ClassNK

Annual Report 2017

[English]

ClassNK Annual Report 2017

March 2018

NIPPON KAIJI KYOKAI

4-7 Kioi-cho, Chiyoda-ku, Tokyo, 102-8567 Japan

TEL : +81-3-5226-2047

E-Mail : eod@classnk.or.jp

www.classnk.or.jp

ClassNK

Annual Report 2017

[English]

The ClassNK Mission

ClassNK is dedicated to ensuring the safety of life and property as well as environmental protection and other related matters through various businesses related to classification, the establishment of various standards, inspection, registration, certification, and research and development, etc.

To achieve this mission ClassNK will:

Independence

Deliver the highest quality services, by the highest quality personnel, while maintaining our totally independent third party, non-profit status.

Standard

Develop relevant rules, guidances, and procedures, and conduct technical research and development to positively contribute to the maritime industry.

Global

Maintain and develop our global operations in line with the needs of our clients.

Profile

Founded on 15 November 1899, Nippon Kaiji Kyokai, better known as ClassNK or simply NK, develops rules for safeguarding vessels, their crews, and the marine environment.
In order to help ensure the safety of the ships on our register, ClassNK provides a full range of survey, auditing, and services, including classification and statutory surveys, material and equipment approvals, auditing and registration of ship safety management systems and security systems, as well as certification of quality, environmental and occupational health and safety management systems in accordance with international standards. As a certified international third party organization, ClassNK has in recent years expanded its certification services to wind power and marine energy equipment, and is working to develop solutions to diverse safety and environmental issues, as well as broaden its range of maritime business services to include the logistics sector. The Society is constantly working to meet new client needs in response to new regulations and changes in the industry. In addition to its main classification services, ClassNK will continue to promote and enhance new business through the latest technology such as IoT and Big Data.

Code of Ethics

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

1. Independence, Impartiality, and Reliability

The Society, its management, staffs, agents, and subcontractors (hereunder "personnel of the Society") shall ensure its independence to provide services as an impartial third party organization and shall be free from any commercial, financial, or other pressures that could possibly affect their judgment in the conduct of any surveys, audits, or other services provided by the Society.
In addition, all personnel of the Society shall work in a professional and conscientious manner so as to bring neither disgrace to the Society's honor nor detriment to the Society's interests. Moreover, all personnel of the Society shall not take any action in the name of the Society, nor make use of their official title, except in the pursuit of their official duties.

2. Confidentiality of Information

All personnel of the Society shall always keep in mind that all certificates and survey records issued by the Society, as well as all relevant survey documents submitted by customers and all such information obtained by the Society is confidential, and that the contents or copies of such documents shall not be made available to any parties other the persons concerned, except as defined in the Rules of the Society, or when required by applicable legislation, court order, legal proceedings, adherence to pertinent flag state requests, or by the owner's authorization.

3. Conduct of Classification and Statutory Surveys and Audits

All personnel of the Society shall be charged with a mission to implement surveys, etc. fairly and appropriately in accordance with the Rules of the Society, the requirements of flag state administrations and the requests of customers. Consequently, the Society shall not issue any classification, statutory or other certificates or survey records, nor endorse any such certificates, without implementation of the required surveys or without taking appropriate actions.

4. Observance of Laws

All personnel of the Society shall recognize that the Society has a duty to society at large and, as such, shall carry out all of its activities fairly and impartiality, and shall strictly observe all laws and social standards.

The management of ClassNK therefore recognize adherence to this Code of Ethics as part of the Society's mission, and shall not only ensure that all members of the Society's staff are made familiar with this Code, but shall also establish a system to ensure its effective application. Further, in the event of a serious violation of this Code or the law, the management of ClassNK recognizes that it has the responsibility to investigate the cause of the violation and to take timely and appropriate corrective action in order to prevent the reoccurrence of such violations in the future.

Contents

Message from Chairman and President

Welcome to the ClassNK Annual Report. I would like to extend my deepest appreciation to all of our clients and stakeholders who supported our activities.

2017 presented some major political events and geopolitical risks, including President Trump taking office in the US, the UK officially announcing their separation from the EU, the nuclear issue surrounding North Korea and the Syrian Civil War. While uncertainties rise in the global state of affairs, the world economy is continuing to recover with the steadiness that was seen in the American and Chinese economy spreading to Japan, European countries, and emerging nations.

While we are seeing some recovery in the maritime industry, it is yet to be seen whether these are the early manifestations of a full recovery. Adding to uncertain factors such as the possible prolonged stagnation in newbuilding demand and changes in the exchange rate, future market trends may change dramatically with industry response to the Ballast Water Management Convention that came into force in September 2017 and the enforcement of SOx emission regulations planned for January 2020.

In light of the current situation, this has placed our organization under more pressure. However, our priority remains to offer the best technical services to each of our clients as part of our mission to contribute to promote the safety of life and property as well as environmental protection and other related matters through various businesses related to classification, the establishment of various standards, inspection, registration, certification, and research and development. Taking the circumstances and the regulatory trends into consideration, we will work even harder to further develop our core classification services and make valued contributions to the industry. Further, as a global third party certification body, we will respond to client needs arising from changes in regulations and the business environment, as well as contribute to safety and the resolution of global environmental issues and expansion of areas involved in maritime logistics projects.

Following my appointment as Chairman and President of ClassNK in March 2016, I reassessed our organization structure and way of governance, and made changes in order to better secure the society and ensure the continuance and development of our services under these more challenging conditions. In 2017, I focused especially on thorough Internal Control and Corporate Governance.

We have updated our Rules and Guidance and guidelines based on the latest R&D outcomes, damage investigations, industry demands and revisions to international regulations made at IMO and IACS. We have also provided extensive information services including our comprehensive range of software.

In the fields of Big Data and the Internet of Things, we are working on providing the necessary platforms and ensuring the cybersecurity so that the maritime industry can reap the biggest rewards from this exciting new opportunity. In 2017, we held an IoS (Internet of Ships) Open Platform Forum with participation from maritime industry players to collectively plan a system for the efficient use of ship IoT data by the entire industry.

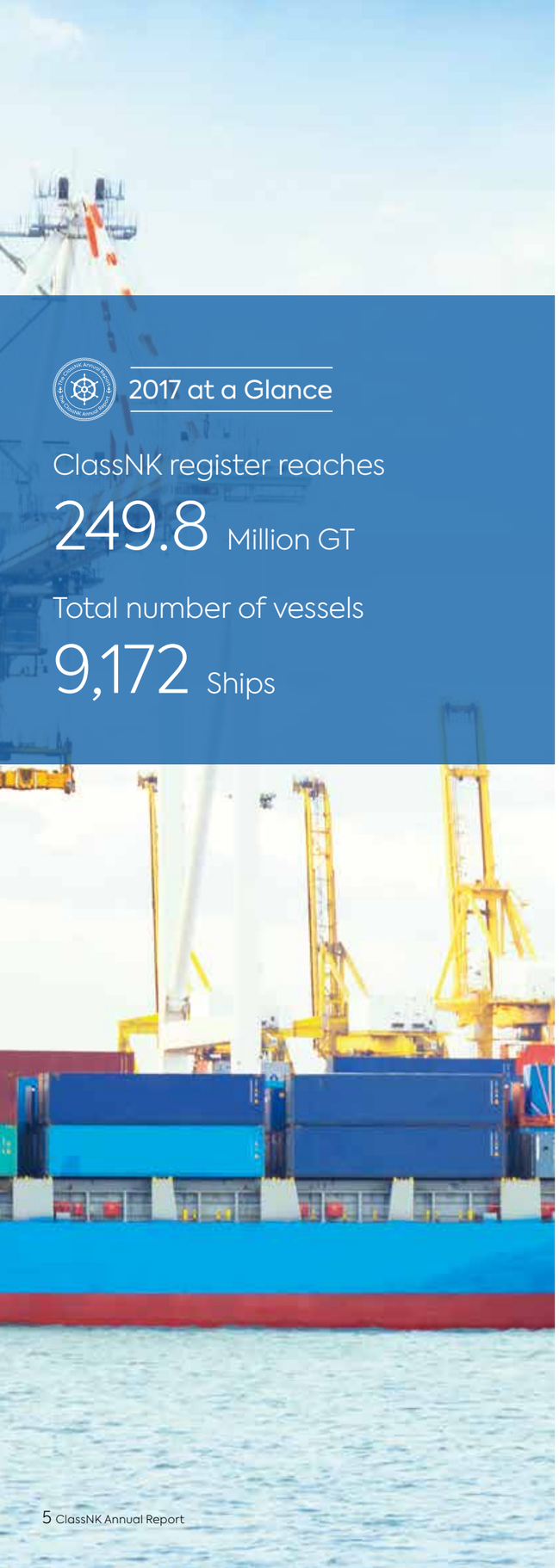
As unveiled in the ClassNK R&D Roadmap in September 2017, we began mid-long term R&D in four focus areas including Survey Technology Innovation, etc. In this technical environment in which digitalization is rapidly progressing, I believe this will support and strengthen ClassNK's technical competitive power and at the same time, also contribute greatly to the development of our human resources.

As the demand for third-party certification services has grown, ClassNK is also working to expand its certification services for quality, environmental, occupational health and safety systems, maritime education and training, greenhouse gas emissions, and renewable energy. Particularly in 2017, we have been particularly proactive in renewable energy, issuing certificates for an ocean current power system prototype for the first time.

ClassNK will continue to deliver the very best technical services to our clients and continue to maintain and strengthen the relations of trust we share with the industry. We look forward to receiving your valued support for our activities.

Koichi Fujiwara

President & CEO,
Representative Director



2017 at a Glance

ClassNK register reaches

249.8 Million GT

Total number of vessels

9,172 Ships

At the end of December 2017, the ClassNK register reached a total of 249.8 million gross tons.
The size of ClassNK's register has grown every year since 1988, reaching 100 million gross tons registered in 1997 and a record breaking 200 million gross tons registered in mid-2012.
Topping the 200 million mark was an important milestone in ClassNK's history, and marked the first time a classification society had achieved such a figure.

