankers (Rules Part CSR-B and CSR-T), and a partial revision related to their application and class notations (Rules Part A)



JP GUNJO

A 88,172 dwt bulk carrier built by Imabari Shipbuilding Co., Ltd. Marugame Headquarters for Kawasaki Kisen Kaisha, Ltd.



JP CITRUS

A 85,926 dwt bulk carrier built by Oshima Shipbuilding Co., Ltd. for Laurel Maritime Co., Ltd.



SHIN OHGISHIMA

A 203,280 dwt bulk carrier built by Universal Shipbuilding Corporation, Ariake Shipyard for Toyo Sangyo Co., Ltd.



ASUKA II

A 8,642 passenger vessel built by Mitsubishi Heavy Industries, Ltd. Nagasaki Shipyard & Machinery Works in 1990 and refurbished in 2005 for NYK Cruises Co., Ltd. Entered NK class in 2006.

- (2) Additional Safety Measures for Bulk Carriers (Rules and Guidance Part A, B, C, U, CS, and D)
- (3) Hold Frames of Existing Bulk Carriers (Rules Part C)
- (4) Class Surveys (Rules and Guidance Part B)
- (5) Preparation for Surveys of Oil Tankers and Bulk Carriers (Guidance Part B)
- (6) Cargo Hold Construction (Guidance Part C)
- (7) Arrangement of Forecastle for Bulk Carriers (Rule and Guidance Part C)
- (8) Bow Flare Slamming Pressure (Guidance Part C)
- (9) Width of the Double-Side Skin Constructions of Bulk Carriers (Guidance Part C)
- (10) Securing Device for Weather Tight Steel Hatches Cover (Guidance Part C)
- (11) Allowable Stress for Steel Hatches Cover (Guidance Part C)
- (12) Means of Access (Rules Part C and CS, Guidance Part B and C)
- (13) Structural Members of Cargo Areas in Bulk Carriers (Rules and Guidance Part C)
- (14) Damage Stability Requirements for Bulk Carriers and the Application of Damage Stability Computers (Guidance Part C and U)
- (15) Water Level Detectors and Dewatering Arrangements and Preparation for Surveys on Bulk Carriers (Rules and Guidance Part B)
- (16) Revisions related to the totally amended IBC Code (Rules Part S, Guidance Part B and S)
- (17) Internal Examinations of Spaces and Tanks for Tankers and Ships Carrying Dangerous Chemicals in Bulk (Rule and Guidance Part B)
- (18) Condition Monitoring System Used in the Planned Machinery Maintenance Scheme (PMS) (Guidance Part B)
- (19) Alignment of Main Propulsion Shafting (Rules and Guidance Part D)
- (20) Calculation of Crankshafts (Rule and Guidance Part D)
- (21) Brittle Crack Arrest Properties (Rules and Guidance Part K)
- (22) Aluminium Alloys (Rules Part K and M, Guidance Part K)
- (23) Non-Destructive Inspection of Welded Joints of Hatch Side Coamings (Guidance Part M)
- (24) Approval Test of Welding Consumables (Rules Part M)
- (25) Control Standard for Welding for Rolled Steels for Hull (Guidance Part M)
- (26) Welding Procedure Qualification Tests (Rules Part M, Guidance Part M and N)
- (27) Manufacture of Anchors (Rules and Guidance Part L)

- (28) Ice Class (Rules and Guidance Part C)
- (29) Boiler Surveys (Rules and guidance Part B)
- (30) Uninterruptible Power Systems (Rules and guidance Part H)
- (31) Service Supply from Emergency Source of Electrical Power to Life Saving Appliances (Rule Part H)
- (32) Electrical Equipment Installed in Hazardous Zones for Tankers (Rules Part B, H, N and S, Guidance Part B, H, N and S)
- (33) Regulation V/23.5 of SOLAS Convention (Guidance Part C)
- (34) Piping Systems (Rules and Guidance Part D)
- (35) Fire Protection and Fire Fighting (Rules Part D and R, Guidance Part R)
- (36) Drawings to be Maintained onboard Ship (Rules Part B and P, Guidance Part B)
- (37) Towing and Mooring Fittings (Rules Part B, C and CS, Guidance C)
- (38) Navigation Bridge Visibility (Guidance Part W)

2) Rules and Guidance for Marine Pollution Prevention Systems Incorporation of amendments to MARPOL Annexes I, II, and VI, etc.

- 3) Rules and Guidance for Safety Equipment**
- 4) Rules and Guidance for Radio Installations**
- 5) Rules and Guidance for High Speed Craft**

- 6) Rules and Guidance for the Survey and Construction of Passenger Ships**
- 7) Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use**

Technical Seminars

Providing up to date technical information to NK clients is an important function which is achieved through a variety of methods, one of which is technical seminars and meetings. ClassNK technical seminars were held in a total of five locations across Japan, starting with Tokyo, followed by Fukuoka, Onomichi, Imabari, and Kobe. There were numerous participants from among shipowners, shipyards, machinery and equipment manufacturers, government, and other groups in attendance at each session. The annual ClassNK 2006 Technical Research Conference, which presents the results of technical research being conducted by the Society, was held in December 2006 and was attended by nearly 200 persons. Technical seminars were also held at numerous locations overseas including New York, Hong Kong, Shanghai, Haiphong, Busan, Glasgow, Piraeus, and Istanbul. Technical presentations also feature as an important part of most NK



YASA TEAM
A 75,621 dwt bulk carrier built by Sanoyas Hishino Meisho Corporation for YA-SA Shipmanagement and Trading S.A.



CHEMROAD LILY
A 33,849 dwt oil/molasses/chemical carrier built by Shin Kurushima Dockyard Co., Ltd. for Iino Kaiun Co., Ltd.

overseas committee meetings, as well. In addition, local NK staff are often asked to share their expertise with local authorities.

General

ClassNK Award

The "ClassNK100 Awards" were originally established to mark the 100th anniversary of the founding of the Society. Since renamed the ClassNK Award, the awards are issued each year in recognition of outstanding postgraduate research by students at selected participating universities. A certificate of merit and monetary award are presented as

part of the award. Awards were presented to students from the following universities in 2006: Seoul National University and Pusan National University in Korea, Shanghai Jiao Tong University in China, as well as the Indian Institute of Technology in Chennai and Cochin University in India.

Design Contest

The Society also contributed a special award to the 2nd China University Architecture and Ocean Engineering Design Contest sponsored by Shanghai Jiao Tong University as part of expanding the scope of the ClassNK Award.



ClassNK Award being presented at Cochin University of Science and Technology



ClassNK 2006 Technical Research Conference



New York Technical Seminar



Hong Kong Technical Seminar

NK in Research

Title of Research	Outline of Research
Study on the structural reliability of ships (Last year of three-year project)	Structural reliability assessments were carried out on the ultimate limit states of several tankers and bulk carriers using pilot models of each type of ship. A reliability assessment method was then developed regarding the indeterminateness of static and wave longitudinal bending moments and hull girder ultimate strength with good accuracy. Knowledge obtained over the three-year period of the study was compiled as technical information.
Study on the practical use of FSA (First year of three-year project)	Formal Safety Assessment (FSA) discussed at the IMO is a tool based on risk analysis techniques that is used in the rule-making process. Risk analysis methods include many technical elements. An extensive literature survey was conducted on the technical elements of risk analysis such as structural reliability analysis (SRA), failure modes and effect analysis (FMEA), safety analysis techniques, and human reliability analysis (HRA), amongst others.
Study on the life assessment of ship structures (First year of three-year project)	A Hull Fatigue Management System (HFMS) capable of estimating residual fatigue life through the use of fatigue damage sensors was investigated. A new hotspot stress estimation method based on FEM analysis results was also investigated with the aim of enhancing the accuracy of fatigue strength assessments. Corrosion protection methods to prevent aging deterioration were surveyed, as well.
Study on wave loads acting on ship structures (Last year of three-year project: Third stage)	A series of calculations of hull girder wave loads on various container ships was carried out using the Rankine source method (a non-linear analysis method) focusing on the non-linear effect. In addition, the effect of bow flare shape on wave bending moment was also studied.
Study on the ultimate strength of large scale hull structures (First year of three-year project)	Simulations of the hull girder collapse of a bulk carrier were carried out under various combinations of longitudinal bending load and cargo load conditions in holds using a non-linear FEM (DYTRAN). In addition, Idealized Structural Unit Method (ISUM) elements applicable to in-plane bending load cases were developed, and their applicability was verified by comparison with the results of double bottom collapse analysis based on non-linear FEM analysis.
Study on condition monitoring methods of marine engines and machinery (First year of three-year project)	In order to examine appropriate monitoring and sensing techniques for condition monitoring systems on main engines and machinery in an engine room, sensing techniques using high frequency pick up sensors and a monitor to count of number of particles in the lubrication oil scored due to wear down were tested to investigate the conditions necessary for effective monitoring with appropriate alarms to avoid failure of the main bearings in the main engine.

