



ClassNK

MAGAZINE 2007 59th EDITION

Nippon Kaiji Kyokai, known as ClassNK or NK, is a ship classification society.

It is what is known under Japanese law as a public service foundation and in its Act of Endowment, its ultimate goal is expressed as: "to contribute to the development of maritime service for the protection of human life and property at sea". Environmental protection has also become an increasingly major concern.

This sentiment has been formally developed into the NK Mission which states:

ClassNK is dedicated to ensuring the safety of life and property at sea, and the prevention of 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 guidance, and maintain and develop its commitment to scientific and technological research and development.

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

NK has earned an outstanding reputation for its long-standing dedication to safeguarding life and property at sea and preventing marine pollution through the establishment of universally recognized standards for the design, construction and maintenance of ships and other marine structures.

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 new buildings and existing ships to ensure their safety. The rules cover not only hull structures, but also propulsion

systems, electronic systems, safety equipment, cargo handling gear, and various other areas. ClassNK's surveyors work in shipbuilding and repair yards and at ports across the world, wherever they may be called upon to examine the condition of a ship.

The Head Office is located in Tokyo and in Chiba, Japan, and there are branch offices at the major Japanese ports and overseas offices throughout the world. By the end of October 2007, the Society had 6,747 ships over 150.7 million gt under class. This figure represents approximately 21 percent of the world merchant fleet currently under class.

In addition to its classification activities, ClassNK conducts surveys on behalf of third parties including State administrations, offers technical services for marine and non-marine construction projects, accommodates requests for appraisals and engineering consultation, conducts research and development in various ship-related fields; provides quality-assurance certification of suppliers based on ISO 9000 and 14001 series criteria*, and verifies the safety management systems of ship-management companies and ships, in accordance with the International Safety Management (ISM) Code and International Ship and Port Facility Security (ISPS) Code**.

In November 1999, Nippon Kaiji Kyokai celebrated the centenary of its foundation.

* For ISO 9000, the number of registered suppliers as of the end of October 2007 was 381, while for ISO14001, the number of registered suppliers as of the end of October 2007 was 96.

** For the ISM code, the numbers of registered companies and vessels as of the end of October 2007 were 575 and 4,354, while for ISPS code, the number of registered vessels as of the end of October 2007 was 3,591.

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Kenji Ogawa
Kenji Ogawa
Chairman and President

Chairman's Message

Welcome to the 2007 ClassNK Magazine

While ClassNK has its origins in Japan, we are an international organization and our success is not a reflection of our local conditions but a result of our unmatched international commitment. Each year in the magazine we highlight this commitment by publishing technical essays on environmentally-sound and cutting edge technology, discussing the impact of developments like global warming, and introducing our exclusive surveyor offices.

I'm proud to say that this year's magazine continues this tradition. This year, the articles once again underscore our commitment to the latest in new technology, exploring new propeller and ship maintenance technologies. At the same time, this year's magazine retains its international outlook, taking you on a journey from Singapore's Maritime and Port Authority, to ClassNK's Kuwait Office and beyond. In addition, we've stayed close to our roots with articles on Imabari, Japan's largest maritime city, and Vietnam's booming shipbuilding and maritime industries.

In recent years, environmental concerns have become paramount and ClassNK remains committed to protecting the environment and promoting environmentally sound technologies. This year, our Technical Essay section begins with an in-depth look at new vortex-reducing propeller designs. These designs point the way towards more efficient and environmentally friendly propellers. Recent demands for more environmentally friendly technologies have also increased demand for Liquid Natural Gas (LNG) and this year our Technical Essay section also contains an in-depth look at our Total Life Assessment (TLA) system for LNG carriers. ClassNK's TLA service ensures the continued safety and reliability of LNG carriers throughout the service life of the ship. TLA is just one of the ways ClassNK is fulfilling its mission to protect human life, maritime property and the marine environment.

Our Special Essay this year explores Vietnam's shipbuilding and maritime sector. Vietnam has become a popular topic of discussion and this year's Special Essay provides a thorough look at the circumstances that have brought about Vietnam's amazing growth in this sector and the ways that ClassNK is helping facilitate and benefit from the rapid growth in the region.

Singapore has also been experiencing a massive expansion in its maritime industries and a major player in that growth has been the Maritime and Port Authority of Singapore (MPA). The Story from the Sea this year introduces the MPA and goes one-on-one in an interview with MPA Chief Executive BG(NS) Tay Lim Heng. The interview provides a great deal of insight into the issues facing Singapore's continued growth and development.

In this year's Focus on Japan, we take a trip to the smallest of Japan's four major islands – Shikoku. While to some Shikoku may seem like an idyllic island to some we'll take you to Imabari, Japan's largest maritime city. Imabari, along with ClassNK, is setting the standard for the next generation of maritime endeavors.

The Middle East has long been an important crossroads and it has also been of great importance to the growth of ClassNK. In this year's ClassNK Around the World we take a look at one of our several offices in the region, the Kuwait Office, which was established in 1993.

The second half of ClassNK Around the World takes us to New York, one of North America's leading ports and an economic powerhouse in its own right. The article looks in on ClassNK's New York Office, one of the Society's oldest international offices, founded in 1962.

This has been an eventful year for the Society. ClassNK not only became the first class society in the world with 150 million gross tons on its register, we've also redoubled our international efforts, visiting many of the world's largest exhibitions and publishing our annual report in a variety of languages. You can read about these milestones, as well as the recent redesign of the ClassNK homepage, in the Topics and Events section of this year's magazine.

This year has been another year of successes for ClassNK, and I think those successes are equally reflected in the quality of this year's magazine. With that said, I hope you enjoy reading this year's edition of the ClassNK Magazine.

Eliminating Propeller Vortices

Towards a More Environmentally Friendly Propeller

Nakashima Propeller Co., Ltd.
S. Yamasaki

Building a Better Propeller

Amid the background of high fuel oil prices and growing demand to reduce emissions of global-warming gases, Japan's Ministry of Land, Infrastructure and Transport, alongside ClassNK, has begun research on a "Maritime 10 Mode" initiative that will provide new assessment criteria for environmental performance. This year, ClassNK has also started research and development work on implementing technical appraisals of the environmental performance of container ships. Alongside these demands for highly efficient, high performance ships, it is

only natural that there will be an increasing demand for highly efficient marine propellers as well.

Major elements that affect propeller efficiency include propeller loading levels, frictional resistance on blade surfaces, and the rotating flow of propeller races. In the past, the efficiency could be increased simply by reducing the effects of these elements. Typical examples of such propeller designs are low-rpm large-diameter propellers, propellers with small blade surface areas, and contra-rotating propellers. The low-rpm large-diameter propeller is an example of how lowered propeller

loading level increases efficiency; the propeller efficiency is increased by slowly rotating the large diameter propeller and propelling larger amount of water aftward. A propeller with small surface area improves efficiency by using narrower, slimmer blades and thus reducing frictional resistance. In contra-rotating, propellers, the rotating flows of the propeller races of the two propellers, arranged one behind the other, cancel each other out by reversing the direction of rotation of the propellers with respect to each other. That is, the efficiency is increased by eliminating the energy loss from the rotational flow. Photo 1 shows the contra-



Photo1: Podded contra-rotating propeller propulsion system

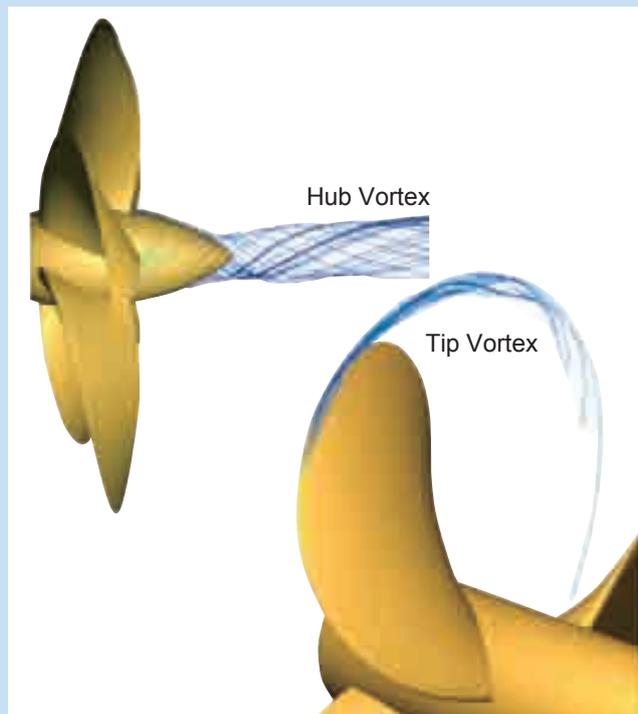


Fig.1: Propeller vortex

rotating podded propeller propulsion system installed on an NK-classed ship in 2007.

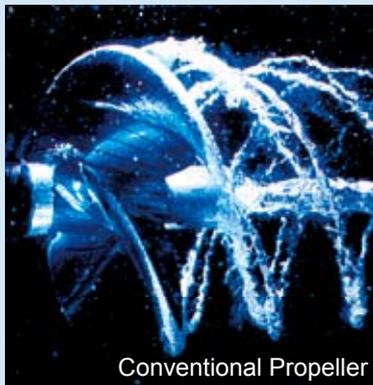
Propeller Vortices

Another area that has become a focus of attention from the viewpoint of energy conservation is propeller vortices. Fig. 1 shows the typical vortex generated by a propeller. Commonly seen vortices include hub vortices and tip vortices. Low pressure vortices of high speed rotational flows generally lead to cavitation, and in the worst case scenario, can cause problems such as

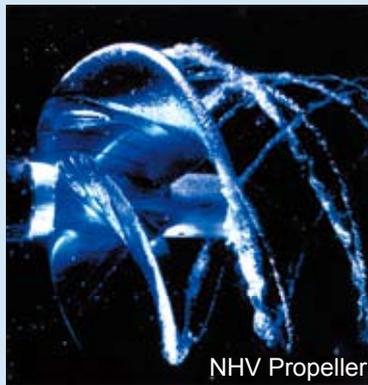
vibration and noise. Therefore, it is vital to inhibit and reduce vortex cavitation to prevent vibration and noise. At the same time, as vortex flows do not contribute to propulsion, reducing such flows will lead to energy conservation. A Hub vortex refers to vortices generated at the root of the propeller blades that accumulate at the aft end of the cap. This kind of vortex creates a cavitation flow that flows aftward.

In recent years, a Non-Hub Vortex (NHV) propeller that prevents the generation of hub vortices has been developed. This propeller is designed so that hub

vortex cavitation is eliminated. (See Photos 2, 3). Photo 2 shows the NHV propeller cavitation for a high speed boat; while Photo 3 shows the same for a high speed car ferry. From the photos it is evident that the occurrence of hub vortices is inhibited by the NHV propeller, and that hub vortex cavitation has been eliminated. The propeller efficiency has been verified to have increased by 5.6% in model tests of NHV propeller on a high speed car ferry, and NHV propellers have since been put to use on actual vessels. Photo 4 shows a photo of a conversion to an NHV propeller.



Conventional Propeller



NHV Propeller

Photo2:NHV propeller cavitation for high speed craft



Conventional Propeller



NHV Propeller

Photo3:NHV propeller cavitation for a high speed car ferry



Photo4:Conversion of a high speed car ferry to a NHV propeller

Fig. 2 shows the in-service records of the high speed car ferry before and after conversion to the NHV propeller. Compared to the existing propeller, a fuel reduction of about 5% has been attained. NHV propellers have also been used in trials on Panamax bulk carriers (about 20ships in all). A fuel reduction of roughly 1.5% has been verified based on the results of these trials, as can be seen in Fig. 3.

Vortices also occur at the center of the leading edge of the propeller blade. These vortices also lead to cavitation; they flow along the leading edge, separate from the blade surface near the blade tip and then flow aftward. Cavitation causing tip vortices can also occur at the blade tips. These vortices merge together after separating from the blade surface and move violently. The so-called bursting phenomenon of tip

vortex cavitation can cause a high degree of vibration and noise.