15.6 Million GT

ClassNK registers more than 15.6 million GT

Over the course of one year, 579 vessels totaling 15.6 million gross tons were newly added to the register in 2017.

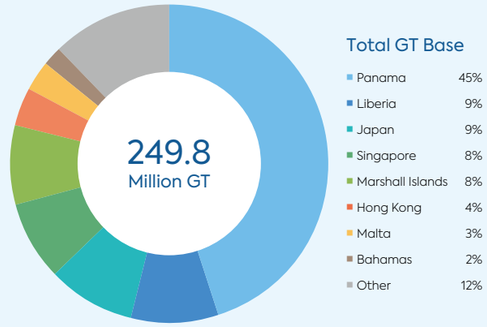
3 Guidelines

Publication of 3 Guidelines

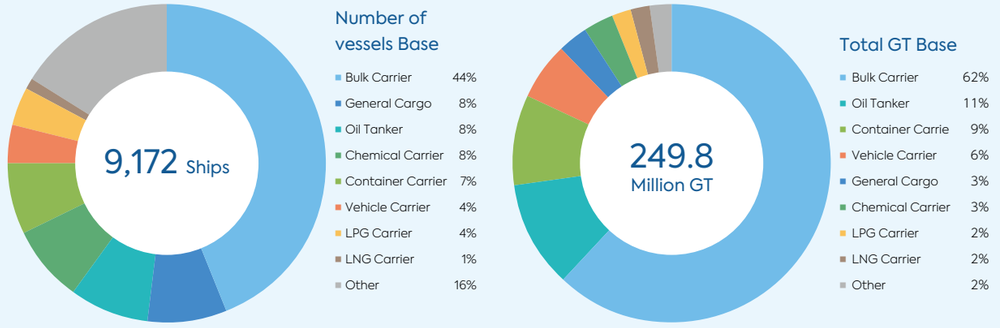
In 2017 ClassNK published the following guidelines. These guidelines are available to download via the Society's homepage after logging into "My Page".

- Guidelines for Type Approval of Products for Marine Use for EU Mutual Recognition V.5
- Guidelines for Liquefied Hydrogen Carriers
- Guidelines for Exhaust Gas Cleaning Systems V.2.1

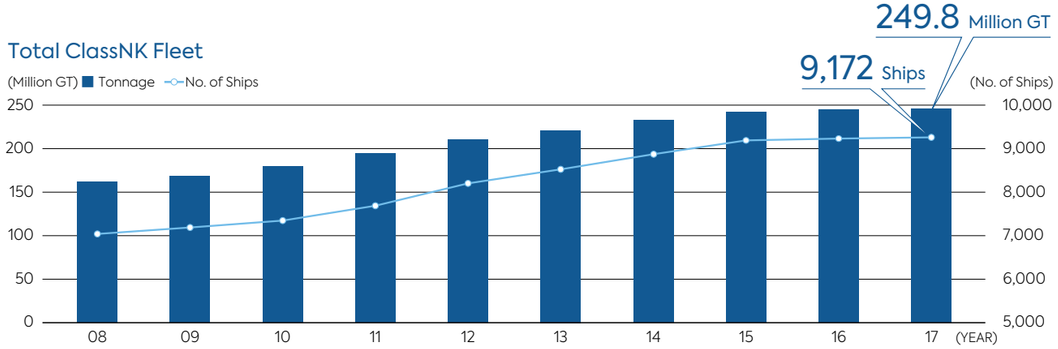
Breakdown of ClassNK Fleet by Flag



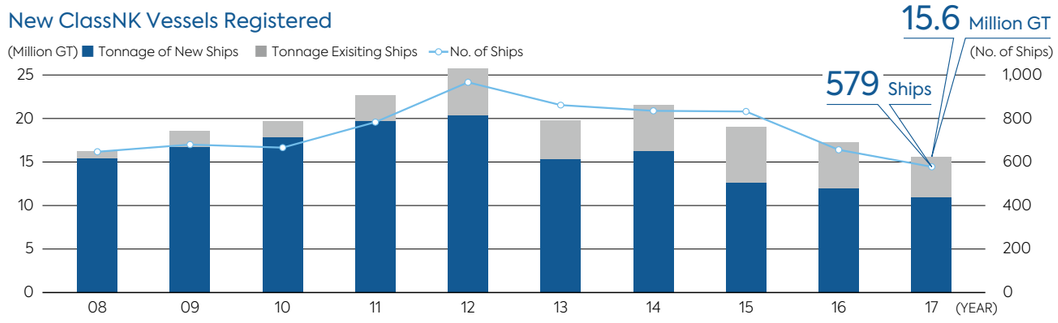
Breakdown of ClassNK Fleet by Ship Type



Total ClassNK Fleet



New ClassNK Vessels Registered



2017 at a Glance

2 Feb.

ClassNK issues Type Certification for LED floodlights for Port Facility-use

ClassNK begins type certification services and issues the first Type Certification for LED floodlights for port facility-use to Stanley Electric Co., Ltd. These LED floodlights, which consume less electricity than conventional sodium lights or mercury lamps and are suitable for use in port facilities, provide terminal operators with green alternative. With this landmark certification, terminal operators are assured that this technology meets the high technical, safety, and durability standards outlined in ClassNK's guidelines.

1 Mar.

ClassNK receives EU MRV accreditation from UKAS

ClassNK receives accreditation from the UK-based national accreditation body UKAS (United Kingdom Accreditation Service) as an EU MRV verifier. Effective as of 1 March 2017, ClassNK is one of the world's first classification societies to receive accreditation from UKAS.
EU MRV is an EU regulation on the monitoring, reporting, and verification of carbon dioxide (CO_2) emissions from vessels. This regulation lays down rules for developing Monitoring Plans to the verifiers accredited by a national accreditation body in the EU by 31 August 2017 for ships above 5,000 gross tons which arrive at or depart from ports under the jurisdiction of an EU member state. EU MRV also outlines requirements for collecting data and submitting Emission Reports.

1 Apr.

ClassNK establishes the Human Resources Development Center

ClassNK establishes a human resources development center to promote broad development of maritime human resources regardless of whether they are internal or external to ClassNK. The establishment of the center strives to be an efficient investment by combining internal education and training programs with those offered by ClassNK Academy to the public, thus managing the related services in a uniform way.

15 Jun.

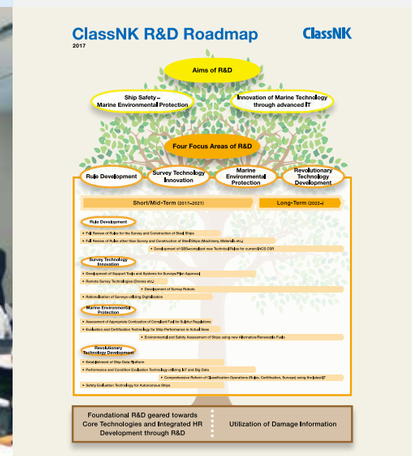
ClassNK introduces electronic certificate service "ClassNK e-Certificate"

ClassNK commences operation of the world's first comprehensive electronic certificate service for classification and statutory certificates starting on 15 June made first exclusively to Liberian-flagged vessels on the ClassNK register. ClassNK later expanded and made the service available to Panama, Singapore, and Marshall Island-flagged vessels beginning on 15 September. "ClassNK e-Certificate" reduces the workload on board and at shore by minimizing potential clerical errors and time-loss associated with paper burden.

Right: Mr. Masahiro Sagae (Executive Officer, Executive General Manager Lighting Application Division, Stanley Electric Co., Ltd.)
Left: Mr. Koichi Fujiwara (Chairman and President, ClassNK)

UKAS VERIFICATION

Left: Mr. Akira Hoshi (Director & General Manager of Engineering Department, Iino Marine Service Co., Ltd.)
Right: Mr. Toshio Koiwa (Director of Assurance Operations Division, ClassNK)



3 Jul.

ClassNK receives Clean Shipping Award at SeatradeAwards 2017

ClassNK receives the Clean Shipping Award for its efforts to support the industry's compliance to regulations on ship recycling. Its software solution "PrimeShip-GREEN/SRM" streamlining the process of developing and maintaining the Inventory of Hazardous Materials (IHM) has come into wide-spread use and has contributed for safe and environmentally sound practice of ship recycling.

28 Jul.

ClassNK issues EU MRV Monitoring Plan approval to Iino Marine Service Co., Ltd.

ClassNK issues approval certification to Iino Marine Service Co., Ltd. on successful assessment of an EU MRV Monitoring Plan for its chemical tanker "CHEMROAD WING" as an EU MRV verifier. The issuance of this approval certification is a first for ClassNK.

4 Sep.

ClassNK announces R&D Roadmap

ClassNK releases the R&D Roadmap, detailing the Class NK vision and goals for projects over the next five years. The R&D Roadmap outlines the two activities as the foundation of ClassNK R&D, and details investigations and research associated with core technologies which also contribute to the development of human resources for contributing maritime technology and engineering as a classification society and utilization of damage information to contribute to damage prevention.

26 Oct

ClassNK wins The Safer, Cleaner Seas Award at the Lloyd's List Asia Pacific Awards

ClassNK's highly praised efforts for issuing Statements of Compliance (SoC) in line with Hong Kong Convention to the ship recycling facilities in Japan, China, India and Turkey as well as providing the industry with IHM development and maintenance software led to reception of the reward as its activities have raised awareness and improved the standards for ship recycling.

Organization Profile

President & CEO, Representative Director
Koichi Fujiwara

Senior Executive Vice President,
Executive Director
Tetsuya Kinoshita

Senior Executive Vice President,
Executive Director
Junichiro Iida

Senior Executive Vice President,
Executive Director
Toshiyuki Shigemi

Executive Auditor
Michio Takagi

Reorganization of the Board of Directors

In March 2018 the senior management changes were made at the Board of Directors and Administrative Council Meeting.

