Partnership

Edited and Printed by CCS 2017 . 2 / The 25th issue in total

Building the World First-class China Classification Society

Recently, the Ministry of Transport has issued the *"Opinion of Building the world first-class China Classification Society"*, which puts forward that by 2025, China Classification Society will reach the international advanced level in the 5 aspects of business scale, technology, service, management and internationalization, and become a first-class international classification society with strong innovation ability, high quality service, good scale economy and high reputation and credibility, leading and promoting the improvement of domestic ship survey technology.

CCS
CHINA CLASSIFICATION SOCIETY
中国船级社

Partnership

The second issue in 2017
(The 25th issue in total)

(Internal data, free of charge and welcome to communicate)

Edited and Printed by CCS

Add: CCS Mansion, 9 Dong Zhimen Nan Dajie, Beijing China.
Postcode: 100007
Tel: +86 10 58112206 / 58112218
Fax: +86 10 58112902
Websit: www.cssponline.com
E-mail: ccsinfo@ccs.org.cn
Weibo: http://weibo.com/ccsponline

Sender Object: Manager and technical staff
Printing party: Beijing Tiancheng Printing Co.,Ltd.

Wechat public ID

Android ios

Please scan the QR code to follow

CCS CHINA CLASSIFICATION SOCIETY 中国船级社

Content

2017, we continue to go forward hand in hand

We are filled with reluctance when saying goodbye to 2016 which has seen so many achievements and joys. The year of 2016 is a very extraordinary year for China Classification Society and it is also a year full of affections and inspirations.

In 2016, the market was still experiencing the coldness of winter; however, we have tried and been committed to decorate each day with warm colors. On March 1, *CCS Rules for Intelligent Ships* came into force; on April 1, the *Guidance for Polar Ships* came into force; on May 13, the 96th IMO Maritime Safety Committee (MSC 96) meeting announced the compliance of CCS construction rules for bulk carriers and tankers with the aim and functional requirements of GBS for bulk carriers and tankers; on July 1, CCS assumed the chairmanship of IACS for the third time; on July 28, CCS classed fleet broke the 100 million gross tonnage record; on August 1, we celebrated the 60th anniversary of CCS……

Taking up the chairmanship of IACS again, we carry many expectations and more importantly we are much more confident since we have the strong support, that is, the nation's entrustment and expectation, the industry's trust and support and the care and attention from the friends. We are both determined and confident to represent China to exhibit the Chinese open mind, the courage of building advanced culture and the concept of harmonious development, and make contributions to the sustainable development of the international shipping industry. The heavy work of IACS chairmanship has not prevented us from keeping the responsibility and trust in mind and making efforts to make each and every day shine. Over the course of half a year, we have taken the leading role in fulfilling the GBS audit and correction work and signing the MOU between IACS and IMO to realize the tremendous promotion of IACS and IMO relations.

Becoming the "100-million-ton classification society" means one step closer to building the first-class international classification society. 60 years of development tells us the future of CCS is always closely related to the development of the country and related industries. The need to cooperate with related industry and working and developing together with them are consistent for CCS, and the development of CCS will not be possible without the care and support of our partners. This is also an important weapon for us to overcome all difficulties and hardships and the eternal driving force for us to create more glories. With the heart of gratitude, we will stick to the commitment of "safety, environmental protection, creating value for clients and society", stay true to the mission, and make efforts to go forward.

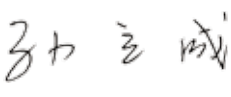
Time does not stay and it flows like a river. A brand new 2017 has come.

At the beginning of the new year, the Ministry of Transport issued the *Opinion of Building the First-Class International China Classification Society*. From the perspective of building the ocean power and the shipping power, the Opinion puts forward specific requirements for the goal, direction, way, route, connotation, quality, speed of development of CCS based on safeguarding China's water transportation safety, promoting technical progress, transformation and upgrading of shipping and shipbuilding industry, improving the discourse power of China on development of international maritime technology standards, safeguarding the national maritime rights and interests related to national energy and maritime transportation safety, serving the strategy of "Belt and Road" and the Yangtze River Economic Belt. It is the guide for CCS to build into the first-class international classification society. We are fully aware of the importance of the responsibility and the glory of the mission, and this is making us even more confident.