In recent years, propellers called Tip Rake (TR) propellers that weaken this tip vortex cavitation and bursting phenomenon have come into use. Fig.4 shows the external view of a TR propeller, while Photo 5 shows a photo of the cavitation. TR propellers have blades that are raked towards the aft (in the direction of the rudder) near the blade tip. This reduces blade surface cavitation and tip vortex cavitation. As a result of this, aftward fluctuating pressures, which can also cause vibration, can be reduced(see Fig.5). Model tests have verified that with optimum tip rake the propeller efficiency can be increased by about 1%.

Future Reserch

Propeller vortices are concentrated at the ends of the propeller blade, both the root and the tip. However, adequate attention has still not been given to these sections. For instance, fillets of ambiguous shape are included in the blade roots in propeller drawings. Also, the blade width at the blade tip is assumed to be zero, and the detailed geometry near the blade tip is still not properly defined. Although NHV and TR propellers have been developed to inhibit the propeller vortex cavitation, there is still much room for improvement in this area. In order to create more environmentally friendly and more highly efficient propellers in the future, propeller vortices and the shape of the blade ends (blade root and blade tip) will become increasingly important areas of study.

Fig.2:Fuel consumption record for high speed car ferries

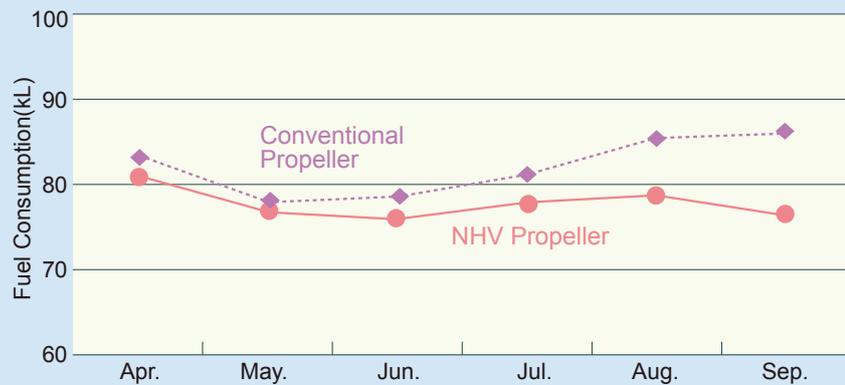
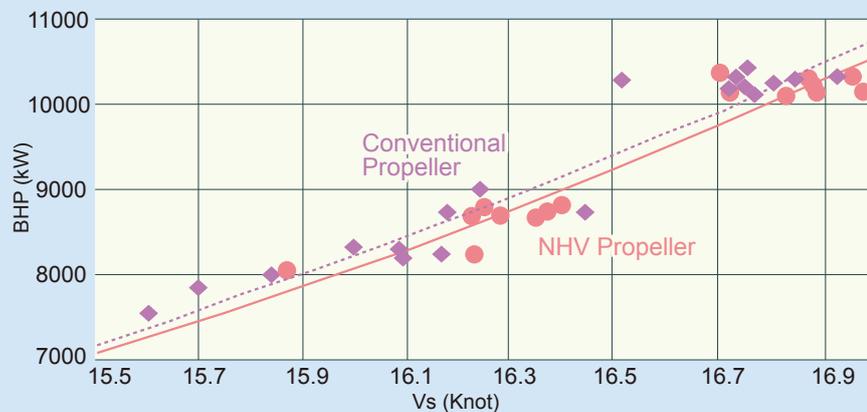


Fig.3:Trial results for Panamax type bulk carriers



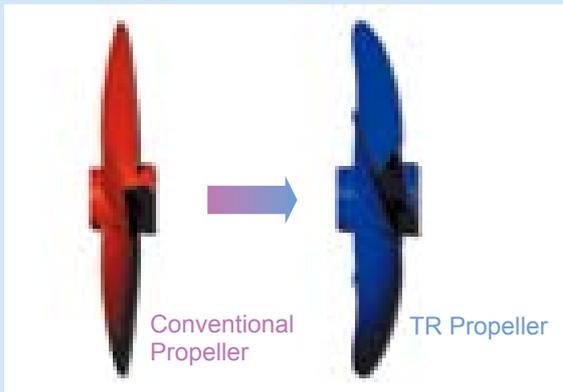


Fig.4:External view of TR propeller

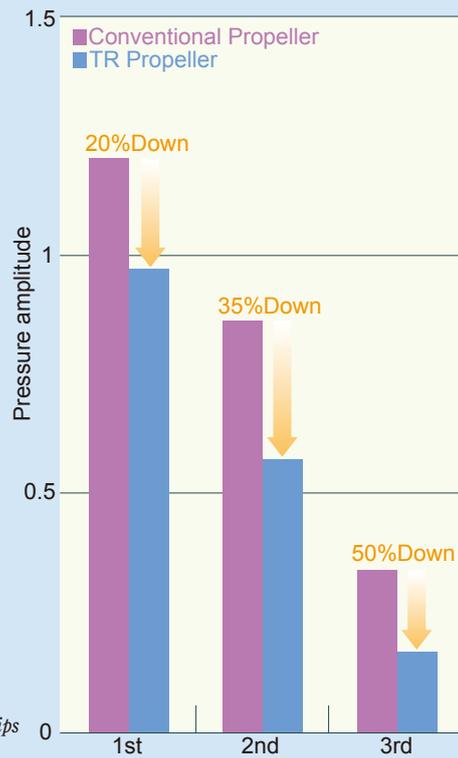


Fig.5:Fluctuating aft pressure on TR propellers for medium speed ships

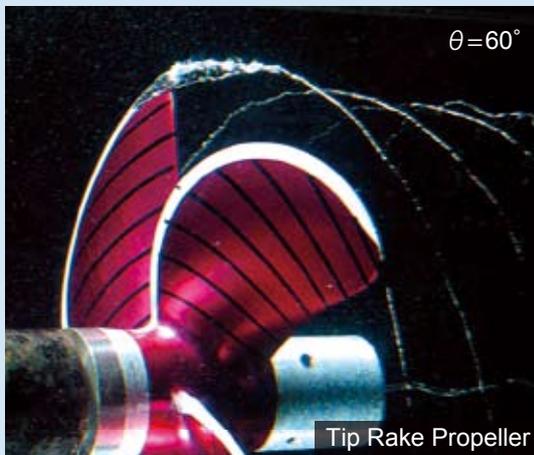
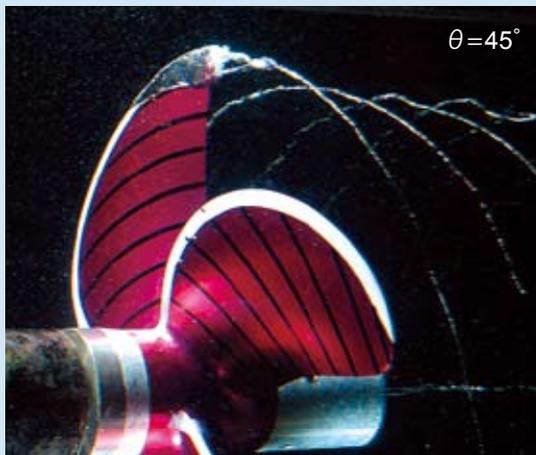
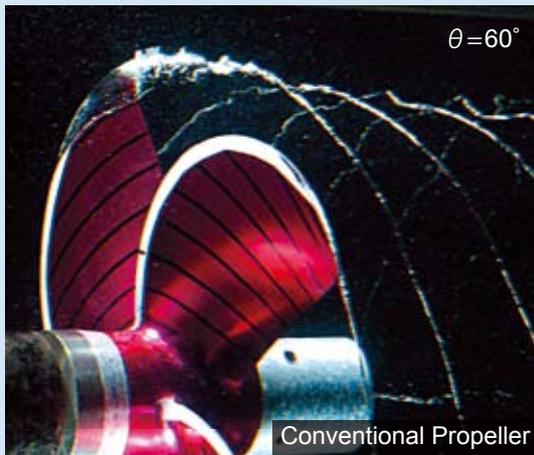
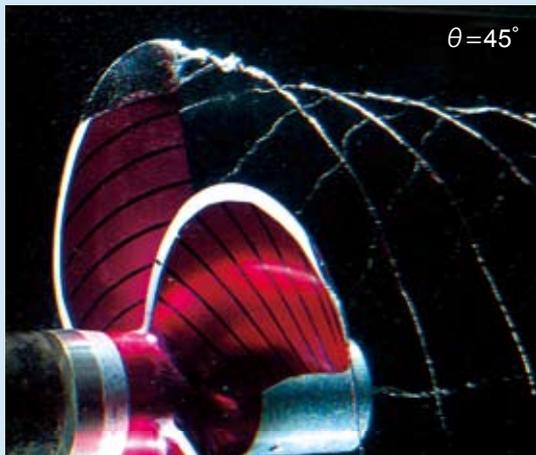


Photo5:TR propeller cavitation

TLA

Total Life Assessment for LNG Carriers

About Total Life Assessment (TLA)

The continued growth in demand for liquefied natural gas has spurred an unprecedented boom in the building of new LNG carriers in recent years. The substantial investments involved have encouraged ship owners, ship managers, and other key players to maximize the economic return from such assets for as long as possible. It is thus essential that these highly specialized vessels be properly maintained and operated in a safe, efficient, and reliable manner.

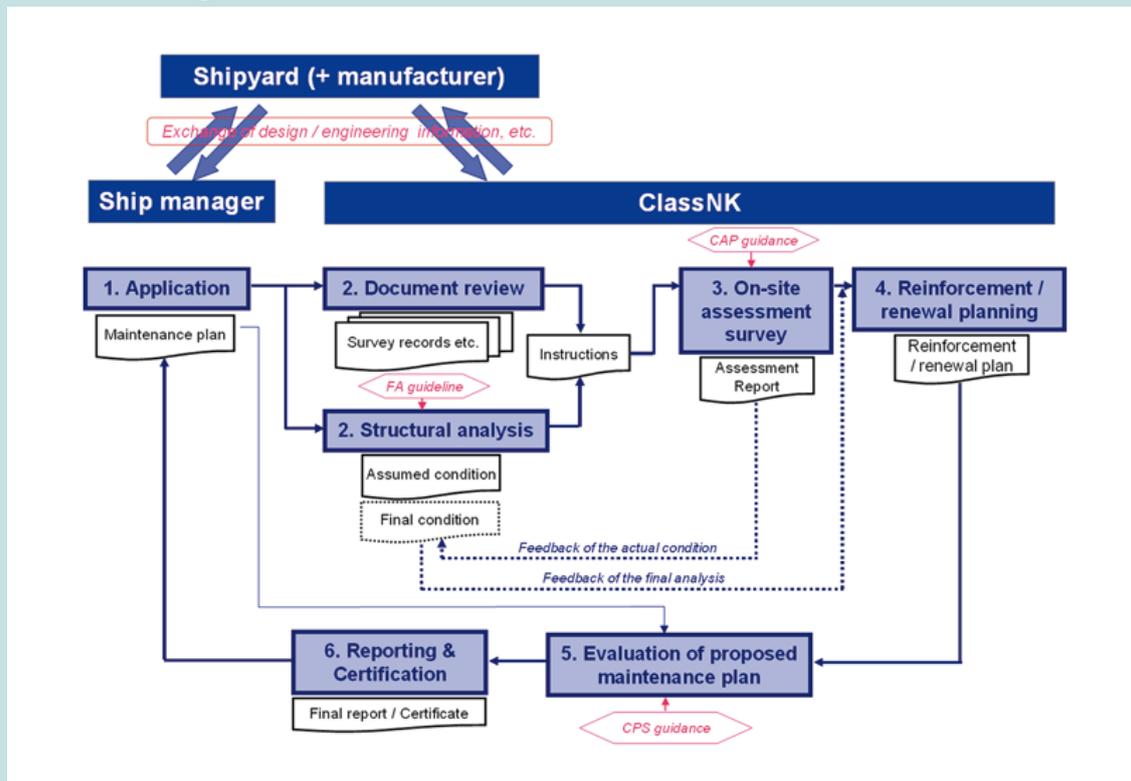
LNG carriers have indeed proven to be highly reliable ships with a safety record unparalleled in the marine transport industry. Having been designed and built to the most rigorous standards and then well maintained with correspondingly suitable budgets, many existing LNG carriers are in fact still in excellent condition despite more than twenty years of service.