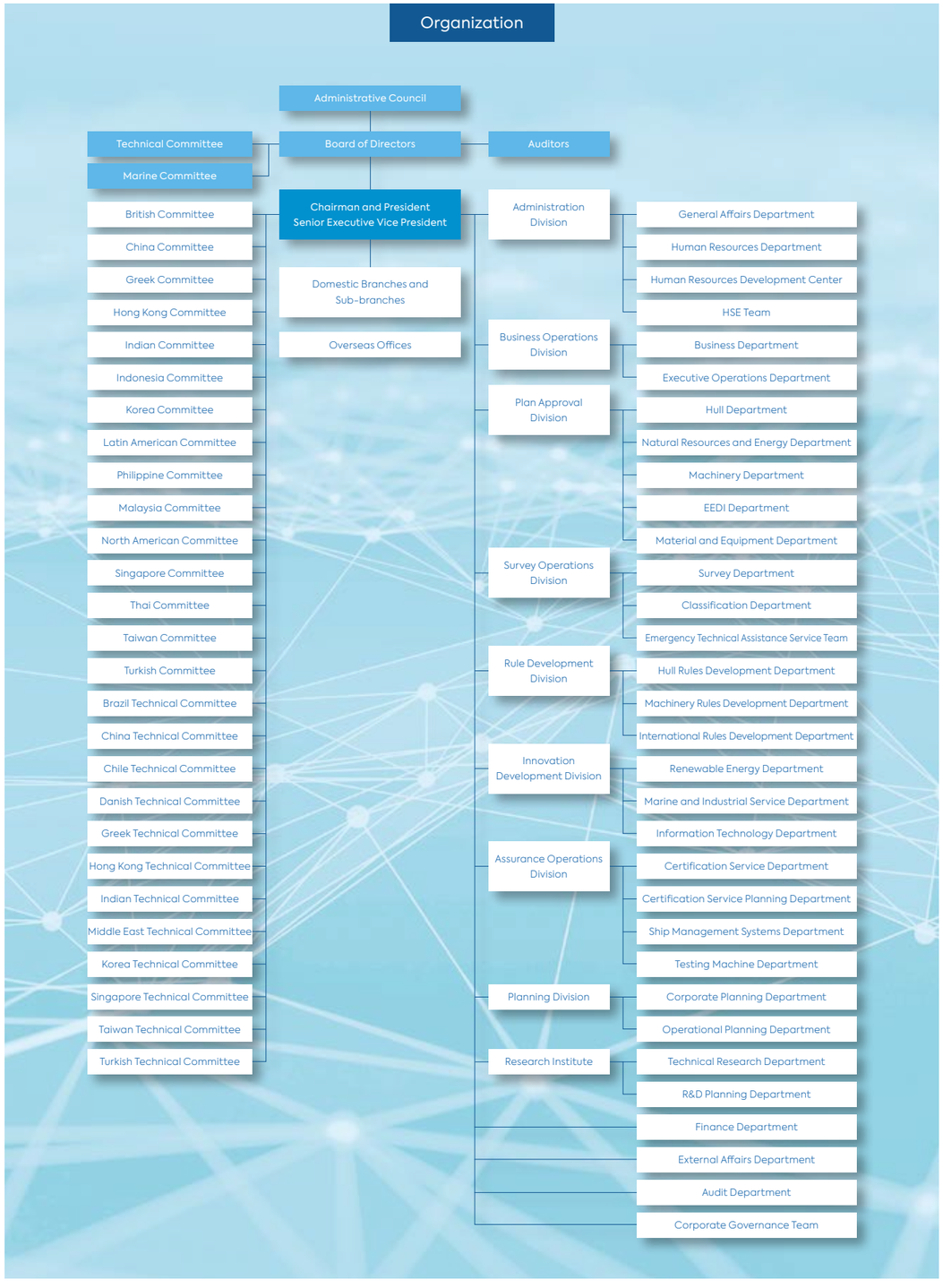
(Executive team as of March 2018)
President & CEO, Representative Director
Koichi Fujiwara
Senior Executive Vice President, Executive Director
Tetsuya Kinoshita
Senior Executive Vice President, Executive Director
Junichiro Iida
Senior Executive Vice President, Executive Director
Toshiyuki Shigemi

Michio Takagi was appointed to Executive Auditor of the Society.

Human Resources Development Center

ClassNK established the Human Resources Development Center on 1 April 2017, in order to promote widely the activity of human resources development in the marine industry. The Center will manage intensively the training services such as ClassNK Academy provided to relevant industries in addition to in-house training.

As of 31 March 2018



Worldwide Service Network

132 Locations

Exclusive Survey Offices

ClassNK is providing a broad range of services via its extensive worldwide survey network, with the number of exclusive survey offices totaling 132 locations around the world at the end of 2017. In addition to these offices, ClassNK also maintains six Plan Approval Centers located in the major shipbuilding regions of the world.

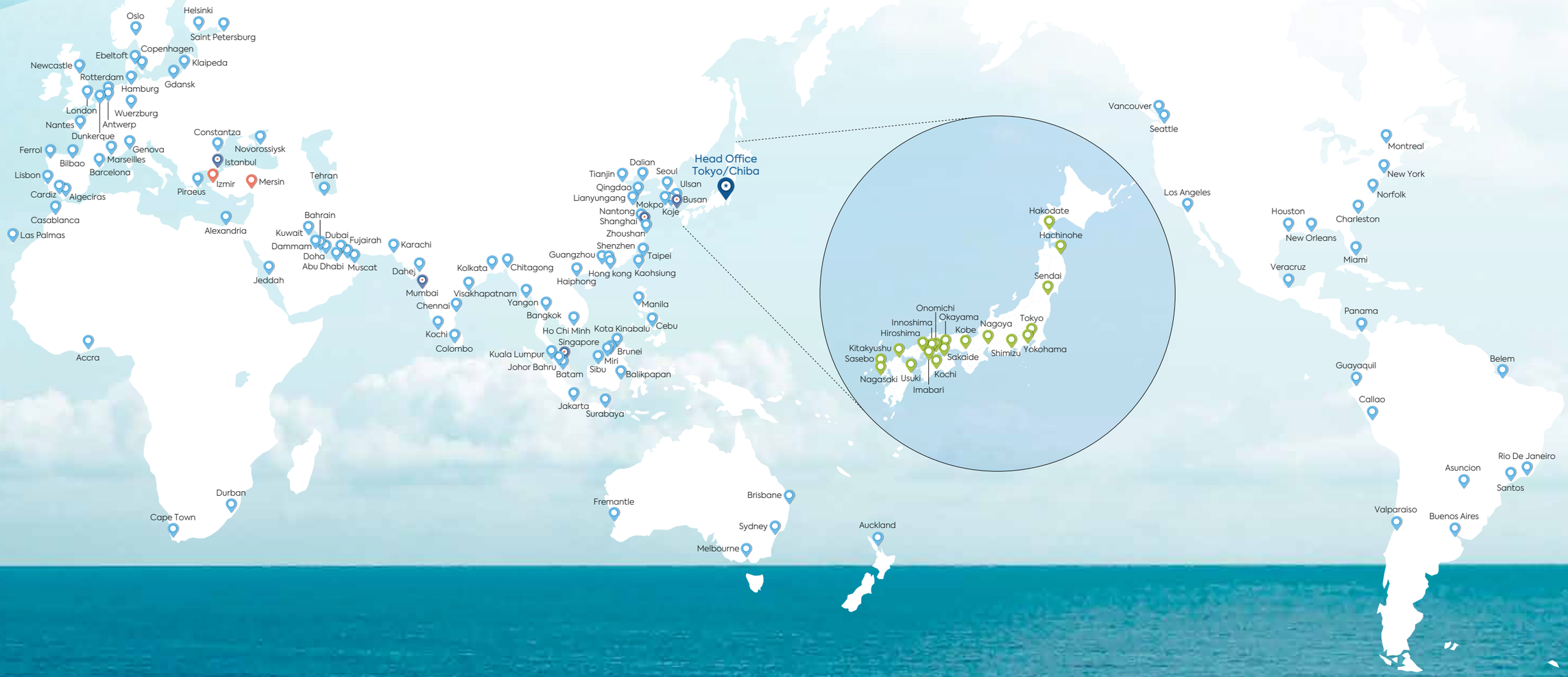
Offices with Plan Approval Center　Overseas Offices　New Exclusive Survey Offices　Offices in Japan

New offices opened in 2017

Jan.	Izmir (Turkey)
Jan.	Mersin (Turkey)

Plan Approval Centers

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

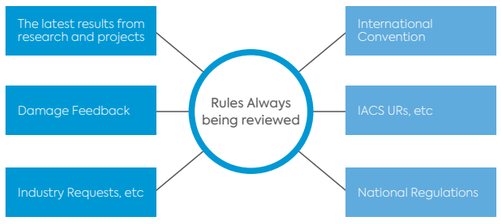


ClassNK in Action

ClassNK is continually expanding its service network, with 132 exclusive survey offices located in major port cities and maritime hubs across the world.
The ClassNK register saw the addition of 579 vessels totaling 15.6 Million gross tons during the period of 2017.
Going beyond traditional classification services, ClassNK is proactively responding to the needs of the industry through a range of technical services, certification services, renewable energy certification, and training.

Establishment and Amendment of Technical Rules

ClassNK is constantly revising its Rules and Guidance in order to reflect the latest results from relevant research and development projects, feedback from damage investigations, correspond to requests from industry as well as changes made to relevant international conventions, International Association of Classification Societies (IACS) Unified Requirements (URs), national regulations, etc. A total of 82 amendments were approved during 2017. This report will introduce some of the major amendments of the rules and the structural strength evaluation software developed in response to the rules in 2017.



