

ClassNK

MAGAZINE 2008 60TH EDITION

Special Article

The Elephant Awakens

India's shipbuilding industry finds its feet

Stories from the Sea

A New Maritime Metropolis?

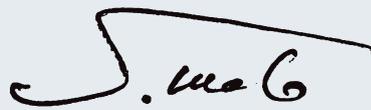
With the new Maritime City development, Dubai looks to become one of the maritime industry's major players

Checking in on the *Chikyu*

The world's most advanced scientific drill ship calls into port

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Chairman and President Noboru Ueda



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60 Years of the ClassNK Magazine

It is an honor to welcome you to the ClassNK Magazine 2008. This issue is special not only because it is the 60th Anniversary of the ClassNK Magazine, but also because I have the privilege to write this foreword as the Chairman and President of ClassNK, my new role which began in March of this year.

Just as the Society has grown to become the world's largest classification society on a gross tonnage basis, over these past 60 years the ClassNK Magazine has grown to become the rich, informative, and high quality magazine you hold in your hands today. Yet for all the changes and improvements, I am proud to say that the ClassNK Magazine continues its long tradition of excellence, and I am sure you will find this year's articles to be both interesting and compelling.

As a technical organization, ClassNK is dedicated to cutting-edge research and development. It should come as no surprise then that this year's magazine includes articles on some of the newest and most exciting technologies appearing in the maritime world. With environmental concerns playing an ever more important role in the industry, and with the unprecedented changes in oil prices as a backdrop, environmentally friendly technologies and energy saving technologies are of prime interest to the shipping industry. This year's issue of the Magazine begins by examining a timely new energy recycling system from Tsuji Heavy Industries. Tsuji's On-deck Recycling System regenerates the electric power produced when the deck crane is unwound and makes it available to power other electrical equipment onboard. This focus on the latest technological developments continues with this year's second Technical Essay which examines a new type of steel plate developed for use in shipbuilding. YP47, a new high tensile steel plate for use in container carriers, represents the newest in material science and is already playing an important role in ensuring the safety of ultra large containerships.

Further, this year's Magazine truly showcases the international focus of the Society. This year's special article takes a look at the shipbuilding sector in India, where yards have been gaining a reputation for successful newbuildings and are racking up impressively large orderbooks. In addition to this in-depth look at India, the Magazine continues with articles covering all parts of the globe, from Kobe to London and beyond. This year's Magazine truly spans the breadth of the maritime world, and I am sure you will find every article to be rich and informative.

I emphasize the technical and international focus of this

year's Magazine because that focus in many ways reflects my goals and expectations for the Society. Over the nearly 40 years that I have worked for ClassNK, the maritime industry, and in turn ship classification, have undergone tremendous changes. The industry, of course, continues to change and progress, and as the shipbuilding boom continues, our workload will only grow. As the maritime industry becomes increasingly globalized, we must work to ensure that we can provide the same high quality service anywhere in the world. As demands for new regulation and new environmentally friendly technology increase, we must help drive the pace of new technology development, and as the shortage of skilled workers continues, we must take a larger role in education and training.

To address the challenges of tomorrow, however, we must begin laying the groundwork today. As Chairman and President, I have dedicated myself to improving every aspect of the Society and I am pleased to report that we are already making great strides. In response to increased workloads, we have increased our recruitment of new university graduates in different parts of the world. In order to improve our global service network, we have opened four new exclusive surveyor offices this year alone. To improve the speed and quality of our services, we have opened three new Plan Approval Centers in Busan, Mumbai and Istanbul, and we have made our NK-PASS electronic plan approval service available to shipyards and design companies around the world. With regards to research, last year we began seven new Practical Research and Development projects, aimed at providing workable solutions to the problems facing the maritime industry. We have already completed the first of these projects and have begun a new environmental awareness certification program based on the results. This year we are further expanding the program to better meet the needs of our clients. Finally, in response to increased workloads and the growing labor shortage in the industry, we have expanded our technical assistance programs, and next year we will unveil our new NK Academy training program, which will provide technical training on everything from newbuildings to ship maintenance.

This focus on improvement is apparent not only in our approach to tomorrow's challenges, but in every aspect of the Society's work, from the consistency and precision of our surveys to the quality of our publications. It makes me quite proud to say that this commitment to quality is equally reflected in the magazine you hold in your hands today. With that said, I hope you thoroughly enjoy reading this year's issue of the ClassNK Magazine.



On-deck Recycling System (ORS)

Tsuji Heavy Industries Co., Ltd.
M. Toyonaga

Energy regeneration and re-utilization system for cargo ships with cargo handling gear

The G8 Hokkaido Toyako Summit concluded with a declaration "seeking all countries of the world to share a long-term goal of reducing GHG emissions by 50% until 2050," which was agreed to by the Group of Eight countries. It has been reported that GHG emissions from the international shipping industry, which consumes 2 billion barrels of oil annually, have reached 1.2 billion tons per annum. This figure amounts to between 5% and 6% of total global emissions. Although total emissions from the international aviation and international shipping industries amount to 10% of the total global emissions, both these industries fall outside the scope of emissions reduction policies laid out in the Kyoto Protocol. The arrows of governance of international organizations and flag state controls have not yet posed any problems to the international shipping industry, which remains secure within the castle walls of an extreme market economy.

Anyone who has tried to untangle the problem of GHG emissions must at some time have wished for a bold solution that

would cut the Gordian knot in a single stroke, much as Alexander did. At this year's Summit, Japan proposed a sectoral approach instead of total targets by country. By transfer of advanced technology from developed countries to developing countries, the reduction of emissions by each industry would approach the total target for each country, and this would be a step forward for the shipping industry. Studies on tax policies and other measures to reassert flag state sovereignty are in progress, but it is too early to say whether these measures will succeed in reducing emissions. Although one cannot be too optimistic, there is a feeling that mechanisms for a successful assault is ready to be mounted on the castle walls within which the shipping industry resides.

The "On-deck Recycling System (ORS)" introduced in this article is an environmentally friendly system designed to enhance the fuel economy of international maritime cargo ships and to resolve issues of GHG emission reduction in electric equipment networks on ships with cargo handling machin-



ery. ORS is a system that reuses the regenerated power created when a deck crane lowers a load (a dynamic phenomenon specific to bulkers with cargo handling gear) by recycling and sharing this power with on-deck electric equipment or another group of cranes. Capacitors are installed for temporary storage of electric power during the reuse process.

The introduction of the total system may be divided into four stages.

Pre-Installation: Generally, hydraulic deck cranes are fitted on bulk carriers equipped with cargo handling gear. The power for operating the cranes is supplied by the ship's generator.

Energy consumption: 100
Energy cost: 100

Preparation: Inverter-controlled electric crane is fitted instead of hydraulic crane. A regeneration unit is provided for the energy regenerated by the regenerative brake; basic power for operating the crane is supplied by the ship's generator.

Energy consumption: 60
Energy cost: 60

Phase 1: External capacitor modules are installed and connected to each crane regeneration unit. Figure 1 shows a conceptual overview of the system. If necessary, they may be linked to local networks of on-deck electrical equipment. The regenerated power generated by lowering a load by crane is accumulated temporarily in the capacitor modules. →

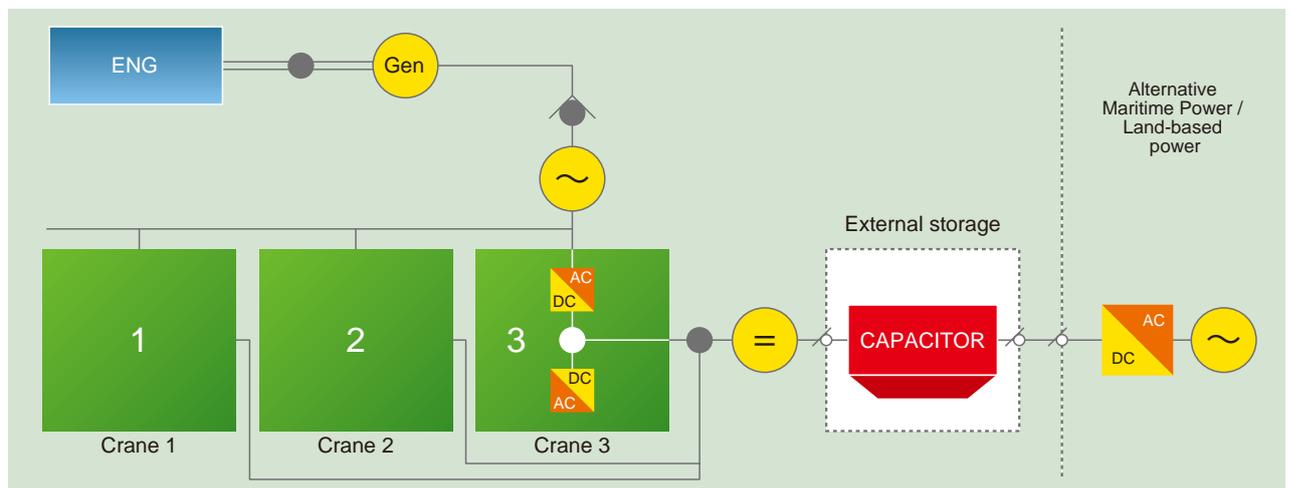


Fig. 1

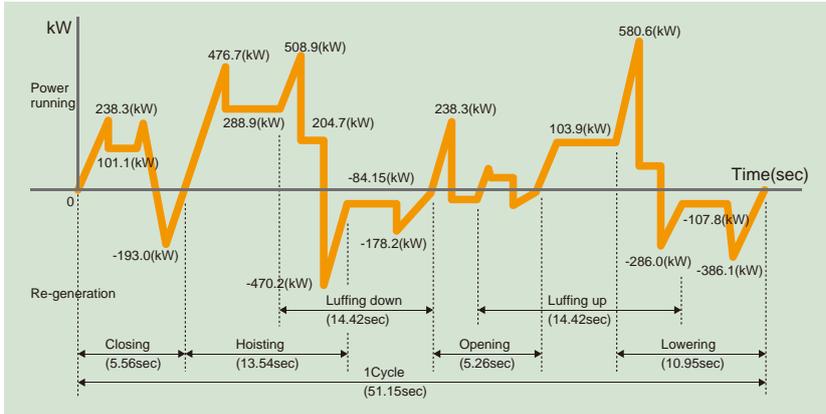


Fig. 2: Power Diagram

→ A sample power diagram for the electric crane is shown in Fig. 2. Although the basic power to operate the crane is originally supplied by the ship's generator, the regenerated power is supplied assistively as a part of the consumptive power of the crane. Additionally, it is re-used as a power supply for power-operated hatch covers and power-operated deck machinery or general electric equipment in the accommodation space. As a result, beneficial effects

anticipated include a reduction in both power consumption and power peaks due to cargo handling work, as well as enabling the use of smaller generators onboard. Figure 3 shows a diagram of the system configuration. ORS also includes control equipment (see Fig. 4) for performing power management. The control equipment receives and stores commands for operation for each crane, and when the commands are executed, the equipment determines

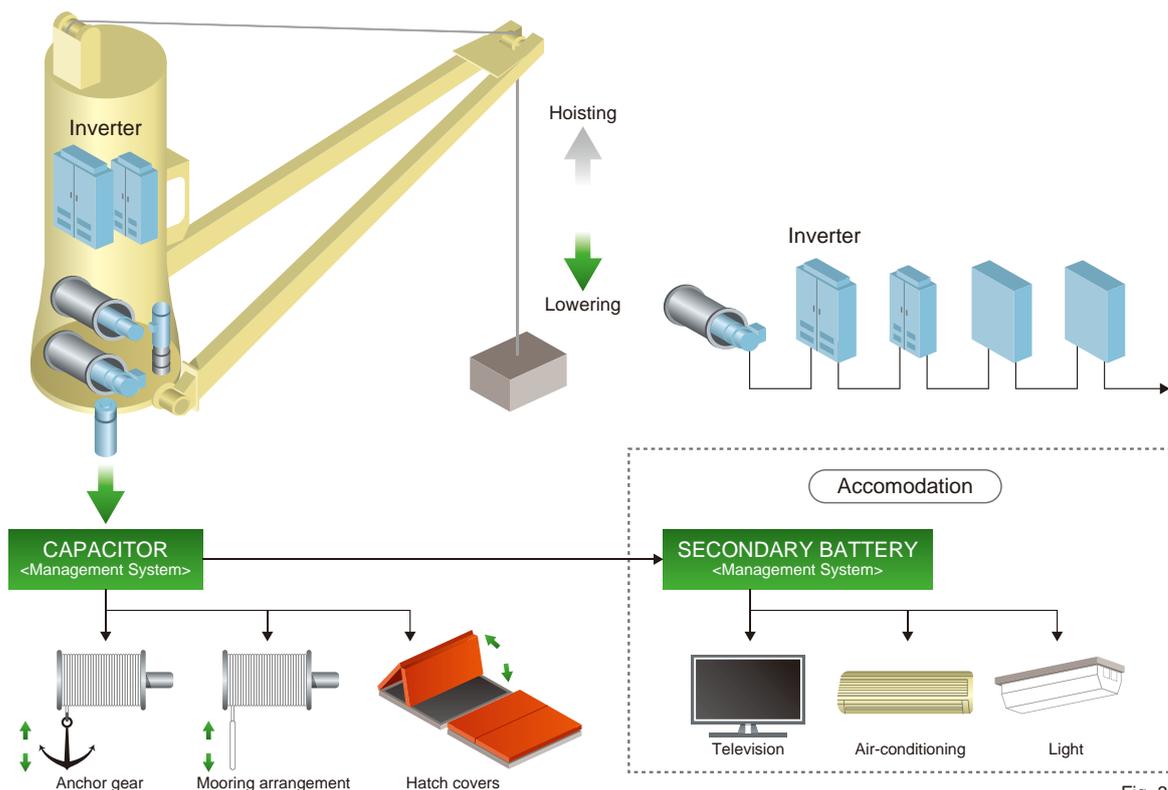


Fig. 3

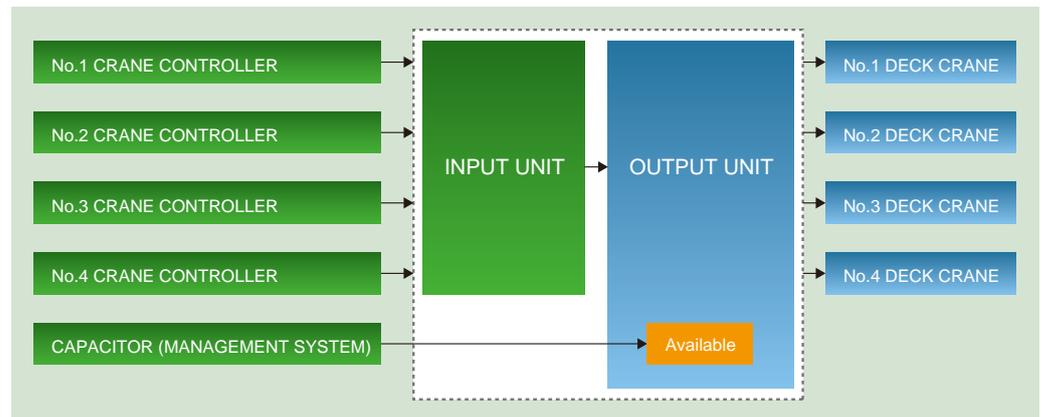


Fig. 4: Control Equipment Diagram

whether to use consumptive power or regenerated power. At the same time, in response to the operating commands of each crane, the equipment considers the anticipated power consumption and capacitor charge and then determines whether to give priority to power from the generator or recycled power.