To help maintain the condition of such ships with the most cost-effective maintenance possible, ClassNK has developed a comprehensive, fully optimized

assessment and consultancy service known as “Total Life Assessment” (hereinafter referred to as “TLA”) designed to support ship owners and operators set up an optimized maintenance plan for each LNG carrier in their fleet. It is part of the ClassNK PrimeShip suite of applications and services designed to provide a range of solutions for the comprehensive care of a ship throughout its lifetime.

TLA is an important part of this “total lifetime ship care” approach. It is a powerful tool that allows ship owners

Fig.1 Flow diagram of TLA initial service.



and managers to determine what structural, preventive maintenance, and other work needs to be done to enable the ship to operate safely and optimally for the rest of its planned service life. This includes putting in place and implementing reinforcement and renewal plans, where necessary, for the hull and all cargo tanks as well as for machinery, electrical systems, and other equipment onboard. These plans are based on the results of a comprehensive assessment of the ship's integrity for the total remaining lifetime of the vessel, based on a comprehensive on-site condition assessment survey of all compartments and state-of-the-art fatigue analysis of all critical areas of the ship.

TLA involves a two-step approach that includes a condition assessment and prognosis component as an initial service followed by subsequent feedback and updates as a follow-up program. TLA is a powerful tool that supports ship owners and operators in the effective preparation and implementation of maintenance plans, particularly for

existing LNG carriers that are intended for extended operation.

The work scope of TLA covers such key elements as hull, machinery, electrical and automation, navigation, cargo containment, and cargo systems. Customers can choose the elements that best suit their needs.

For ship managers with experience in the management of LNG carriers, in general, the maintenance of machinery, electrical, and cargo system elements can be done by regular inspections, and the renewal of equipment parts can be undertaken based on their own experience and the advice of the manufacturer. However, spare parts that have become obsolete due to discontinued production or other reasons can pose a major problem that hinders the renewal or replacement work necessary for proper long-term maintenance. This can be overcome by advance renewal planning based on the results of careful assessment and prognosis.

On the other hand, repairs to hull structures and cargo tanks, once necessary, require significant amounts of time and investment. Consequently, prior preparation of a maintenance plan based on a quantitative diagnosis is most desirable for these areas. Given these circumstances, it follows that hull structures and cargo tanks constitute a substantial portion of TLA for the purpose of achieving the safe and successful extended operation of existing LNG carriers.

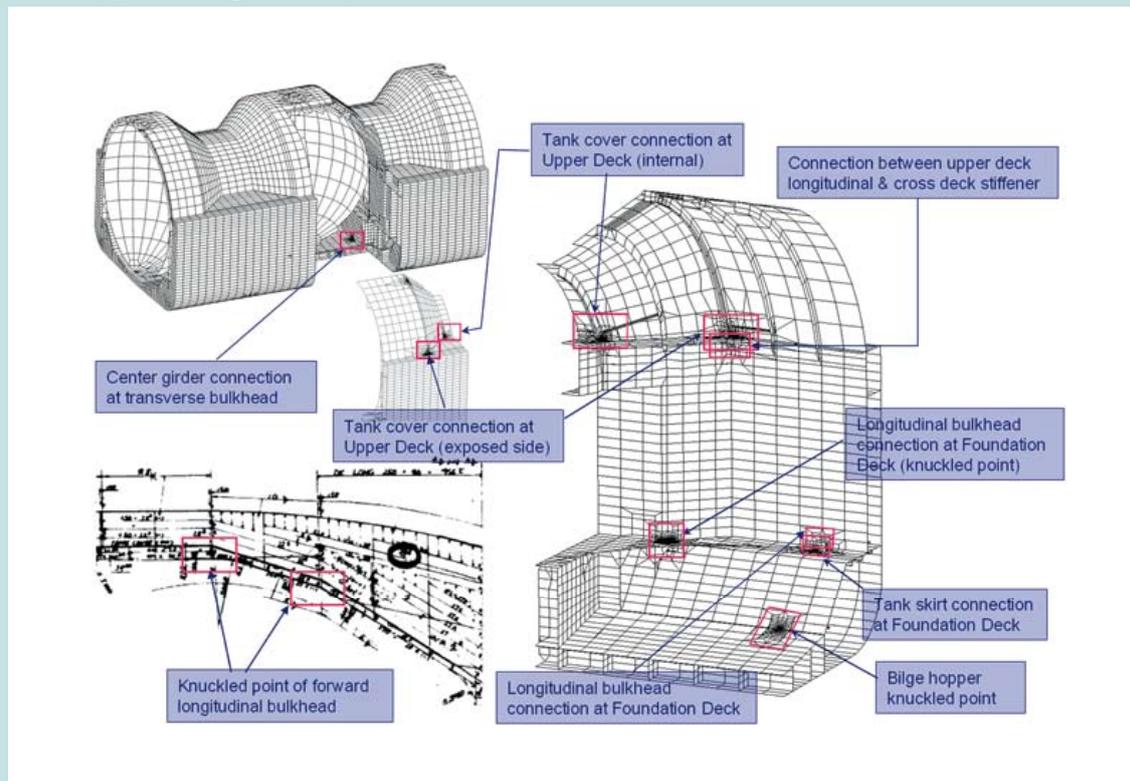
TLA consists of services in two separate stages, the initial service stage and a follow-up stage, which may be added to suit the special needs of the applicant. The components of TLA are detailed below. Fig.1 is a flow diagram of the TLA initial service component.

Initial Service

● Preliminary study

The first step in the TLA process consists of the conduct of a "preliminary study", which includes a

Fig.2 Typical fatigue analysis locations.



document review and structural analysis of the applicable ship structures.

The document review consists of a careful examination of the ship drawings, class and statutory survey records, maintenance and repair records, as well as the navigational records to gain a broad overview of the conditions of each item to be assessed.

Along with a document review, a structural analysis, more specifically fatigue strength analysis, is performed to screen out critical hull structures and to produce a fatigue life evaluation for each selected location. Typical locations of such analysis are shown in Fig.2. The results are, however, treated as tentative ones, since structural diminution due to corrosion are assumed in the calculations. For this analysis, the state-of-the-art fatigue strength evaluation techniques proposed in ClassNK's *Guidelines for Fatigue Strength Assessment (FA)* are used.

For cargo tanks, re-evaluation of the

results of the fatigue strength assessment at the time of newbuilding design is considered sufficient by incorporating feedback from differences in the design and actual sea state conditions encountered during past voyages of the ship. This is because fatigue analysis is required by the "IMO Gas Code" with fairly stringent criteria imposed. Moreover, structural corrosion, a major aging accelerator, is most unlikely since the surrounding environment is dry except in some particular cases.

Detailed instructions for TLA surveyors are then prepared to facilitate an efficient and reliable on-site condition assessment survey. These instructions cover four main areas, as summarized below.

● On-site condition assessment survey

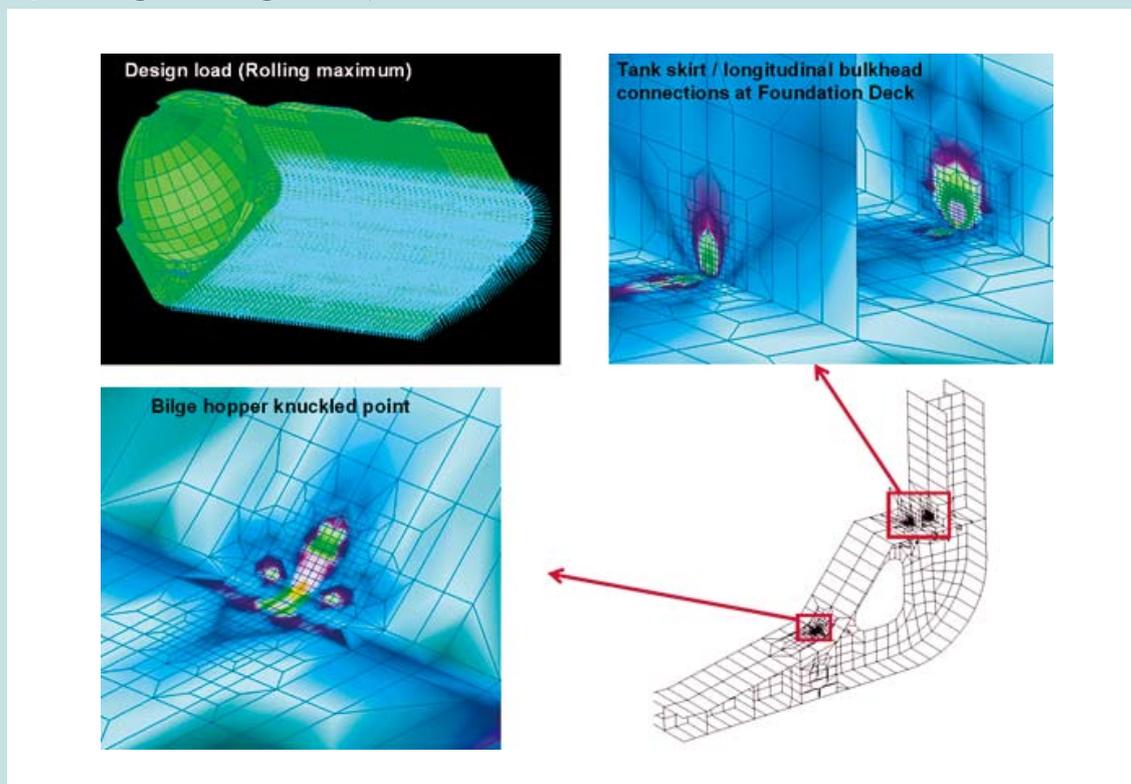
Following the preliminary examination, a thorough on-site condition assessment survey of the hull structure, the cargo tanks and various equipment is carried out according to the standards

and specifications developed in accordance with the ClassNK Condition Assessment Program (CAP). This CAP is a technical assessment service normally adopted for oil tankers, chemical tankers and liquefied gas carriers conducted as a prior vetting process for all major inspections. A combination of CAP survey items and additional items designated in the afore-mentioned instructions makes up the full scope of the on-site condition assessment survey under TLA.

The coverage of the on-site condition assessment, e.g. for the hull structure, includes an assessment of the structural integrity of each compartment, the overall corrosion diminution associated with reductions in hull girder strength, the extent of coating deterioration, and other areas. The standards and procedures set forth in ClassNK's *Guidelines for Corrosion Protection Systems (CPS)* are used in the evaluation of coating conditions.

After all the on-site assessment work

Fig.3 Fatigue strength analysis.



has been completed, each survey item, and consequently the ship as a whole, is assigned an appropriate rating as to its condition.

●Reinforcement/renewal planning

Once the on-site assessment survey has been completed, the hull structure is now ready for screening by a final fatigue strength analysis using the actual diminution values obtained through thickness measurements taken during the on-site survey. This process may be skipped when the thickness diminution assumed for the preliminary analysis happens to coincide with the actual measurements.

The results of the final fatigue assessment and on-site condition assessment survey will be the basis for the preparation of a repair and reinforcement plan, as proposed from a purely technical perspective.

●Evaluation of the proposed maintenance plan

The ship manager will then prepare a

maintenance plan incorporating the repair and reinforcement plan by taking into consideration commercial aspects that affect practical implementation. Review of this finalized maintenance plan and further advice on regular inspections, repair work, and the renewal of parts are provided to the customer.

●Reporting and certification

Once the final verification of the maintenance plan has been completed, a final report, along with a certificate (when requested), are provided to the customer.

Follow-up Service

As already mentioned, the follow-up service is an optional, but very helpful service provided at the request of the customer.