Establishment and Amendments related to International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004

The International Convention for the Control and Management of Ships' Ballast water and Sediments, 2004 (BWM Convention, 2004) was adopted in February 2004 for the purpose of preventing the transfer of aquatic organisms and pathogens harmful to the environment, human health and economic activities, and it entered into force on 8 September 2017. ClassNK established the Rules and Guidance for Ballast Water Management Installations and amended the related rules and guidance in accordance with the above convention, IACS Unified Requirements, domestic laws and insights obtained from our experiences. These Rules and Guidance stipulate the requirements related to ballast water record book, sampling facilities, ballast water exchange, ballast water management system and ballast water management plan etc. Furthermore, ClassNK amended the Guidance for the Classification and Registry of Ships regarding the requirements of the Installations Character (BWM) given to vessels which meet the Rules and Guidance for Ballast water Management Installations.

Amendments related to Fuel Consumption Reporting

Amendments to the Annex VI to MARPOL Convention, which stipulates requirements related to energy efficiency for ships, were adopted in MEPC70 held in October 2016 to mandate reporting of fuel consumption of ships in service for in order to develop regulations for further reducing greenhouse gas emissions.
In line with the amended MARPOL Convention, ClassNK amended Rules for Marine Pollution Prevention Systems and related Guidance, etc. The major amendments were:
Specified that SEEMPs are to include the processes used to collect and report data related to fuel consumption; and
Specified that ships in service are to collect and report the data related to fuel consumption on a yearly basis as well as to keep on board Statements of Compliance issued after verification of the said data.

Major amendments in addition to the above are as follows:

- Torsional Strength of Container Carriers
- Incorporation of Material Factors for High Tensile Steel into Structural Strength Requirements of Floating Docks
- Measures for Steering Control System Failures
- Intermittent Power Demand of Motors for Steering Gear Power Units
- Marking of Safety Working Loads
- Maritime Labour Convention
- Welders and Welder Qualification Tests
- Testing Procedures of Watertight Compartments

More specific details about all of the amendments made during 2017 are available on the "Rule Amendments for Technical Rules" page of the ClassNK website for ClassNK "MyPage" account holders. Please refer to the ClassNK website for more information on how to register for a "MyPage" account.

Development of structural strength evaluation software

In recent years, as structural rules of ships are based on actual sea conditions, introduction of up-to-date analytical technology and sophistication of strength evaluation methods are progressing, and dedicated software that can efficiently examine these are indispensable for a ship's structural design.
Based on the experience of plan approvals so far and the latest information technology, ClassNK has developed the "PrimeShip-HULL" series of structural strength evaluation software corresponding to these rules, and released it for the designers who are planning to design ships registered with ClassNK.
Not only correspondences to the latest rule amendments, but also continuous functional improvements, including intuitive UI and effective use of CAD data etc., based on user demand have been carried out for the purpose of contributing to reduction of design workloads through software.

Major software released in 2017 are as follows:

- PrimeShip-HULL(Rules)/Harmonised CSR, Version 4:Rule calculation software version 4 corresponding to CSR BC&OT(functional improvement)
- PrimeShip-HULL(DSA)/Harmonised CSR, Version 4:Direct strength assessment software version 4 corresponding to CSR BC&OT(functional improvement)
- PrimeShip-HULL(Rules)/PartC15:Rule calculation software corresponding to chapter 15 of Part C (new development)
- PrimeShip-HULL(Rules) /for Container Carriers:Rule calculation software corresponding to chapter 32 of Part C(new development)
- PrimeShip-HULL(DSA) /for Container Carriers, Version 2:

Direct strength assessment software version 2 corresponding to chapter 32 of Part C(functional improvement)

A selection of newbuildings that registered with ClassNK in 2017

76,299gt VEHICLES CARRIER built by JAPAN MARINE UNITED CORPORATION ARIAKE SHIPYARD for MANATEE NAVIGATION S.A.

127,088gt LNG CARRIER built by KAWSAKI HEAVY INDUSTRIES, LTD. SHIP & OFFSHORE STRUCTURE COMPANY SAKAIDE SHIPYARD for TRANS PACIFIC SHIPPING 3 S.A.

22,987gt OIL/CHEMICAL CARRIER built by KITANIHON SHIPBUILDING CO., LTD. for BRILLANTE MARITIME PTE. LTD.

93,702gt BULK CARRIER built by IMABARI SHIPBUILDING CO., LTD. HIROSHIMA SHIPYARD for SEAVANCE SHIPPING S.A.

47,964gt LPG (LOW TEMP.) built by MITSUBISHI HEAVY INDUSTRIES SHIPBUILDING CO., LTD. for MARIASPES COMPANIA NAVIERA, S.A.

160,011gt OIL CARRIER built by JAPAN MARINE UNITED CORPORATION ARIAKE SHIPYARD for CC FUNDING CORPORATION

Class Surveys and Statutory Surveys

Class Surveys

Over the course of the year, ClassNK surveyors carried out a total of 16,496 classification surveys around the world. Of these, 552 were initial surveys, and 15,944 were class maintenance surveys.

Statutory Surveys

As of the end of 2017, ClassNK is authorized to carry out surveys and issue certificates in accordance with international conventions or domestic laws by more than 100 flag administrations around the world. In 2017, ClassNK carried out inspections and issued more than 42,000 statutory certificates based on these authorizations as follows:

- International Tonnage certificates: 890
- International Load Line certificates: 2,752
- SOLAS related certificates: 20,827
- MARPOL related certificates: 14,101
- Anti-fouling system certificates: 1,122
- International Ballast Water Management certificates: 3,004

ISM/ISPS Audits and MLC Inspections

Over the course of the year, ClassNK newly registered 49 companies and 769 ships in accordance with ISM requirements, bringing the total number of companies and vessels registered with ClassNK to 743 companies and 5,937 ships respectively. As of the end of 2017, ClassNK is authorized to conduct ISM audits on behalf of more than 80 administrations. ClassNK registered 753 ships to ISPS Code requirements during the year, bringing the total number of ships registered with ClassNK to 5,313. ClassNK currently conducts ISPS audits on behalf of more than 70 administrations.
ClassNK registered 725 ships to MLC requirements during the year, bringing the total number of ships registered with ClassNK to 5,262. ClassNK currently conducts MLC inspections on behalf of more than 60 administrations.

New services for incoming regulations

Over the past few years, the IMO has adopted a number of new conventions to address environmental issues facing the maritime industry, including the Ballast Water Management Convention and the Ship Recycling Convention. ClassNK offers a wide variety of certification services to support owners' efforts to achieve compliance with new regulations. In 2017, ClassNK issued numerous certificates or statements of compliance in accordance with new conventions, including the following:

- Ballast Water Management Systems: 321
- Ship Recycling Facility Plans: 4
- Inventory of Hazardous Materials: 299

Approval of manufacturers and service suppliers

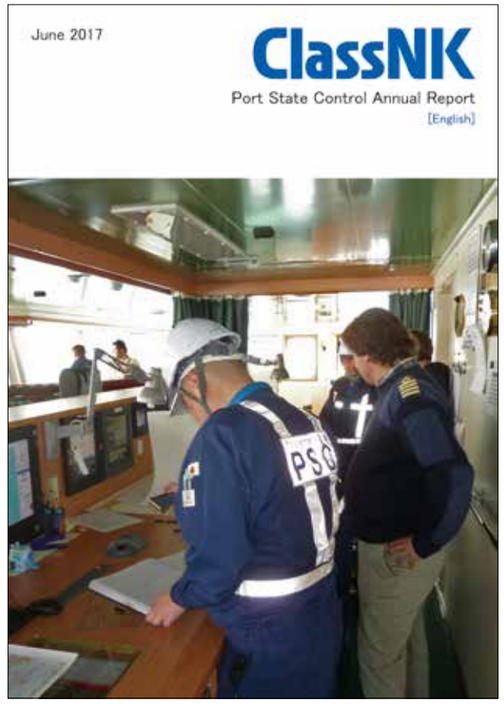
In addition to classification and convention related surveys, ClassNK also carries out audits and certifications for companies who provide testing and measurement services related to class and equipment maintenance surveys.
As part of these activities, ClassNK certified the following number of firms in 2017:

- Thickness measurements on ships: 26(252)
- In-water survey of ships: 44(289)
- Radio inspection services: 21(384)
- Voyage Data Recorders (VDR): 16(290)
- Maintenance of firefighting systems and equipment: 40(318)
- Maintenance of life saving equipment and appliances: 20(151)
- Tightness testing of hatches with ultrasonic equipment: 3(19)
- Testing of coating systems: 0(9)
- Services of lifeboats, launching appliances and on-load release gear: 35(229)
- Measurements of noise level: 1(2)

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

Port State Control (PSC)

As with previous years, the Society continues to work with the managers and owners of detained vessels to help improve ship conditions and increase safety awareness. ClassNK published its "Port State Control Annual Report 2017", a compilation and analysis of PSC related statistics for the previous year, and distributed it to ship owners, ship managers and other stakeholders.
ClassNK also published the "Good Maintenance onboard Ships (October 2017)", to further improve the quality and efficiency of maintenance onboard ships for PSC inspections.
In addition, senior ClassNK staff visited key maritime authorities around the world, including Beijing, Tianjin, Shandong and Qingdao Maritime Safety Administrations in China, Australian Maritime Safety Authority (AMSA), PSC Jakarta in Indonesia, United State Coast Guard (USCG) and PSC Novorossiysk in Russia during the course of the year. ClassNK also sent representatives to bilateral China-Japan and Korea-Japan meetings to discuss inspection related matters and present on ClassNK efforts being taken to reduce the detention ratio of ClassNK classed ships.



Port State Control Annual Report 2017


FORESTAL GAIA

40,350gt CHIP CARRIER built by TSUNEISHI SHIPBUILDING CO., LTD. for Tsubasa Ship Holding LLC


HIGH ADVENTURER

29,513gt OIL/CHEMICAL CARRIER built by ONOMICHI DOCKYARD CO., LTD.