Title of Research	Outline of Research
Study on the application of RCM/RBM to marine machinery (First year of three-year project)	Initial procedures and computer systems for conducting Risk-Based Inspection (RBI) on the main engine were developed and studied with the aim of developing appropriate procedures and computer systems for the RBI of machinery onboard ship. In addition, draft guidelines on the design and maintenance of pipes against flow-accelerated corrosion were completed.
Study of analytical methods relating to combustion characteristics of marine fuel oils and degradation of lubricating oils of 4-stroke diesel engines (Second year of three-year project)	Fuel oil combustion tests and data analysis as well as lubricating oil analysis were carried out on the combustion characteristics of marine fuel oils and degradation of lubricating oils with the aim of developing diagnostic techniques to protect engines from abnormal combustion problems attributable to fuel oil or lubricating oil. Some indications based on the nature of the oil were found for critical values that can be used in checking the characteristics of the oil.
Study on the strength assessment of main propulsion systems (Last year of three-year project: Second stage)	Japanese and English editions of the <i>Guidelines on Shafting Alignment taking into account Variations in Bearing Offsets while in Service</i> were published based on the results of the research conducted in this project.
Study on corrosion occurring in welded joints (First year of two-year project)	The excessive corrosion of steel due to contact of stainless pipes in a seawater environment was analyzed using the boundary element method, and the deterioration effect of coatings on the corrosion rate of the steel structure was examined. An effective anti-corrosion method was studied using this technique for the damage example. In addition, long-term seawater immersion tests of loaded steel plates (MS and HT32 steel) were conducted in order to investigate the effect of plastic strain on corrosion.
Study on the strength of welded joints (Last year of three-year project: Second stage)	The effect of corrosion on the ultimate strength of stiffened plates, which had grooving corrosion at the fillet welded joints subjected to shear and bending due to lateral pressure, was investigated by experiments and FE analyses. Methods of assessing the fatigue strength of load-carrying stainless steel fillet welded joints were examined based on fatigue tests and a review of the literature.
Study on the corrosion of ship structural members (Last year of two-year project: Second stage)	A probabilistic simulation method was developed to predict the thickness diminution behavior of pitting corroded plates, and a series of FE analyses was performed to investigate the ultimate strength reduction behavior of pitted plates. Furthermore, a series of tensile tests on actual pitting corroded members was conducted. Based on the results of the analyses and experiments, a method for evaluating the equivalent thickness loss of pitted plates, defined as the thickness loss of uniformly corroded members with the same strength as the pitted plate, was proposed based on the visually determined DOP (Degree Of Pitting Intensity) approach.
Field tests on an actual ship	A series of detailed stress measurements of a large container ship was undertaken.

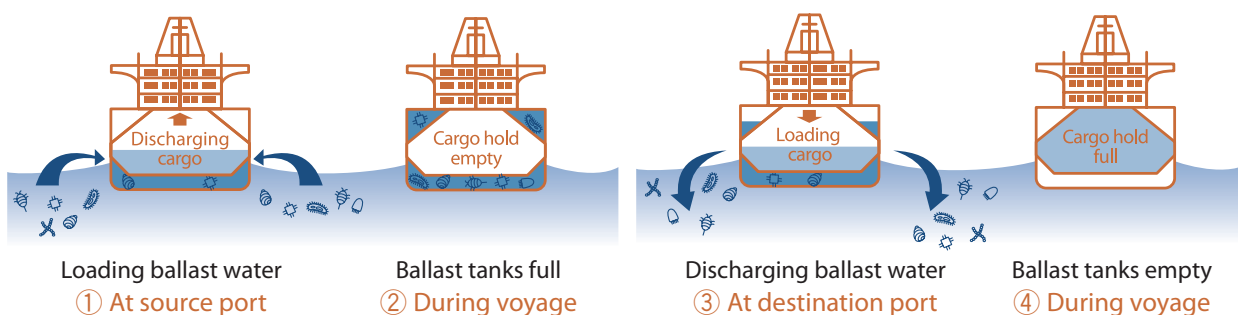
NOBS: A New Design Approach to Ballast Water Management

Background

Ballast plays a vital role in ensuring adequate ship stability while a ship is underway in the unladen or ballast condition. This is particularly important for conventionally designed bulk carriers and tankers that often carry cargo in only one direction and may go unloaded on the return voyage. The main purpose of ballast is to maintain proper trim and to prevent the occurrence of bow slamming and propeller racing that would otherwise result from insufficient draft due to the ship sitting higher in the water when unloaded.

Various problems arise from the use of ballast water, however. More than 10 billion tons of ballast water is transported by merchant ships across vast distances each year as they ply from one part of the world to another. This figure has been increasing as the size of the global fleet continues to grow in both the number and size of ships in use. A major problem with the carriage of so much ballast water is that in the process, a host of harmful aquatic organisms and species indigenous to one area are also transported and introduced into other parts of the world where they are non-indigenous, upsetting the ecology

of the new area. This has increasingly harmful effects on the ecological balance of the marine area where the ballast water is discharged as new cargo is taken onboard. Efforts by the IMO in response to growing awareness of the need to combat these environmental problems and the economic and ecological disruption they cause have led to the adoption of the *International Convention for the Control and Management of Ship's Ballast Water and Sediments* in 2004. The Convention sets forth requirements for the handling of ballast water, including the exchange of ballast water at sea and the use of ballast water treatment systems to eliminate the transfer of harmful organisms from one area of the ocean to another. The eventual goal is to phase out the use of ballast water exchange by 2016 and to replace it with a fairly strict treatment standard. Treatments currently being examined include UV exposure, biochemical treatment, and various types of filtration methods, among others. The expectation is that the technologies and methods of treatment will come to satisfy the treatment standard set forth in the Convention by the time it comes into final effect in 2016.



The NOBS Design Concept

A completely different approach from dealing with ballast water directly is to redesign the ship itself so as to remove the need to rely on ballast water, except in certain special circumstances. This is the basic concept behind the Non Ballast Water Ship or NOBS concept. This innovative concept essentially consists of designing the ship so that its centerline sits more deeply in the water than in the more conventional flat bottom design of most commercial ships currently in service. The aim of the approach is to maintain sufficient draft without using any ballast water while unloaded to avoid bow slamming and propeller racing while ensuring sufficiently safe operation when underway in most sea conditions. This is achieved through the use of a transversely raked bottom design. The resulting decrease in displacement is compensated for by increasing the breadth, length, and draft of the vessel. A key advantage of the NOBS design is that it basically eliminates the need for expensive ballast water treatment systems and associated

operational costs, although two small redundant ballast tanks are incorporated in the design for use in adjusting trim and passage through extreme seas.

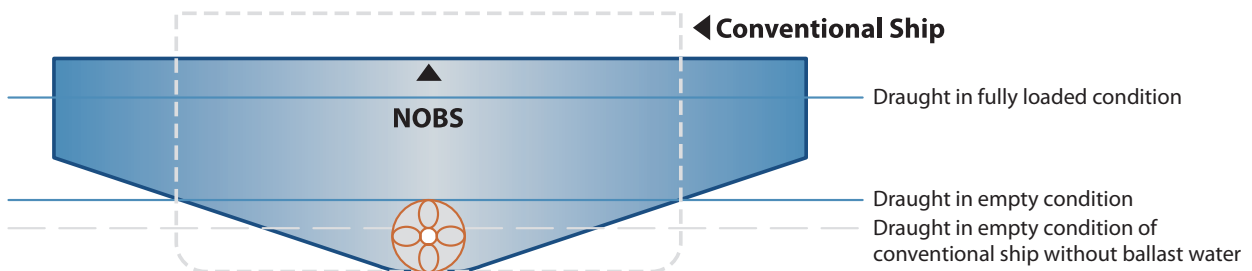
Development of the novel NOBS design first began in 2001 by the Shipbuilding Research Center of Japan (SRC). R&D into the design entered a new stage in 2003 with the start of a three-year joint project using tank tests under the auspices of the SRC. The project has been promoted by the Japan Ship Technology Research Association with support from the Nippon Foundation and undertaken in cooperation with Mitsubishi Heavy Industries, IHI Marine United Inc., the SRC, and ClassNK, which has played both leading and technical roles in the project. A main goal of the project has been to determine the practical feasibility of the NOBS design in terms of satisfying requirements for safe operation and existing regulatory and other relevant standards, seakeeping performance, and economic viability by studying the application of the design to a Suezmax tanker and VLCC.