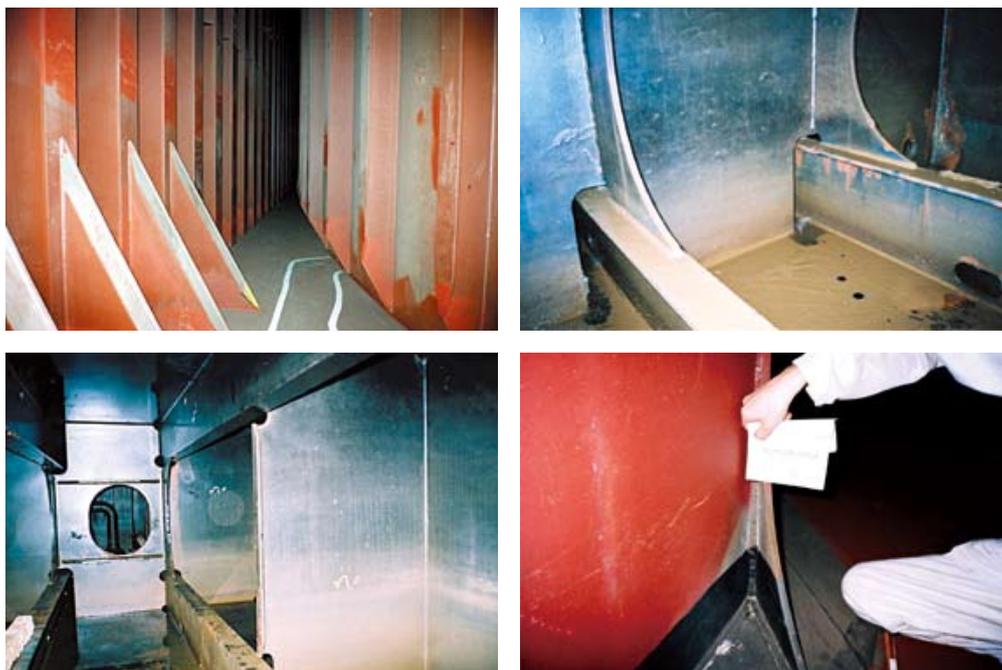
The main objective of the follow-up service is to provide regular confirmation of the subsequent condition of the ship, in order to verify the adequacy of the

original prognosis and resulting maintenance plan prepared at the initial service stage. Improvements to the maintenance plan may be proposed depending on the results of the follow-up assessment. Furthermore, the maintenance plan may be further refined by the results of any re-analysis using any newly developed techniques when such new skills and techniques become available as a result of technical innovations.

Thus, the performance of the TLA can be enhanced by combining the follow-up service with the initial service, thereby helping to make life assessment of the ship even more reliable and accurate.

Thus, the TLA service can play a vital role in the continual improvement of the lifecycle value and safety of LNG carriers.

Fig.4 On-site assessment survey.





Red Star Rising

The rise of Vietnamese Shipbuilding

A Rising Star

If you were to ask which country in Southeast Asia had the fastest growth rate, chances are few people would give the correct answer: Vietnam. A program of 'economic openness' begun in the mid-1980's has spurred the growth rate to more than 8% annually in recent years. This growth rate makes the country 2nd in all of Eastern Asia, lagging only slightly behind China, and the undisputed leader in Southeast Asia. Based on investment prospects and expectations for future growth, Goldman Sachs recently placed Vietnam in its 'Next-11' countries to watch. With its entrance into

full membership of the WTO this year, Vietnam has surely become one of the regions brightest rising stars.

Vietnam is hardly just another Southeast Asian economic powerhouse. The nation has some 3,200km of coastline and the nation's ports will soon be able to accommodate ships of up to 300,000 dwt. More importantly the country has made huge strides in shipbuilding and related maritime industries. In 2001, the country announced an aggressive plan to completely revitalize and redevelop the nation's shipbuilding industry, and is aiming to become 4th in the world in shipbuilding by 2015. Many have taken notice recently, as the Viet-



Vietnamese Commissariat



CENTER of HO CHI MINH CITY and Saigon River

namese government and the state-backed Vietnamese Shipbuilding Industry Corporation (Vinashin) have poured money into new shipyards and racked up ever more impressive new-building statistics. Though the country's star has been steadily rising since at least 1996, the world is only just now beginning to come to terms with Southeast Asia's new shipbuilding power.

The Major Players

Vinashin: Vinashin is *the* shipbuilding powerhouse of Vietnam. The conglomerate and its 20-some affiliated companies will operate roughly 30 shipyards by 2010. Vinashin oversees shipbuilding and related industrial development, as well as, maintaining a 25-ship fleet of 315,510 dwt.

Vinalines: Vinalines is to shipping what Vinashin is to shipbuilding in Vietnam. The company and its various affiliates boast a fleet of some 121 ships with 1.29 million dwt. What's more, the company is bent on rapid expansion and plans to increase its fleet by 73

ships as well as build two major 100,000 dwt repair-yards over the next few years.

Vietnam Register: Founded in 1956, the non-IACS Vietnam Register is the main register for Vietnamese ships, with 908 of the 1,007 ships flying the Vietnamese flag bearing the VR class. While recently a number of classification societies have established a presence in Vietnam, VR remains a major player classifying 39% of newbuilds by gt in 2006.

Spotlight Vinashin

Vinashin, and its sister corporation the Vietnamese National Shipping Lines (Vinalines), were both spun off from the overarching Vietnamese National Maritime Bureau in 1996. Vinashin is a massive company, responsible not only for the management of more than 24 shipyards, but also large amounts of infrastructure, factories, and other industrial resources. Since its establishment, Vinashin has achieved astonishing growth, averaging more than 30% year-on-year growth over the past 10 years. Production value went up

53.2% last year reaching a total of more than twenty-seven million US dollars. Equally, revenue rose some 48% in 2006. This year the number of employees rose to some 50,000 and after bond issuance and securing foreign investments, Vinashin hopes to reach \$1 billion in total revenue. As various long-term investments in shipyards and infrastructure pay-off Vinashin hopes to reach a goal of one-billion US dollars in ship exports by 2010.

Just this year, Vinashin began building its largest ship to date: a 104,000 dwt oil tanker for state-backed oil company PetroVietnam. This success follows on an already impressive year for Vietnamese shipbuilders, delivering the first three of eight 22,500 dwt NK classed bulk carriers to Vinalines, as well as two 53,000 dwt cargo ships to the UK's Graig Group. This year Vinaship also continued work on a series of five NK classed 56,000 dwt cargo ships, the first of which will be delivered next year to the Netherlands's Vroon B.V. Shipping Group. This frenzy of shipbuilding would not have been possible except for massive investments in shipyards by Vinashin and its local and



international backers. Vinashin currently has some ten shipyards 'under construction,' with more than half scheduled to be online by the end of 2007. At the same time, the company has announced plans for seven new shipyards, six shipbuilding industrial parks and seven shipbuilding industrial complexes throughout the country.

More Than Just Shipyards

What truly makes the growth in Vietnam's shipping industry so spectacular is that it goes beyond mere shipbuilding. The comprehensive plans made by Vinashin in 2001 place a large emphasis on infrastructural development. Indeed, one of the reasons for the industry's rapid growth has been the increasing ability to keep costs down by streamlining production, that is, building parts and equipment locally rather than importing them. By 2010, Vinashin hopes to have 70% of shipbuilding materials and supplies sourced from within Vietnam. Already, the shipbuilding giant has begun construction on steel mills and iron mills and plans to further develop its heavy manufacturing sector. Of course, such development is neither cheap nor easy, and Vinashin has responded by reaching out not only to foreign investors but foreign companies and governments as well.

To develop a national infrastructure, Vinashin doesn't just need money; they need technology and human resources. On the technology end, Vinashin has been anything but shy in reaching out to foreign manufacturers. In 1999, Vinashin teamed up with Korean manufacturing giant Hyundai to build the massive Hyundai-Vinashin Shipyard near Nha Trang. Similarly this year's 22,500 dwt NK classed cargo ships, built for a Vinalines affiliate, were also the product of international cooperation. The ships were designed by VINAKITA, a joint venture between Vinashin and Japanese builder Kitada and are dual-classed by VR and NK.

These connections with foreign companies go beyond mere ship assembly. In 2005, Vinashin contacted Mitsubishi to license their Akasaka Diesel Engine design. Vinashin plans to produce the engine locally, setting up a factory at one of its main shipyards and maritime complexes, Haiphong's Bach Dang Shipyards. Vinashin has also never been afraid to ask for aid from foreign governments. A number of the improvements to Haiphong's port area were made thanks to a loan from the Japan Overseas Economic Cooperation Fund (OECF), and Vietnam also recently received some \$4 million from Norway to help improve management

practices and human resources in the country.

ClassNK in Vietnam

Obviously, the massive growth in shipbuilding also presents opportunities for classification societies and ClassNK has been poised to take advantage of this growth. In recent years, ClassNK has seen a huge surge in demand for surveys in Vietnam. From 2005 to 2006, the number of surveys performed by NK increased by 20% and in 2006 ClassNK classed 47% of all newbuilds in the country. Between 2002 and 2006, NK's workload in the country increased by some 300%.

In response to this incredible growth in workload, NK has also increased its presence in the country. ClassNK's first Vietnamese office was established in Haiphong in 1996 and the Society opened a new office in Ho Chi Minh City in order to provide better service to the southern part of the country. At the beginning of December 2007, ClassNK established its third exclusive survey office in Nha Trang to match the increasing demand for service in the region.

ClassNK's commitment to Vietnam goes beyond just establishing new sur

Table: Vietnam Shipyard's Under Construction

| Shipyard Name | Location | Size (dwt) | Notes |
|--------------------|-------------|----------------------------------|--|
| Nghi Son | Thanh Hoa | Newbuild: 50,000 | Completed in 2007 |
| Nhat Le | Dong Hoi | Newbuild: 2,000 | Completed in 2007 |
| Da Nang | Da Nang | Newbuild:15,000 Repair:30,000 | First Ship (6,500DWT) delivered in Oct. 2007 |
| Dung Quat | Quang Ngai | Newbuild: 300,000 x 2 | Completed in 2007 |
| Nha Trang | Cam Ranh | Newbuild: 50,000 | Completed in 2007 |
| *Undecided | Van Phong | Area 3.0million m ² | STX plans to construct. |
| Saigon Shipmarin | Ho Chi Minh | Newbuild: 50,000 | Completion Date: Unknown |
| Undecided | Ho Chi Minh | Newbuild:100,000~200,000 | SHINPETROL will start construction in 2008 |
| SESCO | Dong Nai | Newbuild: 20,000 | First ship(15,000DWT GC) will be delivered in April 2008 |
| Undecided | Dong Nai | Newbuild: 30,000 | Completion in 2008 |
| Nam Can | Ca Mau | Newbuild: 10,000 | Completed in 2007 |
| *Ba Son (Transfer) | Ho Chi Minh | Newbuild: 70,000 | Completion by 2010 |

*non-vinashin

veyor sites. ClassNK has strong ties with the countries shipbuilding industries and has equally strong ties with the Vietnam Register. The two societies have some twenty years experience together, having signed their first mutual cooperation agreement in 1987. For almost ten years, NK has provided training to VR surveyors both at NK's Information Center and Research Center and at survey offices throughout Japan and Asia. ClassNK also provides software and technical information to VR to help keep the society up to date and capable of classifying ever larger ships.

As the shipbuilding industry in Vietnam continues its impressive rise, ClassNK will continue to further strengthening its relationship with Vietnam's entire maritime sector, and looks forward to Vietnam's ascension to the world's top class of shipbuilding nations.