As a result, the regenerated power and the consumptive power can be balanced to a certain extent, the operating pattern can be optimized, and the overall energy consumption rate of the cargo ship can be reduced.

Energy consumption: 40
Energy cost: 40

Phase 2: Eventually, the capacitor modules are plugged in and connected to the local power network. Power needed above that provided by the regeneration units is fully supplied by the port. By using the port power efficiently and

economically, both energy consumption and cost can be reduced. When the port makes use of green energy, GHG emissions approach zero.

Energy consumption: 40
Energy cost: 10

In a standard cargo ship equipped with four cranes, the final energy costs through the year from the present state to Phase 2 is one-tenth of the present cost (see Fig. 5) and the GHG emission reduction effect is comparable to that of 200 Japanese hybrid cars. The Japanese Government has decided to make a proposal on "Fuel Consumption Performance Standards" for ships operating in international waters jointly with Denmark to the IMO. The establishment of a common global fuel consumption template is a mechanism to introduce environmental technology of this kind and industry and political leaders believe that such efforts are a necessary first step in the reduction of GHG emissions.

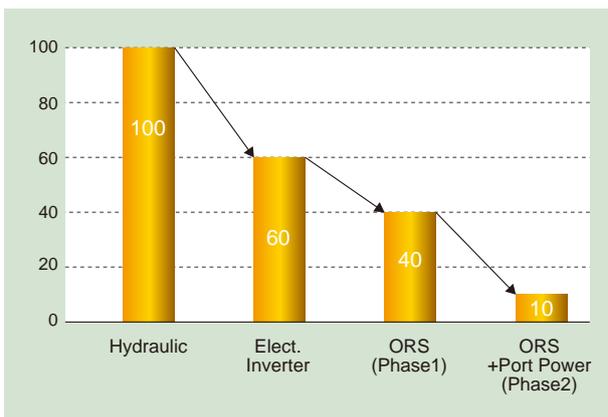


Fig. 5: Energy Index





© Mitsubishi Heavy Industries, Ltd. Nagasaki Shipyard

8000 ton Strength Tester

YP47

Ensuring the safety of ultra large containerships

The development of YP47 high strength steel and methods for arresting brittle cracks

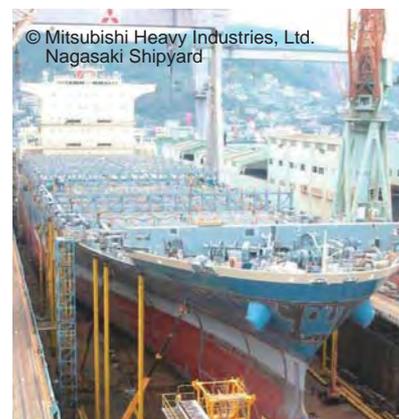
The ever-greater demands of international trade are driving a transition toward the use of ships of ever-greater size and efficiency. Nowhere is this more apparent than in the containership market, where ships of sizes once unimaginable are becoming commonplace. Less than two decades ago, the largest containership could only carry 5,000 TEU. Yet this year alone, orders have already been placed for ships of up to 14,000 TEU in size, and shipbuilders have unveiled designs for ships approaching 16,000 TEU and even for 18,000 TEU Malaccamax ultra-mega sized carriers.

The increasing size of containerships has led to the use of ever larger and thicker steel plates, especially in the construction of strength deck structures, such as hatch side coamings, strength deck, sheer strakes, and longitudinal bulkheads, in order to accommodate greater loads. These plates can exceed 70 mm in thickness, with some plates reaching thicknesses of up to 100 mm, sizes previously uncommon in shipbuilding. Such thick steel plates are used in the construction of containerships in order to satisfy the requirements for longitudinal hull girder strength, especially in light of the open deck design of these ships. The open deck design

means that longitudinal strength must be ensured with limited structural members. The application of such extremely thick steel plates in hull structures, however, raises concerns about:

- the tendency towards a decline in toughness as plates become thicker;
- the adequacy of strength to resist brittle fracture in the base metal and welded joints, including preventing the occurrence of brittle fracture and arresting the propagation of brittle cracks;
- the assembly, fitting and welding work of the hull structures due to the resulting increase in weight to be handled; and
- the quality control (welding work, non-destructive inspection, etc.) of welded joints on extremely thick plates.

In order to address these concerns, ClassNK has cooperated with Nippon Steel and Mitsubishi Heavy Industries in the development and practical application of a new grade of higher tensile steel plate with a specified yield point of 47 kgf/mm², known as YP47 steel plate, since 2001. This has led to the construction of the *MOL CREATION*, a 8,110 TEU



The MOL CREATION, the first ship in the world to use YP47 in its construction

containership built at the Mitsubishi Heavy Industries Nagasaki Shipyard & Machinery Works in 2007 to NK class as the first ship in the world to utilize the new YP47 high strength steel plating. Five sister ships using YP47 steel plate have already been delivered, and a number of other other containerships are scheduled be built in Japan and overseas using the new material. YP47 steel plate is tougher and stronger yet less thick than comparable types of steel used until now. Further, as YP47 incorporates brittle crack arrest as part of its design, the use of YP47 steel not only contributes to weight reduction and improved fuel efficiency but also helps to increase the reliability of the ship's hull.

Another result of this cooperation was the publication of *Guidelines on the Application of YP47 Steel Plates in the Strength Deck Construction of Ultra Large Container Ships* by ClassNK. The Guidelines set forth requirements for four major areas:

- the hull structure, including hull girder strength and higher tensile steel factors, fatigue strength, application of steel grades to hull structural members, and brittle crack arrest design;
- steel material requirements and approval of manufacturing processes, including the approval of steel materials;
- welding work, welding procedures including welding joint requirements, and welding materials; and
- inspections with particular focus on non-destructive inspections. →

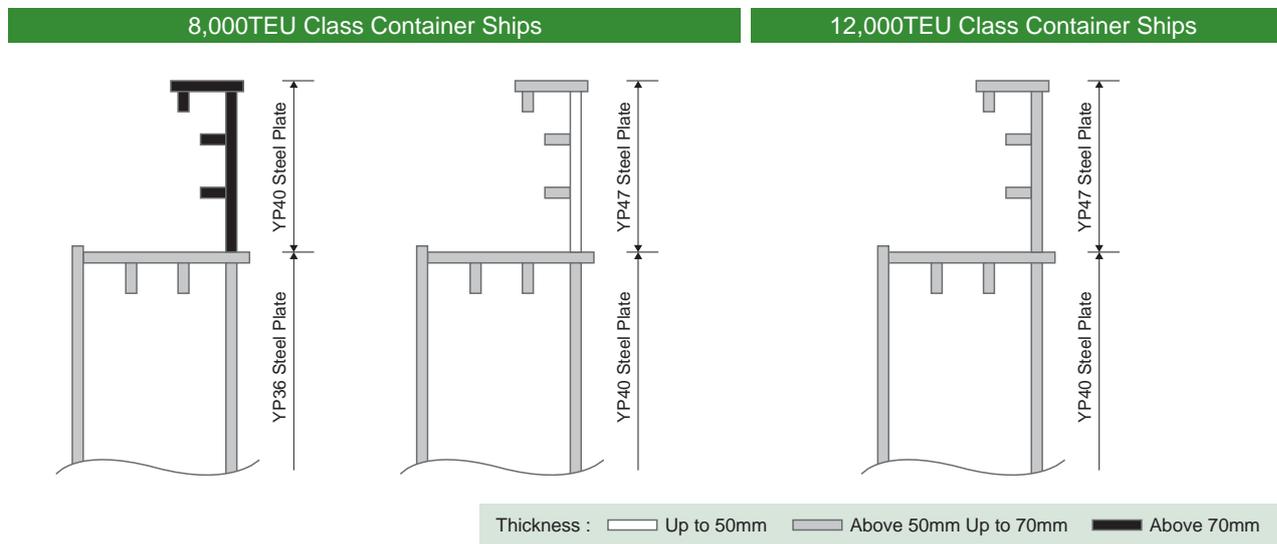


Fig. 1: Example of strength deck structures of ultra large containerships (application of YP47 steel plates).

→ ClassNK has also been conducting practical research studies in cooperation with industry partners on the application of higher strength steel plates of heavy thickness in 10,000 TEU to 12,000 TEU class containerships. In these studies, particular attention has been paid to the brittle fracture toughness of the steel plates, brittle crack arrestability, and the quality of welded joints.

Preventing brittle fracture and ensuring brittle crack arrestability are of primary importance in ensuring the structural reliability of containerships. Classification society rules have prescribed stringent toughness requirements as a major aspect in the specifications of steel plate, material selection, toughness of welded joints, and the like, with a view to preventing the initiation of brittle fracture. Recent large-scale model tests have shown that the introduction of backup brittle crack arresting elements in strength deck construction is one of the most effective ways of preventing crack propagation. As a result, ClassNK has developed and included special requirements for steels with brittle crack arrest properties in its technical rules since 2006. These requirements have been verified by large-scale tests and have been applied in the use of high strength YP47 steel in

the construction of the first ultra large container vessels in the world to use this material.

Of special concern is the fact that when brittle cracks occur in the welds of very thick steel plates, they propagate in ways that are contrary to conventional wisdom. Recent testing shows that brittle cracks in very thick steel plates propagate in straight lines, without swerving or deviation. Moreover, such cracks may not stop and may continue propagating even after penetrating the parent material. This suggests that if a brittle crack does in fact occur in a hull structure using very thick steel plates, there is a risk that such a crack could propagate at high speed and cause a major or catastrophic accident, including failure or collapse of the hull structure. Thus, the proper study of the brittle crack propagation and behavior in very thick steel plates and the establishment of suitable technical standards to prevent the occurrence of brittle fracture accidents should be considered a critical matter of concern.

Since February 2007, ClassNK has been conducting a research and development project aimed at developing technical requirements and design methodologies for arresting

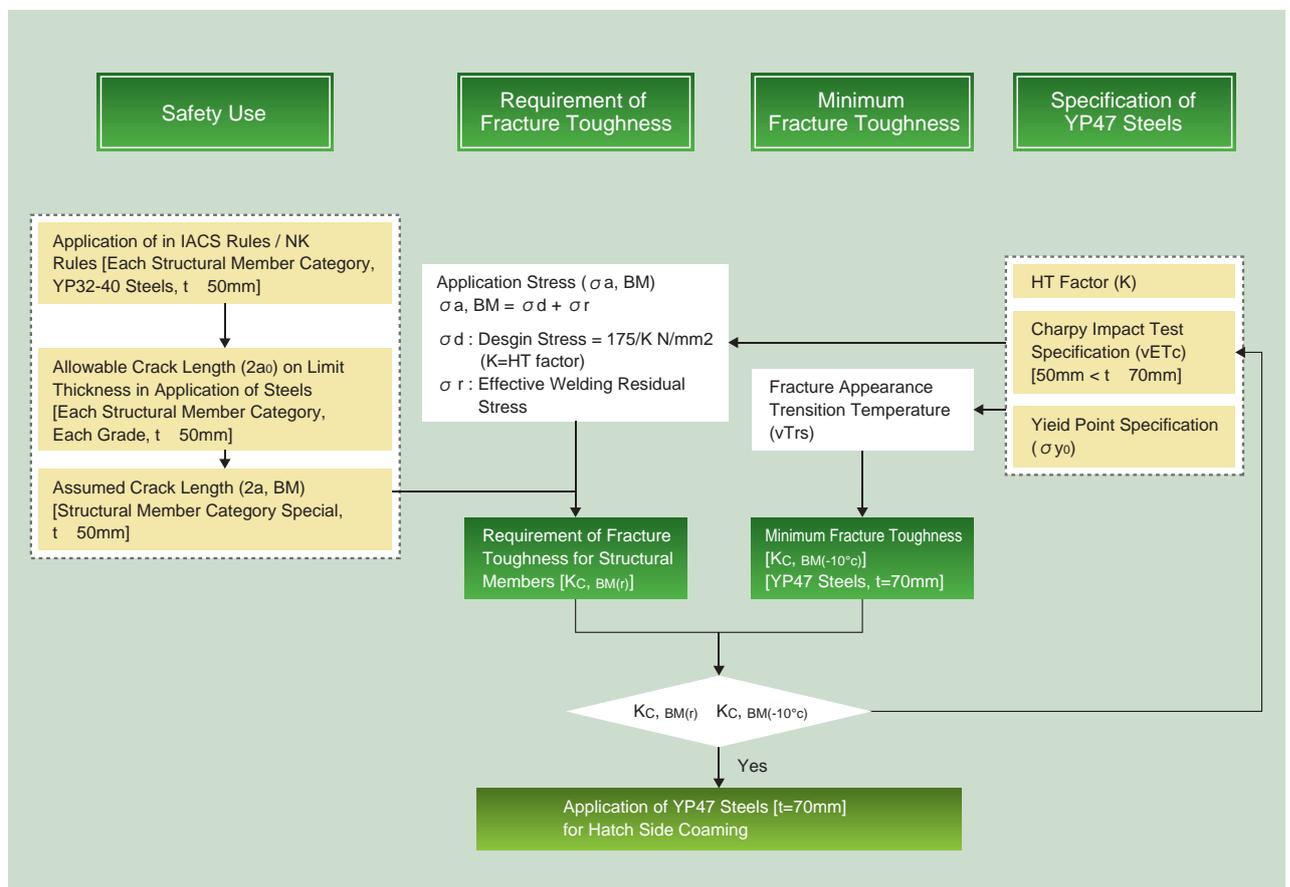


Fig. 2: Flow for evaluation of application of YP47 steel plates.