Recently, when I was visiting and meeting with some industry partners, we all reviewed the good cooperation with CCS in the past years, and they all look forward to strengthening extensive and intensive cooperation with CCS in the future.

Carrying the country's entrustment and requirements and the industry's trust and expectations, we know that we must promote the construction of the first-class international classification society with stronger mission and more solid steps, commit to innovation in service quality, efficiency and level, and make comprehensive improvement in service capability and development momentum based on service innovation.

The way ahead is full of challenges. We will make refreshed efforts to forge ahead. The grand blueprint means heavier responsibility and longer journey to go, but we are full of confidence and ambition because we have and cherish the power of cooperation and support from our partners which can be strong enough to conquer all difficulties. In 2017, let us start from the new beginning and continue to go forward hand in hand.

CCS Chairman & President 

CCS President Sun Licheng chaired IACS council meeting

Recently, the 74th IACS Council meeting was held in London. As the IACS Chairman, China Classification Society (CCS) President Sun Licheng presided over the meeting which 12 IACS members attended. As IACS CCS council member, CCS Vice President and Chief Engineer Zhu Kai attended the meeting, together with the Deputy Director of CCS Technology Management Department Li Zhiyuan who is IACS GPG Chair. They made relevant deliveries and reports.

The focus of this council meeting is the signing of MOU between IACS and IMO, which further strengthens and promotes the coordinated and cooperative relationship between the two sides, and the relationship between IACS and its members with IMO and its member states to jointly make efforts to achieve the common objective of safe shipping, environmental protection and sustainable development.

In addition, this meeting discussed intensively on issues including follow-up work of GBS, the formulation of requirements for ship cyber system safety, application of new technologies for survey and testing and IACS strategic development with a view to ensuring the effective promotion of key work.

President Sun Licheng said: "the 74th IACS Council meeting will be remembered due to the signing of MOU between IACS and IMO. For IACS, this is a historic event, reflecting IACS' sustained commitment to the legislation work of IMO." He also said: "many other issues have also been satisfactorily solved in this meeting, at the same time, IACS will pay high attention to quality. IACS will continue to fulfill its commitment to ensuring safe, environment-friendly and efficient shipping."

Semi-submersible flagship "Xin Guang Hua" was successfully delivered

Recently, the grand naming and delivery ceremony of 100,000ton semi-submersible ship "Xin Guang Hua" whose construction survey was conducted by China Classification Society (CCS) was held in Nansha shipyard of Guangzhou Shipyard International Company Limited. CSSC Chairman Dong Qiang, COSCO Shipping Chairman Xu Lirong and CCS Vice President Sun Feng and other leaders attended the ceremony and witnessed singing of the delivery .

The name of "Xin Guang Hua" has a profound meaning, it means "rejuvenation of China". The original "Guang Hua" is an ocean-going passenger cargo ship built by the United Kingdom in the 1930s, on April 28,1961, as China's first self-run ocean ship flying the five-star red flag, it sailed to Indonesia to receive overseas Chinese, bringing to the end of "no Chinese ship for centenary". From "Guang Hua" to "Xin Guang Hua", this semi-submersible vessel inherits the historical mission of China shipping, and it is the world's second largest, and China's largest semi-submersible vessel.

CCS signed strategic cooperation agreement with Shenyang Institute of Automation of Chinese Academy of Sciences

Recently, China Classification Society (CCS) signed the strategic cooperation agreement with Shenyang Institute of Automation of Chinese Academy of Sciences (SIA), CCS Vice President and Chief Engineer Zhu Kai and SIA Vice Director Li Shuo witnessed the signing of the agreement and delivered speeches.