HIROSHIMA STAR

43,019gt BULK CARRIER built by TSUNEISHI GROUP (ZHOUSHAN) SHIPBUILDING INC. for LUCRETIA SHIPPING, S.A.


IKAN KERAS

47,047gt BULK CARRIER built by SASEBO HEAVY INDUSTRIES CO., LTD. SASEBO SHIPYARD for WAKOH PANAMA S.A.


ISUZU MARU

56,825gt BULK CARRIER built by OSHIMA SHIPBUILDING CO., LTD. for MISUGA S.A.


KIRISHIMA

159,793gt OIL CARRIER built by MITSUI ENGINEERING & SHIPBUILDING CO., LTD. CHIBA SHIPYARD for ASIASHIP MARITIME S.A.

Technical Services

Condition Assessment Program (CAP)

During 2017, ClassNK issued Statements of Compliance to 45 vessels under its Condition Assessment Program (CAP). As of the end of 2017, the total number of Statements of Compliance issued by the Society for CAP stood at 468.

Emergency Technical Assistance Service (ETAS)

ClassNK's Emergency Technical Assistance Service (ETAS) is on call 24/7 to support the owners and operators of ships registered for this service in ensuring the safety of their vessels and minimizing the environmental impact if disaster should strike. In 2017, this team was called into action for 4 incidents related to maritime casualties to provide technical support. In 2017, 122 vessels newly registered for the ETAS service, bringing the total number of vessels registered for the service to 1,373.

Certification Services

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

Quality Management Systems – ISO 9001

In 2017, ClassNK certified a total of 11 organizations in line with ISO 9001, bringing the total number of organizations registered with the Society to 510.

Environmental Management Systems – ISO 14001

In 2017, ClassNK certified a total of 6 organizations in line with ISO 14001, bringing the total number of organizations registered with the Society to 140.

Occupational Health & Safety Management Systems – OHSAS 18001

In 2017, ClassNK certified a total of 3 organizations in line with OHSAS 18001, bringing the total number of organizations registered with the Society to 36.

Energy Management Systems – ISO 50001

In 2017, ClassNK certified a total of 5 organizations in line with ISO 50001.

Assessment and Verification based on EU MRV

In 2017, ClassNK started to provide services to assess Monitoring Plans (MP) based on the EU MRV Regulation.

Other Certification Services

ClassNK also provides certification services for the following fields:

- Maritime Education and Training
- Seafarer Recruitment and Placement Services
- Clean Shipping Index
- HSE (Health, Safety & Environment systems)
- Road Traffic Safety Management Systems (ISO 39001)
- Verification of Greenhouse Gas Emissions

Services for Renewable Energy Technologies

Certification for Wind Energy Technologies

ClassNK provides certification and classification for wind power generation systems such as large and small wind turbines, windfarm, floating offshore wind turbines and their supporting structures.
In 2017, ClassNK provided one type certification for a large wind turbine and seven type certifications for a small wind turbine. In regard to certifications for windfarms by large wind turbines (certification required to obtain license and approval as specified in Electricity Business Law of Japan), ClassNK issued 22 certifications for onshore windfarms in 2017. One certificate was issued for a floating offshore wind turbine and its supporting structure, which was registered as a classification vessel.

FUKUSHIMA HAMAKAZE Photos by ClassNK

Certification for Marine Renewable Energy Technologies

ClassNK provides a variety of certification services for marine renewable energy power generation systems that utilize wave, tidal, ocean current and ocean thermal energy. In 2017, ClassNK provided one prototype certification for an ocean current power generation system.

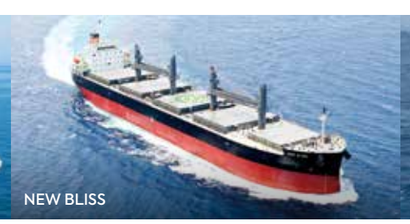
Source: IHI Corporation KAIRYU as part of a NEDO project

Marine Warranty Surveys

A Marine Warranty Survey (MWS) is the third party surveillance of marine operations which is often requested by re-insurance underwriters in order to ensure that offshore marine operations such as the installation and transportation of wind turbines and offshore sea structures, and the laying of cables etc. are being carried out safely and reliably.
In 2017, ClassNK was newly approved as a Marine Warranty Surveyor by a major reinsurance company and acquired a cumulative total of three approvals.

107,753gt BULK CARRIER built by NANTONG COSCO KHI SHIP ENGINEERING CO., LTD. for KUMIAI NAVIGATION (PTE) LTD

43,368gt BULK CARRIER built by SANOYAS SHIPBUILDING CORPORATION MIZUSHIMA SHIPYARD for SUNDIA ONE SHIPPING S.A.



31,898gt BULK CARRIER built by OSHIMA SHIPBUILDING CO., LTD. for CECO MARITIME S.A.

107,440gt BULK CARRIER built by IMABARI SHIPBUILDING CO., LTD., SAIJO SHIPYARD for NS United Kaiun Kaisha, Ltd.

144,277gt CONTAINER CARRIER built by JAPAN MARINE UNITED CORPORATION, KURE SHIPYARD for WAKABA SHIP HOLDING S.A.

45,652gt VEHICLES CARRIER built by SHIN KURUSHIMA DOCKYARD CO., LTD. for Atlantic Lease Co., Ltd.

Educational and Training Services

ClassNK Academy

ClassNK Academy was established in 2009 to provide the necessary basic knowledge to those involved in the shipbuilding, maintenance and transport industries. ClassNK Academy has been held actively since then and more than 2400 participants around the world took part in courses in 2017. Courses offered during 2017 included:

[Courses Related to Newbuildings]

- Classification Societies and Statutory Issues Course
- New Shipbuilding Course (Hull)
- New Shipbuilding Course (Machinery & Electrical Installations)
- Material and Welding Course

[Courses Related to Existing Ships]

- Damage (Hull) Course
- Damage (Machinery and Electrical Installations) Course
- Safety Equipment Course
- Port State Control (PSC) Course

[Courses Related to Ship Management]

- Incident Investigation & Analysis Course
- Risk Management Course
- ISM Internal Audits Course

ClassNK Technical Seminars

ClassNK holds technical seminars around the world to provide maritime experts with a wide-range of information about recent technology and technical findings in addition to the latest trends for Class rules. The technical seminars have a high degree of usability for the global maritime industry.
The following are just some of the presentations held by ClassNK at Technical Seminars in 2017:

[ClassNK Technical Seminars (June)]

- Outlines of ClassNK R&D Activities
- Development and Amendment of the Rules & Guidelines for Hull Structural Strength Assessment - Basic concept on the Rules for Structural Strength -
- Global Sulphur Cap from 2020 and Technical Measures (SOx Scrubber, etc.)
- Joint Research Initiatives into the Code on Noise Levels On Board Ships
- Recent Topics at IMO

[ClassNK Autumn Technical Seminars (November)]

- Amendments to Rules and Guidance
  - Outline of establishment, revision and abolition of rules
  - Amendments to Class Rules and Guidance for the Survey and Construction of Steel Ships
    - Engine and Electrical Installations
    - Equipment
    - Hull and Materials
    - Recent Topics on IACS Environmental/Machinery/Safety/Survey/Hull/Cyber Systems Panel
- Latest trends on international conventions
- HSE ~Implementation through the collaboration between design and ship-building stages~
- ClassNK's Digitalization ~Digital-transformation~

[Overseas Technical Seminars]

ClassNK holds regular technical seminars around the world to provide in-depth information on incoming regulations, and introduce the latest technologies and technical findings to its clients and maritime stakeholders. The seminars aim to deliver practical information on a wide range of topics in line with the needs of each country.
The following are just some of the presentations that were carried out in 2017:

- Recent Topics at IMO and IACS
- Latest PSC Trends and ClassNK Activity
- Global Sulphur Cap from 2020
- Maritime Cyber Assurance – ClassNK's initiatives

[Primemanagement Seminars]

ClassNK has been providing its integrated PrimeManagement System for management system certifications (ISO etc.), training course certification and certification for ISM Code among others since 2011.

Training upon requests of external organizations

In 2017, ClassNK conducted the following training upon the request of external organizations:

- "Case Studies of Ship Damage and Lessons Learned" at Innoshima Technical Center
- Part of "SOLAS / MARPOL / Ballast Water Management conventions and newbuilding surveys" for government officials gathered to JICA group training course for "Ship Safety" held by the Shipbuilding Research Centre of Japan
- "The activities of classification societies, and the management and inspection of welding" at the Eastern Japan Training Center for Shipbuilding Skills
- Providing the lecture about classification societies upon the request of graduate school of WASEDA university.
- "Ship maintenance management/Ship building 1" for ship inspectors of Maritime Safety Authority of Fiji upon the request of JICA.
- "Outline of ClassNK's activities and its certification services for Maritime Labour Convention" upon the request of the Ministry of Health, Labor and Welfare, Yokohama Quarantine Station as part of its training ship hygiene inspections

Internal Auditor and Surveyor Training

ClassNK conducts regular training in order to ensure that its surveyors and auditors can provide services to meet the diversifying needs of its customers. ClassNK conducted the following training in 2017:

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

46,884gt LPG (LOW TEMP.) built by KAWASAKI HEAVY INDUSTRIES, LTD. SHIP & OFFSHORE STRUCTURE COMPANY KOBE SHIPYARD for KUMIAI NAVIGATION (PTE) LTD

43,067gt BULK CARRIER built by TSUNEISHI SHIPBUILDING CO., LTD. for RICH OCEAN SHIPPING INC.

122,694gt ORE CARRIER built by IMABARI SHIPBUILDING CO., LTD. HIROSHIMA SHIPYARD for Mitsui O.S.K. Lines, Ltd.

75,044gt VEHICLES CARRIER built by SHIN KURUSHIMA DOCKYARD CO., LTD. for SIRIUS HIGHWAY SHIPPING (MARSHALL) INC.