8th Meeting of the NK Brittle Crack Arrest Committee



© Mitsubishi Heavy Industries, Ltd. Nagasaki Shipyard
Large scale crack arrest test (Crack arrest design)

brittle cracks in the thick steel plates used in ultra large containerships. This project is the latest in a series of studies started several years ago by the Society on the safe application of new thick and heavy, high-strength steel plates used in container ship construction. The current project has been conducted in cooperation with major shipbuilders, steel mills and other interested parties in Japan (six shipbuilders, four steel mills, two universities, and two institutes).

The project has been focused on the following main tasks:

- the conduct of large-scale model tests to establish technical standards relating to the brittle crack propagation behavior of very thick steel plates based on the latest cutting edge knowledge;

- the study of design methods that are effective in arresting the propagation of brittle cracks based on the knowledge obtained from the above tests; and
- the development of technical standards for designs incorporating suitable brittle crack arrest techniques, and at the same time study the establishment of related rule requirements.

Research is slated to conclude at the end of 2008 and it is expected that the outcome of this project will greatly contribute to enhancing the structural integrity of large and ultra large container ships classed with ClassNK. The outcome will be used to upgrade NK's own technical rules and provided to IACS in order to develop applicable IACS URs.

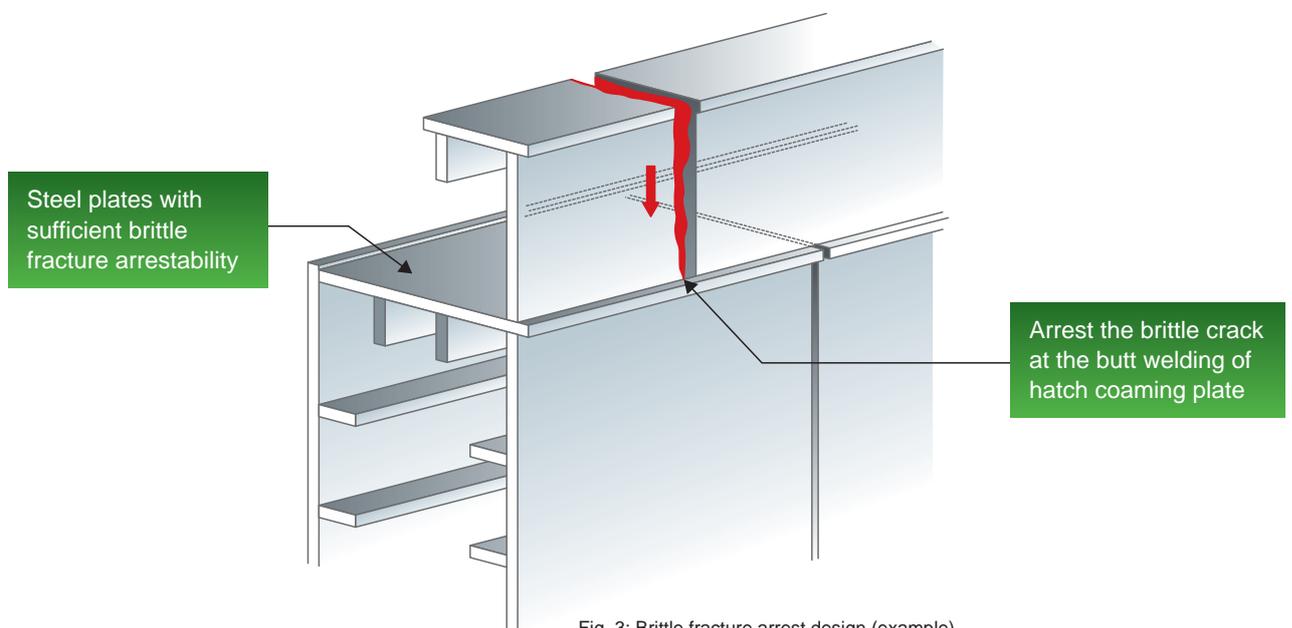
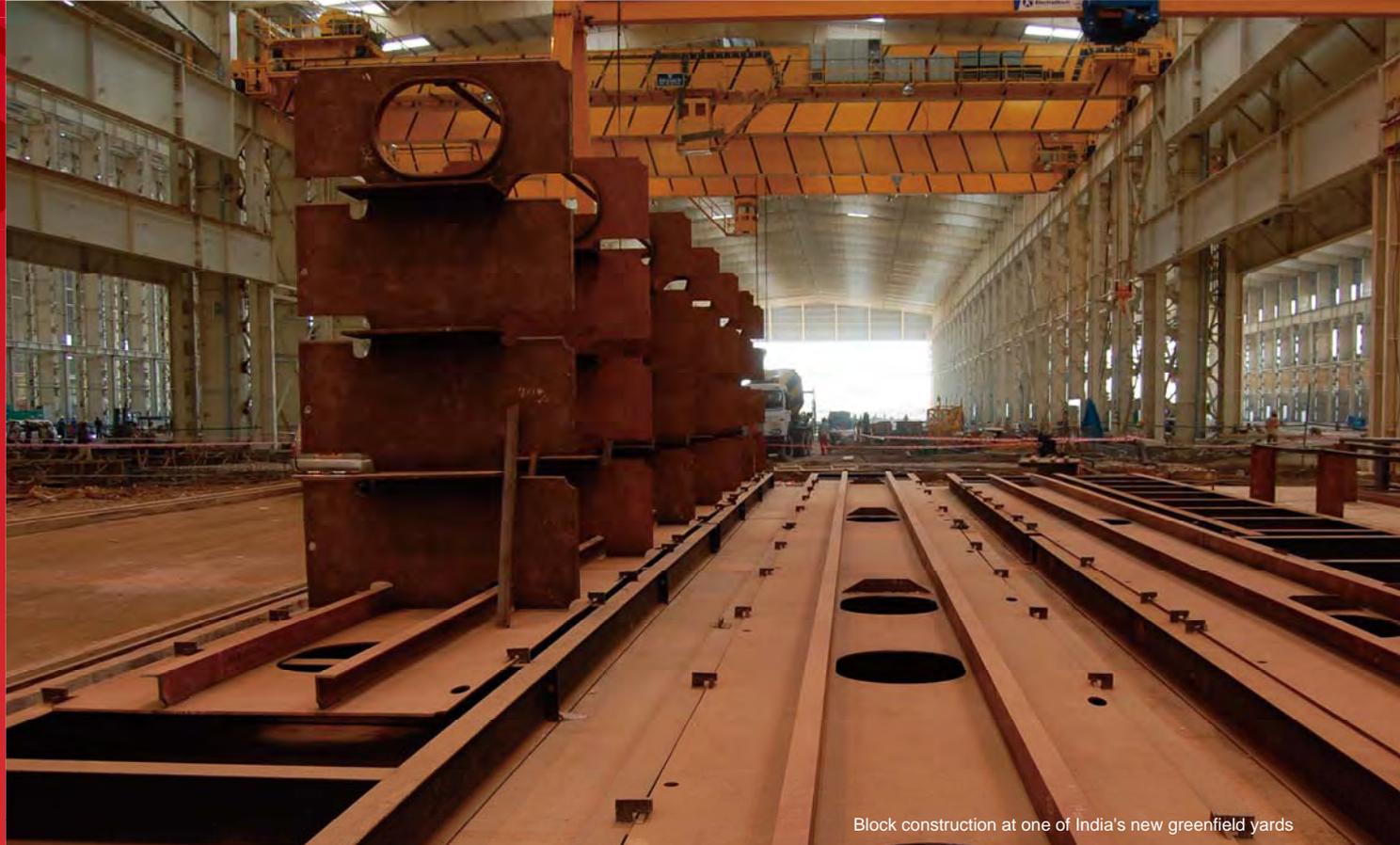


Fig. 3: Brittle fracture arrest design (example).



Block construction at one of India's new greenfield yards

The Elephant Awakens

India's shipbuilding industry finds its feet

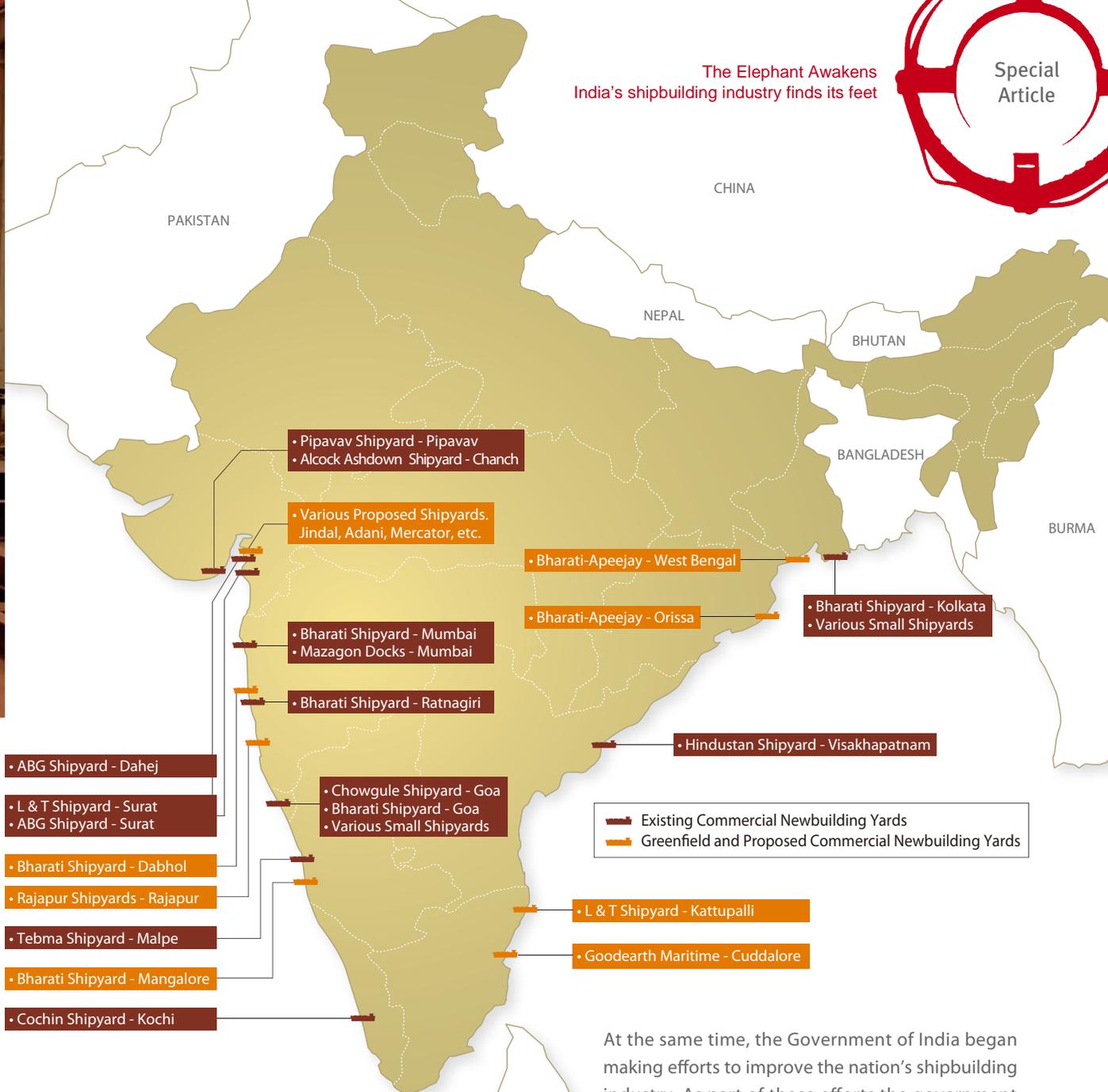
With its large and relatively well educated populace, expansive coastline, and rapidly growing economy, India has long been considered one of the most promising developing nations. Yet while India has benefited from the development of home grown industrial infrastructure (India is already one of the world's top steel producers) and drawn significant foreign investment, the nation has never developed a reputation as a shipbuilding power. This is set to change over the next decade as India moves to become one of the world's top shipbuilding nations. The country's government is backing an expansive plan for the shipbuilding industry and currently expects to claim as much as 5% of the total world orderbook by 2015. With foreign and local investors pouring money into new yard developments and yards making headlines with record orders, such goals are surely within the realm of possibility.

Though India may not have a reputation as one of the leading shipbuilding nations, it does have a long history in shipbuilding. The world's first recorded dock was built thousands of years ago in what is now the Indian state of Gujarat, and some of India's current shipyards, like Mumbai's Mazagon

Docks, have been in existence for more than 200 years. Most of India's largest yards, however, were established in the 1940s and 1950s. Following independence, the Indian Government, recognizing the importance of the industry for the nation's economy and defense, proceeded to nationalize many of these yards in the early 1960s. In many ways, this move was a boon for the nascent industry, ensuring steady business for the yards from the navy and government run shipping companies. The government also poured money into infrastructure and, with the help of Japan's Mitsubishi Heavy Industries, built Cochin Shipyard, India's largest greenfield shipyard in the 1970s.