CCS and SIA enjoy good cooperative relationship, especially in 2015 and 2016, the two sides cooperated with each other through the construction and classification survey of the 4500m deep sea autonomous resource exploration system "Qian Long 2", which further consolidated and strengthened the cooperation basis of both sides. Through building closer comprehensive strategic cooperative relations, the two sides will take advantage of their own strength in their own fields to gather innovation elements and resources effectively. Based on the principle of complementing advantages and supporting mutually, the two sides will seize the opportunities, promote the development of each other. In the future, CCS and SIA will carry out detailed work on the application and development of key research projects at national, provincial and ministerial level and international cooperation projects in the field of marine equipment, the formulation, promotion and application of deep sea equipment regulation standard, personnel training and communication and other fields. The two sides will also innovate and develop jointly, constantly improve technical competitiveness and make efforts to promote the development of China marine equipment manufacturing industry.

CCS published the *Guidance for Testing the Underwater Radiation Noise of Ships*

On January 4, 2017, China Classification Society (CCS) published the *Guidance for Testing of Underwater Radiation Noise of Ships*, this guidance will come into force in March 2017.

The issue of "the impact on marine life of underwater radiation noise of merchant vessels" has been receiving extensive attention of all countries from MEPC 57, and has been listed as the priority issue. In March 2013, the non-mandatory "guideline for reducing underwater radiation noise of merchant vessels" was approved in DE 57, and this guideline was formally adopted in MEPC 66 in March 2014, and is published as circular MEPC.1Circ.833, the aim is to reduce the short and long term bad impact on marine life, especially on marine mammals caused by merchant vessels.

Considering the influence of circular MEPC.1Circ.833 on construction and survey of ships, CCS has carried out intensive study on legislation of underwater radiation noise, the source of underwater radiation noise, the influence on environment, the measurement method and the limit value of ship's underwater radiation noise and other subjects, and stipulated this guidance on the basis of the applicable sections of international rules and standards, and the practical experience of the industry, provide the guidance for underwater radiation noise survey in the process of ship construction and operation. With the issuance of this guidance, CCS also becomes one of the few classification societies which have formally published underwater noise testing standard.

CCS got approval for its service certification business

Recently, China Classification Society Quality Assurance Ltd. (CCSC)'s service certification business was approved by the Certification and Accreditation Administration of the People's Republic of China (CNCA).

According to the scope approved, CCSC can carry out service quality assessment and certification services on urban rail, railway, highway, shipping, civil aviation, logistics, multimodal transportation; cargo handling, warehousing, freight forwarders, bus station, parking and other supporting and auxiliary transportation services; ship repair and ship maintenance and repair service, household electrical appliances and mechanical equipment maintenance and repair services, wind power market services, comprehensive transportation services, pipeline transportation services; car maintenance and repair services, car rental services, travel agency and tour guide services.

CCS obtained CMA and CNAS laboratory accreditation certificate

Recently, China Classification Society Quality Assurance Ltd. (CCSC) obtained CMA certificate issued by Certification and Accreditation Administration of the People's Republic of China (CNCA), and ISO/IEC 17025 testing institution approval of China National Accreditation Committee for Conformity Assessment (CNAS).

According to the scope approved, CCSC can carry out test on wind turbine load, power, power quality and noise test, and industrial electric heating equipment, air compressor, lighting system, power supply and distribution system energy efficiency test.

CCSC has integrated its testing and certification capabilities to provide more comprehensive service to customers, and take more social responsibilities in the industry, at the same time it is a response to the policy guidance of the "Notice on implementation of integration of inspection, testing and certification bodies" issued by the State Quality Inspection General Agency and forwarded by the State Council. With this, CCSC aims to provide trustful quality service to the society in all fields with high sense of responsibility and excellent expertise and by adhering to the policy of "independence, impartiality, integrity".