ClassNK in Research

In order to fulfill its mission of protecting life, property at sea and the maritime environment, and contribute to the maritime industry, ClassNK carries out R&D related to classification as well as activities based on our role as a member of the maritime community.

R&D Roadmap Schedule

The "ClassNK R&D Roadmap 2017", which was established in July 2017, aims to bring about the innovation of maritime technology using the latest IT as well as help ensure the safety of life and property at sea, with specific focus on development in the following four areas:

- Rule Development
- Survey Technology Innovation
- Marine Environmental Protection
- Revolutionary Technology Development The R&D activities of the above are based on the following two major elements.
- Foundational R&D geared towards Core Technologies* and Integrated HR Development through R&D
- Utilization of Damage Information for Major Damage Prevention

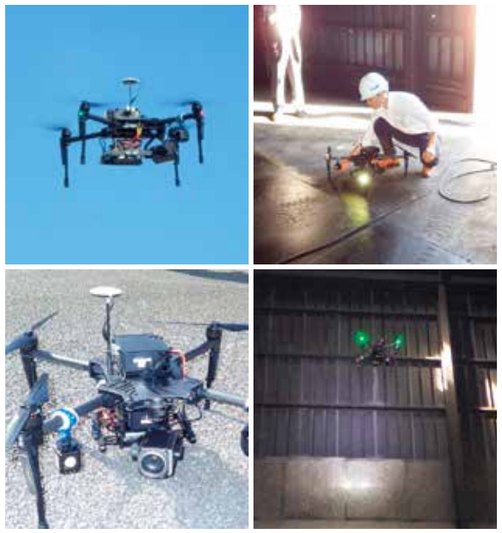
*The five Core Technologies are: Structure; Motion, load; Material, welding; Information, control, communications, electronics; and Energy, environment.

The following are the main initiatives from these R&D activities for the 2017 fiscal year.

Investigation of drone use in vessel surveys

Drone technology is improving at a rapid pace. Specifically, with the dramatic improvement of operability and reduction in price in recent years, drones are expected to play a major role in a diverse range of fields. Many sides have also expressed their expectations for drones to be used in the inspection and survey processes for vessels.
There are ongoing discussions at the IMO regarding the use of drones and other Remote Inspection Technics (RIT) in vessel surveys, with IACS Rec.42 (Guidelines for Use of Remote Inspection Technics for surveys)being amended in June 2016, and now comprehensive revision of the related URs (uniform rules) is taken place.

This investigation will employ the use of general retail "hobby drones" to confirm basic functionality through flight experiments, as well as "industrial drones" to perform internal inspections of tanks. This will ascertain what preparations will be needed in order to use drones in surveys, with the findings of the investigation to be used in the development of relevant guidelines.



Investigation into safety of autonomous and automatic vessels

The rapid development of data transmission technologies such as IoT and AI are paving the way for safer, more reliable and more efficient seaborne transport through the realization of autonomous and automatic vessels. With the diverse range of design concepts expected to be proposed for autonomous and automatic vessels, the Society is carrying out an investigation into the functional requirements to safeguard these vessels and enable it to provide Approval in Principle for design concepts which meet the standard. Specifically, we aim to publish guidelines for automatic and autonomous operations, and set technical requirements for each level of automation and autonomy, design approval procedures, as well as risk assessment etc. of automatic and autonomous vessels.

Copyright©2017 Japan Ship Technology Research Association All Right Reserved

Joint R&D in Industry

Joint R&D for industry program began in 2009, which chose subjects that would contribute to the development of the maritime industry. At the end of 2017, 361 projects had been completed as part of ClassNK's joint R&D for Industry Program". In 2017 alone, 59 projects in various fields were completed, some of which are introduced below.

National project on utilization of IoT for maritime industry

Japan's Ministry of Land, Infrastructure, Transport and Tourism is encouraging productivity revolution in the marine industry, called i-Shipping. As part of its actions, it has defined seven projects for the research and development of IoT-based technologies to help improve marine safety, to be subsidized under the Support Program for Research and Development of Advanced Safety Ship Technology.
ClassNK participates as a joint researcher in all seven projects and provides appropriate support from the standpoint of a third party ship classification society.

- A Study on the Determination of Ship Collision Risk and Autonomous Shipping
- Development of a system for the automated observation and transmission of marine weather data
- Improvement in analytical accuracy with the automatic correction of the ship characteristics model and application to safe operations
- Research and development of a technology supporting safety in LNG transport with the use of communication between ships and land
- Research and development concerning hull structure health monitoring for large container ships
- Development of a method of preventing accidents at ship engine plants with the use of Big Data for improving safety and economic efficiency
- Research and development for the introduction of IoT to deck machinery on cargo carriers and bulk carriers
- Automatic Reporting system of Weather Observations for Ships

ClassNK in International Affairs

ClassNK maintains active engagement with various organizations in the international maritime industry. ClassNK is an active member of the International Association of Classification Societies (IACS) and played a key role in the development of the Unified Requirements.

International Maritime Organization (IMO)

As one of its many important international activities, ClassNK contributes to the International Maritime Organization (IMO) on a wide range of technical issues. In 2017, the Society attended the IMO meetings listed to the right as part of the Japanese Government delegation or as a representative of the International Association of Classification Societies.
Information regarding decisions on amendments to Conventions at the major IMO meetings such as Maritime Safety Committee (MSC) and the Marine Environment Protection Committee (MEPC) are regularly provided to ClassNK clients via email and are also uploaded to the IMO International Convention Calendar on the ClassNK website.

4th	Session of the Sub-Committee on Ship Design and Construction
4th	Session of the Sub-Committee on Human Element, Training and Watchkeeping
4th	Session of the Sub-Committee on Pollution Prevention and Response
4th	Session of the Sub-Committee on Ship Systems and Equipment
71th	Session of the Marine Environment Protection Committee
98th	Session of the Maritime Safety Committee
4th	Session of the Sub-Committee on Implementation of IMO Rules
4th	Session of the Sub-Committee on Carriage of Cargoes and Containers

International Association of Classification Societies (IACS)

Technical matters associated with the development and revision of Unified Requirements (UR) and Unified Interpretations (UI) are conducted by six Panels (Hull, Machinery, Safety, Environment, Survey and Cyber Systems) and the Project Teams under their control. In 2017, ClassNK staff served as the Chair of the Expert Group on IMO Goal Based Standards (GBS).
ClassNK, as the Chair of the Expert Group on IMO Goal Based Standards (GBS), led the activities on finalizing IACS Corrective Action Plans for IMO GBS Audit findings or communicating with IMO Secretariat and IMO GBS Audit Team for the smooth conduct of the audit.
ClassNK participated in the following IACS meetings in 2017 listed below:

Council Meetings	twice
General Policy Group Meetings	twice
Steering Committee Meeting (Strategy of IACS)	once
Quality Committee Meetings	twice
Small Group Meetings (Quality Policy)	once
Expert Group Meetings (EU, Law, Material and Weldings, etc.)	5 times
Panel Meetings (Hull, Machinery, Safety, Environment, Survey, Cyber Systems)	12 times
Project Team Meetings (CSR Maintenance, etc.)	10 times
IACS/Industry Technical Meeting on the Rule Change Proposals for IACS CSR BC & OT	twice

Association of Asian Classification Societies (ACS)

The Association of Asian Classification Societies (ACS) was formed in 2010, following nearly two decades of informal meetings between its members. In 2017, ClassNK led ACS technical activities by serving as the chair of the Environment Working Group and developed the ACS own Guidelines. Furthermore, ClassNK also contributed to ACS independent Technical Seminar, and endeavored to strengthen the relations with Asian maritime organizations. ClassNK participated in the following meetings in 2017:

15th	Technical Management Group Meeting
6th	Technical Seminar
16th	Technical Management Group Meeting
25th	Executive Committee Meeting

ClassNK R&D Roadmap 2017

The “Advancement in R&D Activities” was detailed as one of the basic strategies of the ClassNK Mid-Term Plan (2017~2021) established in September 2016. Based on this policy, the ClassNK R&D Roadmap was established in July 2017 to set out the Society’s long-term vision on R&D activities, as well as define the direction of these activities.

Two activities and four basic themes to support R&D activities

The R&D activities of “ClassNK Roadmap 2017“ are based on the following two foundational elements, which are being carried out with regard to the constantly changing environment:

- Foundational R&D geared towards Core Technologies* and Integrated HR Development through R&D
- Utilization of Damage Information for Major Damage Prevention

*The five Core Technologies are: Structure; Motion, load; Material, welding; Information, control, communications, electronics; and Energy, environment.

Based on these foundational activities, ClassNK is carrying out R&D based on the following four major themes:

- Rule Development (rationalization of existing rules, increased transparency/rationalization of new rule development)
- Survey Technology Innovation (revolutionizing surveys through high level ICT technologies, development of remote survey technologies and survey robots)
- Marine Environmental Protection (investigation trends in environmental regulations, developing evaluation and verification techniques for environmental protection technology)
- Revolutionary Technology Development (innovation of marine technology through digitalization, developing evaluation and verification techniques for revolutionary technologies)

ClassNK will collaborate with universities, research institutions, and the industry to execute the R&D Roadmap together with contributions from the further development of human resources. Through this R&D, ClassNK aims to bring about the innovation of maritime technology using the latest IT based on its mission to help ensure the safety of life and property at sea.

R&D plan based on ClassNK R&D Roadmap

The ClassNK R&D Roadmap aims to bring about the innovation of maritime technology focus based on the four main themes previously described. The following is an outline of the R&D activities being carried out under these four major themes.

Rule Development

From 2017 until 2021, ClassNK will carry out a full review of Rules and Guidance for the Survey and Construction of Steel Ships (Part C) in relation to hull structure strength over the course of five years. R&D will be conducted in the following areas:

- Quantitative evaluation of effect of ship handling in actual seas under structural load evaluation loads
- Building tank test benchmark data for wave load analysis code verification
- Development of rationalized fatigue strength evaluation methods
- Advancement standards for fracture toughness of ultra-thick plate welding joints and brittle crack arrest designs.