Despite this strong foundation, India was never quite able to develop its full shipbuilding potential. While the government's influence had ensured that the yards would have sufficient domestic business, it could not ensure that the yards would receive interest from foreign customers. At the same time, strict licensing rules helped prevent the entry of private shipyards into the market, limiting internal competition. Further, India's lack of overall development meant that it missed out on the first shipbuilding boom in the 1970s, and over the next decade Indian yards



earned a reputation for high prices, complex vetting and bidding processes, and late deliveries. With the downturn of the worldwide shipbuilding industry in the 1980s, it would take Indian yards years to rebuild their reputation and emerge as a viable option for foreign shipowners.

Proper Intervention and Perfect Timing

The real birth of the current Indian shipping industry can be traced back to the early 1990s, when the Indian government took a step back from its policies of direct control, and loosened its Industrial Licensing Policy. These changes allowed the nation's few private yards, which had previously been restricted to building smaller ships, to expand and develop their shipbuilding capacity. It was during this period that that India's leading private yards, Bharati Shipyard and ABG Shipyard, came into their own. While these were important first steps, these new yards began developing right as the Asian economic crisis came to its peak, and the yards were not able to draw a significant number of foreign customers until the early years of this decade.

At the same time, the Government of India began making efforts to improve the nation's shipbuilding industry. As part of these efforts the government decided to liberalize the dockyards under its control. Foremost among these efforts was the partial privatization of Cochin Shipyard, the nation's largest shipyard. This liberalization helped the yard attract foreign shipowners, and when the market began to pick up again, the yard began to pile up orders. Partial privatization of yards alleviated some of the issues, however, that alone would not be enough to make Indian shipbuilding competitive on the international stage. Despite loosened regulations and the continued low cost of Indian labor, ships built in India continued to be built at prices 30-50% higher than other Asian nations. In order to level the playing field, the Indian government agreed to begin providing a subsidy for ships built in the country in 2002. The new 30% subsidy suddenly made shipyards in India, both government-owned and private, a viable option for shipowners around the world. India's shipbuilding industry was at last ready to join the major leagues.

Of course, the success of Indian Shipbuilding cannot be laid at the feet of the government alone. The newbuilding →

→ market began to surge just after the subsidies took affect, and world's largest and most well known yards quickly found their orderbooks swamped. With markets booming, yards in the shipbuilding industry's East Asian core increasingly focused on filling berths with larger and more profitable ship types. Indian yards, however, have tended to focus on the small and mid-size ship market and open berths at Indian yards quickly found owners willing to fill them. At the same time, rapidly increasing oil prices have helped drive the demand in the offshore and support vessel markets, markets which Indian yards are perfectly suited to serve. The combination of competitive pricing, competent shipyards, and open berths have spurred the Indian shipbuilding industry to new heights.

Success and New Investment

Since the introduction of the subsidy in 2002, Indian shipyards have been booming. Among the public yards, both Hindustan and Cochin Shipyard have become profitable enterprises. Cochin Shipyard, in fact, has become one of the most impressive yards in the country, matching profitable growth with impressive shipbuilding results. The yard tripled its profits between 2002 and 2007, and at the end of 2007 launched the last of a series of six bulk carriers. Most notable about the series was that as the ships progressed, they were completed and launched further and further ahead of schedule, with the last delivered some 105 days early. Cochin Shipyard, which may soon be floated as an IPO, has certainly helped eliminate the idea that Indian shipyards cannot compete with their East Asian counterparts.

This success has certainly not been limited to the public yards. In 2002, 40% of India's ship production was slated for foreign production, by 2008 that had increased to 65%, even as total production volume has risen dramatically. For private yards, however, this number is even greater, with more than 85% of production destined for foreign owners. ABG and Bharati, for their part, have been huge beneficiaries of this boom. The two yards have been putting up record profits for several years

now and both yards' orderbooks are full to 2011. The yards have also taken an incredible number of orders from the offshore market, with both yards surging into the world's top ten yards in terms of orders for offshore support vessels.

With orderbooks full for years to come, ABG and Bharati are also investing heavily in expansion. ABG has already begun expanding with the establishment of its new yard at Dahej, north of Mumbai, which will be capable of building Aframax and VLCCs. ABG also recently purchased Western India Shipyard in Goa in order to expand its business in the ship repair field. Bharati is equally busy setting up a joint venture yard with Apeejay Shipping in the state of Orissa, and is also setting up two new yards in Mangalore and Maharashtra.

New Yards and New Players

The established yards certainly aren't the only ones benefiting from India's shipbuilding boom, and investors see a much brighter future ahead for India's shipbuilding industry. Shipbuilding capacity in India is growing at a ferocious pace, and new investments in all parts of the country suggest that India may soon play a major role in world shipbuilding.

Given the incredible demand for new ships, the supportive tone of Indian federal and state governments, and the availability of land and labor, it should not be surprising that many investors would look to India to establish new shipbuilding enterprises. Foremost among these is Pipavav Shipyard in Gujarat. While construction on the yard has yet to be completed, when finished the yard will have the largest drydock on the subcontinent. Pipavav has already pulled down more than one billion dollars in orders, giving the yard the largest orderbook in India. The yard has some 26 Panamax bulk carriers on order for a number of different European owners, and Pipavav is now the second largest Panamax builder in the world by orderbook, coming in only slightly behind Japan's Oshima Shipbuilding. The first of these ships is slated for delivery in 2009 and Pipavav is also increasing its supplementary construction facilities, including those for engines and other



Many new Indian yards boast state-of-the-art equipment, like this HGG CNC Profile Cutting Machine at Pipavav Shipyard.

essential machinery, in order to ensure that all the ships can be delivered on time.

While Pipavav is without a doubt the most successful of the new yards, it is only one among a plethora of new shipbuilding developments. More than US\$3.69 billion is expected to be invested in Indian shipyards over the next few years. Indian engineering giant Larison and Tourbo (L&T) alone is expected to invest some US\$750 million to expand its small yard in Gujarat and establish a massive new greenfield yard in Tamil Nadu in cooperation with the local government. Chennai-based Tebma Shipyards is also looking to set up two large new yards, one on each side of the country, and invest a total of ten billion rupees in new shipbuilding infrastructure. In addition to those players with concrete plans, local powerhouses like the Jindal Group and Essar Steel, and even international players like Korean shipbuilder STX, have expressed their interest in establishing new yards in India. Admittedly, many of these yards are still in the planning stages, but some yards are already taking orders. Newcomer Rajapur Shipyards, which has yet to begin construction work on its new yard, has already secured orders for a number of ships, including four VLOCs.

While some suggest that much of this infrastructure is simply speculative and will likely not be built, others point to India's strong fundamentals. While the subsidies for shipbuilding ended in August, the Indian government seems prepared to re-enact the subsidies, albeit at a slightly lower rate. Equally, the Indian economy is growing and industrializing rapidly, and new ports will have to be developed to support the growing economy. This in turn, will require the nation's large shipping companies, like the Shipping Company of India (SCI), to increase the size of their fleets, and it would only be natural that they turn to local yards to do so. Just as importantly, ship repair facilities are increasingly crowded and Indian yards are looking to become a player in the ship repair market. India's location along many of the world's major trade routes makes it something of a perfect fit for this role. With the world economy expected to grow in the future, India, with its low-cost labor, excellent location, and strong government support, seems ready to become an essential part of the world maritime industry.

NK in India

ClassNK has had an incredibly long relationship with the Indian maritime community. The Society's first international committee was the Indian Technical Committee established in 1968. Though the Committee's membership was expanded and renamed as the India Committee in 1994, the committee has played an essential role in keeping ClassNK in touch with



When completed, Pipavav Shipyard's drydock will be the largest on the subcontinent.

the leading members of the Indian maritime community and keeping the Society informed about the needs and desires of the Indian maritime industry.

ClassNK provides a full range of services in India via four exclusive surveyor offices in the country. NK established its first exclusive office in the country in Mumbai in 1985, and in the years since, the Society has established new offices in Chennai, Visakhapatnam, and just this year in Kochi, as well. With the completion of ClassNK's new Plan Approval Center in Mumbai this past April, every aspect of ship classification, from plan approval through newbuilding and in-service surveys, can now be handled locally. This year, ClassNK also began surveys for the first newbuildings to be built to NK class in India, and with the rapid expansion of the Indian shipbuilding market, the Society plans to open several more offices in the country in the near future.

In addition to providing a full range of classification services, ClassNK also conducts a number of technical, educational and research related projects within India. The Society holds technical seminars in India each year to provide the latest information and research developments to the local maritime community, and NK conducts technical training with clients throughout the country. ClassNK is also currently conducting joint research projects on FPSO slamming with the Indian Institute of Technology in Chennai, and ship recycling with the Cochin University of Science and Technology. The Society also presents the NK Award, a monetary prize for scholastic excellence, to Indian students conducting ground-breaking research in the maritime field at each university.



The Port of Kobe

Revitalizing Japan's Oldest Maritime City



Only an hour away from Tokyo by plane is the city of Kobe, one of Japan's oldest and most important maritime cities. The city of 1.5 million people is located in the heart of Western Japan's industrial region and is the capitol of Hyogo Prefecture. Despite Kobe's long illustrious history as one of Japan's leading ports, the city has faced enormous challenges over the past decades. In 1995, the Great Hanshin-Awaji Earthquake devastated the city and its environs, and in recent years the Port of Kobe has faced increasing competition from newly developed ports in China and South East Asia. The city, however, has not let these challenges stand in the way of continued success and thanks to concerted redevelopment efforts, the city and its port are once again rising to prominence.

Though Kobe's history as a port city stretches back more than twelve hundred years, what would become the modern Port of Kobe was founded in 1868. Despite this long history, the port did not find its greatest successes until after the Second World War. Post-war reconstruction efforts helped drive the Japanese economy, increasing cargo volumes and bringing business to Japanese ports, especially Kobe. Over the course of the post-war boom, Kobe became Japan's leading port, and in 1967, as the port celebrated its 100th anniversary,

Kobe became the first port in Japan to begin handling container traffic. The port would remain Japan's leading container port, handling nearly one-third of the nation's total container traffic, until the earthquake in 1995.

Much of Kobe's success as a port city has to do with geography. The city is built along a natural deep-water harbor and its long east-west span is easily accessible and navigable. Just as importantly, no major rivers empty into Kobe's harbor, preserving the depth of the port's berths and making dredging unnecessary. The city also benefits from its proximity to the Rokko Mountains, which serve as the city's impressive and scenic backdrop and also protect the harbor from strong seasonal winds.

Yet as much as geography has been an integral part of the city's success, it has also been the source of the city's greatest challenges. Though Japan is seismically active and earthquakes are common, large earthquakes are a rarity. The 7.3 magnitude Great Hanshin-Awaji Earthquake that struck the city on January 17, 1995, was a once in a lifetime catastrophe. The earthquake left almost 6,500 people dead and devastated the city's infrastructure. In monetary terms, the quake caused 6.9 trillion yen (US\$12.5 billion) in damages and



holds the Guinness World Record for the most expensive natural disaster to affect a single country.

After the earthquake, the port's infrastructure was devastated and damage was incredibly widespread. While the man-made islands that make up an essential part of the port facilities survived, the quake collapsed the Harbor Highway and Harbor Bridge, and destroyed warehouses, loading equipment and ship berths. As the port had handled some 30% of Japan's container cargo, the quake not only greatly affected the lives of Kobe's residents but also disrupted international and local trade and distribution networks.

While natural disasters can sometimes cripple communities, that was not to be the case with Kobe. The local and national government responded rapidly to the disaster. In addition to rescue and rebuilding efforts throughout the city, rebuilding the port was also made a high priority. By March 20, 1995, just two months after the earthquake, the first temporary container berth was opened and container service resumed. A little more than a month later, the port had 6 temporary berths open and through a process of staggered reconstruction, the port was completely rebuilt by March of 1997.

What truly marks Kobe's dramatic redevelopment though, is not just the reconstruction efforts, but the array of policies, both local and national, that have helped bring the port back to life. The local government began the process by reducing tariffs in 1998, shortly after port reconstruction had been completed. This was followed by efforts by the National Government, which declared the port one of three national Super Core Ports in 2004 and an International Port and

Special Economic Zone in 2005. These designations allow for a streamlining of port rules and simplification of port tariffs, as well as mandating improved container terminals and loosening strict immigration restrictions for port related businesses. Port usage has been further boosted by the city's decision to support a new modal-shift policy, beginning in 2006. Though aimed at reducing carbon emissions, the shift has had the knock on benefit of increasing port traffic.

Though container volumes have yet to reach pre-quake levels, the city's redevelopment efforts have been nothing less than a stunning success. In the aftermath of the earthquake there were many who did not believe the city or its port would ever recover. Yet today, just a decade after its successful rebuilding, the port is bringing in record revenues and has just completed its new Port Island 2 expansion, greatly expanding its already world class container facilities. This story of redevelopment, from utter devastation to record profits, is ongoing, and Kobe continues to implement new policies in order to continue the ports development. In order to get the details on the port's current projects and future goals, ClassNK Magazine sat down with Yuichi Kanaya, Manager of the Promotion Division of Kobe's Port and Urban Projects Bureau.



KOBE night view

"We are unafraid of failure and taking proactive steps to ensure further success."

Tell us about the history of the Port of Kobe and what role the city has played in its development.

Though the Port just celebrated its 140th Anniversary, the Port's development really began following the Second World War, with a shift towards policies emphasizing local control of ports and port infrastructure development.

From the opening of the port to some 20 years after World War II, Kobe served mainly as a gateway for exports. Raw materials and parts would be brought in for industries in the Osaka-Kobe region and then manufactured items would be shipped out. Mitsubishi Heavy Industries, Kawasaki Heavy Industries and other manufacturers, a number of shipyards, and Kobe Steel and Kawasaki Steel's steelworks - these industries created the goods for export. For its part, the City of Kobe took the burden of establishing the necessary infrastructure and ensuring that things ran smoothly. This role has been expanded since the earthquake.

What was the effect of the earthquake?