Imabari and the Maritime City Concept

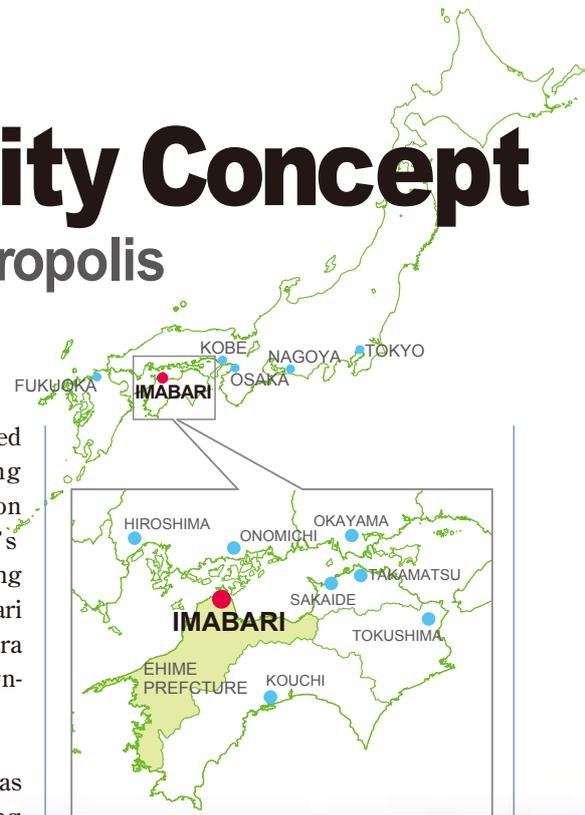
Japan's New Maritime Metropolis

An Ambitious Plan

While ports and shipyards were once celebrated parts of urban life, in Europe and America especially port expansion and investments in shipbuilding are becoming ever more contentious affairs. While some cities are turning their backs on their maritime histories, Imabari, in Japan's Ehime prefecture, is dramatically bucking this trend and taking the exact opposite

approach. The city has boldly embraced its rich maritime past and its strong local maritime sector and set out on an ambitious plan to become Japan's largest maritime city. By implementing its new Maritime City concept, Imabari promises to pave the way for a new era of collaboration between local governments and the maritime industry.

While Imabari may not be as famous as some other Japanese cities, it has long



been synonymous with shipping and shipbuilding. The city sits astride the Seto Inland Sea at the end of a small chain of islands. In ages past, the people of Imabari rose to prominence through the control of the straits between these islands; control which was used at turns both for piracy and for commercial gain. In modern times, the region has become famous for textiles and towels, as well as shipbuilding and maritime commerce. Locally-based shipbuilder, the Imabari Shipbuilding Company, is the second largest shipbuilder in the world by dwt and the city has a long history as a leading maritime city. The city has further prospered from the completion of a set of bridges across the straits, making the city accessible by car and rail from Honshu, Japan's main island.

While the city has always had a reputation as a center for maritime industries, the city's status has risen dramatically in the past two years, following a merger with twelve local municipalities in January 2005. Since the merger, Imabari has boasted an incredibly dense and concentrated maritime cluster, the likes of which are hard to find outside of Norway. There are some 500 maritime-related companies within the city's new boundaries, primarily in shipping and shipbuilding. At the same time, the number of foreign shipowners puts Imabari in the same league as Hong Kong, China and Pireaus, Greece. Even with more than 250 shipping companies based in the region, in terms of ship volume, Imabari based shipping companies account for 60% of prefectural shipping and 7% of the national total. Imabari is also home to more than 2,000 Japanese overseas oceanliners, one-third of which are owned by shipowners in Imabari.

The merger has also strengthened Imabari's role as a shipbuilding center and the city has a world-class reputation in terms of quantity and volume. The city's 18 shipyards account for some 15% of the domestic total. The ships produced by companies headquartered in Imabari to be included, that number would jump to 25% of the national total. Following the



Hashihama Port and Kurushima



A bulk carrier under construction



A bulk carrier being coated

merger in 2005, the city was already producing well more than 1.2 million gross tons of ships and the market has only continued to boom. Imabari is certainly the biggest shipbuilding hub in Japan, and can easily claim to be one of the largest shipbuilding centers in the world.

Obviously, the concentration of shipping and shipbuilding industries has attracted interest from other maritime sectors as well. Imabari is fast becoming a major center for marine banks, maritime finance companies, and insurers. The city has likewise seen tremendous growth in maritime-related legal offices and ship management companies. The regional government has also taken note of Imabari's impressive growth and has transferred the entire prefecture's maritime-related activity to the Imabari Maritime office, which now handles about 70% of the prefecture's maritime business.

The increasing concentration and development of the Imabari Maritime cluster is anything but an accident. It is the product of the redoubled efforts of

the local government which has invested heavily in developing the infrastructure necessary to fuel further growth. Indeed, what separates Imabari from other maritime cities, is that the dramatic growth of the city has been driven and consistently supported by the city's Maritime City Concept.

The Maritime City Concept

Behind much of Imabari's recent success is its three part Maritime City Concept, which was brought into action following the merger in 2005. The three main policies are: nurturing talent in the next generation, construction of maritime clusters, and encouraging maritime culture and promoting exchanges. The policies were developed and implemented with the purpose of making Imabari a "Maritime City for the new age," and it is these three policies and they way they interact and support each other that are driving Imbari's growth.

The first basic policy, 'nurturing talent in the next generation,' addresses a problem that the maritime industry is

facing the world over: the shortage of skilled personnel. The policy calls for the establishment of “an educational environment that nurtures talented people to work in the maritime industries.” In practical terms, this means support for maritime education and personnel development. In this area Imabari benefits from an already impressive maritime education system. The Namikata National Junior College of Maritime Technology and the Yuge National College of Maritime Technology, both located within the city’s new borders, have a long history of preparing students for lifelong careers in the maritime industry. These two schools were joined by the Imabari Training Center for Shipbuilding Skills, which the city opened in April 2005. In many ways the opening of the new center helped inaugurate the city’s development plans. The new center perfectly realizes the goals of the Mari-



Shipbuilders in training

time City concept; it aims to create a personnel pool with “broad vision, rich internationalism, and high ambition.” The new center play a major role in passing along the wealth of experience gathered over the years by Imabari’s shipbuilders and will ensure the shipyards have highly-trained and highly-skilled workers well into the future.

The second policy calls for the construction and support of maritime clusters and this is again an area where the city is pouring its efforts. While Imabari has long been famous for shipping and shipbuilding, that reknown has not extended to other maritime sectors. However, the city’s leaders wisely recognized that as the world market gets more competitive it’s important to create new synergies, and new economies of scale. Much of the city’s recent work has to been foster cooperation between various maritime sectors helping to unify the disparate industries, much as the merger united Imabari with its twelve neighboring communities. This approach can already be seen in places like Norway, where the various branches of the maritime industry work to support one another. From financing to shipbuilding through commissioning, everything a shipowner or management company needs can currently be

found within Imabari’s boundaries. As the city’s name value as a maritime center increases, we can only expect that the strength and unity of this maritime cluster will increase.

Of course, these first two policies are focused on the new; new educational centers, attracting new industries and encouraging new cooperative efforts. Yet, what makes Imabari’s efforts so special is that they recognize the value in preserving and supporting the old; that is “honoring the history and culture of the maritime industry” in Imabari. While some cities turn away from their maritime heritage, Imbari is embracing is maritime past. The city supports a number of festivals celebrating the city’s maritime history and industries and has also embarked on a new program with the Imabari board of education. As part of this program schools receive visits from those working in the maritime sector and students go on field trips to ports and shipyards in order to experience the charm of maritime work.

These policies are of course self-reinforcing. By encouraging children to treasure their maritime heritage, the city ensures that there is a constant stream of new students for its maritime colleges. This talented enthusiastic personnel pool supports the local maritime trade and encourages new industries to set up shop in the city. The city’s efforts to encourage cooperation and the development of the maritime cluster then tie the whole program together; working to make Imabari a model for maritime cities well into the future.



The Yuge National College of Maritime Technology



The joys of maritime education

Imabari and ClassNK

ClassNK has deep historical links to Imabari going back to the founding of the Society's Imabari Office in 1967. Since the founding of the office, ClassNK has taken an active part in encouraging and supporting the maritime industry in Imabari. ClassNK has been a strong supporter of the Maritime City Concept since it was put forth in 2005 and as a way of showing its continued support for both the city's development plans and local industry, ClassNK has recently expanded its popular "Last Friday" meeting to the Imabari Office.

The first "Last Friday" meeting was held in Kobe in May 2004. The meetings provide a wonderful outlet to the maritime industry, facilitating networking as well as allowing for presentations and discussions on new technological developments and the state of the industry. The meetings are generally coupled with a social gathering, held after the meeting, and are scheduled for the last Friday of the month, hence the name. The meetings have been a huge success since their inception in Kobe, and ClassNK is proud that they have now spread to Imabari as well.



An exclusive container berth at the Port of Imabari

On July 27th 2007, ClassNK, in collaboration with the Imabari Overseas Shippers Association and with the endorsement of the City of Imabari, held the second Last Friday meeting at its Imabari branch office. The first Last Friday meeting in Imabari was solely sponsored by ClassNK and was mainly aimed at shipowners in Ehime Prefecture. This time, in order to interact with a broader swath of the maritime industry and to better suit the needs of Imabari's maritime sector, ClassNK



Ferries still play a vital role in Imabari



teamed up with the Imabari Shippers Association and garnered the support of the City of Imabari. Thanks to this, the Society was able to invite speakers from a wider range of maritime-related fields and provide a variety of useful presentations and create a venue for open, frank, and positive discussions. The meeting began with a special presentation on the current status and future prospects for repair yards and shipyards in Japan, and continued with an explanation of ClassNK coating standards. After a short Q&A session, the meeting ended with a well-attended reception. The meeting was one in a long line of successful collaborations with the City of Imabari and its maritime industries. ClassNK looks forward to working with the City of Imabari and the Imabari Overseas Shippers Association in the future and will continue to work for the success of the Maritime City Concept.

An Interview with Imabari's Mayor Ochi

When the concentration and accumulation of a specific industry in an area reaches a certain point, it becomes something special in itself.



As you noted, it has been two years since the merger and the implementation of the Maritime City concept. What are some of the results you have seen?

We have seen a great increase in the number of maritime related financial institutions and insurance companies in the area. At the same time, we are seeing signs that shipping companies and shipbuilding companies from outside the region are starting to gather here as well.

What was the impetus for the concept and how did you go about drawing up the framework for the project?

When people in Japan think about maritime cities, they think of Kobe and Yokohama, but Imabari is a maritime city of the same caliber. Especially after the merger, we realized that the resulting concentration of maritime industries gave us a great opportunity. Take Tokyo's Akihabara district for

example, it is famous because of its concentration electronics stores. When the concentration and accumulation of a specific industry in an area reaches a certain point, it becomes something special in itself. This is the idea that led to the Maritime City concept

Imabari has a labor force of roughly 85,000 people. What percentage of them work in the maritime industry?

Just under 10,000 people work in the maritime industries, but if we were to include supporting industries as well, the number would be even more substantial.

What is the biggest challenge that Imabari is facing?

I think this a problem that is felt throughout the country, but we face a problem of succession; there simply aren't enough new skilled workers. The maritime industry is divided into two fields; shipbuilders and manufacturers and others, –“builders,” and shipping companies and charter companies and the like – “movers.” On the “builders” side of things, we supported the establishment of the new Imabari Training Center for Shipbuilding Skills, which will address the workforce issue. The new center has made it possible for the various shipyards to put aside their rivalries and work together to pass on their skills. We think we've

First of all, please tell us about how Imabari is supporting the local maritime industry.

The merger of the 12 municipalities two years ago created a new and rather unique maritime cluster in Imabari. At the same time, due to the influence of China, the distribution market has strengthened and as a result the maritime industries are in an excellent situation. As an administration, we have basically been trying to support this good market environment and tie our local maritime cluster into this market.

Tatara Bridge

been really successful here and we are happy with the support the shipbuilding industry is providing.

What are you doing on the “movers” side of things?

Imabari’s shipping companies have the image of being very independent and so, on the “movers” side of things, we are working to get the various shipping groups to voluntarily meet and network. One of the best examples of this is the Last Friday Meetings that NK has so graciously supported. It lets industry people meet and discuss important issues and also provides them a way to socialize and get to know each other. I think that any event that builds connections between industry people and facilitates the industry working together is an event that the city should support.