Development of NOBS

(Illustration of NOBS Section)

1. Development of most suitable hull design of NOBS

2. Development of propulsion system for shallow draught



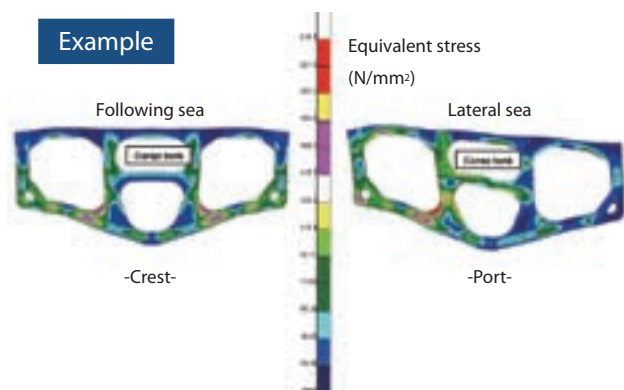
3. Development of system to expected wave impact pressure

Research Results

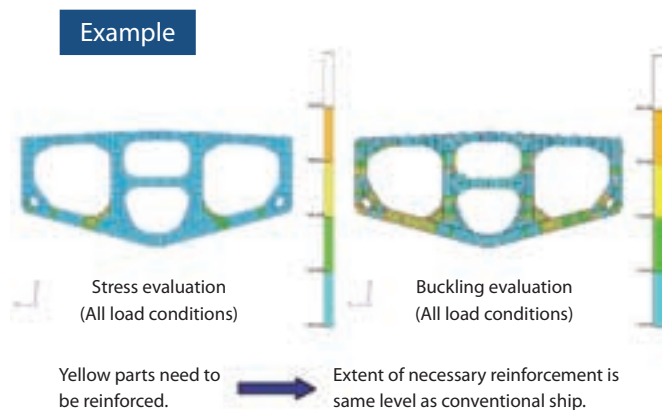
In order to determine the feasibility of the NOBS design to actual ships, a range of tank tests were conducted on model ships built based on the design and compared with a Suezmax tanker and a VLCC of the same deadweight with respect to eight specific design objectives. Factors compared included propulsion efficiency in still water, resistance in waves, dynamic motion in waves, as well as response to wave loads. Each objective was found to be met or exceeded, as summarized below.

1. The frequency and impact pressure of forward bottom slamming and propeller racing in the NOBS design in the unloaded condition was found to be similar to the values for the conventional ships tested in the normal ballast condition. These results demonstrate that a NOBS is capable of operating safely as an ocean going vessel without ballast water under normal sea conditions just as a conventional ship in the ballast condition with a ballast water displacement of 30-40%.
2. It was also confirmed that a NOBS maintains the draft necessary for safe navigation in very rough sea conditions with approximately one-quarter the ballast water that a conventional oil tanker carries.

3. While a NOBS did not perform quite as well as a conventional ship in the loaded condition in terms of propulsive performance, performance was notably better in the unloaded condition. Overall, performance was shown to improve by as much as 6.4% on average. Thus, it was determined that application of the NOBS design would yield energy savings of at least 5% on average compared with a conventional ship in terms of both main engine power and fuel consumption.
4. The strength of the NOBS hull structure was found to be satisfactory and comply with all regulatory and class requirements for every expected voyage and condition. ClassNK's PrimeShip-HULL application was used to analyze the longitudinal, transverse, and fatigue strength characteristics of the NOBS design and then compare the results with the comparable values for the conventional tankers studied in the project with respect to the applicable class rule requirements for such tankers. Example results for different sea conditions as well as the stress and buckling evaluations obtained are shown in the following graphs.



Example results of effects of different sea conditions on hull stresses for a transverse section of the cargo hold. Yellow and red colors highlight areas of increased stress. The results were determined using the ClassNK PrimeShip-HULL application.



Example of cumulative evaluation of hull strength under all load conditions. Areas in yellow indicate where the hull for a section of the cargo hold needs to be reinforced. The extent of reinforcement required is essentially the same as that needed for a similar sized ship of conventional design.

5. The characteristics for ship motion, wave resistance, and longitudinal bending moment in waves of the NOBS were found to be comparable to the characteristics for the conventional ships studied, thereby confirming the seaworthiness of the NOBS design.
6. The broader width of the NOBS and transverse hull form help to maintain the equilibrium of the ship against rolling. Actual tests showed that the NOBS had a significantly larger extinction ratio in rolling motion compared to the conventional box-type hull forms, thereby making a bilge keel unnecessary.
7. The water tank tests demonstrated that the NOBS has favorable maneuverability characteristics capable of maintaining a stable heading in compliance with IMO standards for ship maneuverability.
8. Although up to as much as 10% more steel would be required both for the broader hull form and to reinforce certain areas of the hull structure compared with conventional designs, the improvements in propulsive performance lower fuel costs are expected to more than compensate for this demerit. And of course, there no longer be any need for any large-scale ballast water treatment system with a NOBS, which would be a major savings in and of itself.

All told, the innovative NOBS concept proposed at the start of the project was indeed found to satisfy the objectives initially set forth for the design. Hence, it was determined that the NOBS design is practical for large sized tankers and is well capable of enabling safe navigation without the need for ballast water except in the most extreme sea conditions. Although studies still need to be conducted on the application of the NOBS concept to other types of ships such as bulk carriers, container ships, and middle-sized vessels of various types, initial results thus far show the NOBS concept to be a very

promising alternative approach to ballast water management.

While other technical and practical issues still need to be addressed such as how some ports will accommodate the broader beams of such vessels and the fact that blocks of different size will need to be arranged during construction, drydocking and repair, it can be expected that these issues can be readily resolved as the NOBS concept becomes a truly viable design. However, the greatest benefit of the NOBS concept is that it would be free from the requirements for ballast water management and treatment, and as such can be expected to contribute greatly to preserving the marine environment as a totally new environmentally friendly ship type of the next generation.



Tank test of NOBS design for a Suezmax tanker in the non-ballast condition

Main Benefits of NOBS Design

Prevention of Marine Pollution

-Ballast-free hull form

- Prevents transfer of ballast water and invasive organisms to other sea areas.

Safety

-Safe operation without water ballast

- Ship motion and bow slamming are on same level as similar sized conventional ship.
- Broader transverse hull form maintains equilibrium against rolling.
- Maneuverability complies with IMO standards.

Economy

-More than 6% power/propulsion savings

- Increased building costs due to greater steel use offset by improved propulsion efficiency.

NK in International Affairs

ClassNK has always been an internationally oriented Society. In addition to 21 offices in Japan, the Society has over 78 service sites in 42 countries and territories overseas. An important aspect of NK's international activities is related to the Society's capacity to undertake statutory surveys on the behalf of national Administrations around the globe. The number of States that have authorized ClassNK to carry out surveys and issue certificates on their behalf based on international conventions was 106 as of December 2006. This includes the addition of authorization by the MCA of the United Kingdom

Another important aspect of the Society's international activities is NK's contribution to the International Maritime Organization (IMO). NK participated in the following meetings during 2006 either as a member of the Japanese Government delegation or a representative of IACS:

- Maritime Safety Committee (MSC) – 81st and 82nd sessions
- Marine Environment Protection Committee (MEPC) – 54th and 55th sessions
- Sub-Committee on Ship Design and Equipment (DE) – 49th session
- Sub-Committee on Bulk Liquids and Gases (BLG) – 10th session
- Sub-Committee on Fire Protection (FP) – 50th session
- Sub-Committee on Safety of Navigation (NAV) – 52nd session
- Sub-Committee on Stability and Load Lines and on Fishing Vessels Safety (SLF) – 49th session
- Sub-Committee on Flag State Implementation (FSI) – 14th session
- Sub-Committee on the Carriage of Dangerous Goods, Solid Cargoes and Containers (DSC) – 11th session

The outcomes of NK participation in major meetings such as MEPC and MSC are conveyed to ClassNK clients through a variety of methods, including "NK Technical Information" bulletins and providing updates on the Society's website under "IMO International Convention Calendar".

Another key aspect of NK's international activities is the Society's active involvement in IACS related activities.

The IACS Common Structural Rules (CSR) for bulk carriers and tankers came into effect in April 2006 and were incorporated into the Rules of the Society, accordingly. ClassNK played a significant role in the development of the CSR for bulk carriers, in particular. The Society actively participates in the review and updating of the CSR undertaken by IACS as part of the IACS CSR maintenance scheme, and updates its own Rules on a regular basis.

ClassNK participated in the following IACS meetings in 2006 (numbers after each item indicate number of times meetings took place):

- Council: 2
- Quality Committee: 2
- General Policy Group: 2
- Panel Meetings (total for all four Panels): 9
- Project Team Meetings: 13
- Expert Group Meetings: 3

Small Group Meetings: 4
 Joint Working Group with Industry: 3
 IACS Common Structural Rules related: 4
 A3 (NK, CCS, KR): 3

Overseas Committee meetings are an important avenue for the two-way exchange of information and advice between NK and key industry and regional stakeholders in local regions around the world. A full list of NK Committee meetings held during 2006 is summarized in the following table.