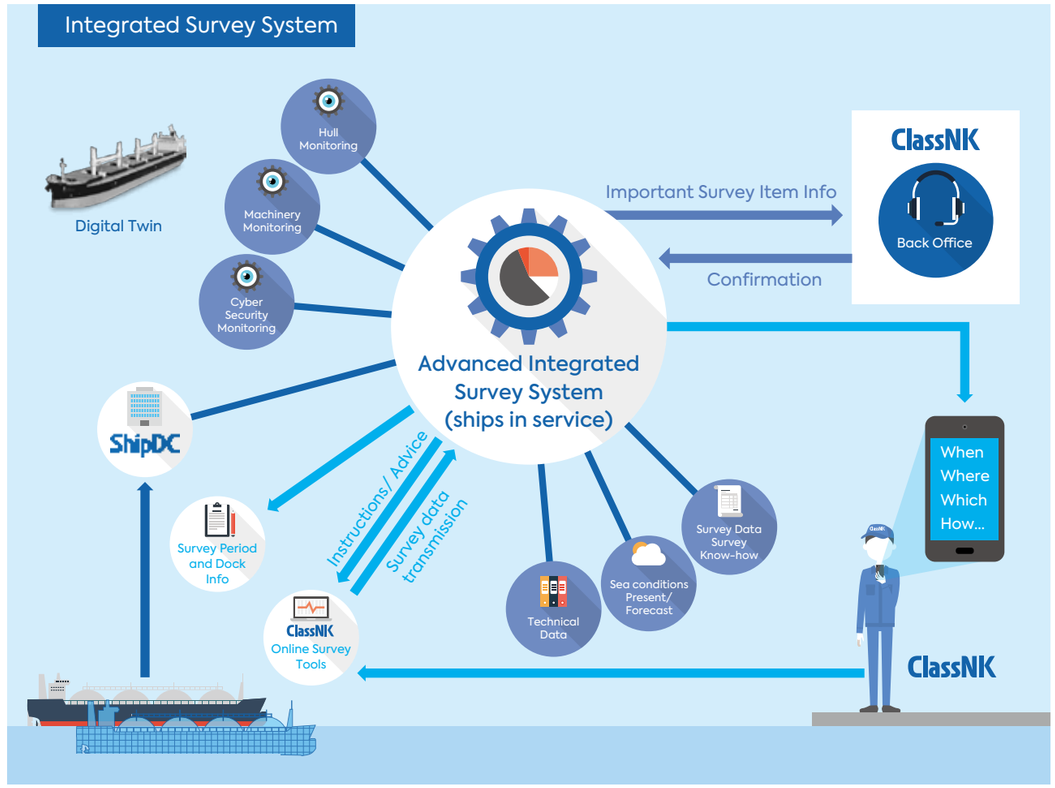
ClassNK is also carrying out R&D into hull structural strength evaluations based on reliability methods as part of its efforts towards the advancement of Goal Based Standards (GBS) in the IACS Common Structural Rules (CSR).

Survey Technology Innovation

High level information and communication technologies such as IoT, big data and AI are advancing at a rapid pace. ClassNK will utilize these technologies in survey process to offer an even higher level of quality and rationality. Developments will focus specifically on the following:

- Investigation into application of drone technology in vessel surveys
- Development of remote survey technologies
- Development of survey drones
- Advanced vessel surveys utilizing ICT (development of integrated survey system)

We are aiming to release guidelines for the use of drones in vessel surveys during 2018.



Marine Environmental Protection

In light of the incoming SOx emission regulations in 2020, an investigation into the development and application of analysis methods for the combustibility of low sulphur fuels and a mechanism to prevent combustibility deterioration will be carried out, and the results will be compiled into a new set of guidelines. ClassNK will also act as an independent verifier for the performance evaluations and verification methods for the "Performance Evaluation Project for Ships in Actual Seas, a joint maritime cluster research project.

Revolutionary Technology Development

We are advancing with the development and provision of the following revolutionary technical services through the application of digital technology and other information and communication technologies:

› Digitalization (including data collection and copy) of design/ construction, and related technical services
› Digitalization (including data collection and copy) of operations, maintenance/management, surveys, and related technical services
› Development of technical services for vessel big data utilizing IoS

ClassNK subsidiary Ship Data Center Co. Ltd. (ShipDC) will be used as a hub for Internet of Ships (IoS) by providing an open platform as a foundation for the industry's vessels data. This is one example of our contribution to the innovation of maritime technology.

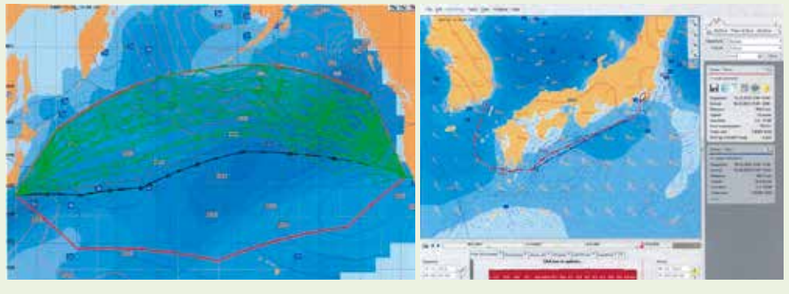
In regards to autonomous and automatic vessel technology, ClassNK established technical requirements for each level of automation and autonomy, and released relevant guidelines in March 2018.
ClassNK will carry out investigative research on foundational technology and develop safety evaluation technology for seafloor resources such as methane hydrate and hydrothermal deposits.
ClassNK will collaborate with universities, research institutions, and the industry to execute the R&D Roadmap together with contributions from the further development of human resources.
Through these R&D activities, ClassNK strives to fulfill its obligation as a classification society to help ensure ship safety and protect the marine environment, as well as provide an even greater level of service to the industry.

Digital twin

ClassNK-NAPA GREEN

PLAN
MONITOR
FOLLOW-UP

Weather routing



- Optimizing Route and Speed using Ship"specific Performance Model"
- Weather and Sea current forecast
- Requred COST and TIME always checked
- Re-optimizing during voyage
- Just-in-time operation / Virtual Arrival

ClassNK R&D Roadmap

2017

ClassNK

Introduction of “ClassNK e-Certificate”

The digitalization wave is rapidly advancing in every industry and the maritime industry is no exception. We are focusing on various kinds of software development and on providing service for the improvement of our clients’ productivity. Here we will introduce “ClassNK e-Certificate”, one of our main digitalization initiatives for FY2017.

“ClassNK e-Certificate” Electronic Certificate System The first classification Society to implement a comprehensive electronic certificate service.

ClassNK commenced operation of the world’s first comprehensive electronic certificate service for classification and statutory certificates on 15 June 2017. The ClassNK e-Certificate service was first made available to Liberian-flagged vessels on the ClassNK register exclusively. The scope of the service was expanded on 15 September 2017 to include more flag states.

ClassNK e-Certificate Merits

ClassNK e-Certificate is an optional service for issuing class and statutory certificates in electronic format (PDF) to vessels who apply for use of the service.
No extra fee is charged for using the e-certificate service, except for the issuance of certificate(s) and Flag Surcharge fees (Panama etc.).

- Reduces administrative burdens/costs (shipping/preservation of documents)
- Averts the risk of lost papers.
- Certificates can be easily updated, amended and endorsed online.

What is an e-Certificate?

Electronic Certificate (e-Certificate) is a certificate issued in electronic format (PDF) that reduces the administrative burden onboard ships. The IMO has issued “GUIDELINES FOR THE USE OF ELECTRONIC CERTIFICATES (FAL.5/ Circ.39/Rev.2)” to facilitate the use and acceptance of electronic certificates.

IMO FAL Guideline Requirements (Summary)

ClassNK e-Certificate fulfills the following IMO FAL guidelines.

- Conformity with international convention formats
- Protection against falsification
- Use of a unique tracking number
- Use of a printable/visible symbol
- Use of a secured online verification site (*conforming to ISO/IEC27000)
- Conformity with ISM codes
- Use of electronic signatures approved by flag states
- Verification of certificate validity (including endorsements)

Scope of ClassNK e-Certificate

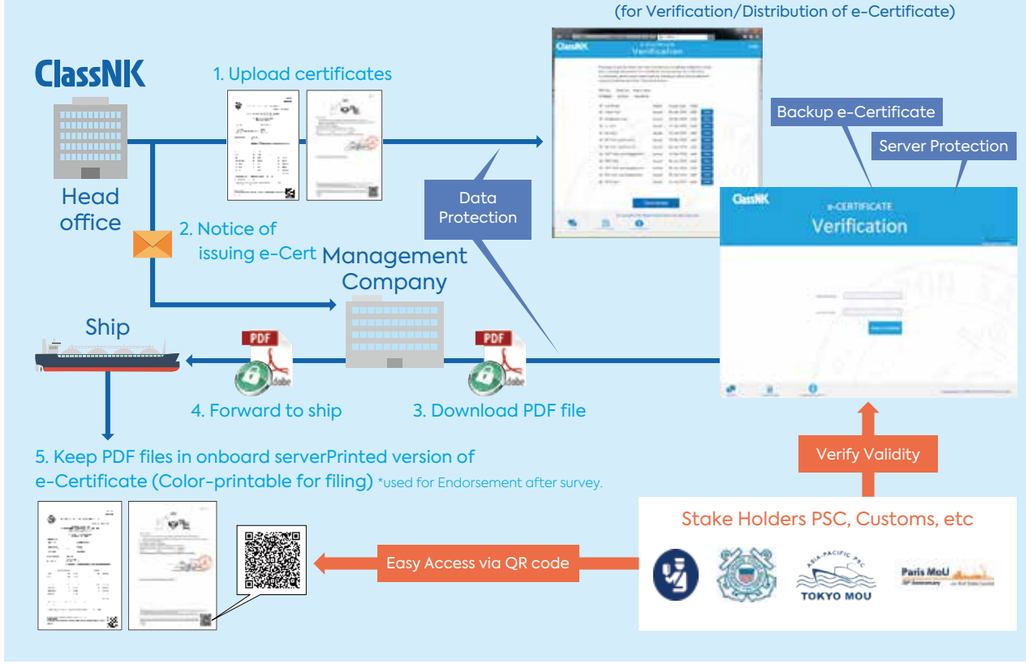
The issuance of electronic certificates has been authorized by many flag state administrations.