Of course, the merchant marine is not currently a popular career, but we are working with the local board of education to conduct school visits and try to impart the importance of the maritime industry and the charm of working in the industry to the city’s young people.

In order to exchange ideas with maritime industry leaders and to promote sales, in 2007 Imabari participated in one of the world’s largest maritime exhibitions Nor-Shipping. What were your impressions of the event?

The first thing I realized was that the name-value of Imabari was far greater than I had thought. At the same time, Nor-Shipping isn’t just an exhibition – it’s the parties and meetings that take place around the exhibition that I thought might really have been the most important. We were able to meet with the mayors of Oslo and Bergen and Copenhagen and discuss various issues. I was very impressed by the way, in Copenhagen for example, the port and the city melt into each other. I’d like to see the same thing happen in Imabari.

Imabari also currently has sister city relationships with Panama City, Panama and Lakeland, Florida. We are



Imabari Castle



Imabari is Japan’s top towel producer



Kurushima Kaikyo Bridge

working on establishing a new sister city relationship with a city in Norway.

Were there any other results from your visit to Nor-Shipping?

We are looking into holding similar maritime events in Imabari, but we are just beginning to talk to specialists and make arrangements. In terms of time, we have to think about fitting into the schedule of maritime events and so we would need to have everything decided well in advance. We are short on event space in Imabari, but we are looking into holding the event in Hiroshima or Matsuyama and then sponsoring parties and organizing meetings. Our local industrial leaders, Imabari Shipbuilding, Shinkurishima and others, have already expressed interest in participating in such an event. I think it would be good if we could make this a reality as soon as possible.

Has Imabari as a city considered supporting the maritime industry through tax-relief or other economic assistance?

We currently support the industries through the establishment of facilities like the Training Center and

by promoting our maritime heritage through festivals and school visits. As taxes are controlled by the central Japanese government, creating special local tax free areas and the like is rather difficult. However, we do try and influence and improve policies that affect the entire maritime industry, things like tonnage taxes for instance.

Other than the maritime industry what are some other areas that Imabari is investing in?

The maritime industry and the textile (towel) industries are the twin pillars of life in Imabari. As the textile industry has shifted to china, we are currently only producing 1/4 of what we produced in our best years. However, we still produce 66% of the national share of towels. Even as the industry is moving to china, there are still new towel factories opening in Imabari. China is producing more towels, but we are still producing higher quality towels. In order to better control our goods, we are attaching a ‘made in Imabari’ mark and much as we are trying to with shipbuilding, we are trying to increase the awareness of the Imabari brand.



Story from the Sea

The Maritime and Port Authority of Singapore (MPA)

To capture the lion's share, there's no time for complacency.

The MPA of Singapore

With its long and proud maritime tradition and a strong local maritime sector, Singapore has emerged as the world's busiest container port in terms of shipping tonnage. Singapore is also an ideal hub for a variety of maritime industries including ship repair, bunkering, and, maritime law, to name just a few. While Singapore celebrates these good results, the city-state does not intend to simply sit back and enjoy its success. Instead, Singapore remains intent on continuing its impressive growth.

Founded in 1996, the Maritime and Port Authority of Singapore, otherwise known as the MPA, is an important part of these plans. The MPA is constantly

striving to advance and safeguard Singapore's reputation as a "premier global hub port and an international maritime centre".

Strategically located in the heart of Asia, Singapore is truly an international maritime center. Of course, the MPA takes an active role and works closely with its maritime industry partners. The MPA not only facilitates an open business environment, but also provides support for Singapore's research and development projects.

The Maritime R&D Advisory Panel (MRDAP) is one good example of this. The panel consists of renowned local and overseas personalities and brings together a wealth of expertise from a

variety of fields. The 1st Maritime Research and Development Advisory Panel (MRDAP) established in March 2002, developed a Maritime Technology Cluster Roadmap to enhance Singapore's maritime R&D capability and strengthen the maritime technology cluster. This also directly led to the establishment of the S\$100 million Maritime Innovation and Technology (MINT) Fund. ClassNK has been working with the group since the establishment of the 2nd MRDAP in 2004. Development Department General Manager Dr. T. Yoneya has participated in both the 2nd and 3rd R&D Advisory Panels, helping the panels sharpen results and lay out the future of Singapore's R&D development.



An Interview with MPA Chief Executive BG(NS) Tay Lim Heng

We serve as both the regulator and the promoter for Singapore's maritime industry.

Please tell us briefly about your organization, the MPA.

The Maritime and Port Authority of Singapore (MPA) was established on 2 February 1996. Our mission is to develop and promote Singapore as a premier global hub port and International Maritime Centre (IMC), and to advance and safeguard Singapore's strategic maritime interests. We therefore serve as both the regulator and the promoter for Singapore's maritime industry.

As an organization, we aim to be a leading maritime agency driving Singapore's global maritime aspirations.

We seek to achieve our vision and fulfill our mission through a deliberate strategy centered on what we have called the "5 P's". The "5 P's" refer to

- Nurturing Competent and Committed People;
- Building Strong Partnership;

- Developing a Pro-Business Environment;
- Improving Operational Processes; and
- Achieving International Prominence

We believe that this strategy will enable the MPA to grow internally, while we continue to work with external partners to develop Singapore's maritime cluster beyond merely being a hub port.

Regarding the IMC concept, what kind of achievements have been made?

We have made good progress in broadening the services offered under our maritime clusters, and towards establishing Singapore as an international maritime centre.

The core cluster of shipping companies in Singapore has grown over the years, with major shipping companies from leading maritime countries such as Denmark, Japan and Norway establish-



Chief Executive BG(NS) Tay Lim Heng

ing operations in Singapore. There are now more than 90 reputable shipping groups in Singapore under our Approved International Shipping Enterprise (AIS) scheme, with representation of ship owners from more than 25 countries.



We are also seeing good growth in the ship financing sector. Currently, there are 15 banks with ship financing operations in Singapore, of which five are amongst the top 10 shipping banks in the world. In recent years, we have seen new entrants or expansion of activities in Singapore from entities such as DVB Group Merchant Bank, HSH Nordbank, Natixis, Pareto Securities Asia and HVB.

The Maritime Finance Incentive (MFI) introduced in 2006 has helped to stimulate the nascent alternative ship financing sector. To date, five companies have been awarded MFI status. Recent media reports indicate that some of these companies have done well to meet or better their targets for the year.

The marine insurance market is also growing. For instance, the number of Lloyd's Syndicates in Singapore that undertake marine insurance activities has increased from two in 2002, to about five to date. We are seeing greater interest from the marine mutuals to come to Singapore to tap into the market. These include the Norwegian Hull Club and the North of England P&I Club, both of which have established representative offices in Singapore.

Although Singapore is already considered the centre of the maritime industry in Asia, do you think there is still room for improvement?

While we have made good progress in developing the maritime clusters, there is still much work to be done.

One area that calls for closer attention is the maritime talent crunch. As more maritime businesses establish themselves in Singapore, we need to ensure that there is a pool of qualified professionals available to support and propel the growth.

The MPA therefore works closely with our industry partners and education institutions to develop manpower for the industry. We look into developing a pipeline of maritime-ready manpower; upgrading the knowledge and skills of those already in the industry; and reaching out to those who are unaware of the possibilities the maritime industry offers, through various publicity and outreach initiatives.

Recent initiatives targeted at raising awareness of the public for the career prospects in the maritime industry

include the Maritime Youth Day @ SeaAsia event and the MaritimeONE (Outreach NETwork) programme. In particular, the MaritimeONE platform allows the various maritime stakeholders to work collectively to raise awareness of the industry and attract quality manpower. This is achieved through a range of partnership activities such as scholarships and internships with maritime companies, student outreach activities and regular networking events for maritime employers and graduating students.

We have also extended the MPA's S\$80 million Maritime Cluster Fund set up in 2002, for a second five-year term. The MCF serves the dual objectives of developing manpower for the maritime industry and enhancing the competitiveness of our port. Since its establishment, some 760 companies have drawn on the MCF to co-sponsor over 3,000 employees for a wide variety of maritime education and training programmes. These include seminars and courses, as well as local and overseas post-graduate studies.

To date, the MCF has been tapped into to develop nine tertiary programmes at both undergraduate and postgraduate levels. The courses range from ship-



ping management and maritime law to naval architecture and marine engineering. These programmes will produce some 300 graduates each year for the maritime industry.

How important is R&D for you? What was the backdrop for establishing the first Maritime R&D Advisory Panel? How well has it worked?

There is heightened concern within the maritime community over safety, security and the environment. Technological research & development has the potential for coming up with solutions to address these concerns. It also offers new business opportunities for the maritime industry. The MPA has thus made maritime R&D one of our key focus areas in our push to develop Singapore's maritime clusters.

We established a Maritime R&D Advisory Panel to advise us on how we could create an environment in Singapore that is conducive to nurturing maritime R&D. The Panel comprises industry leaders and renowned researchers from Singapore and abroad, and they have generously shared their ideas and experiences, contributing towards the establishment of our Maritime Technol-

ogy Cluster Roadmap. In 2003, the MPA set up the S\$100 million Maritime Innovation and Technology (MINT) fund to support the implementation of this Roadmap, which includes building up a pool of maritime R&D expertise and funding promising maritime technology start-ups.

Guided by the recommendations of the Advisory Panel, the MPA has adopted a cluster approach to R&D promotion, focusing on the Port sector, the Shipping sector, and the Offshore and Marine Engineering (OME) sector.

One recent initiative to promote R&D in the OME sector is the Offshore Technology Research Programme jointly set up by the MPA, the Agency for Science, Technology and Research, the Singapore Economic Development Board and the National University of Singapore in March this year. This multi-agency programme sets up a framework for the government to contribute funding, manpower and research facilities towards OME research.

For the Port and Shipping sectors, we have collaborated with the Infocomm Development Authority (IDA) to launch the Infocomm@Seaport programme – a S\$12 million joint initiative

to promote the development and use of infocomm technologies (ICT) for the maritime community. The programme aims to enhance connectivity and communications within the seaport, promote operational efficiency and increase opportunities for business development, through the innovative use of ICT.

The Wireless-broadband-access for SEaPort, or WISEPORT, pilot project is one of the first projects under the Infocomm@Seaport programme. The project aims to provide vessels with high bandwidth, low-cost and secure wireless broadband access up to 15 kilometres from Singapore's southern coastline. When in place by early 2008, Singapore will be the first port in the world to offer wireless broadband connectivity throughout its port waters.

The MPA will continue to work in partnership with the local tertiary and research institutions (TRIs) and the maritime industry to develop new capabilities and technology products and services that will add value to industry operations and businesses. This will benefit Singapore's maritime industry and enable it to retain its attractiveness as an IMC.





Kuwait

Gateway to the Middle East

Tradition and Modernity

Since ancient times, Kuwait's geographical location has made it a gateway to the Middle East. As a crossroads, Kuwait has been able to draw upon the accumulated wisdom of countries around the world to power its own growth. In the few short decades since the discovery of oil, this nation of fishermen and traders has transformed itself into one of the richest and most developed nations in the world.

Times may have changed but traditions have not. The country has modernized, but its people's links with their heritage are as strong as ever. Kuwait's wealth -- Black Gold -- may be buried underground, but its spirit is still vibrantly free and alive.

Kuwait is an independent and sovereign Arab state. It is a hereditary Emirate and follows a democratic system of

governance. To the north and west it shares a border of 225 km with the Republic of Iraq, and to the south and southwest it shares a border of 250 km with the Kingdom of Saudi Arabia. To the east it has a coastline of 290 km on the Arabian Gulf. Kuwait's territory also includes nine islands that lie off its coast.

Kuwait won independence from the UK in 1961. The country's total area is 17,818 km and it has an estimated population of 3 million.

The Amir is the official head of state. By law, he must be a male descendent of the late HH Mubarak Al-Sabah. Legislative power is vested in the Amir and the National Assembly. Executive power is vested in the Amir, the Cabinet and the Ministers, while judicial authority is vested in the courts.

The country is divided into six Governorates. Each Governorate is adminis-

tered by its own local governing body called a Governorate Council.