"SHUANGTAI 28/ SHUANGTAI 29" ro-pax ferry

The "SHUANGTAI 28 / SHUANGTAI 29" is owned by Guangdong Shuangtai Group Co., Ltd, designed by South China University of Technology Guangzhou Biyang Ship Design Co., Ltd and constructed by Taizhou Port Ship Co. The ro-pax ferries has a carrying capacity of 50 vehicles and 999 passengers. They are 127.50m long, 20.80m wide and 6.40m deep with a design draft of 4.45m and they can navigate from all domestic coastal shipping areas from Haian to Haikou. Those ships have a total of 6 decks and two of which are for vehicles. They have 50 standard parking spaces for large trucks and 50 for cars, while loading 999 passengers at a speed of 14 knots. All ferries were regulated for survey under construction by CCS and approved for CCS.

The ship type is further optimized and upgraded on the basis of the master pattern Shuangtai 26 and Shuangtai 27, and it is safer, more comfortable, green and energy saving with excellent technical indexes and performance. The ship is equipped with a bow thruster and fin stabilizer which make it able to sail in rough weather conditions such as winds of Po's 8. The bow with integral glass curtain wall is more streamlined, beautiful and attractive. In the meantime, the equipped stretcher lifts and detachable seats which meet the national defense construction requirements can be used as a transport ship for the delivery of formed unit and wounded soldiers and meet related requirements.

"NEW ENERGY"31.9 million DWT tanker

The tanker is owned by China Merchants Energy Shipping Co., Ltd. and was built by Dalian Shipbuilding Industry Company(DSIC). The tanker is 333 meters long, 60 meters wide, 30.5 meters deep and 22.45 meters of full load draft. Its host MCR power is 25360KW with 318862.2 DWT. At full load draft and CSR (82.5% MCR) power, the measured speed is 15.75 knots. The tanker is subject to CCS construction survey and was classed with CCS.

This type of crude oil tanker is a new type of VLCC which meets the CSR requirements, and has the characteristics of high energy efficiency and environmental protection. The hull line of the tanker has been optimized and the latest model of the G-type host engine is used to lower host fuel consumption and reduce NOx emissions. The adoption of air seal with the tail pipe is in line with the US EPA VGP 2013 rules and it has patented anti-sediment chamber design to effectively solve the sedimentation of ballast tanks which plagues the owner.

“DA QIAO HAI OU” double-boom crane ship

“DA QIAO HAI OU” double-boom crane ship has a carrying capacity of 3600 ton, with lift height of 110 meters. The ship has the function of auxiliary propulsion and is equipped with the crane which is the biggest in carrying capacity and the highest in altitude double-boom crane ship in China. It can be applied to hoisting and installing large bridges and equipment in China coastal and offshore areas. The ship is subject to CCS construction survey and is classed with CCS.

“COSWISDOM LAKE” 308000 DWT tanker

The 308000 dwt tanker owned by COSCO Group is the first DSIC built after corporate restructuring. The series of crude oil tankers are energy-saving anti-sediment VLCC products designed especially for Dalian COSCO Marine Oil Transportation Co., Ltd. The tanker is 333m long, 60m wide, 30m deep with no limited navigation area. It has energy-saving S-type main engine and new propeller of large-diameter and high-efficiency which meets CSR requirements. It is classed with CCS.

As a new VLCC designed by DSIC, “COSWISDOM LAKE” is green, energy-saving and environment-friendly, and it is equipped with the international energy efficiency certificate issued by CCS and the Declaration of Hazardous Substance Compliance. The ship adopts the green anti-sediment technology of the pod design and introduces the concept of combing large cabin small cabin to reduce the ballast tank sedimentation. At the same time it applies for C-meter additional notification, and use the pressure plate technology at key nodes of the structure.

"XIN GUANG HUA" semi-submerged flag ship

The "XIN GUANG HUA" is up to now the largest in China and the world's second largest semi-submerged ship. The semi-submerged ship is of 100,000 ton, 255 meters long,68 meters wide, 14.5meters deep and 10.5 meters designed draft. It has 117 ballast tanks and 4 floating boxes, and has a submergence depth of 30.5 meters in less than 6 hours.