Prior to the earthquake we were handling 2.92 million TEU a year. After the earthquake that fell to 1.46 million TEU. When the earthquake hit, international goods that had been bound for Kobe were diverted to Busan and Kaohsiung, and domestically, goods were diverted to Osaka, Nagoya, and Yokohama. Now, a little more than a decade later, container volumes have risen to 2.47 million TEU.

The earthquake didn't just affect the port facilities. After the quake, attracting new industries and exporters to the port became a large and vital part of our work. In the past, there was a sense of "please feel free to use the port", but now, we are working hard to attract new customers. We are really focused on making the port easier to use and improving the quality of our services.

For example we have attracted a number of automobile exporters to the port. Used cars are gathered at the port, auctioned, and then exported. We provide the facilities for the auction and so on.

Since 2006, as an effort to reduce CO2 emissions, the city has been subsidizing a modal shift program. What has been the effect of the modal shift and how have the results been so far?

For the most part, cargo that used to be sent overland to the port is now being shipped here via the Seto Inland Sea. Each year the number of applications to enter the program has increased, and this year alone (through the end of August) we have reduced our CO2 emissions by 27,462 tons.

Essentially, our goal is to reduce CO2 emissions, but with the prices of gasoline skyrocketing, the modal shift has the benefit of improving overall efficiency by encouraging short-sea shipping.



Yuichi Kanaya, Manager of the Promotion Division of Kobe's Port and Urban Projects Bureau

What effect has being designated an International Port and Special Economic Zone had on the Port?

After the earthquake, we wanted to establish a free trade zone to help maintain the businesses that had made use of the port, but this proved to be impossible. However, within the existing regulations a special tax break was established. This system basically cut some taxes in half for a period of three years, this helped speed the process of attracting new enterprises.

After that, the International Port and Special Economic Zone provisions helped further loosen regulations. For example, it became possible for us to operate 24 hours a day and not charge expensive premiums. Additionally, before we were declared a Special Economic Zone, a special license was required for doing any kind port related businesses. Now, if you ship a certain amount of goods, special licenses are no longer necessary. More than half of the companies who have come to the port since the earthquake are here because of the loosened regulations. The used car exporters and the large distributions centers are a good example of this.

How much of Kobe's labor force work in the maritime sector? How much of the city's income comes from the maritime sector?

We conducted a study of the economic efficiency of Kobe Port



in 2003 and discovered that the workforce of the city stood at 688,171 people. Of these, 197,443 people, or just under one-third of the total, worked in port-related enterprises. Of course, shipbuilding and logistics account for much of this number, but it also includes those who work in the waterfront area (hotels, commerce, etc.) and not just people who are directly involved in the maritime industries. With regards to earnings, the city's income stood at 4.2 trillion yen in 2003. Of that, 34.7% or 1.45 trillion yen was created by the port and related industries. The Port still obviously plays a huge role in both Kobe's employment and overall earnings.

What advantages does Kobe have compared to other maritime cities?

Kobe is one of Japan's oldest maritime cities with shipbuilding, a strong port, and excellent educational institutions. Kobe's shipyards are offering prices that are competitive with China and other Asian nations, and berths are full for the next 4-5 years.

At the port itself, cargo volumes are steadily increasing, and the cargo packaging and loading industries are doing extremely well. The Port has a strong and experienced workforce that has know-how and excellent technical skills.

We also have strong maritime universities, with the Maritime Sciences Department at the University of Kobe, Kobe Harbor Polytechnic College, and the Marine Technical College.

Along with our history of results, with the new measures we are taking to support industry, we are bringing together a number of industries that will raise the bar for the Port. However, this is something that can't only come from the government; we have to work together to train new workers, and to ensure the future of the industry.

With the domestic labor force shrinking, how are you addressing prospective labor shortages?

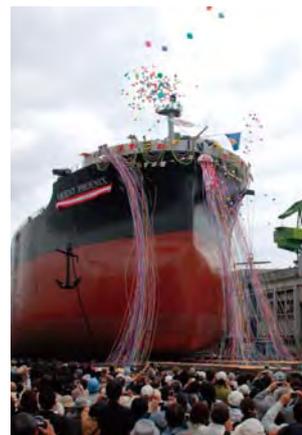
Domestically, as birth rates are low and the population is aging, bringing new workers into the industry is difficult. One problem is that, from the time they are children, many of the city's residents don't have any desire to work on ships or in the maritime industry. This is partly because the news only shows the accidents and tragedies and so the industry does not have the best image. In order to change this, the city has started a new initiative to improve the image of the maritime industry, especially among children. This program includes taking students to shipyards and out on sailboats and the like. Starting this year, we have also begun publishing a booklet containing interviews of people working in the industry to

help introduce new graduates to the industry and hopefully spark their interest. This is a project being undertaken jointly by local shipyards, shipping companies, logistics companies and the Kobe Board of Education.

What is the Port's situation now? How do you hope to develop in the future?

Before the earthquake, when the port was at its peak, more than 30% of the cargo was transhipped. However, over these past ten years, Chinese port infrastructure has advanced incredibly, and there is no longer a need to transship goods at Japanese ports. Currently, only 2% of our shipments are transhipped and almost all of the 2.47 million TEU we handled last year was domestic cargo or exports. If you exempt the transhipped portion, we've basically returned to the level we were at before the earthquake.

Despite the overall decline in volume, last year we took in a record 9 trillion yen in tariffs. Even as tonnage and total TEU have decreased, the price of cargo is increasing and we are transporting more value-added products. Exports of automobiles, railroad cars, and construction equipment, for example, are all on the rise. The port also has a strong background in packing and containerization and we hope to make use of this in the future for the containerization and export of other high-value added goods, like the Panasonic LCD screens made nearby in Himeji.



Currently, some 390 ships operating on 92 different routes call regularly at the port. Of these, 72 ships ply major international routes. While we expect this to grow in the future, we expect to see the biggest growth as the modal shift continues and local feeder services improve.

We are also looking to increase the number of cruise ships that call at Kobe. Currently, Yokohama is Japan's number one port for cruises, but with Nara, Kyoto, Himeji Castle and other World Heritage Sites so close by, we would like serve as a gateway for all of Asia. We are also redeveloping the waterfront on the west side of the port; bringing in new tourist hotels and shops and trying to make the port a place where people can enjoy themselves.

The main thing is that the Port of Kobe is not bogged down in past success. Rather we are unafraid of failure and are taking proactive steps to ensure future development.



IHI Aichi Works' expansive dry dock

A Return to Form

IHI Aichi Works Returns to Newbuilding



IHI AICHI WORKS

With even ageing bulkers being sold at record prices and shipyard orderbooks filling up for 2013 and beyond, these past several years have certainly been good to the shipbuilding industry. The growth of the Chinese economy and the widening of the Panama Canal have helped spur a surge in demand for new ships, and all over the world, public and private financiers have been investing in new shipyards and expanding yard capacity. The shipbuilding market however, is cyclical, and Japan, which once led the world in shipbuilding, cut back drastically following the oil shocks of the 1970s and again at the behest of the former Ministry of Transportation in the 1990s. Yet the continuing strength of the market is driving a new spate of investment in Japanese shipbuilding, and in 2007, Japanese shipbuilders began to increase building capacity for the first time in thirty years.

One company that has certainly benefited from the newbuilding boom is the IHI Corporation, one of Japan's oldest and largest shipbuilding companies. Over these past years the company has stacked up a number of impressive results, from developing a new high strength steel, to winning contracts for some of the largest containerships to be built in Japan, in addition to securing orders for a score of bulk carriers. To address the increasing demand for new ships, IHI is expanding opera-

tions at its Yokohama Shipyard and has restarted newbuilding construction at its Aichi Works shipyard in Aichi Prefecture. In order to capture this historic reawakening of the Japanese shipbuilding industry, ClassNK Magazine visited IHI Aichi Works, which began its first newbuilding in 11 years last October.

The facility that is now Aichi Works began as part of the Nagoya Shipbuilding Company more than 60 years ago. When the works were established in 1941, however, the facility was focused primarily on steel fabrication and transportation-related projects; bridges, shield machines, tubes for underwater tunnels, cranes, and highway interchanges and ramps. IHI and Nagoya Shipbuilding merged in 1964, and in 1973 the facility began constructing its very first ship, the 273,150 dwt VLCC *Andes Maru*. Within a few years, the yard would be turning out some of the world's largest VLCCs. Over the course of the next few decades, the yard diversified, chalking up completions of bulk carriers, double hull tankers and offshore platforms. The yard also blazed ahead of its peers, building container carriers, high-tech LNG carriers, and FPSOs.

The economic downturn in the 70s and 80s, however, forced many yards to close their doors, and things looked bleak for much of Japan's shipbuilding industry. Yet Aichi Works had



Block Construction at Aichi Works

maintained the non-maritime construction side of the business, and its employees had a wealth of experience in a variety of technical construction fields. The yard weathered the tough times by focusing on crane production, bridges, shield machines, and other civil projects. Of course, the staff's rich experience in shipbuilding and the yard's ample construction facilities made it perfectly suited for reactivation when the shipbuilding market started to look up again.

The yard itself is optimally located in Chita City just outside of Nagoya and only a short train ride from Chubu International Airport, which serves Nagoya and the central part of Honshu, Japan's main island. It has enormous manufacturing and transportation facilities, including more than 730,000m² in total building area. The main shop is over 600 meters long and can handle everything from initial machining to final assembly. Thanks to overhead cranes and equipment trailers, the yard can construct blocks of up to 320 tons completely indoors. The dry dock is another major source of pride for the yard workers. The dock is capable of handling any major project, from the largest bridges to vessels of up to one million dwt. It's an impressive sight, not only for its magnitude but for the two 90m tall Goliath Cranes that tower over it. The cranes are capable of lifting some 400 tons each and do the vast majority of the heavy lifting at the yard. The yard also boasts an 11 meter deep quay, meaning that even the largest projects can be moved from the yard without disassembly.

While some have suggested that Japanese shipbuilders have been slow to increase production and meet the demands of the burgeoning market, Aichi Works' return to newbuilding had been in planning for some time. Realizing that restarting

newbuildings after a 30 year hiatus would not be an easy task, the yard began block and superblock construction as early as 2005. These blocks, produced for customers both inside and outside the IHI Group helped smooth the transition and paved the way Aichi Works return to full shipbuilding form.

After testing the waters and working out the kinks, the company boldly jumped back into the complete newbuilding business by winning a contract for a series of 56,000 dwt bulkers to be built for sister company, IHI Marine United (IHIMU). The keel for the first ship was laid in October 2007, and the ships will be built in rapid succession through 2010. IHI currently plans on continuing block construction for a variety of clients, but newbuilding construction will primarily be conducted in cooperation with IHIMU. In addition to these newbuildings, IHI hopes to turn the yard towards the booming LNG market and begin building LNG FPSOs and other offshore structures in the future.

The expansion of Japanese shipbuilding for the first time in 30 years may come as a surprise to some, but with the first ship completed in November, IHI Aichi Work's is clearly re-establishing its record of success. With the approaching completion of this new ship marking the beginning of a new era for the yard, ClassNK sat down for an interview with Aichi Works' General Superintendent Masatsugu Doi, who filled us on the yard's work and plans for the future.





“Shipbuilding is in our DNA.”

After a long hiatus, Aichi Works has returned to newbuilding. How is the work progressing and what are your impressions about this return?

We delivered our first ship in November and while there have been a few complications, everything is proceeding according to plan. Our final objective though, is to build on the success of these ships and move into the construction of offshore structures for LNG and other clean energies. This is something that we are totally committed to. Right now though, we are still at a stage where we are developing our capabilities.

With the completion of this first ship, there is almost a sense of nostalgia. A number of our workers have been here since before we stopped newbuilding work, and I started my career here and just came back to Aichi Works this July after being away for seven years. There is a very personal and emotional element to our return to newbuilding.

How large is the staff here at Aichi Works and among them how many are dedicated to newbuilding projects? How many of the staff remain from when the yard previously conducted newbuilding work?

We currently have about 200 full-time employees directly involved in construction work, with about 100 other full-time staff doing related work. On top of this, we employ roughly 750 contractors. About 70% of our total staff is dedicated to the newbuilding projects.

Currently, about 16 of our foremen are veterans from when we last did newbuildings, and a large part of their work is passing that experience on to newer staff members.



Prior to restarting newbuildings, Aichi Works conducted a significant amount of both repair work and block construction. How does this experience and know-how contribute to the current newbuilding work?

I think there is a tremendous influence. Even when we stopped newbuilding work, we were still doing a lot of shipbuilding-related work. Shipbuilding work has been a constant part of our operations, it's in our blood. Shipbuilding is in our DNA. Of course, I have to admit that there are differences between block building and newbuilding. We are now dealing with issues related to machinery and outfitting and for many of our younger workers, this is their first time doing that sort of work.



Masatsugu Doi,
General Superintendent, IHI
Aichi Works

One of IHI Aichi Works' strengths is the record of success that the yard has developed in a wide variety of fields, including bridge building, shield machine production and shipbuilding. Do you plan to maintain this production diversity in the future?

We have managed to amass experience and technical knowledge in a number of fields, and I think it is important that we can continue to develop new technical capabilities in shipbuilding and other areas. The market is constantly changing, and if we have the ability to respond to a variety of market conditions, it will help hedge some of the risk going forward.

One of the problems facing the entire maritime industry is the issue of manpower shortages and workforce development. How is Aichi Works dealing with this issue?

The first thing we are doing is steadily hiring new workers. With regards to training, for welding and other technical areas, we have started a new Technical Academy which is aimed at developing the skills and technical proficiency of each worker individually. We also have instituted policies to help retain older workers who would otherwise have retired. These older workers are a huge benefit to our operations and as I said they also make great contributions to training new workers.

Earlier I noted that one of IHI Aichi Works' strengths was its wide variety of production capabilities. As the head of Aichi Works, what do you think the yard's strengths are?

I mentioned before that shipbuilding is in our DNA and I think that is one of the real strengths of our yard. Much like real DNA, our shipbuilding DNA has two important strands. One is that, even when we stopped newbuildings, we were still involved in block production. So we have been able to maintain those skills. The other is human resources, where we've been able to maintain employees from before the shutdown and they can then pass this experience on to other workers.