Arab culture and traditions are the solid foundation upon which the modern State of Kuwait is built. Kuwait has also always paid special attention to the preservation of its culture and heritage by maintaining monuments and preserving artifacts and historical documents.

The metamorphosis in lifestyle brought about by the discovery of oil has not effaced the identity of the Kuwaiti people. The ravages brought by the Iraq war also could not stifle the spirit of the people of Kuwait and the country was rebuilt in record time.

As a member of OPEC, Kuwait owns about 10 per cent of the world's proven oil reserves. Its reserves of 96.5 billion barrels are expected to last more than 100 years.



From a nation of pearl divers and spice merchants to one of the world's largest oil exporters, Kuwait has undergone many exciting transformations. Kuwaiti society is truly a cosmopolitan and modern while still remaining true to its heritage and traditions.

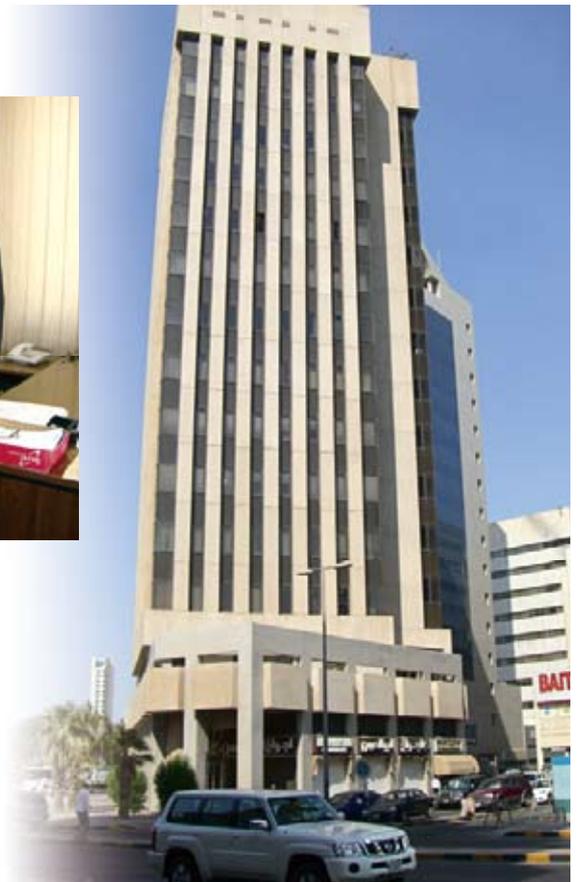
A highly urbanized state, Kuwait offers a host of attractions and services to tourists and visitors to the country. It offers a world class experience in hospitality through its small yet strong hotel industry. A number of fascinating tourist attractions allow Visitors to get a glimpse of Kuwait's rich cultural tradition and heritage. The shopping experience in Kuwait is also very rewarding. From ancient souks to sprawling malls selling the latest consumer goods, the range and variety is truly incredible.

The Kuwait National Petroleum Company (KNPC), a subsidiary of Kuwait Petroleum Corporation, operates the refineries and associated export facilities. There are three refineries in Kuwait operated by KNPC: Mina al-Ahmadi, Mina Shuaiba and Mina Abdulla Kuwait has a well-developed infrastructure for exporting crude oil, refined products, and LPG.

HIESCO, Kuwait's main ship repair facility that carries out ship building / repairs and other marine services is located in the original 200,000 sqm facility in the shuwaikh port area of Kuwait. It has all the same major workshops and resources that are required of any modern ship repair / building facility, such as engineering, steel work, fabrication, welding, heat treatment, galvanizing, painting, hydro blasting, finishing trades and inspection services. Supporting these services are slipways, jetties, cranes, a floating dock capable of accepting 35,000 dwt vessels and a syncrolift capable of lifting 5,000 dwt vessels.

Ports of Kuwait

Shuwaikh Port is located next to Kuwait city and is the main commercial port in the country. Doha port is a smaller coastal port that is used to berth dhows, barges and coastal vessels operating between various gulf



ports. Shuaiba port is located 45km to the South of Kuwait city and is mainly a commercial port.

Mina Al-Ahmadi which is next to Shuaiba port is principally an oil port consisting of a south and a north pier. This port handles most of Kuwait's petroleum exports. Offshore berths can load more than 2 million bpd of oil and can accommodate the largest oil tankers.

The loading facility at this artificial island port can handle 375,000 ton tankers and consists of a loading platform with six docking platforms with a depth of almost 30 meters of water. There are also a variety of single point mooring options and several other ports can also handle oil export.

NK Kuwait

The ClassNK Kuwait Office was established in 1993 to address the need for expanding services in the Middle East. Mr. Atsushi Hisata was the first General Manager followed by Mr. S. F. Gilani in 1995. The office has one surveyor and one office staff.

The office is responsible for surveys and

audits in Kuwait, Bahrain, Iran and Pakistan. All of the surveys and audits in these countries are carried out by this office.

In Bahrain, surveys are mainly conducted at the Arab Ship Repair Yard (ASRY) that has a graving dock capable of accepting 500,000 dwt vessels and two floating docks capable of accepting 120,000 and 80,000 dwt vessels respectively. The yard also boasts ten separate repair berths.

Apart from ASRY, surveys and audits are also carried out at many other ports located in the country.

In Pakistan, the Kuwait office regularly conducts surveys and audits at the port of Karachi and Port Bin Qasim that lies some 60 km east of Karachi.

In Iran, the Kuwait office attends to vessels at different ports and occasionally at Iran Shipbuilding & Offshore Industries Complex Co (ISOICO). ISOICO is an Iranian ship yard located on the Strait of Hormuz, 37 km west of Bandar Abbas port. The yard is active as both a shipbuilder and ship-repairer for a variety of different types of vessels and offshore structures.



New York

Metropolis of the World

The “Big Apple”

Baseball, Broadway, Times Square, Wall Street, fashion, arts and theater, the Statue of Liberty, and of course, the tragedy of 9/11 – New York City calls to mind many things to many people. Home to more than 8 million people, the “Big Apple” is the largest city in the United States.

Located on the East Coast of the United States where the Hudson River meets the Atlantic Ocean, New York City consists of five boroughs separated by various waterways, with Brooklyn and Queens to the east, the Bronx to the north, Staten Island to the southwest, and Manhattan in the center. A major world capital and leader in finance, the

arts, and communications, the city also has a long and dynamic history as a shipping and maritime center, at one point having been the busiest maritime port in the world.

From Discovery to Major Global Commercial Center

The deep natural harbor, upon which New York City and northern New Jersey now thrive, was first discovered by Giovanni Da Verrazano in 1524. Henry Hudson later sailed up the river in 1609 that now bears his name, and in 1624 the first permanent Dutch settlement was established upriver at what was to become Albany, the present day capital of New York State. One year later, the Dutch gover-



nor Peter Minuit purchased the island of Manhattan (“island of many hills” in the native Lenape language) from the Lenape Indians in exchange for beads and trinkets and founded the Dutch colony of New Amsterdam. The colony



was renamed New York in honor of the English Duke of York, who had quietly seized the settlement from the Dutch without bloodshed in 1664.

After the Revolutionary War, George Washington was inaugurated as the first president of the United States in 1789 in New York, which was briefly the U.S. capital until 1790. The city remained the state capital until 1797. By 1790 New York City was the largest city in the U.S. Further growth as a major economic center was spurred by the opening of the Erie Canal in 1825, which linked New York with the Great Lakes and rapidly developing American heartland. Massive immigration, mainly from Europe, swelled the city's population even further in the late 19th and early 20th centuries, and after World War II, people from all over the U.S., Puerto Rico, and Latin America migrated to the city in search of jobs.

New York City is a bustling center of manufacturing, advertising, fashion, trade, commerce, banking, publishing, theater and the arts. New York is also home to the New York Stock Exchange, the largest exchange in the world, and the NASDAQ. It is also home to the greatest number of corporate headquarters in the U.S., as well as home to the United Nations.

The city also boasts numerous famous tourist attractions, museums, universities, and landmarks, one of the most famous of which is the Statue of Liberty, recognized around the world. Other attractions include Times Square, the world renowned Metropolitan Opera, Yankees baseball, and the Empire State Building, as well as many events such as "Fleet Week", Macy's Thanksgiving Day Parade, the New York Auto Show, and spectacular 4th of July fireworks.

Although the Twin Towers of the World Trade Center had also been a unique feature of the New York skyline until 9/11, the new Freedom Tower being built in its place will be 1,776 feet (541 meters) tall, making it one of the tallest buildings in the world.



New York: A major global maritime port

The launch of New York as a prominent port started with the construction of a single wharf on the west bank of the East River at the direction of Governor Peter Stuyvesant in 1647. Thanks to its favorable location, the ready supply of raw materials, and geographical advantages of a natural deep harbor, the Hudson River, and a waterfront more than 1,000 kilometers long, New York became the most

important port and shipbuilding area on the East Coast. At one point, there were more than one hundred wharves in Manhattan alone.

Notable events in New York's maritime history include the launch of the world's first steamship, the *Clermont*, by Robert Fulton in 1807 and the building of the first dry dock in U.S. in 1824. The first clipper ship designs were developed by New York shipbuilders, in which volume was sacrificed for speed. These vessels were the supreme



sailing ships of their day, renowned for their sleek design and speed. These ships were the focus of great “tea races” to East and Southeast Asia and supported the westward expansion of the U.S. in the mid 1800’s after the discovery of gold in California. In fact, by the mid 19th century, more passengers and products passed through the port of New York than all other harbors in the United States combined. At the height of World War II, New York had become not only the busiest port in the world, but also the busiest port in all of history.

Although the port diminished in importance during the decades after the war, it still remains a vital hub for the transport of people and cargo from around the world and throughout the region. The Port of New York and New Jersey is currently the third busiest port in the United States, after Los Angeles and Long Beach, both in California. In 2005, more than 5,300 ships delivered goods that went to an estimated 35% of the U.S. population. Some 100 million tons of cargo now flow through New York and New Jersey shipping terminals each year, with more than 5 million teu, much of it from Asia, having been handled by the port in 2006, the highest volume ever.

The ClassNK New York Office

Although presently located directly across the Hudson River from Manhattan in Fort Lee, New Jersey, the ClassNK New York Office was originally established in February 1962 in Battery Park in lower Manhattan. Thus, the New York Office celebrates its 45th anniversary this year.

When the office was first founded, the Society did not have any exclusive surveyors in the U.S. or outside of Japan. The New York Office was founded in order to establish more careful control over the activities of non-exclusive surveyors who conducted work abroad on behalf of ClassNK. However, during the late 1970’s, ClassNK began to carry out surveys in the U.S. using its own exclusive surveyors.

Manhattan was the center of the shipping industry in the region at the time, but during the 1970’s shipping businesses began to relocate and eventually settle in the northern areas of the state of New Jersey. These new locations were closer to terminals and facilities that were better equipped to accommodate modern shipping, thanks to more land and easier access to railways and highways. In addition, the non-

scheduled or tramp sectors, which had always been closely connected to bunkering and cargo interests, were consolidated in southwestern Connecticut.

This resulted in a shift in the focus of shipping from Manhattan and Brooklyn to areas surrounding the city, and a decline in the former traditional maritime centers in the city itself. In fact, New Jersey at one point came to handle more than 90% of the trade in the harbor. The last decade, however, saw a dramatic resurgence in the shipping and maritime industry in Staten Island.

The New York Office moved to its present address in Fort Lee, New Jersey in July 1989 in order to better accommodate these trends. Located very close to the George Washington Bridge, the office is easily accessible by Car. Unfortunately, this can at times also be somewhat inconvenient for the office staff, who are routinely plagued by heavy traffic during the morning and afternoon rush hours. In October 2000, the Norfolk local representative office was established, which has helped to improve mobility and swiftness for servicing the East Coast region of the U.S.