Meeting at NK Head Office of IACS Hull Panel chaired by NK

NK Committee Meetings Held during 2006	Date	Venue
12 th Indian Committee	12 January	Mumbai
15 th Greek Committee	9 February	Piraeus
4 th Hong Kong Technical Committee	7 April	Hong Kong
11 th China Technical Committee	19 April	Shanghai
6 th Taiwan Technical Committee	27 April	Taipei
17 th Korea Committee	5 May	Seoul
3 rd Turkish Committee	15 June	Istanbul
2 nd Malaysian Committee	14 July	Kuala Lumpur
3 rd Singapore Committee	17 July	Singapore
16 th Danish Technical Committee	5 September	Copenhagen
4 th British Committee	21 September	London
4 th Thai Committee	5 October	Bangkok
10 th Singapore Technical Committee	10 October	Singapore
32 nd Hong Kong Committee	26 October	Hong Kong
13 th Korea Technical Committee	30 September	Pusan
4 th Philippine Committee	9 November	Manila
4 th Indonesia Committee	10 November	Jakarta
13 th China Committee	21 November	Beijing
13 th Indian Committee	21 November	Mumbai
7 th Taiwan Committee	5 December	Taipei

Authorizations Granted to ClassNK*

Areas/Countries	LL	SOLAS					MARPOL 73/78		TM
		SC	SE	SR	SMC	ISPS	IOPP	NLS	
Algeria	★	★	★	★		★	★	★	★
Antigua and Barbuda	●	●	●	●	●		●	●	●
Argentina	★	★	★	★					
Aruba	★	★	★	★	★		★	★	
Australia	●	●	●	●			●	●	●
Bahamas	●	●	●	●	●	●	●	●	●
Bahrain	●	●	●	●		●	●	●	●
Bangladesh	●	●					●		●
Barbados	●	●	●	●	●	●	●	●	●
Belgium	●	●				★			
Belize	●	●	●	●	●	●	●	●	●
Bermuda	★	★							★
Bolivia	●	●	●	●	●		●	●	●
Brazil	●	●	●	●			●	●	●
British Virgin Islands	★	★	★	★	★		★		★
Brunei	●	●	●	●	●		●	●	●
Cambodia	●	●	★	★	●		★	●	★
Canada	●								
Cape Verde	●	●	●	●	●		●	●	●
Cayman Islands	●	★	★	★	★		★	●	●
Chile	★	★	★	★			★		★
Cuba	★	★	★	★					
Cyprus	●	●	●	●	★	●	●	●	●
Denmark	●	●	●	●	●	●	●	●	●
Djibouti	●	●	●	●			●	●	●
Dominica	●	●	●	●	●	★	●	●	●
Dominican Republic	●	●	●	●			●	●	●
Ecuador	★	★	★	★			★	★	
Egypt	●	★	★	★	★	●	★		★
Equatorial Guinea	●	●	●	●	★	●	●	●	●
Fiji	★	★	★	★			★		★
Gambia	★	★	★	★			★		★
Georgia	●	●	●	●	●	●	●	●	●
Ghana	●	●	●	★			●		●
Gibraltar	●	●	●	●	★	★	●	●	●
Greece	●	●	●	●	●	●	●	●	●
Honduras	●	●	●	●	●		●	●	●
Hong Kong	●	●	●	●	●	●	●	●	●
Iceland	●	●	●	●	●		●	●	★
India	★	★	★	★			★	★	
Indonesia	●	★	★	★			★	★	★
Iran	●	●	●	●			●	●	●
Iraq	★	★	★	★					
Ireland	●	●			●	●	●	●	●
Isle of Man	●	★	★	★	★	★	●	●	●
Israel	●	●	★	★	★		★		●
Jamaica	●	●	●	●	●	●	●	●	●
Japan	●	●	●		●	★	★	★	
Jordan	●	●	●	●		●	★	★	
Kenya	●								
Kiribati	★	★	★	★		●	★		★

* For ships other than passenger ships.

Abbreviations:

- Authority has been delegated.
- ★ Authority has been delegated subject to some conditions.
- LL International Load Line Certificate
- SC Cargo Ship Safety Construction Certificate
- SE Cargo Ship Safety Equipment Certificate

Areas/Countries	LL	SOLAS					MARPOL 73/78		TM
		SC	SE	SR	SMC	ISPS	IOPP	NLS	
Kuwait	●	●	★	★	★	●	●	●	●
Lebanon	●	★	★	★		★			
Liberia	●	●	●	●	●	●	●	●	●
Libya	●	●	●	●		●	●	★	★
Luxembourg	●	●	●	●	●	●	●	●	●
Madeira	●	●	●	●			●	●	●
Malaysia	★	★	★	★	★	●	★	★	★
Maldives	●	●	●	●	●		●		●
Malta	★	★	★	★	●	★	★	★	★
Marshall Islands	●	●	●	●	●	●	●	●	●
Mauritius	●	●	●	●	●	●	●	●	●
Mexico	★	★	★	★			★		★
Morocco	●	★	★	★	★		★	★	★
Mozambique	●								
Myanmar	●	●	●	●	●	●	●	●	●
Namibia	●	●	●	●			●	●	●
Netherlands	●	★	★	★	●	●	★	●	●
Netherlands Antilles	★	★	★	★	★	★	★	★	
Oman	●	●	●	●					●
Pakistan	●	●			★		●	●	●
Panama	●	●	●	●	●	★	●	●	●
Papua New Guinea	●	●	●	●			●		●
Paraguay	★	★	★	★	★				★
Philippines	●	●	●	●	●	●	●	●	●
Portugal	★	★					★		
Qatar	★	★	★	★	★	●	★	★	★
Saudi Arabia	●	●	●	●	●	●	●	●	●
Seychelles	●	●	●	●	●	●	●	●	●
Singapore	●	●	●	●	●	●	●	●	●
Solomon Islands	●	●	●	●					●
Somalia	●								
South Africa	●	●					★	●	
Sri Lanka	●	●	●	●			●		●
St. Christopher and Nevis	●	●	●	●	●	●	●	●	●
St. Vincent and the Grenadines	●	●	●	●	●	★	●	●	●
Switzerland	●	●	●	●	★		●	●	●
Tanzania	●								
Thailand	★	★	★	★	★		★		★
Tonga	●	●	●	●			●	●	●
Tunisia	●	★					●		
Turkey	●	★	★	★	●	●	●	●	
Tuvalu	●	●	●	●	●	●	●	●	●
UAE	●	●	●	●	●	●	●		●
Uganda	●								
UK	★	★				★	★		★
Uruguay	★	★	★	★					
Vanuatu	●	●	●	●	●	●	●	●	●
Venezuela	★								
Vietnam	★	★	★	★	★		★	★	★
Yemen	●								

SR Cargo Ship Safety Radio Certificate
 SMC Safety Management Certificate
 ISPS International Ship and Port Facility Security Certificate
 IOPP International Oil Pollution Prevention Certificate
 NLS International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk
 TM International Tonnage Certificate (1969)

Service Network





Branches in Japan

NK in Committee

ADVISORY COUNCIL

Members	Chang Yung-fa Frank W. K. Tsao Sumate Tanthwanit	Group Chairman Group Chairman President	Evergreen Group IMC Group of Companies Regional Container Lines Group
----------------	--	---	---

BRITISH COMMITTEE

Chairman	J. G. Davis	Chairman	IMIF (International Maritime Industries Forum)
Members	Robert Houston Enys Dan Epaminondas G. E. Embiricos Philip D Atkinson Sunil Malhotra Alastair Fischbacher Alan P Davey F. M. Marchant Ray McNamara Vivek Puri Peter McIntosh	Managing Director Director, Marine Assurance Chairman Technical Director Commercial Director General Manager General Manager Director for Marine Affairs Fleet Director Director Senior Underwriter	Anglo-Eastern Ship Management (UK) Ltd. BP Shipping Limited Embiricos Shipbrokers Ltd. Graig Ship Management Limited Ocean Bulk Carriers Limited Rio Tinto Shipping Limited Shell Shipping Technology The Peninsular and Oriental Steam Navigation Company V. Ships UK Ltd. Wallem Limited Wellington Underwriting

CHINA COMMITTEE

Chairman	Li Jianhong	Executive Vice President	China Ocean Shipping (Group) Company (COSCO)
Members	Xu Zi Qiu Lv Yi Bin Mao Shi Jia Li Junfeng Han Chengmin Ge En Hua Yang Jian Ming Tian Zhongshan	President Deputy Manager Managing Director Vice Director Deputy Managing Director Director Vice President President Managing Director	China Shipbuilding & Offshore International Co., Ltd. China Shipping (Group) Company China Shipping Development Company Limited China Shipping Development Co., Ltd., Tanker Company China State Shipbuilding Corporation COSCO Container Lines Hebei Ocean Shipping Co., Ltd. Jiangsu Ocean Shipping Co., Ltd. Sinotrans Shipping Limited

GREEK COMMITTEE

Chairman	Charalambos N. Mylonas	Chairman	Transmed Shipping Ltd.
Members	Markos A. Nomikos Michael D. Chandris George J. Souravlas Anna G. Dracopoulos Prokopis N. Karnesis Kriton Lendoudis Michael E. Veniamis Ghikas J. Goumas Dimitris Z. Kritsas Panagiotis C. Laskaridis Diamantis P. Diamantides Theodore P. Angelopoulos Thanos Crassaris George S. Livanos Constantinos J. Martinos Panagiotis N. Tsakos Michael M. Scufalos	Director Chairman Managing Director Director Director Managing Director Director Director President Managing Director Managing Director General Manager Chairman Managing Director President Managing Director	A. M. Nomikos Transworld Maritime Agencies S.A. Chandris (Hellas) Inc. Elmira Shipping and Trading S.A. Empros Lines Shipping Company S.A. European Navigation Inc. Evalend Shipping Co. S.A. Golden Union Shipping Co. S.A. J. G. Goumas Shipping Company S.A. Kritsas Shipping S.A. Laskaridis Shipping Co., Ltd. Marmaras Navigation Ltd. Metrostar Management Corp. Springfield Shipping Co. Panama S.A. Sun Enterprises Ltd. Thenamaris Ships Management Inc. Tsakos Shipping & Trading S.A. Union Commercial Inc.