The ship is equipped with DP2 dynamic positioning system, electric propulsion of double-shaft dual spindle and pair oars, and two sets of lateral thruster in stem and stern. It is the world's largest semi-submerged ship equipped with DP2 dynamic positioning system. The ship is subject to CCS construction survey and is classed with CCS, and has class notations of CCS GRP, PR-2 redundancy propulsion system, BWMS and Ice Class B2.

"STELLA BELLA" 250000 ton ore carrier

The ore carrier is 325 meters long, 57 meters wide and 25 meters deep with gross weight of 49175 tons, net weight of 49175 tons and 250379.90 DWT. The host power is 18600KW and it has no limited navigation area. The carrier was subject to CCS construction survey and classed by CCS.

The cargo hold of the carrier is divided by two vertical longitudinal sloping bulkheads, deck, inner bottom, and transverse bulkhead into 9 cargo tanks with 9 hatchways. The double bottom area under the cargo holds is the empty area and two longitudinal bulkheads and the side shells of the cargo hold form side tanks which are divided into seven pairs of ballast tanks and two pairs of empty tanks by plane transverse bulkheads with single bottom structure. Two fuel tanks are allocated in the wing tanks of the 9th cargo hold with double shielding protection.

At the same time, the carrier is highly equipped for energy efficiency, environmental protection and comfort, the propulsion system uses one engine and one screw, it is also equipped with Wartsila W6X82, a kind of high pressure common rail electronic injection low-speed two-stroke diesel engine. In the meantime, the carrier adopts high automated unmanned cabin and it is very comfortable for crew while the NO_x emissions of the diesel engine meet the requirements of Tire II, tanks and equipment equipped meet the low sulfur fuel requirements and the whole carrier has no ozone-depleting substances.

“XIU YU HAI” 38500 DWT bulk carrier

“XIU YU HAI” is owned by COSCO bulk carrier and built by DSIC-SSIC with a size of 182 meters long, 30 meters wide, 1480 meters deep, 24198 tons in gross, 12855 tons in net, 6132 kW of host power and no limited navigation area.

Its five cargo holds can carry dry bulk, coil, packaged goods or some dangerous goods, and a total of 206TEU can be loaded on the cargo hatch cover. The main layout includes steel, double shell an bottom, single deck, a bow and deck mast room no ball nose, single-propeller and rudder, water treatment system and ship energy efficiency intelligent online management system.

The carrier was subject to CCS construction survey and has acquired the following ship class notations:

★CSA Bulk Carrier; Double Side Skin; CSR; BC-A(Holds Nos. 2&4 may be Empty); COMPASS (D,F); Grab(20); Ice Class B; PSPC(B,D); CM; Equipped with Container Securing Arrangements; Loading Computer (S, I, G); ESP; In-Water Survey; FTP; BWMP

★CSM; AUT-0; SCM; PMS; BWMS; Clean; NEC (II); GPR; EOM

“TIAN HONG ZUO” 64900 DWT crude oil carrier

This platform shuttle tanker is owned by Shanghai COSCO marine oil transportation Co., Ltd. and was designed by Marine Design & Research Institute of China and built by SSIC. The ship is 220 meters long, 32.26 meters wide, 20.60 meters deep and with no limited navigation area, it is also the first ship with ship width of 32.26 meters using “L” ballast tank to meet the MARPOL Reg.27 ship. It has 12 cargo tanks, 2 slop tanks and its cargo tanks meet the PSPC standards with a speed of 14.2 knots, endurance up to 10000 nautical miles satisfying the request of ship energy efficiency design index (EEDI) for the second phase. Considering its excellent overall performance and indicators of safety, energy saving, environmental protection and spacious living room, it can provide a comfortable living and working environment for the crew. The carrier was subject to CCS construction survey and was classed with CCS.

R&D of standards supports river-sea direct transportation

By Xiao Shuming, Liu Guangming & Wang Zhifang

River-sea direct transportation is an important part of the world shipping, of which many developed countries think highly. River-sea direct transportation has reached quite a high level in Western Europe, the United States, Brazil and other countries which are developed in inland waterway transportation. As the largest base of inland waterway and ship type research, VBD researched and built the largest 420TEU river-sea direct transportation containership.