We also have an excellent technical knowledge base and specialized shipbuilding expertise. The SPB-LNG ships we built before the shutdown are a good example of this. While it may have been a while since we built a ship of that type, the ships have been in operation for 15 years now without any problems. The owners have told us that there still haven't been any problems with the ship's aluminum tanks and they have nothing but praise for the ship's quality. I think that this kind of technical expertise is applicable not only to shipbuilding, but to other fields like the offshore sector. Our LNG experience for example is directly applicable to the construction of FSRUs.

What trends do you see in the maritime industry and what are Aichi Works' plans for the future?

As global warming and the effects of other environmental issues becoming increasingly stark, industry will increasingly have to embrace its social responsibilities and demand for green energy will only grow. With our background in with our background in maritime construction and LNG, we are well suited to address this market. Our long term plans call for us to shift towards the construction of offshore structures, with a specialization in LNG and other clean energies, but we will also continue to construct large scale shore-based projects like bridges, as well.

Do you see the shipbuilding boom coming to an end? Or do you see it continuing?

The shipbuilding market is still healthy, but we are already seeing signs of weakness from the Baltic Index. We also have to worry about the risk from increased prices for raw materials. While I think the outlook for the next few years is still relatively bright, the boom won't just continue going on forever. It's important to take measures now and to be prepared for when the boom finally comes to an end.

In addition to China, recently Vietnam and India have made bold moves into the shipbuilding industry. What do you think about their entry into the market?

I think it is important to realize that shipbuilding is not an easy industry. Developing the skills and technical knowledge necessary to build quality ships takes time and a certain amount of patience. Shipbuilding is a highly cyclical market, as the history of Aichi Works clearly shows, and new yards can sometimes be hard hit by the downturns. Nevertheless, I think their entry in the market does say something good about the overall strength of the industry, and for what its worth, I wish them the best of luck.

Lastly, could you tell us about your relationship with ClassNK and what you would like to see from class in the future?

We have always had an excellent relationship with ClassNK and NK's surveyors have been a tremendous help with our return to newbuilding. More than just certifying our ISO 9001 quality assurance procedures, ClassNK has really worked with us to improve the overall quality of our entire operation. I definitely look forward to working with NK in the future, and hope that NK will continue to assist us in maintaining this high level of quality as we move into the off-shore field as well.





Dubai Maritime City

A New Maritime Metropolis?

With the new Maritime City development, Dubai looks to become one of the maritime industry's major players

Dubai has a long history of grabbing headlines and drawing the world's attention. The city is rife with premier construction projects designed by celebrity architects, and Dubai's major land reclamation and residential developments have attracted the world's rich and famous. Yet beneath the glitz and glamour, Dubai is a financial and business powerhouse. The city's business friendly tax policies, strategic location, and aggressive approach to development have helped draw some of the world's most important businesses to the city-state. Despite this reputation, few regard Dubai as a leading maritime center. However, with the new Dubai Maritime City in its final phase of construction, the city looks set on becoming the next maritime metropolis.

Like many of the other developments that are raising cranes all over the city, Dubai Maritime City is nothing if not bold. The last of the man-made islands scheduled to be developed off Dubai's coast, Dubai Maritime City will occupy an area of some 2.27 million square meters located between Port Rashid

and the Dubai Drydocks. With land reclamation already complete, construction is beginning on the six maritime clusters that will make up the City. When construction is completed in 2012, DMC will be the world's first purpose built maritime center, representing every aspect of the maritime industry – management services, retail and recreation, education and research, and ship repair and maintenance for ships of all sizes. In just a few short years, DMC hopes to elevate Dubai into the same league as Singapore and London. Dubai Maritime City's backers, however, go out of their way to downplay the idea that DMC will be a direct competitor with the other great maritime cities. A feasibility study commissioned by the authorities showed that Dubai Maritime City offered a number of unique advantages that would make Dubai attractive as a supplement to other maritime clusters, but not necessarily a replacement.

One of these unique advantages is Dubai's excellent location. Dubai sits astride many of the world's most important Asia-



A New Maritime Metropolis?
With the new Maritime City development, Dubai looks to become one of the maritime industry's major players



Europe trade routes, and Dubai is quickly becoming the business center of the Middle East. Alongside the close proximity to many of the world's most important oil-producing nations, the Dubai region also includes no less than five drydocks for ship repair. With so much maritime traffic originating in the area, especially in the tanker field, Dubai provides a natural opportunity for ship managers and operators to be close to their operations. Insiders also note that Dubai has other geographical advantages, as well. For example, the city provides easy access by plane to many of the India's major cities and easy access to the subcontinent's booming maritime industry and growing crewing resources.

Dubai's location also gives the city an important advantage in terms of time. The maritime industry as a whole is somewhat bipolar; Europe remains a hub for ship ownership, management, finance, and insurance, while Asia remains the heart of the shipbuilding industry. The time difference can make scheduling and coordinating projects extremely difficult. Dubai, located three hours ahead of Europe and just four hours behind Asia, provides a simple and elegant solution to these problems. As the shipping world grows ever more complex, there is a growing demand for timely and prompt ship management, and Dubai Maritime City seems ready to answer that demand.

Dubai Maritime City also benefits from the intentional nature of its construction. Traditional maritime clusters are the products of history, created much more often by necessity than

design. This leads to a diffusion of sorts, as companies expand to where space is available, rather than the most efficient or ideal location. This is where DMC breaks radically with tradition, creating a central hub for maritime affairs right from its inception. The city's six planned maritime clusters speak for themselves – The Marina District, Harbour Offices, Harbour Residences, Industrial Precinct, and the Dubai Maritime City Campus. It is an entire maritime community, encompassing everything from research to ship repair, all on the same 227 hectare island. Residents will be able to enjoy the rich Dubai lifestyle, and have the entire breadth of the maritime industry within easy reach.

Despite these advantages, some have raised concerns about the suitability of Dubai as a new maritime center. These critics often point to the city's growing traffic problems and note that, thanks to inflation, Dubai is no longer as economical a place to conduct business. While Dubai's traffic issues are well known, DMC is the last island scheduled to be completed off Dubai's coast, and a new subway system is expected to help relieve traffic problems. At the same time, while Dubai has grown since its early days and is certainly more expensive than it once was, it still remains cheaper than other international maritime centers. Additionally, while prices have been rising, the city's infrastructure is steadily improving. Improvements to schools for example, have helped make Dubai an option for families with young children, and such developments play an important role in building and maintaining a competent workforce.

The Dubai Maritime City Authority, however, has not been deterred by its few detractors, and the marketing campaign launched to introduce the maritime community to the new maritime center has been almost as grand as the construction of the Maritime City itself. Since its unveiling at this year's Posidonia Exhibition, DMC's backers have been aggressively courting the top leaders of the maritime industry, and booths showcasing the city have been part of almost every major maritime exhibition this year. Recently announced tie ups with the Italian shipowners association CONFITARMA and some leading ship managers suggest that this approach has already been effective and should continue to pay dividends in the future. While only time will tell if the city will reach its goal of 80-90% occupancy upon completion by 2012, Dubai has established a strong track record of meeting expectations and few doubt that Dubai Maritime City will soon become one of the next great maritime metropolises.





A ClassNK surveyor looks out over Sasebo Heavy Industries from the *Chikyu*'s helipad.

Checking in on the *Chikyu*

The world's most advanced scientific drill ship calls into port

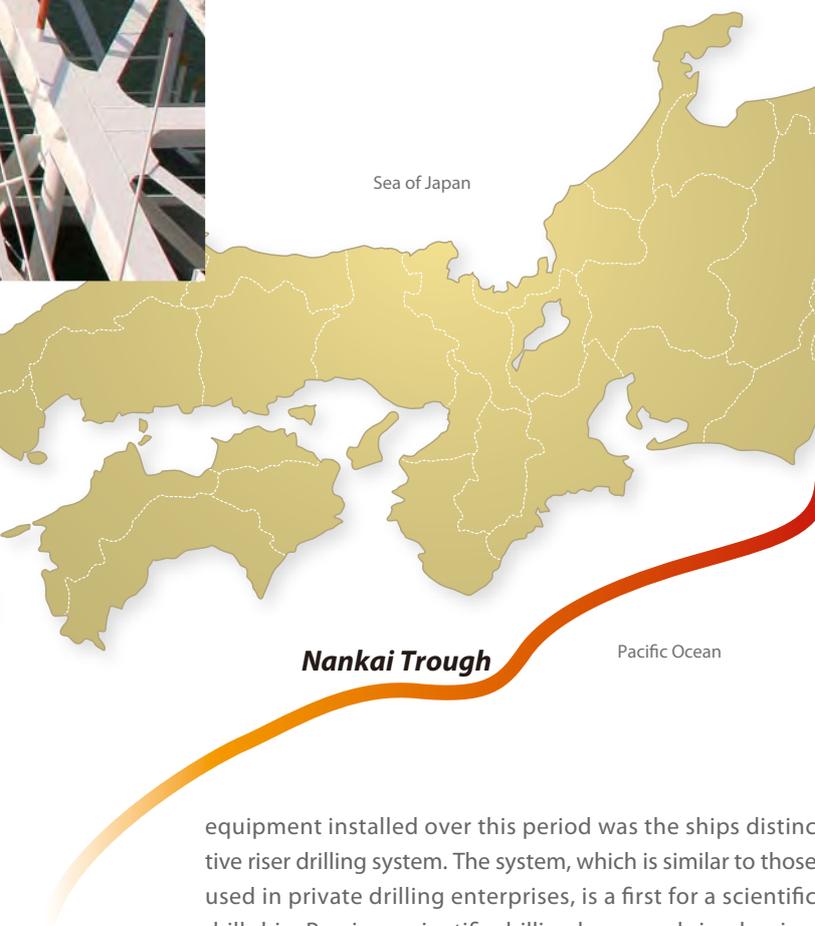
Long time readers of the ClassNK Magazine will know that we first profiled the *Chikyu*, the world's most advanced scientific drill ship, shortly after its launch in 2002. At the time, the NK classed ship had yet to be outfitted with its distinctive riser drilling system and was still years from embarking on its first scientific mission. Yet over the past six years, the ship has completed field testing, conducted shake-down cruises around the world, and embarked on the first of its research expeditions. This February, after 138 days of continuous operations, the *Chikyu* finished the first phase of its research program, and in April, the ship sailed to city of Sasebo, on the Japanese island of Kyushu, to undergo its first intermediate survey. As this was the first survey of the ship since its delivery, ClassNK Magazine took advantage of the opportunity and paid a visit to Sasebo to get an update on the *Chikyu*'s condition and its activities over the past several years.

The *Chikyu* is without a doubt the world's most advanced research drilling vessel. Ordered by the Japanese Agency for

Marine-Earth Science and Technology (JAMSTEC), construction of the vessel began in June of 2001 at Mitsui Engineering and Shipbuilding's Tamano Works. The ship was built as part of the Integrated Ocean Drilling Program (IODP), a joint-research program that is primarily funded by the Japanese and U.S. Governments but also receives support from the European consortium, the Republic of Korea, and China. The *Chikyu* is the newest and most advanced drilling vessel in the IODP's fleet and the ship is expected to make incredible contributions to a variety of scientific fields, including marine biology, geology, and plate tectonics.

Though the *Chikyu*'s hull had already been completed when we profiled the ship in 2002, the *Chikyu* was still something of a skeleton. This would change, however, over the next three years, as the ship was slowly outfitted and navigation and drilling systems were installed. Foremost among the





equipment installed over this period was the ship's distinctive riser drilling system. The system, which is similar to those used in private drilling enterprises, is a first for a scientific drill ship. Previous scientific drilling have used simpler riserless drilling systems, but drilling depths for these systems are quite limited. The riser drill system on the *Chikyu* will allow the ship to drill in ocean depths of up to 2.5 kilometers and reach a further 7 km below the ocean floor, the deepest that any ship has ever drilled.

The difference between riser and riserless drill systems is a simple matter of physics. When a drill is engaged, it creates shavings or scraps of material that need to be cleaned out of the drill hole. In riserless systems these shavings are cleared through the use of pressurized seawater. The problem is that as you drill down, pressure increases and the pressure differences between the seawater filled hole and the surrounding material eventually cause the hole to collapse. Riser systems, however, use a special drilling fluid that is denser than sea



The *Chikyu* shortly after launching in 2005

water, and thus allows for deeper drilling. However, because this drilling fluid is used to preserve cuttings for examination and is expensive to produce, it has to be contained in a special tubelike apparatus, the riser pipe, that surrounds the drill pipe and stretches from the bottom of the hull to the ocean floor.

Though this riser system is the same type used in commercial drilling vessels, the *Chikyu's* stated purpose could not be more different. As a research vessel, the *Chikyu's* main goal is not the discovery of gas or oil, but retrieving samples or 'cores' from the ocean floor. While scientists know a great deal about land-based earthquakes, the specifics of under-sea earthquakes and their potential for tsunami creation are still largely unknown. The need for such research is of course readily apparent after disasters such as 2004's Sumatra Earthquake and the subsequent Indian Ocean Tsunami. Among other research goals, the *Chikyu* hopes to shed light on the mechanics of such catastrophes. →



The blow-out preventer is an essential part of the riser system.

→ The *Chikyu* contributes to such research by taking core samples from seismically active areas and making them available for researchers around the world. The coring system itself is quite ingenious. The process uses special drill bits that are hollow and have an open center. As the drill penetrates the ocean floor, a column of up to 10 meters in length is preserved and can be drawn up to the ship for archiving and analysis. Of course the sea-floor is made up of a variety of materials, and so the *Chikyu* has to be able to draw samples from numerous locations with differing compositions. For loose soft materials, the ship makes use of a hydraulic piston coring system (HPCS), a knife-edge cylinder shaped drill bit that is shot into the seafloor using pressurized water. For harder materials, the *Chikyu* makes use of a standard rotary core barrel (RCB).