HONG KONG COMMITTEE

Chairman	Andrew Y. Chen	Chairman & Managing Director	Grand Seatrade Shipping Company Ltd.
Vice Chairman	Xu Zunwu	Vice President	COSCO (Hong Kong) Group Ltd.
Honorary Chairman	M. H. Liang	Chairman	Island Navigation Corp Int'l Ltd.
Members	Robert Alexander Ho	President	Fairmont Shipping (HK) Ltd & Affiliates
	Huang Shao Jie	Director & President	Hong Kong Ming Wah Shipping Co., Ltd.
	Arthur Bowring	Managing Director	Hong Kong Shipowners Association
	Frank W. K. Tsao	Group Chairman	IMC Group of Companies
	Steve G. Hsu	Group Chairman	Oak Maritime (H.K.) Inc., Ltd.
	Kwai Sze Hoi	Chairman & President	Ocean Longevity Shipping and Management Co., Ltd.
	Richard Hext	Chief Executive Officer	Pacific Basin Shipping (HK) Ltd.
	C. C. Liu	Chairman	Parakou Shipping Ltd.
	M. T. Yung	Director General Manager	Patt Manfield & Co., Ltd.
	Peter Cheng	Shipping Division Managing Director	Peter Cheng Naval Architect & Marine Consultant Ltd.
	Raymond Pao	President	Regent Shipping Ltd.
	Li Hua	Deputy Managing Director	Sinotrans Shipping Limited
	Kenneth K.W. Lo	Managing Director	Teh-Hu Cargocean Management Co., Ltd.
	Edward S. C. Cheng	Chairman	Unique Shipping (H.K.) Ltd.
	C.A.J. Vanderperre	Chairman	Univan Ship Management Ltd.
	David C. C. Koo	Managing Director	Valles Steamship Co., Ltd.
	Sabrina S. M. Chao	Deputy Managing Director	Wah Kwong Shipping Holdings Ltd.
	Jim Nelson	Managing Director	Wallem Shipmanagement Ltd.

INDIAN COMMITTEE

Chairman	Arun Mehta	Vice Chairman & Managing Director	Varun Shipping Company Limited
Vice Chairman	R. L. Pai	Group Sr. Vice President	Reliance Industries Limited
Members	Ashok V. Chowgule	Executive Director	Chowgule & Company Ltd.
	Ajoy Chatterjee	Chief Surveyor with the Government of India	Directorate General of Shipping Ministry of Shipping, Road Transport & Highways Government of India
	Madhusudan P. Dhanuka	Executive Director	GEE Limited
	Atul J. Agarwal	Joint Managing Director	Mercator Lines Limited
	H. Ansari	Additional Director	National Law University
	S. Govindrajan	Managing Director	Progressive Shipping
		Consultancy Services (PVT) Ltd.	
	K. M. Sheth	Executive Chairman	The Great Eastern Shipping Co., Ltd.
	R. K. Mitra	Director	The Shipping Corporation of India Ltd.

INDONESIA COMMITTEE

Chairman	Widihardja Tanudjaja	President Director	PT. Berlian Laju Tanker Tbk
Members	Bobby R. Mamahit	Director	Directorate General of Sea Transportation
	Choy Ngee Sheng	Director	GBLT Shipmanagement Pte. Ltd.
	Oentoro Surya	Chairman	INSA (Indonesia National Shipowners Association)
	Joeswanto Karijodimedjo	Chairman	IPERINDO (Indonesia Shipbuilding & Offshore Industry Association)
	Adiwibowo	Senior Vice President of Shipping	PERTAMINA SHIPPING
	Supardi Somantri	President Director	PT. Adnyana
	Andy A. Mallian	Fleet Director	PT. Arpeni Pratama Ocean Line Tbk.
	Kasim Arifin	President Director	PT. Bumi Perkasa Bahtera
	Djoko Mulyanto	Fleet Director	PT. Djakarta Lloyd
	Suyoto	President Director	PT. Dok & Perkapalan Kodja Bahari (PERSERO)
	Hendrato	General Manager	PT. Gesuri Lloyd
	H. Soenarto	President Director	PT. Gurita Lintas Samudera
	Teguh Arya Putra	President Director	PT. Humpuss Intermoda Transportasi Tbk.
	Adwin H. Suryohadiprojo	President Director	PT. PAL Surabaya
	Asmary Herry	Executive Director	Samudera Shipping Line Ltd.

KOREA COMMITTEE

Chairman	Jong-Kew Park	Adviser	KSS Line Ltd.
Members	Sang-Tae Nam	President & C.E.O.	Daewoo Shipbuilding & Marine Engineering Co., Ltd.
	Soon-Ick Hong	C.E.O., President	Hanjin Heavy Industries & Construction Co., Ltd.
	Kil-Seon Choi	President & C.E.O.	Hyundai Heavy Industries Co., Ltd.
	Hyun Yung-Won	Chairman	Hyundai Merchant Marine Co., Ltd.
	Jae-Byoung Song	President	Hyundai Mipo Dockyard Co., Ltd.
	Soo-Hyun Kang	President & C.E.O.	Hyundai Samho Heavy Industries Co., Ltd.
	Jin-Bang Lee	President & C.E.O.	Korea Line Corporation
	Jing-Wan Kim	President & C.E.O.	Samsung Heavy Industries Co., Ltd.
	Jeong-Hwa Lee	President & C.E.O.	SK Shipping Co., Ltd.
	Jong-Chul Lee	President	STX Pan Ocean Shipping Co., Ltd.

MALAYSIAN COMMITTEE

Chairman	Shamsul Azhar Abbas	President & C.E.O.	MISC BERHAD
Vice Chairman	Nordin Mat Yusoff	Vice President of Fleet Management Unit	MISC BERHAD
Members	Lim Leng-Pin	Managing Director	Aurora Tankers Sdn. Bhd.
	Stein Eriksen	General Manager	Barber Ship Management Ltd.
	Billy Tan Gim Hoe	Director/Chairman	Ecoship Sendirian. Berhad
	David Tan	Managing Director	Everise Maritime Sdn. Bhd.
	Halim Mohammad	Executive Chairman	Halim Mazmin Bhd.
	Dennis Liong	General Manager	Hub Shipping Sdn. Bhd.
	Wan Yusoff Wan Hamat	Managing Director & C.E.O.	Malaysia Marine & Heavy Engineering Sdn.Bhd.
	Muhamad Azmi Alwi	Managing Director	Nepline Berhad
	A. Aziz Ishak	Managing Director & C.E.O.	Petronas Maritime Service Sdn. Bhd.
	Elias Kadir	Senior Executive Director/S.E.D.	Sutrajaya Shipping Sdn. Bhd.

PHILIPPINE COMMITTEE

Chairman	Arben E. Santos	President & C.E.O.	Southwest Maritime Group of Companies
Members	Roy R. Alampay	Vice President for Operations & General Manager	Baliwag Navigation, Inc.
	Vicente T. Suazo, Jr.	Administrator, Department of Transportation & Communications	Republic of the Philippines
	Rogelio A. Torres	Vice President Eastern	Shipping Lines, Inc.
	Ko-Lin Toh	President	Keppel Philippines Marine, Inc.
	Michael G. Bernardino	Vice President	Loadstar International Shipping, Inc.
	Doris Magsaysay Ho	Chairman of the Board	Magsaysay Maritime Corporation
	Edgardo G. Lacson	President	MIS Maritime Corporation
	Kenji Kawano	President	Tsuneishi Heavy Industries (Cebu), Inc.

SINGAPORE COMMITTEE

Chairman	David T. E. Lim	Group President and CEO	Neptune Orient Lines Ltd.
Members	Tong Chong Heong	Managing Director	Keppel FELS Limited
	Tay Lim Heng	Chief Executive	Maritime and Port Authority of Singapore
	Aloysius Seow F S	Chief Operating Officer	Ocean Tankers (Pte) Ltd.
	Teo Joo Kim	Chairman	Pacific Carriers Limited
	Teo Cho Keng	Executive Director	Pacific International Lines (Pte) Ltd.
	K. K. Tan	President	SembCorp Marine Limited

TAIWAN COMMITTEE

Chairman	Loh Yao-fon	Assistant to Group Chairman	Evergreen Group
Members	Danny Wang	C.F.O.	Cheng Lie Navigation Co., Ltd.
	Kuang-Nan Fan	President	China Shipbuilding Corporation
	Donald K. L. Chao	President	China Steel Express Corporation
	Jei-Yuan Chen	Executive Manager	Chinese Petroleum Corp.
	Shang-Wen Liao	President	Eastern Media International Corporation
	Huang Chin-san	Chairman	Evergreen International Corp.
	Joseph J. M. Jhu	President	First Steamship Group
	Huang Mei-Hsiung	Chairman	Glorly Navigation Co., Ltd.