Currently, the New York Office has a total staff of six: one general manager,



two managers, two exclusive surveyors, and one secretary. The territory serviced by the Office consists of the Eastern seaboard of the U.S. This area covers more than 2,000 kilometers, from the border of Canada to the State of Georgia, and includes more than a dozen major U.S. ports along the coast of the Atlantic Ocean.

The jurisdiction of the office also extends to the Great Lakes region and inland U.S., where surveyors from the office conduct approvals and certifications of machinery and equipment. Moreover, the New York Office serves as a liaison of the Society with the Panama, Liberia, Marshall Islands, and Vanuatu flag administrations, as well as the U.S. Coast Guard.

The U.S. Coast Guard is highly active in the conduct of PSC inspections. As a result, occasional surveys originating from PSC inspections are requested routinely. Accordingly, surveyors from the New York Office often accommodate these requests by working on around-the-clock schedules.

Staff from the New York Office represented ClassNK at the last two Connecticut Maritime Association (CMA) Shipping Exhibitions held in Stamford, Connecticut, one of the largest maritime



organizations in the U.S. established in 1984, in order to enhance the international presence of the Society in the U.S.

**Fort Lee:
Birthplace of American Cinema**

The town of Fort Lee, New Jersey is a town of many surprises. Located right across the Hudson River from Manhattan and in sight of where the Twin Towers once proudly stood on the west side of the island, Fort Lee itself has an interesting history.

Fort Lee was named by George Washington after General Charles Lee, who camped in the area defending New York City during the American Revolu-

tion. In fact, George Washington and his troops actually walked on a road that later came to be called Main Street in Fort Lee. The western end of the George Washington Bridge, which connects New Jersey to uptown Manhattan, is located in Fort Lee. It is interesting to note that the history of cinema in the United States can trace its roots to the East Coast where at one time, Fort Lee was the motion picture capital of America. In 1909 the forerunner of Universal Studios, the Champion Film Company, built the first studio, and by the 1910s and 1920s, more than a dozen film studios were making pictures in Fort Lee.



ClassNK Register Surpasses 150 million Gross Ton Mark

At the end of August 2007, The Society had 6,729 ships totaling 150,048,643 gross tons on its register. This was the first time that the total tonnage of ships on the ClassNK register exceeded the 150 million gross ton mark. This was not only a milestone for the Society, but also a milestone for classification, as it marked the first time that any classification society had 150 million gross tons on its register.

With the exception of 1987, the total gross tonnage under NK class has grown steadily ever since the end of the Second World War, averaging more than 5% year-on-year net growth over the past five years. The NK register broke the 100 million mark for the first time in 1997 and increased 1.5 times over the past ten years to reach 150 million gross tons.

The NK register grew by more than 15 million gross tons during 2006, a new record for ClassNK. Based on current

projections, the Society fully expects to break this record by the end of 2007.

INMEX CHINA 2007

The first international exhibition that ClassNK attended this year was INMEX CHINA 2007, held at the Guangzhou Jinhua Exhibition Center in Guangzhou, China from 7 to 9 March 2007. A total of 208 companies attended the exhibition. Managing Director Dr. H. Kitada, H. Kaji, general manager of the Guangzhou Office, J. Q. Song, a manager at the Beijing Office, Y. Seto, a manager of the Business Department, and Y. Takasu, a technical staff member in the Business Department, were present

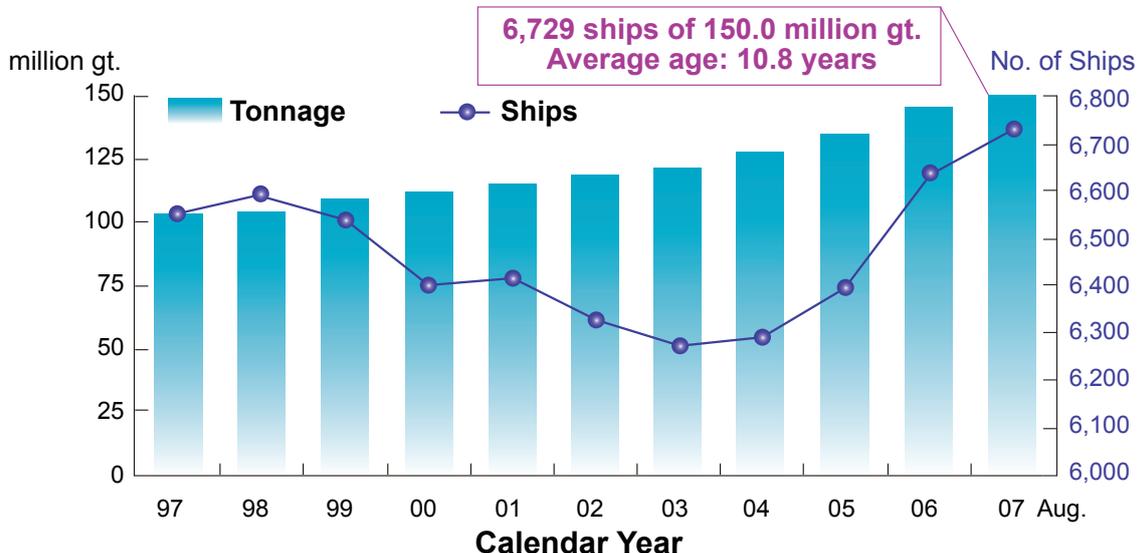
from the Society.

Attending the exhibition provided the Society with an excellent opportunity to showcase its outstanding technical capabilities to not only the marine industry both inside and outside of China, but also to several global press firms such as SeaTrade, Worldyards, and the China Ship Report (in Chinese). It also had the benefit of enhancing the recognition of ClassNK as a truly international ship classification society. In addition, Mr. Wang Rong Sheng, Honorary Chairman of the China Association of the National Shipbuilding Industry, also paid a visit to ClassNK's booth.



ClassNK Fleet

NK in Action



CMA Shipping 2007

CMA Shipping 2007 was held from 19 to 21 March under the sponsorship of the Connecticut Maritime Association (CMA) at the Westin Stamford Hotel in Stamford, Connecticut in the U.S.. The CMA, founded in 1983, is the largest maritime organization in the United States. The CMA, in cooperation with other major maritime organizations, sponsors CMA Shipping each and every year. This was the second time for the Society to participate as an exhibitor at this event.

Display panels and a large plasma screen were set up at the NK booth to introduce the various activities of the Society. Regional Manager M. Homma and T. Narisawa, a manager of the Business Department, were present to greet visitors at the NK booth. Numerous shipowners visited the NK stand as well as representatives from seven national administrations, including Liberia and Panama. ClassNK took advantage of the conference and used it to highlight the fact that NK has a greater amount of tonnage on register, in terms of gross tons, than any other classification society and that the ships under NK class are of the highest technical quality. There were a great many visitors to the NK booth and they offered a wide variety of praise for NK and its activities.



SEA ASIA 2007

The SEA ASIA 2007 marine exhibition was held at the Suntec Singapore International Convention & Exhibition Centre during a four-day period from 2 to 4 April 2007. Mr. S. R. Nathan, President of the Republic of Singapore, opened the event with a speech and cut the tape at the opening ceremony. More than 7,000 people attended the event from 42 countries, and more than 250 companies participated as exhibitors. Mr. T. Kamata, Regional Manager of the Singapore Office, the staff of the Singapore Office, Mr. Y. Seto, a manager of the Business Department, as well as Mr. S. Yasuda, a staff member of the Business Department, were present from ClassNK.

Business cards were exchanged with more than 300 persons who visited the NK booth.

In addition to its booth ClassNK also participated in the conference which was held on the second day of the



exhibition. The Society's Dr. T. Yoneya, attended the conference and gave a presentation on ClassNK's new "Total Life Assessment" service.

LNG 15

The 15th International Conference and Exhibition on LNG (LNG 15) was held in Barcelona, Spain over 4 days from 24 to 27 April 2007. The event is held once every three years and is one of the most important events for the LNG sector. This year almost 5,000 participants and delegates representing 500 companies from 55 countries attended the event.

In addition to the NK booth, which received a great number of visitors, ClassNK was also represented by Executive Vice President N. Ueda. The Executive Vice President visited the booths of a number of Japanese companies including MES, MHI, and IHIMU among others and also took part in discussions with some of the world's largest gas and oil companies.

NOR-SHIPING 2007

ClassNK also participated in NOR-SHIPING 2007, which was held from 12 to 15 June in Oslo, Norway. As with the previous event held in 2005, the Society once again set up a booth at the exhibition. Nor-Shipping, held every other year, is one of the largest maritime exhibitions in the world. This was

the twenty-first time that the exhibition has been held. A total of some 828 exhibitors from 42 countries attended the event this year, representing a wide range of businesses and organizations from across the globe. According to the organizers, more than 20,000 visitors in all came to four-day period that the event was held.

Since the NK booth was located in the central area of the exhibition hall, many visitors came by during the four day period. The ClassNK booth was arranged so as to facilitate easy interaction with visitors while introducing the various activities of the Society with continuous televised images and the display of a vast array of pamphlets, brochures and other promotional and informational materials.

In order to enhance the presence of the Society in Europe, ClassNK Chairman and-President K. Ogawa visited the exhibition and had friendly discussions with clients from various countries around the world and participated in a variety of meetings and conferences that are held in conjunction with the exhibition.

In addition, Regional Manager for Europe and Africa E. Owada, London Office manager H. Shibako, General Manager of the Oslo Office N. Nilsen, Business Department manager T. Narisawa, and, Business Department tech-

nical staff member K. Nagata met and took care of visitors at the NK booth.

New Barcelona Local Area Representative, Bilbao Office Established

A new Barcelona Local Area Representative office was established under the jurisdiction of the Bilbao Office on 1 April 2007. Located in northeastern Spain, on the coast of the Mediterranean, Barcelona is the capital of both the State of Catalonia and of Barcelona Province. It is the largest port in Spain and has a population of about 1.6 million people, making it the second largest city in Spain, after the national capital of Madrid. The Barcelona Local Area Representative's office is the 99th exclusive surveyor site opened by ClassNK.



ClassNK Website Renewed

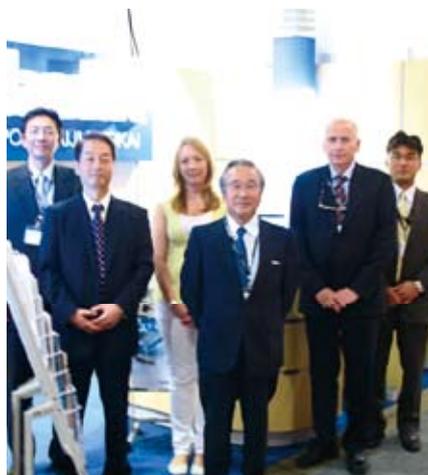
The ClassNK website underwent a complete renewal on 1 August 2007. Various changes have been made to the layout of the site, including the use of traditional Japanese colors in a more sophisticated design. The different login pages to ClassNK's web-based services for registered users have been integrated into a single new Web Service Portal page. Further, Approval Lists have been converted from a PDF file format to a database format that allows users to search for things more easily. These are among the many changes that have been incorporated to

help make the site even more user-friendly. In addition, new pages have been added that describe the various new research projects being undertaken by the Society, and the previously separate ISM and ISPS pages have also been fully integrated into the newly revised ClassNK website. Moreover, Chinese language (both simplified and traditional forms) and Korean language pages have also been created for the website.

Japanese, Chinese, and Korean Language Versions of the 2006 ClassNK Annual Report Released

Following up on the publication of the English version of the "ClassNK Annual Report 2006" this past May, the Japanese, Chinese, and Korean language versions of the report were published in August and distributed to various interested locations. Copies of the Annual Report are to be presented to clients and other interested parties at roundtable meetings, technical seminars, exhibitions, and other venues.

The respective reports can be viewed on the "Free Publications" page of the ClassNK website. Actual physical copies of the reports can also be obtained by contacting the Information Service Department.



ClassNK

NIPPON KAIJI KYOKAI

4-7, Kioi-cho, Chiyoda-ku, Tokyo 102-8567 JAPAN
Tel : +81-3-3230-1201 Fax : +81-3-5226-2012

www.classnk.or.jp



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