Following the completion of the outfitting process, the ship was delivered to JAMSTEC on July 29, 2005. Prior to embarking on its first shake-down expeditions, the ship made public appearances at several of Japan's major ports. With its PR activities finished, the ship headed to its first drill site, located some 90km northeast of the Shimokita Peninsula in northeastern Japan. During the voyage, the ship completed

a series of system integration tests and went on to take its very first core samples. The voyage also served as an excellent test for the ship's Dynamic Positioning System (DPS). The DPS is vital to keeping the ship stable and centered while drilling, and despite strong winds, the system passed the tests with flying colors.

In order to gain further drilling experience, from 2006 to the middle of 2007 the ship embarked on shake-down voyages to Kenya and northwestern Australia. These voyages, organized on behalf of an international coalition of public and private interests, saw the *Chikyu* conduct drilling in a wide variety of environments. Not only did the crew gain valuable experience drilling, but the ship also conducted its first riser drilling at depths of greater than 2km.

With these training missions completed, the ship finally embarked on its first voyage for the IODP in September of last year. On 21 September, the *Chikyu* headed out to the Nantong Trough, 90km off the south eastern coast of Japan, to conduct a series of three research missions. The Nankai Trough sits at the boundary of the Eurasian and Philippine tectonic plates, and marks the area where the Philippine



© IODP/JAMSTEC

The *Chikyu*'s riser drilling system



Plate is subducting, or sliding under, the Eurasian Plate. Such subduction zones are capable of creating some of the most devastating earthquakes and tsunamis. In the first half of the 20th century, two enormous magnitude 8 earthquakes originated in the Nankai Trough, and the 2004 Sumatra Earthquake and the resulting tsunami began in a similar subduction zone. Researchers have wanted to take a closer look at such areas for many years, but it was not until the *Chikyu* was completed that such work became possible.

Over the next 138 days, the *Chikyu* completed three separate research missions and hosted 67 researchers from 22 countries. This was the first time for many of the researchers to travel aboard a drilling vessel, and with tidal currents reaching speeds of up to four knots, the ship's undulations were a shock to many members of the research staff. Nevertheless, the *Chikyu* and its crew proceeded to drill thirty-three different holes at eight separate sites and at depths of up to 1400 meters below the sea floor. Although the expedition did encounter some difficulties, including the loss of a drill bit after the collapse of a bore hole, the *Chikyu* succeeded in taking a large number of core samples for further study. The third mission was especially successful, as it was the first time that the ship had drilled into the "mega-splay" region, which is riddled with earthquake causing faults. Initial studies conducted onboard the ship revealed the variety of stresses affecting the fault region, and further studies hope to reveal more about the mechanisms of underwater earthquakes.

After successfully completing its first three research missions,



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The *Chikyu* returning to port

the ship headed to Sasebo Heavy Industries to undergo an intermediate survey, as well as to undergo regular maintenance. While docked, it was discovered that some of the gears of the ship's azimuth thrusters had sustained damage. As the thrusters are a vital part of the DPS system, and are heavily used during drilling, it was decided that the gears should be upgraded to higher quality components. With repairs and maintenance coming to a close, the *Chikyu* is already making preparations for its next set of research missions. The ship will return to the Nankai Trough in March 2009, and we look forward to seeing the results of the *Chikyu's* latest endeavors.



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Research staff prepare a freshly taken core sample for archiving and analysis.



Istanbul

The World's Capital City

Istanbul, which is sometimes called the capital of the world's capital cities, has played an extremely important role in history, serving as the capital of the Roman and Eastern Roman (Byzantine) Empires, and later as the capital of the Ottoman Empire. A thoroughly modern city, Istanbul takes great pride in the fact that it has managed to preserve its magnificent heritage, and the city charms its visitors with a combination of museums, churches, palaces, mosques, bazaars, and natural beauty. If you were to stand with your back to the straits, looking out as the sun sets over the houses along the coast, it is possible to feel that you are truly at the center of the world.

Istanbul's history reaches back to its founding in the seventh century, when it was known as Byzantium. The city was later renamed Constantinople and would become one of the most important cities in the Roman Empire. However, the history of the modern city really begins in 1453, when, after years of preparation, the 21 year-old Ottoman Sultan Mehmed II conquered the city. Mehmed proceeded to convert the Hagia Sophia, a cathedral constructed by the Byzantine Emperor Justinian, into a mosque and changed the name of the city to Istanbul.



The Ottoman Empire would reach its peak in the 16th century after conquering Egypt and the Ottoman Sultan's assumption of the title of Caliph, making him the highest ranking religious leader in the Muslim world. The Ottoman Empire, with Istanbul as its most important city, would continue to be a major regional power until the end of the First World War.

Following the defeat of the Ottoman Empire and its allies in World War I, the country waged a National War of Independence from 1919 to 1923. After the war, the Republic of Turkey was formed with Mustafa Kemal Ataturk, Commander-in-Chief during the war, as the country's first president.

As a result of the modernization process that has characterized Turkey since its founding, Istanbul has developed an identity as a unique and modern global city. From an economic and cultural perspective, Istanbul remains not only the heart



of contemporary Turkey, but thanks to the city's unparalleled historical heritage, it continues to be a uniquely important city for the entire world.

Geography

Istanbul is bounded on the north and the south by two seas, the Black Sea and the Sea of Marmara, respectively. The western half of the city lies in Europe, while the eastern half is situated in Asia, with the flows of the Bosphorus Strait separating the two halves. Istanbul, as the Asian city closest to Europe and the European city closest to Asia, is a leading port whose importance is made apparent by the ages old trade routes that pass through the Bosphorus.

The Bosphorus (Istanbul) Strait

Northwestern Turkey is divided by a complex set of waterways connecting the Black Sea to the Sea of Marmara and the Aegean Sea. The channel passing between the Black Sea and the Sea of Marmara is called the Istanbul Bogazi or, as it is more commonly known, the Bosphorus. Istanbul is located at the southern end of the Bosphorus Straits. The Sea of Marmara then connects to the Aegean Sea via a channel called the Canakkale Bogazi, also known as the Dardanelles.

The Turkish Straits, comprising the Canakkale Strait, the Istanbul Strait and the Sea of Marmara, are unique in many respects. The narrow and winding shape of the straits make them more akin to a river than anything else. Mariners have long considered the Turkish Straits to be one of the most hazardous, crowded, difficult and potentially dangerous waterways in the world.



The Bosphorus is approximately 16.74 nautical miles long, with an average width of 0.81 nautical miles. At its narrowest point, the straits is only 0.378 nautical miles wide. The strait is winding with several sharp turns requiring that ships alter course at least 12 times to safely navigate through it. At the narrowest point, Kandilli (700 m), the current can reach 7-8 knots and a 45 degree course alteration is required. While at Yenikoy, the necessary course alteration reaches some 80 degrees.

While the Turkish Straits separate Asia and Europe, they also connect the Black Sea to the Mediterranean and the Aegean. The straits themselves are also the only straits to be governed by a major international convention, the Montreaux Convention, which has been in effect since its signing in 1936. The size and number of vessels passing through the straits has been increasing since 1936, leading to the establishment of a new Sea Traffic Control System and VTS (Vessel Traffic System) In the year 2000. →



The Bosphorus Strait

→ Last year, 56,606 vessels passed through the Bosphorus Strait. Of these, 54,468 of these ships were over 500 gt, and some 31,826 were transit ships bound for destinations outside of Turkey.

The Marmara Region

Istanbul is located in the Marmara region of Turkey, which includes the parts of the country in Europe, as well as the northwestern section of the Asian part of the country. There are numerous ports in the Marmara Region and these ports are playing an increasing role in reducing the intense traffic around the Port of Istanbul. In fact, a large part of the marine traffic has already been transferred to these ports and the region plays an important role in Turkey's maritime industry.

The main ports in the Marmara Region are: Zeyport, Ambarli, Haydarpasa, Diliskelesi, Hereke, Yarimca, Derince, Tekirdag, Marmara Ereğlisi, Bandirma, Altinova, Tavsancil, Aksa, and Canakkale Icdas. In addition to these ports, twelve new shipyards have been established at Yalova – Altinova and one new shipyard is under construction at Tekirdag.

Tuzla Bay Shipyards

Tuzla is located to the southeast of Istanbul on the Anatolian side of the city. At present some 70% of the shipyards in Turkey are located in the Tuzla Bay. There are 43 large ship-

yards in the region, as well as a large number of smaller shipyards. Tuzla's shipyards cover a huge region, approximately 1,350,000 m² in total, and this does not include the 15 dry docks in the region. Turkish yards also boast one of the largest floating docks in the world with a width of 80m width, a length of 355 m length and a 340,000 dwt floating capacity. Other docks in the region have a floating capacity of up to 100,000 dwt.

As the majority of Turkey's newbuildings and ship repair industries are based in Tuzla, it is without a doubt the heart of the Turkish maritime industry.

NK Istanbul Office

ClassNK established its Istanbul Office in 1994 to meet the growing demand for survey and audit services in Turkey. The office is responsible for surveys and audits in all of Turkey, and strives to provide the highest quality services to clients throughout the region. The size of the office has grown as the Turkish maritime industry has prospered. At present, with fourteen surveyors and five administrative staff, it is the Society's largest exclusive surveyor office in all of the Middle East, Eastern Mediterranean and Black Sea Region.

The Istanbul Office is only one part of the Society's investment in the country's maritime industry. In 2004, the Society



Tuzla is the heart of Turkish shipbuilding.



The Maiden's Tower is one of the symbols of Istanbul.

established its Turkish Committee in order to hear the views of Turkish shipowners and shipbuilders first hand. The committee has been welcomed with open arms by Turkish maritime figures, and by this year's 5th meeting the Committee had grown to 21 members, including some of the biggest names in the industry.

The Turkish maritime industry, especially the local shipbuilding industry, has grown by leaps and bounds over the past several years. As orderbooks have remained full at major yards in Asia, Turkish yards have been taking orders for bigger and more sophisticated ships. This year alone the ClassNK Istanbul Office has begun surveys on the first of 15 Capesize bulk carriers to be built at Sedef Shipyard, and the first of 10 Handysize bulk carriers at Yardimci Shipyard. The ships being built at Sedef are the largest ships to ever be built in Turkey, representing the growing importance of the Turkish industry.



The conference room at the NK Istanbul Office



Istanbul and the Bosphorus

In response to the growing number of newbuilding projects and growing demand for technical assistance and better customer service, ClassNK established a new Plan Approval Center at the Istanbul Office on May 1, 2008. The new Plan Approval Center will greatly improve the speed of plan approval and also allow for owners, shipyards, and design companies to discuss issues and work out plan approval issues face to face with the Society's staff. With shipbuilding capacity expanding and newbuilding orders piling up at local yards, this new Plan Approval Center is an important element in the Society's commitment to meeting the constantly growing needs of the Turkish maritime industry.



London

Home to some of the world's most important maritime institutions - the International Maritime Organization, The Baltic Exchange, the International Association of Classification Societies, International Maritime Industries Forum, International Chamber of Shipping, INTERTANKO, INTER-CARGO, to name only a few - London remains the world's maritime center. London's impressive maritime cluster represents every aspect of the maritime industry, from maritime lawyers, to underwriters, brokers and insurers, to ship owners, managers, operators, charterers, and registers.

Beyond merely being a metropolis with a rich maritime history, London is also the birthplace of ship classification. The Lloyd's insurance market began in Edward Lloyd's coffeehouse on London's Tower Street in 1688, and over time this insurance market would grow in complexity and diversity, serving as the direct forerunner of modern ship classification and a number of other related industries.

History of London

London's origins go back to Roman times. When the Romans invaded Britain in 43 AD, they moved north from the Kentish Coast and traversed the River Thames in the London area, building a permanent wooden bridge, just east of the present London Bridge's location. It was this bridge that attracted settlers and led to London's inevitable growth. The settlement quickly grew to become a flourishing city known as



Londinium. and about 200 AD, the city became a regional capitol.

Over the next several centuries, the city would increase in size and importance as it came under the rule of a number of different kings, from Anglo-Saxon rulers to the Tudor and Stuart Dynasties. The incorporation of the City of London actually predates England's Parliament. and the first records of a Mayor of London, date back to 1193. Later, the Magna Carta gave shared responsibility to the Mayor of London for upholding the terms of the charter and protecting the liberties of the city.

Since the beginning of the twentieth century, London has grown to become the modern city we know today. Though the city was largely unaffected by the First World War, the city was devastated by German bombs in World War Two.



After the destruction of the war, however, there was a feeling of optimism and renewal as the rebuilding began. In the years following the war, various groups of immigrants have come to London and made it a cosmopolitan city. It is now possible to sample cuisine from all over the world within a very small area, and London has benefited from the cultural influences of India, China, Thailand, Japan, Africa, and many other ethnicities.

As always, London is a mixture of the old and the new. For the tourist, it remains a safe and a fascinating environment, providing a unique historical perspective, mixed with the freshest and most contemporary entertainment. The city will undoubtedly go into the next millennium with the attributes it has always had - a cosmopolitan viewpoint, a feeling of optimism and excitement, the hum of history as its background, the clatter of commerce and business in the forefront, changing as it has always changed through the ages.

NK London Office

The ClassNK London Office is housed at the Finsbury Circus House which overlooks Finsbury Circus. Each summer, music festivals at Finsbury Circus Gardens showcase musicians of all types.

The Society's London Office was first established in 1962 at the Lloyd's Chambers on Crutched Friars. From 1972 to 1981, the office was located at the Europe House in the World Trade Centre, and from 1981 to 1989 at the P & O Building on Leadenhall Street. The office then relocated to the 17th floor of the prestigious Baltic Exchange Building, which was in many ways the headquarters of the global ship sales and ship

information marketplace. However, the office was severely damaged when the Provisional Irish Republican Army (PIRA) bombed the building on 10 April 1992. Though the office was able to relocate to the 24th floor of the building and reopen within the week, the PIRA bombed the same Bishopsgate area of the city in 1993, damaging many buildings that had sustained damage in the Baltic Exchange bombing. The old Baltic Exchange Building has since been replaced by the Gherkin building and in the aftermath of the bombings the ClassNK office was relocated to its current location in Finsbury Circus.