Harvey Chiu	Chairman	Hsin Chien Marine Co., Ltd.
Michael M. K. Hsiao	Chairman	Mingtai Navigation Co., Ltd.
Lan Juin Der	Chairman	Shih Wei Navigation Co., Ltd.
Mathias K. Y. Chen	Chairman & President	Sincere Industrial Corporation
Fred C. P. Tsai	Chairman	Sincere Navigation Corporation
I. Y. Chang	President	Taiwan Navigation Co., Ltd.
Nobuyoshi Morimoto	C.E.O., Managing Director	TMT Co., Ltd.
C. K. Ong	President	U-Ming Marine Transport Corp.
C. C. Lin	Chairman	Unison Marine Corporation
Chao-Hon Chen		Wan Hai Lines Ltd.
Lan Chun Sheng	Chairman	Wisdom Marine Lines S.A.
David C. H. Liu	Senior Vice President	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.
	Wirat Chanasit	Managing Director	Italthai Marine Ltd.
	Chanet Phenjati	President	Jutha Maritime Public Co., Ltd.
	Suraphon Meesathien	Managing Director	Nathalin Co., Ltd.
	Amares Phulsawat	Director	Phulsawat Navy Co., Ltd.
	Jaipal Mansukhani	Director	Precious Shipping Public Co., Ltd. (Great Circle Shipping Agency Ltd.)
	Wittawat Svasti-Xuto	Vice President	PTT Public Co., Ltd.
	Voravit Visitkitjakarn	Managing Director	Sang Thai Shipping Co., Ltd.
	Pongpun Amornvivat	Managing Director	Thaioil Marine Co., Ltd.
	Yodchai Ratanachiwakorn	General Manager	Thoresen & Co., (Bangkok) Ltd.
	Teruo Kondo	Senior Ship Repair Manager	Unithai Shipyard & Engineering Ltd.

TURKISH COMMITTEE

Chairman	Yalcin Sabanci	Chairman	Yasa Holding S.A.
Members	Necdet Aksoy	Chairman	Akmar Holding S.A.
	Ali Umur	President	Aktif Shipping
	Kenan S. Sumra	Superintendent Engineer	(QMR) Aygaz Anonim Sirketi
	Esref Cerrahoglu	Chairman	Cerrahgil A. S.
	Akin Falay	Managing Director	Cornships Management and Agency Inc.
	Serdar Akcali	Managing Director	Denak Ship Management & Agency
	Bilge Bayburtlugil	General Manager	Ditas Tanker and Marine Operations
	Orhan Karademir	Technical Manager	Genel Denizcilik Nakliyatı A.S.
	Sadan Kaptanoglu	Member of Board	H.I. Kaptanoglu Shipping Group
	Suha Izmirligil	General Manager	Hasatmar Ship Management S.A.
	Bedri Ince	President	Ince Shipping and Trading Co. Inc.
	Murat Edip Karahasan	Chairman	Karahasan Group of Shipping Companies
	Tamer Kiran		KIRAN Group of Shipping Companies
	Faruk Miras	Managing Director	Korfez Shipping and Trading Inc.
	Huseyin Yardimci	General Manager	Moliva Shipping Inc.
	Serif Ozdaglar	Managing Director	Nemtas Nemrut Liman Isletmeleri A. S.
	Murat Dortbudak	Executive Vice President	Odin Shipmanagement

CHINA TECHNICAL COMMITTEE

Chairman	Lu Zhi-Ping	Honorary President	Shanghai Merchant Ship Design & Research Institute
Members	Zhang Yong Jian	General Manager	China Ocean Shipping (Group) Company
	Luan Fukai	Senior Manager	China Ocean Shipping (Group) Company
	Chen Zhengjie	Director	China Ocean Shipping (Group) Company
	Zhao Zhanjun	Managing Director	China Ship Design & Research Center Co., Ltd.
	Cao Zhi Teng	Vice President	China Shipbuilding Trading Co., Ltd.
	Lv Yi Bin	Deputy Manager	China Shipping (Group) Company
	Li Xue Qiang	Deputy General Manager	China Shipping Container Lines Co., Ltd.
	Mao Shi Jia	General Manager	China Shipping Development Co.
	Pu Li Fei	General Manager	China Shipping International Trading Co., Ltd.
	Wang Guorong	General Manager	COSCO Bulk Carrier Co., Ltd.
	Qiu Xin Yao	General Manager	COSCO Ship Management Co., Ltd.

Zhang Minghua	Vice General Manager	COSCO Shipbuilding Industry Company
Hong Ying	Deputy General Manager	COSCO Shipping Co., Ltd.
Li Jun Bao	General Manager	Dalian Ocean Shipping Company
Yang Wei Zan	Deputy Technical Director	Dalian Shipbuilding Industry Co., Ltd.
Zhang Zhen De	Vice President	Dalian Shipbuilding Industry Co., Ltd.
Li Yi Wen	Vice General Manager	Guangzhou Maritime Transport (Group) Co., Ltd.
Zhou Zhi Hao	Vice Chief Engineer	Guangzhou Shipyard International Co., Ltd.
Lou Dan Ping	Manager	Hudong-Zhonghua Shipbuilding (Group) Co., Ltd.
Yang Shiming	Duputy Technical Director	Jiangnan Shipyard (Group) Co., Ltd.
Hu Keyi	Technical Director	Jiangnan Shipyard (Group) Co., Ltd. TDCC Office
Luo Jian	Assistant General Manager	Jiangsu Ocean Shipping Co., Ltd.
Zhu Yue Chen	General Manager	Liaoning Bohai Shipyard
Yu Baojun	Principal Naval Architect	Marine Design & Research Institute of China
Tokio Yamashita	Vice General Manager	Nantong COSCO KHI Ship Engineering Co., Ltd.
Liu Haijin	Director, Executive Vice President	New Century Shipbuilding Co., Ltd.
Sun Wen Tian	Vice General Manager	Qingdao Ocean Shipping Company
Jin Yun Long	Technical Chief	Shanghai Ship & Shipping Research Institute, Ministry of Communications
Ye Jinwen	Technical Director	Shanghai Shipyard & Chengxi Shipyard Co., Ltd.
Tao Ying	Deputy Chief Engineer Senior Engineer	Shanghai Waigaoqiao Shipbuilding Co., Ltd.
Feng Guo Ying	Deputy General Manager	Sinotrans Shipping Limited
Zhang Li Feng	Commercial Director	Xingang Shipyard

DANISH TECHNICAL COMMITTEE

Chairman	Preben Terndrup Pedersen	Professor	Technical University of Denmark
Members	Mogens Fynbo	Executive Vice President	A/S Dampskibsselskabet Torm
	Carsten Melchior	Secretary General	BIMCO
	Anne Skov Struver	Head of Division, L.L.M.	Maritime Safety & Environmental Legislation, Danish Maritime Authority
	Flemming Schmidt-Andersen	Fleet Manager / Vice President	Lauritzen Kosan A/S
	Erik Moller	Fleet Manager Tankers	Lauritzen Tankers A/S
	Peter Sunn Pedersen	Executive Vice President	MAN Diesel A/S
	Christian D. Schmidt	Head of Engineering	Odense Steel Shipyard Ltd.
	Valdemar Ehlers	Technical Director	DFDS

HONG KONG TECHNICAL COMMITTEE

Chairman	Peter Cheng	Managing Director	Peter Cheng Naval Architect & Marine Consultant Ltd.
Members	Marcel Liedts	Group Managing Director	Anglo-Eastern Group
	Y. Q. Huang	Deputy General Manager	Associated Maritime Co. (HK) Limited
	Vishal Khurana	Director & Chief Executive	Chellaram Shipping (HK) Ltd.
	Yan Zhi Chong	Vice President & General Manager	China Shipping (H. K.) Marine Co., Ltd.
	Wang Yongfu	Deputy Managing Director	COSCO (HK) Shipping Co., Ltd.
	B. N. Prasad	General Manager	Eurasia International (China) Limited Partnership
	Kishore S. Rajvanshy	Managing Director	Fleet Management Limited
	Lau Pong Sze	Managing Director	Gold Bridge Shipping Ltd.
	Y. H. Shum	Director	Goldbeam International Limited
	K. H. Li	Director-Technical	IMC Pan Asia Alliance Pte Ltd.
	Jagmeet S. Makkar	Vice President	KC Maritime Ltd.
	S. S. Tse	Director & Deputy General Manager	Lihai International Shipping Ltd.
	Bibhash Chaudhuri	Fleet Manager	New Asian Shipping Company, Limited
	James S. C. Tai	General Manager	Orient Overseas Container Line Ltd.
C. Kocherla	General Manager	Pacific Basin Shipping (HK) Ltd.	
Kenneth Koo	Group Vice Chairman & Chief Executive Officer	Tai Chong Cheang Steamship Co. (HK) Ltd.	
W. L. Hung	General Manager	Wah Kwong Ship Management (HK) Ltd.	