- Class/Installation Certificate (Final)
- Statutory Certificates (Final)

LL, SOLAS, MARPOL, ISM, ISPS, MLC, AFS, BWM, GAS, Chemical, DG etc.

*(Interim/Conditional certificates are issued on paper).

Outline of ClassNK e-Certificate



ClassNK e-Certificate Security Measures

The following security measures are being taken to ensure the reliable use of ClassNK e-Certificate:

Data Protection through encryption

E-Certificate files (PDF files) are uploaded/ downloaded through secured protocol (SSL)

Server Protection

- Surveillance and monitoring of unauthorized access and cyber-attacks
- A Redundant server will be added to enhance availability of the Online Secure Server

File Backup

E-Certificate files are backed up and stored in a server apart from the Online Server

For Details and How to Apply

For further ClassNK e-Certificate details and to apply, visit our web service portal at
http://www.classnk.or.jp/hp/ja/activities/portal/e-cert.html
For related inquiries contact: nkecert@classnk.or.jp

Introduction of a New Convention

This section describes the newly enforced convention in an easy-to-understand way. On 8 September 2017 the Ballast Water Management Convention (BWMC) went into effect. The convention requires ships engaged in international voyages to install Ballast Water Management Systems (BWMS) until the implementation deadlines set by IMO. And the convention requires exchange ballast water until the implementation deadlines of BWMS installation.

About Ballast Water Management Convention

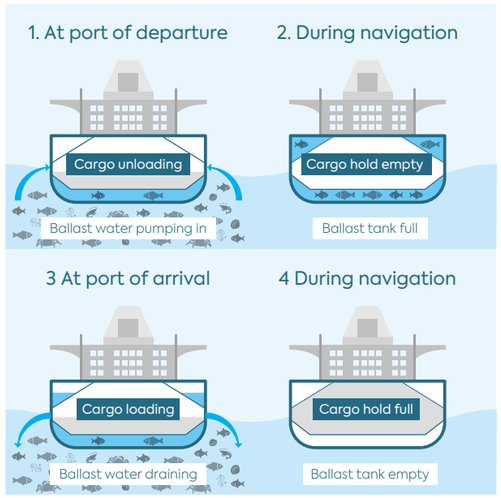
The convention was adopted for the purpose of preventing the transfer of aquatic organisms and pathogens harmful to the environment, human health and economic activity, emitted from vessels carrying ballast water engaged in international voyages. The convention also requires all ships carrying ballast water which are engaged in international voyages to gradually phase in the installation of Ballast Water Management Systems (BWMS) which satisfy relevant ballast water exchange standards, carry approved ballast water management plan, and appropriately maintain ballast water record book.

Background

According to IMO reports, ships carry some 3 billion tons to 5 billion tons of ballast water globally each year. In 2004, the IMO developed and adopted “The International Convention for The Control and Management of Ships Ballast Water and Sediments, 2004” (Ballast Water Management Convention) with the aim of protecting the marine environment from the transfer of harmful aquatic organisms in ballast water carried by ships.

Transfer of aquatic organisms etc. through ballast water

“Ballast water” means water with its suspended matter taken on a ship for its stability and control.
A ship unloading cargo at its port of departure pumps in aquatic organisms and suspended matter along with ballast water of the surrounding area and departs. When draining ballast water in order to load more cargo onto the ship at the port of destination, the ship ends up draining the aquatic organisms along with the ballast water from the port of departure.



Transfer of aquatic organisms through ballast water
Source: Ministry of Land, Infrastructure, and Transport translated by ClassNK (http://www.mlit.go.jp/kisha/kisha04/10/100216_.html)

The 10 aquatic organisms with the most influence on the environment to date

The following table outlines the major examples of aquatic organisms which were transferred through ballast water and had negative influences on the environment of the destination.

Species	Mitigation Areas	Influence
Daphnia	Black Sea → Baltic Sea	Impact on fishing industry due to reproduction
Mitten Crab	North Asia → West Europe, Baltic Sea, North American West Coast	Disruption of ecosystem
Red Tide Plankton	Various areas → Various areas	Impact on fishing market,coastal pollution
Goby	Black Sea → Baltic Sea, North America	Disruption of ecosystem
Crab	Europe → South Australia, South Africa, US, Japan	Extermination of indigenous crabs
Vibrio Cholerae	Unknown → South America, Gulf of Mexico	1 million people in South America infected in 1991, 10 thousand people dead
Ctenophore	US East Coast → Black Sea	Zooplankton devoured and fishing industry harmed
Starfish	North America → South Australia	Scallops and oysters devoured
Zebra Mussel	East Europe → West Europe, North Europe, US East Coast	Blockage of factory floodgates, US economic loss of 1 billion USD over 12 years starting in 1989
Seaweed	North Asia → South Australia, US West Coast, Europe	Disruption of ecosystem, harm to shellfish cultivation

The 10 aquatic organisms with the most influence on the environment to date
Source: Ministry of Land, Infrastructure, and Transport translated by ClassNK (http://www.mlit.go.jp/kisha/kisha04/10/100216_.html)

What is a Ballast Water Management System?

A “Ballast Water Management System” is a system that removes or detoxes harmful aquatic organisms and pathogens found in ballast water through mechanical, physical, chemical, and biological processes or through a combination of these.
In general, ballast water taken in from the outside of the ship gets sent by the ballast pump to a physical treatment filter that eliminates organisms and waste larger than 50μm. Afterwards, chemical or biological processes kill any organisms that were not able to be removed by the filter and the treated water gets injected into the ballast tank.

ClassNK-PEERLESS

ClassNK-PEERLESS is a fee-based software program that allows users to dramatically shorten the design process for installing ballast water management systems on existing vessels. Factors such as lack of engine room space and complicated piping make installing ballast water management systems on existing vessels a difficult process. ClassNK-PEERLESS uses data gathered from 3D laser scanners to create highly accurate 3D models, greatly simplifying the process to cut down on design lead times.

Corporate Governance

As a third party organization, we carry out our services from a fair and just perspective in accordance with laws and without deviation from societal norms. Additionally, we strive to contribute to the development of society through our services and to establish a fair workplace with healthy business relations.

Establishment of an Internal Control System

The Society prepares an Internal Control System in order to ensure that the director carries out duties that conform to laws and Society's Articles of Incorporation and that all other conducted business practices are appropriate.
Related measures in Japan taken in 2017 are outlined below.

- Established and informed all staff of the Internal Control Manual for constructing, implementing, maintaining and continuously improving internal control.
- Assessed and analyzed risk factors that are estimated to greatly influence the management of The Society.
- Reviewed the managerial methods of the Board of Trustees and Board of Directors in order to construct and manage a system which ensures that the director's duties are carried out efficiently.
- Established and informed all staff and group companies of a compliance manual which describes the code of conduct designed for accomplishing ClassNK's vision/management principles and Mid-Term Plan.

Notwithstanding the above, informed all overseas staff and overseas group companies of the Compliance Manual.

We will continue constructing a risk management system for all internal control system maintenance, operational evaluation, and business processes.

Health, Safety and Environmental Policy (HSE)

As an international classification society providing services to ensure the safety of life and property at sea and to promote the protection of the marine environment, ClassNK considers health, safety and environment to be of the utmost importance. We have established the "Health, Safety and Environmental Policy" designed to ensure the health and safety of all employees and to protect the marine environment. In order to implement this policy effectively, we have established the Occupational Health and Safety (OH&S) Manual, began operating it in Japan in January 2017, and have continued to manage and improve our occupational health and safety performance.

We promoted the safety of all employees by implementing the following activities in 2017:

- Improvement of employee safety awareness by sharing identified hazards in the workplace and their risk assessment results with all survey offices.
- Promotion of accident prevention by sharing information with all survey offices on accidents/near-miss incidents and cautions in the workplace.
- Advancement of employee safety knowledge through education of occupational health and safety.

In 2018, we will continue to promote our health and safety performance by operating the OH&S Manual in all survey offices. Furthermore, we strive to continually improve our health and safety performance and to further enforce safety in the workplace for all employees through efforts such as safety education, and incident reporting.

ClassNK

Health, Safety & Environmental Policy

General Policy

Nippon Kaiji Kyokai (ClassNK) is committed to placing utmost priority on ensuring the health and safety at work of all employees, and managing and continually improving our health and safety performance with the overall goal of no injury and ill health.
We also contribute to social development through the protection of the marine environment as an international classification society.

Strategies

To fulfill this policy, we will

- give our consideration to health, safety and environment aspects in preference to our other activities,
- comply with all applicable legislation and any other requirements we subscribe to which relate to occupational health and safety (OHS), and its own rules, statutory, regulatory requirements and the requirements of the flag administration which relate to the protection of the environment,
- conduct surveys strictly and fairly to promote the protection of the marine environment,
- utilize a systematic approach to managing health and safety to achieve continual improvement of OHS performance by establishing OHS objectives and targets and, performing regular reviews,
- promote prevention of accidents and ill health through hazard identification and risk assessment of the work and workplace,
- give all employees the right and responsibility to refuse to conduct work they consider to present an unacceptable risk,
- increase awareness and improve knowledge of all employees related to health and safety by providing adequate OHS training and/or education,
- actively support industries to promote renewable energy use,
- contribute to Joint research and development (R&D) on emissions-reduction technologies with industries and academic partners.

Koichi Fujiwara
Chairman and President, Representative Director
NIPPON KAIJI KYOKAI
1st September 2017