The London Office is the Regional Office for Europe and Africa, and currently has a staff of six: The Regional Manager, two managers, an exclusive surveyor, and two office staff. The ClassNK London Office also oversees two Local Area Representatives (LAR) at Milford Haven, in the southwest corner of Wales established in 1997, and Newcastle in the northeast of England, established in 2006. Each of the LAR offices are managed by exclusive surveyors.

The NK London Office also works with the Maritime and Coastguard Agency (MCA), the UK Flag Administration. NK has maintained close cooperation with MCA for PSC related and other maritime matters ever since NK became a Recognized Organisation of the British Flag in 2004.

In addition to regular survey activities, ClassNK holds yearly meetings of its British Committee. The British Committee was established in 2003 and consists of members drawn from the wide spectrum of the UK's maritime industry. The Committee is an important forum for the mutual exchange of information and allows the Society to meet face to face with industry leaders and discuss maritime issues and developments.



ClassNK British Committee

Topics & Events

Newly Established Offices >>>



Nha Trang Sub-Office Newly Established

A sub-office was newly established in Nha Trang on 3 December 2007 under the jurisdiction of the Haiphong Office to meet the growing demand for surveys in central and southern Viet Nam.

Nha Trang is located in the southern portion of Viet Nam about 450 kilometers northeast from Ho Chi Minh City. The area is noted for its scenic beaches and islands. Nha Trang beach with its seven kilometers of beautiful sandy beach enjoys fine weather throughout the year, and as a result has become the top resort area in Viet Nam.

A large-scale shipyard is scheduled to be built in the region and development of an international transshipment port is also underway.

Tianjin Office Established

A new branch office was established in Tianjin, China on 1 April 2008 in order to accommodate increasing workloads in China. Tianjin is one of the municipalities in China directly

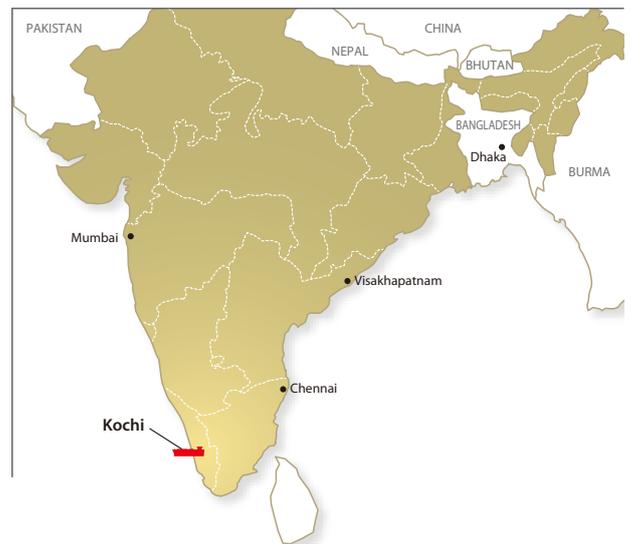
ruled by the central government, along with Beijing, Shanghai, and Chongqing. The city occupies a major place as an administrative, industrial and transport center. Tianjin is connected to Beijing and Dalian by expressway and has the largest port in Northern China, allowing for convenient transport by sea.

Zhoushan Office Established

A new branch office was established in Zhoushan, China on 1 May 2008, in order to accommodate the growth of the shipbuilding and shiprepair industries in the Zhoushan region, and better meet the needs of clients in the region. The Zhoushan Office is the seventh exclusive office to be established in mainland China.

Mokpo Local Area Representative Established

A new Local Area Representative (LAR) was established in Mokpo, Korea under the jurisdiction of the Busan Office on 1 July 2008. Mokpo is a port city located in the south-western part of South Jeolla Province that once served as a crucial transfer point between mainland China and Japan. The LAR at Mokpo is the fifth surveyor site to be established by the Society in Korea, following Busan, Seoul, Ulsan, and Koje.



Kochi Local Area Representative Established

A Local Area Representative (LAR) office was established at Kochi under the jurisdiction of the Mumbai Office on 24 April. Kochi is a city in the State of Kerala in southern India. It is an industrial city with a major trading port where cargo ships come and go around the clock.

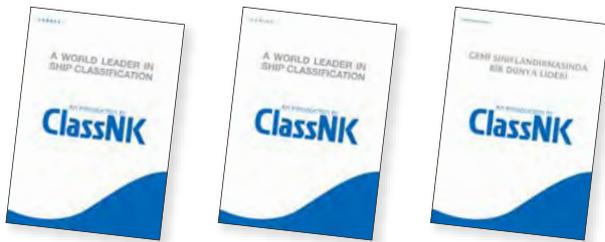
The new Kochi LAR is the fourth exclusive surveyor site to be established by the Society in India, joining existing sites in Mumbai, Chennai, and Visakhapatnam.



Publications >>>

Chinese, Korean and Turkish Editions of "An Introduction to ClassNK" Released

Chinese, Korean and Turkish editions of "An Introduction to ClassNK" were published in August 2008. These new editions follow the English, Japanese, Greek and Vietnamese editions of the brochure that were published in the spring of this year. The new editions of the brochure will be distributed to clients and other interested parties at meetings, technical seminars, exhibitions, and other venues. You can view the brochure on the "Free Publications" section of the Society's website. If you would like a printed version of the brochure, please contact the Information Service Department.



"NK-Pass" Pamphlet Issued

In line with the development of NK-PASS, the Society's new electronic plan approval system, a new pamphlet describing the system was published at the beginning of October. You can view the pamphlet on the "Free Publications" section of the Society's website. If you would like a printed version of the pamphlet, please contact the Information Services Department.



Guidance for Measures to Cope with Degraded Marine Heavy Fuels – Version II Measures to Cope With Poor Combustibility of Fuels Published

The Society's *Guidance for Measures to Cope with Degraded Marine Heavy Fuels* was first published in 1996, and over the past 12 years, the Guidance has been used by a large number of shipowners and other parties to reduce engine damage believed to be caused by degraded fuel oil. However, growing worldwide concerns over the environment and the strengthening of emissions regulations in MARPOL Annex VI have led to changes in the characteristics of marine heavy fuels. Previously, the main source of incidents of problems was fuel oils with high density, high viscosity, high sulfur content, and high catalyst residue (i.e. four "high" fuels). However, as a result of these changes to fuel oil characteristics, a growing number of fuel combustion problems are believed to be a result of fuel oil with high density, low viscosity, low sulfur content, and low catalytic debris (one 'high' and three 'low' fuels). To address these problems, the Society established a committee to develop a guidance for measures to cope with the poor combustibility of fuels in June 2007, and the new *Guidance for Measures to Cope with Degraded Marine Heavy Fuels Version II - Measures to Cope With Poor Fuel Combustibility* was published in June 2008. The Guidance is available free-of-charge on the Society's website. To receive a printed version of the Guidance, please contact the Information Service Department.



Exhibitions >>>

GASTECH 2008

GASTECH is a global, international conference and exhibition held every other year for the LNG, LPG, and related industries. GASTECH 2008 was held from 10 to 13 March in Bangkok, Thailand.

This year, just under 300 gas producers, oil majors, shipyards, plants, machinery makers, and other companies and organizations attended the exhibition. As in previous years, ClassNK erected a stand at the event and promoted its various activities related to gas carriers. Executive Vice President Dr. H. Kitada visited the stand and conference and spoke with many of the important guests who attended the event.

At the international conference, Research Institute Manager



Dr. N. Yamamoto gave a presentation entitled "Total Support System During the Life Cycle of LNG Ships: Advanced Ship Maintenance Support System". The paper discussed methods for extending the operational life of LNG carriers, which was one of the core themes covered by the conference. →

→ Vietship 2008

Vietship 2008 was held from 11 to 14 March 2008 in Hanoi under the sponsorship of Vinashin. Vietship is the largest maritime exhibition in Vietnam. This year some 368 companies partici-



ipated in the exhibition. The Society attended the event with a stand in one corner of the Japan booth with the Japanese Marine Equipment Association (JSMEA) and Kanematsu. This was the second time the Society attended the Vietship event. The NK stand was located at a superb location right at the entrance to the hall. Many visitors stopped by the NK stand, and all 1,000 copies of the Vietnamese language version of the brochures brought to the exhibition were handed out to visitors.

Many prominent people visited the NK stand, including a Deputy Prime Minister of the Vietnamese government, the Vice President of VOSCO (Vietnam Ocean Shipping Company), and the Chairman of VR (Vietnam Register of Shipping).

CMA Shipping 2008

The maritime event CMA Shipping 2008 was held from 17 to 19 March under the auspices of the maritime organization Connecticut Maritime Association (CMA) at the Hilton Stamford Hotel in Stamford, Connecticut in the U.S. The



CMA, which is the largest maritime organization in the U.S., sponsors CMA Shipping every year in cooperation with other major maritime organizations such as INTERTANKO, INTERCARGO, and BIMCO. Some 113 companies and organizations participated in the exhibition this year. NK has attended the event each year since 2006 with the aim of expanding its presence in the North American region. Numerous shipowners and important figures visited the NK stand, including representatives from seven national flag administrations.

Asia Pacific Maritime 2008

The Asia Pacific Maritime 2008 exhibition was held from 26 to 28 March 2008 in Singapore under the sponsorship of major event organizer Reed Exhibitions. This was the tenth time that the Asia Pacific Maritime event has been held. The Society attended the exhibition with a stand in one corner of the

Japan booth with the Cooperative Association of Japan Shipbuilders (CAJS). This was the first time the Society attended the event.

Some 800 companies participated in the event, and it is estimated that 7,000 to 8,000 visitors attended the exhibition. Many people visited the NK stand, including the Vice President of Ocean Tanker, a Managing Director of V Ships, the Chairman of the Cooperative Association of Japan Shipbuilders, the President of Kanda Shipbuilding, and the President of Sanwa Dock.



Sea Japan 2008

SEA JAPAN 2008 was held from 9 to 11 April at the Tokyo Big Sight Exhibition Center. A total of 364 companies and organizations from both inside and outside Japan participated in the exhibition.

The Society's stand was located next to the Japan stand and grouped together with the Japanese Marine Equipment Association. The Society's stand was clearly visible from even a long distance away, and was very popular with the visitors attending the event.

Honorary Chairman K. Ogawa, Chairman and President N. Ueda, and other members of the board visited the event and met with important clients. Additionally, Materials and Equipment Department Manager Y. Yamaguchi gave a presentation on "Addressing the Use of Increasingly High Strength and Very Thick Steel Plate in Ultra Large Container Ships" at the New Technology Seminar that was held concurrently with Sea Japan 2008.



ShipTek 2008



The Society attended the ShipTek 2008 international conference and exhibition held in Kochi, India on 29 and 30 April 2008. The exhibition was sponsored by Mari-

time Biz TV, a television station that specializes in maritime related matters. This was the first time the event was held. Chairman and President N. Ueda gave the opening address at the international conference and London Office Manager Dr. Rahim gave a presentation on the Super Eco-Ship. The Marine BizTV International Maritime Awards 2008 took place during



the evening of the last day of the exhibition. Mr. Ueda attended the event as a representative of the Society, which also sponsored the event. This was the second year that the Awards event was held, and more than 500 VIPs from the maritime industry and local government attended the awards ceremony.

Posidonia 2008

The Posidonia 2008 international maritime exhibition was held from 2 to 6 June 2008 in Athens, Greece. Posidonia is one of the world's largest maritime exhibitions and leading industry figures from around the globe meet during and after the event in Athens and Piraeus. This year's event was the twenty-first time the biennial event was held. Some 1,600 companies attended the exhibition from 81 countries. This year the Society's stand was located at a prime spot next to the main entrance.

ClassNK Honorary Chairman K. Ogawa, and Chairman and President N. Ueda visited the exhibition site and engaged in



friendly conversations with many clients. Mr. Ogawa also joined the Japanese ambassador to Greece, a representative of the Japan Ship Exporter's Association, and others in cutting the ribbon during the opening ceremony for the Japan booth.

Asia Maritime & Logistics 2008



On 24 and 25 June 2008, the Society participated in the Asia Maritime Logistics 2008 Exhibition. This was the first time the Society exhibited at the event, which is held in Kuala Lumpur and jointly organized by Baird Events and the Malaysia Shipowners Association (MASA).

This year's event was held at the Kuala Lumpur Convention Center and included both an exhibition and an international conference. Roughly 50 companies exhibited at the event and according to the organizer, Baird Events, more than 2,000 visitors attended the exhibition.

Among the many important individuals to visit the Society's booth was the Malaysian Minister of Transport, as well as

MISC Berhad Vice President Ir. Nordin Mat Yusoff. Mr. Nordin is the President of the Malaysian Shipowners Association and the Vice Chairman of the Society's Malaysian Committee.

2008 China (Nantong) Shipbuilding & Complimentary Products Exhibition

The 2008 China (Nantong) Shipbuilding & Complimentary Products Exhibition was held from 23 to 25 September at the Nantong Sports and Exhibition Center in



Jiangsu, China, under the sponsorship of the City of Nantong and the China Association of the National Shipbuilding Industry (CANSI). Located in Jiangsu Province, Nantong's local maritime industry has been developing rapidly over the past several years and the city is home to NACKS, COSCO and a number of other shipyards and manufacturers.

Businesses and organizations from six fields, including shipyards, manufacturers (both domestic and foreign), universities, design companies, and classification societies exhibited at the event. A total of 200 firms participated in the event.

Many people visited the NK stand, including VIPs such as the Mayor of Nantong and the Chairman of China Association of the National Shipbuilding Industry.

SMM 2008

The SMM (Shipbuilding · Machinery & Marine Technology) 2008 exhibition was held from 23 to 26 September 2008 at the Hamburg Messe in Hamburg, Germany. This was the first time the Society attended the event.

The exhibition is the world's largest maritime exhibition in terms of floor size, number of exhibitors, and number of visitors. The exhibition floor was divided into 11 areas by type of business, and roughly 1,900 firms from more than 55 countries participated in the event.

A large number of people visited the ClassNK booth, and the Society was able to strengthen its relationships with many of the visitors, including such VIPs as the Chairmen of the Korean Register and the Indian Register of Shipping.





ClassNK

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