KOREA TECHNICAL COMMITTEE

Chairman	Sung-Won Kang	Professor, College of Engineering	Pusan National University
Members	Sang Woo Lee	Executive Director	(Design & Business)
		Naval Architect	(Professional Engineer)
	Duck-Yull Lee	Executive Director	Dae Sun Shipbuilding & Engineering Co., Ltd.
	Kyu-Won Park	Executive Vice President	Daewoo Shipbuilding & Marine Engineering Co., Ltd.
	Soo-Geun Lee	Director	Hanjin Heavy Industries & Construction Co., Ltd.
	Hyun-Sang Shim	Director	Hyundai Heavy Industries Co., Ltd.
	Jae-Sung Choi	Professor	Hyundai Samho Heavy Industries Co., Ltd.
	Hyung-Yong Lee	Vice President	Korea Maritime University
	H. K. Leem	Senior Vice President	Samsung Heavy Industries Co., Ltd. Geoje Shipyard
			STX Shipbuilding Co., Ltd.

SINGAPORE TECHNICAL COMMITTEE

Chairman	Goh Teik Poh	Senior Vice President	APL Co. Pte Ltd.
Members	Toshikazu Saito	Director, General Manager	"K" Line Ship Management (Singapore) Pte Ltd.
	Robert Sumantri	Managing Director	Altus Shipping and Logistics Pte. Ltd.
	Surajit Chanda	Fleet Manager Technical	BW Shipping Managers Pte Ltd.
	Liu De Tian	Managing Director	COSCO (Singapore) Pte Ltd.
	B. S. Teeka	Managing Director	Executive Ship Management Pte Ltd.
	Wong Sin Futt	Senior Manager Newbuildings	IMC Pan Asia Alliance Pte. Ltd.
	Seow Tan Hong	Senior General Manager	Jurong Shipyard Pte Ltd.
	Nelson Yeo	Executive Director	Keppel Shipyard Limited (A member of the Keppel Group)
	Wong Len Poh	Senior Assistant Director	Maritime & Port Authority of Singapore
	Hiroaki Kubo	Managing Director	MOL Tankship Management (Asia) Pte. Ltd.
	K. K. Kumar	Fleet Manager	NYK Shipmanagement Pte Ltd.
	Teh Eng Hua	Vice President	Ocean Tankers (Pte) Ltd.
	Lim Tau Kok	General Manager	PACC Ship Managers Pte Ltd.
	Chia Che Kiang	General Manager	Pacific International Lines Pte Ltd.
	Ng Sing Chan	Senior General Manager	Pan-United Shipyard Pte Ltd.
	Kenneth Kee	Managing Director	Petroships Pte Ltd.
	Joe Ng Guan Tee	Managing Director	Stellar Shipmanagement Services Pte Ltd.
	Tadic Tonci	Director	Tanker Pacific Management (Singapore) Pte Ltd.
	Naresh Chand	General Manager	Planning United Ocean Ship Management Pte Ltd.
	Arun K. Ahluwalia	Technical Director	V. Ships Asia Pte. Ltd.

TAIWAN TECHNICAL COMMITTEE

Chairman	Huang Shiun-kwo	Senior Officer	Evergreen Marine Corp. (Taiwan) Ltd.
Members	K. C. Lin	Senior Manager	Cheng Lie Navigation Co., Ltd.
	Hsiung Lee	Vice President	China Steel Express Corporation
	J. Z. Fang	General Manager	Chinese Petroleum Corporation
	C. S. Chen	Director / Secretary	Deryoung Maritime Co., S.A.
	Michael L. Y. Pan	Executive Vice President	Eastern Media International Corporation
	Lee Yeou-tou	Executive Vice President	Evergreen Marine Corp. (Taiwan) Ltd.
	Johnny J. Ho	Advisor	First Steamship Co., Ltd.
	Anthony Lin	Vice President	Formosa Plastics Marine Corporation
	Guo I-Lung	Director, President	Glory Navigation Co., Ltd.
	K. J. Leu	Assistant Vice President	Hsin Chien Marine Co., Ltd.
	Dave Ding-Hang Lee	Manager	Kee Yeh Co., Ltd.
	C. K. Lin	Vice President	Mingtai Navigation Co., Ltd.
	Y. Y. Ho	Vice President	Shih Wei Navigation Co., Ltd.
	Tommy T. M. Li	General Manager	Sincere Industrial Corp.
	Young Perng-Terng	Chief Engineer	Ta Tong Marine Co., Ltd.
	N. K. Chu	General Manager	Ta-Ho Maritime Corporation
	Chen Teng	Senior Vice President	Taiwan Navigation Co., Ltd.
	Robert Y. P. Kao	Assistant Vice President	U-Ming Marine Transport Corp.
	J. R. Kuo	Vice President	Unison Marine Corp.
	Hawk Huang	Vice President	Wan Hai Lines Ltd.

NK in Control

Board of Directors

Directors

K. Ogawa	Chairman and President	Nippon Kaiji Kyokai
Y. Tsudo	Executive Vice President	Nippon Kaiji Kyokai
N. Ueda	Executive Vice President	Nippon Kaiji Kyokai
T. Kaji	Managing Director	Nippon Kaiji Kyokai
K. Yamanaka	Managing Director	Nippon Kaiji Kyokai
F. Imakita	Managing Director	Nippon Kaiji Kyokai
Dr. H. Kitada	Managing Director	Nippon Kaiji Kyokai
A. Ashida	President	Mitsui O.S.K. Lines, Ltd.
M. Furukawa	President	Hitachi Zosen Corporation
Dr. S. Hayama	Professor Emeritus	The University of Tokyo
K. Ishihara	President	Tokio Marine & Nichido Fire Insurance Co., Ltd.
Dr. H. Itagaki	Professor Emeritus	Yokohama National University
H. Maekawa	President	Kawasaki Kisen Kaisha, Ltd.
K. Miyahara	President	Nippon Yusen Kabushiki Kaisha
T. Motoyama	President	Mitsui Engineering & Shipbuilding Co., Ltd.
Dr. Y. Nakagawa	Executive Vice President	Ishikawajima-Harima Heavy Industries Co., Ltd.
T. Nishioka	Chairman	The Shipbuilders' Association of Japan
Dr. T. Nomoto	Professor Emeritus	The University of Tokyo
T. Ohashi	President	Kawasaki Heavy Industries, Ltd.
Dr. H. Ohtsubo	Professor	Hosei University
K. Sugimoto	President	Iino Kaiun Kaisha, Ltd.
K. Suzuki	Chairman	The Japanese Shipowners' Association
K. Tsukuda	President	Mitsubishi Heavy Industries, Ltd.
Dr. K. Yoshida	Professor Emeritus	The University of Tokyo

Auditors

N. Ishii	Former Managing Executive Director	
	Nippon Yusen Kabushiki Kaisha	
K. Kondo	Senior Executive Officer	Mitsui Sumitomo Insurance Co., Ltd.
H. Nagai	Adviser	Japan Airport Terminal Co., Ltd.
I. Shintani	Board Counselor	Kawasaki Kisen Kaisha, Ltd.

Councilors

H. Bada	President	JFE Steel Corporation
Dr. Y. Fujita	Professor Emeritus	The University of Tokyo
T. Fujita	President	Kyoei Tanker Co., Ltd.
K. Fukui	President	Kyokuyo Co., Ltd.
K. Furukawa	President	Hachiuma Steamship Co., Ltd.
Y. Hamane	President	Onomichi Dockyard Co., Ltd.
T. Hayashi	President	Taiyo Nippon Kisen Company
T. Higaki	Chairman	Imabari Shipbuilding Co., Ltd.
K. Hirayama	President	Tokyo Senpaku Kaisha, Ltd.
Y. Imashimizu	President	IHI Marine United Inc.
Y. Inamura	President	Taiheiyo Kaiun Co., Ltd.
Dr. Y. Inoue	Professor	Yokohama National University
Y. Inubushi	President	Kobe Steel, Ltd.
S. Inui	President	Inui Steamship Co., Ltd.
T. Kakei	President	Shinwa Kaiun Kaisha, Ltd.
N. Kakizoe	President	Nippon Suisan Kaisha, Ltd.
K. Kanbara	President	Tsuneishi Shipbuilding Co., Ltd.
H. Kashimoto	President	Sumitomo Heavy Industries Marine & Engineering Co., Ltd.
T. Kawakami	President	Shin Kurushima Dockyard Co., Ltd.
H. Kawata	President	Idemitsu Tanker Co., Ltd.
S. Kobayashi	President	NYK-Hinode Line, Ltd.
Dr. H. Kobayashi	Professor	Yokohama National University
T. Matsui	President	The Sanko Steamship Co., Ltd.
K. Matsuzawa	President	Nippon Koa Insurance Co., Ltd.
S. Minami	Chairman	Daizo Corporation
A. Mimura	President	Nippon Steel Corporation
H. Morishima	President	Sasebo Heavy Industries Co., Ltd.
M. Nagata	President	The Japan Steel Works, Ltd.
T. Nagumo	Chairman	Sanoyas Hishino Meisho Corporation
T. Namura	President	Namura Shipbuilding Co., Ltd.
C. Nomura	President	Daiichi Chuo Kisen Kaisha
M. Obata	President	Japan Railway Construction, Transport & Technology Agency
T. Okubo	President	Nissho Shipping Co., Ltd.
M. Sato	President	Sompo Japan Insurance Inc.
K. Shimakawa	President	Nippon Steel Shipping Co., Ltd.
S. Sudo	Chairman	Nissay Dowa General Insurance Co., Ltd.
E. Sugiyama	President	Nippon Oil Tanker Corporation
Dr. Y. Sumi	Professor	Yokohama National University
S. Takeuchi	President	Universal Shipbuilding Corporation
T. Taniguchi	President and Director	Kawasaki Shipbuilding Corporation
Dr. H. Tanikawa	Professor Emeritus	Seikei University
H. Tomono	President	Sumitomo Metal Industries, Ltd.
S. Tsuji	President	Taiheiyo Kisen Kaisha, Ltd.
M. Tsuji	Chairman	Japanese Marine Equipment Association
K. Uchida	President	Meiji Shipping Co., Ltd.
G. Yanai	President	Fuji Electric Systems Co., Ltd.
T. Yoshizawa	President	Yuyo Steamship Co., Ltd.

Classification Committee

Chairman

K. Ogawa Chairman and President Nippon Kaiji Kyokai

Vice Chairman

Y. Tsudo Executive Vice President Nippon Kaiji Kyokai

Members

A. Aoyagi	Naval Architect, General Manager Ship & Ocean Engineering Dept. Shipbuilding & Ocean Development Headquarters	Mitsubishi Heavy Industries, Ltd.
O. Handa	Managing Director	The Japanese Shipowners' Association
Dr. S. Hayama	Professor Emeritus	The University of Tokyo
F. Imakita	Managing Director	Nippon Kaiji Kyokai
N. Ishii	Former Managing Executive Director Nippon Yusen Kabushiki Kaisha	
Dr. H. Itagaki	Professor Emeritus	Yokohama National University
T. Kaji	Managing Director	Nippon Kaiji Kyokai
S. Kanai	General Manager Commercial Lines Claims Department	Tokio Marine & Nichido Fire Insurance Co., Ltd.
K. Kiriake	General Manager Technical Affairs Department	The Shipbuilders' Association of Japan
Dr. H. Kitada	Managing Director	Nippon Kaiji Kyokai
T. Matsubara	Corporate Officer and General Manager Technical Group	Nippon Yusen Kabushiki Kaisha
S. Miyamoto	Managing Director	Kawasaki Shipbuilding Corporation
H. Mori	Director Deputy General Manager	Universal Shipbuilding Corporation
H. Nagai	Adviser	Japan Airport Terminal Co., Ltd.
O. Niho	General Manager Basic Design Department Ship & Ocean Project Headquarters	Mitsui Engineering & Shipbuilding Co., Ltd.
T. Nishikawa	Executive Officer	Mitsui O.S.K. Lines, Ltd.
Dr. T. Nomoto	Professor Emeritus	The University of Tokyo
Dr. H. Ohtsubo	Professor	Hosei University
I. Shintani	Board Counselor	Kawasaki Kisen Kaisha, Ltd.
N. Tsutsumi	Director Managing Executive Officer	Kawasaki Kisen Kaisha, Ltd.
N. Ueda	Executive Vice President	Nippon Kaiji Kyokai
M. Utsunomiya	Director	IHI Marine United Inc.
K. Yamanaka	Managing Director	Nippon Kaiji Kyokai
O. Yamane	Executive Officer	Iino Kaiun Kaisha, Ltd.
K. Yokoyama	General Manager Marine Claim Department	Mitsui Sumitomo Insurance Co., Ltd.
Dr. K. Yoshida	Professor Emeritus	The University of Tokyo

Technical Committee

Chairman

Dr. H. Itagaki Professor Emeritus Yokohama National University

Members

T. Abe	Officer Steel Casting & Forging Division	Kobe Steel, Ltd.
Dr. S. Hayama	Professor Emeritus	The University of Tokyo
Dr. M. Horigome	President	Hiroshima National College of Maritime Technology
S. Iijima	Director, Senior Vice President, General Manager Shipbuilding & Ocean Development Headquarters	Mitsubishi Heavy Industries, Ltd.
Dr. Y. Inoue	Professor	Yokohama National University
T. Ishiguro	Technical Superintendent	The Japan Steel Works, Ltd.
T. Iwasaki	Managing Director General Manager of Ship & Ocean Project Hq.	Mitsui Engineering & Shipbuilding Co., Ltd.
Y. Kato	Managing Director General Manager of Shipyard	Sasebo Heavy Industries Co., Ltd.
M. Kawano	Member of Marine Safety & Environment Committee	The Japanese Shipowners' Association
H. Kawasaki	Plate Division Plate Sales Division General Manager	Nippon Steel Corporation
M. Kishimoto	Director Chief General Manager	Sumitomo Heavy Industries Marine & Engineering Co., Ltd.
Dr. H. Kobayashi	Professor	Yokohama National University
T. Matsubara	Member of Marine Safety & Environment Committee	The Japanese Shipowners' Association
S. Miyamoto	Managing Director	Kawasaki Shipbuilding Corporation
H. Mori	Director Deputy General Manager	Universal Shipbuilding Corporation
T. Nishikawa	Vice Chairman of Marine Safety & Environment Committee	The Japanese Shipowners' Association
Dr. T. Nomoto	Professor Emeritus	The University of Tokyo
Dr. H. Ohtsubo	Professor	Hosei University
H. Okuda	Managing Executive Officer	Sumitomo Metal Industries, Ltd.
Y. Onuki	Member of Marine Safety & Environment Committee	The Japanese Shipowners' Association
T. Sekita	Vice President	JFE Steel Corporation
Dr. Y. Sumi	Professor	Yokohama National University
N. Tsutsumi	Member of Marine Safety & Environment Committee	The Japanese Shipowners' Association
M. Utsunomiya	Director	IHI Marine United Inc.
Dr. K. Yoshida	Professor Emeritus	The University of Tokyo

Quality Committee

Chairman

Dr. H. Sakai Professor Emeritus The University of Tokyo

Members

F. Imakita	Managing Director	Nippon Kaiji Kyokai
S. Ishikawa	Director	The Association of Consumer Affairs Professionals
E. Kudo	Supporting Member	Japan Environmental Disaster Information Center (NGO)
Y. Midorikawa	Managing Director	The Shipbuilders' Association of Japan
Dr. N. Ooka	Chairman of ISO Committee	The Japanese Society for Non-Destructive Inspection
T. Seino	General Manager	The Japanese Shipowners' Association
N. Takei	General Manager	The Marine & Fire Insurance Association of Japan, Inc.
H. Yoshida	Managing Director	Japanese Marine Equipment Association

Regional Contacts

Head office

- **Administration Center**

Nippon Kaiji Kyokai
4-7 Kioi-cho, Chiyoda-ku
Tokyo 102-8567, Japan
Tel: +81-3-3230-1201
Fax: +81-3-5226-2012
E-mail: bnd@classnk.or.jp
(Business Department)
www.classnk.or.jp

Asia and Oceania

- **Singapore Office***

Nippon Kaiji Kyokai
101 Cecil Street
#21-01 Tong Eng Building
Singapore, 069533
Tel: +65-6222-3133
Fax: +65-6225-5942
E-mail: sp@classnk.or.jp
*Other than Chinese Mainland

- **Shanghai Office***

Nippon Kaiji Kyokai
Rm. 2208, International Trade Center
2201 Yan-an West Road, Shanghai
200336, China
Tel: +86-21-62703089
Fax: +86-21-62195699
Email: sc@classnk.or.jp
*Chinese Mainland

Middle East and Black Sea

- **Piraeus Office**

Nippon Kaiji Kyokai
Possidonos Av. & 1-3 Pindou Str.
183 44 Moschato, Piraeus, Greece
Tel: +30-210-4832404
Fax: +30-210-4832405
E-mail: pr@classnk.or.jp

Europe and Africa

- **London Office**

Nippon Kaiji Kyokai
6th Floor, Finsbury Circus House
12-15 Finsbury Circus
London, EC2M 7EB
United Kingdom
Tel: +44-20-7628-5102
Fax: +44-20-7628-3691
E-mail: ln@classnk.or.jp

The Americas

- **New York Office**

Nippon Kaiji Kyokai
One Parker Plaza, 11th Floor
400 Kelby Street, Fort Lee
N.J. 07024, U.S.A.
Tel: +1-201-944-8021
Fax: +1-201-944-8183
E-mail: ny@classnk.or.jp

For permission to reproduce any part of this publication,
please contact: Business Department
Tel: +81-3-5226-2040
Fax: +81-3-5226-2039
E-mail: bnd@classnk.or.jp

Annual Report 2006
Published by Nippon Kaiji Kyokai
Copyright Nippon Kaiji Kyokai

ClassNK

NIPPON KAIJI KYOKAI

4-7 Kioi-cho, Chiyoda-ku, Tokyo 102-8567, Japan
Phone : +81-3-3230-1201 Fax : +81-3-5226-2012
www.classnk.or.jp