In our country, with the development of economy, the demand of Yangtze river-sea direct transportation increases rapidly. Especially from the 18th CPC National Congress, the CPC Central Committee and the State Council aim to build a new pattern of opening up policy and regional coordinated development, put forward the "Belt and Road" strategy and the strategic deployment of Yangtze River economic belt, and developed a series of documents about shipping, put forward "develop the multimodal transportation, research and promote the river-sea direct transportation ship type"; at the end of 2014, when the Prime Minister Li Keqiang visited Zhejiang, he pointed out the important instructions of building "Zhoushan river-sea direct transportation service center". Currently, our country's economic development has entered in the new period of the common development of coastal economy and inland economy, the river-sea shipping integration has become the new normal of the shipping development of Yangtze River.

The implementation of the national strategy promotes the transformation of the economic development model. Sustainable development, low carbon economy, innovation economy and other concepts have become the main melody. Transforming the traditional logistics mode into the modern logistics mode of low cost, low emission and standardization is the trend of the times. The Outline of Yangtze River economic belt development plan which was published in September 2016 put forward that the strategic positioning of Yangtze River economic belt development must adhere to ecological priority and green development; the transformation of economy and logistics mode also decided the shipping industry should go to the road of green, efficient and technology development. With the setting and implementation of environmental law and emission control area, according to the planning requirements of green transportation, the promotion of green shipping construction has become a top priority.

From the view of logistics market, the current demand of river-sea direct transportation is big, in 2015, the cargo throughput of "sea to river" of Zhoushan port, Ningbo was 170 million tons, while the containers volumes of Suzhou, Zhejiang, Shanghai accounted for 70% of the total in Shanghai port; but the multiple transportation way of containers transportation of Chongqing and Wuhan were mainly by the river boat to Shanghai Waigaoqiao, and then by ships to Yangshan port, this way lead to big damage and low efficiency; for the containers transportation in Yangtze River, the trucks accounted for more than 90%, it caused saturated traffic around Shanghai, and aggravated the environmental protection, energy and other problems.

From the view of navigation condition, in order to coordinate with the Yangtze River economic belt strategy, the Yangtze River golden waterway implements the waterway construction plan of "improve the construction of downstream, midstream and upstream". In view of the navigation bottleneck of the Three Gorges' lock and the shortage of the depth of Yangtze River's midstream and downstream, the second waterway construction and the work of 6m depth to Wuhan were launched, which provided a favorable navigation environmental condition to river-sea direct transportation. The current ships cannot adapt to the navigation features of river-sea direct transportation, and it is hard for them to meet the growing demands of energy conservation and environmental protection. In order to adapt to the new normal of economy and shipping development, starting from saving energy and improving environment effectively, the market calls for the real river-sea transportation and walking on a green and low carbon cycle development path.

In order to carry out the work of river-sea navigation better, in April 2015, Zhoushan government, Changjaing River Administration of Navigational Affairs, MOT and China Classification Society (CCS) signed a strategic cooperation agreement and MOU. It is intended, through the research work of river-sea direct transportation ship type and the rules and standards, to grasp the key technology of river-sea direct transportation ships, to research and develop the river-sea direct transportation ship which is adapted to the specific routes of Zhoushan-Yangtze River; to build a technical standard system based on specific routes navigation environmental conditions; to create a professional river-sea direct transportation fleet, accelerate the construction of Zhoushan river-sea direct transportation service center.

On the basis of the relevant contents of strategic cooperation agreement, CCS actively organized to carry out the work. According to the research content, formulated the project implementation plan, adopted the technical route of "theoretical analysis, numerical prediction and test and verification" to carry out the related research.

Based on the safety principle of "load first", according to the technical routes of "load, response, criterion", on the basis of the meteorological and hydrological conditions of Zhoushan, Ningbo waters, focus on "specific waters, specific routes, specific ship", considering the balance coordination of "adaptability, safety, economy" of the ship, conducted the project research (all the research will be introduced subsequently), based on the research results, formulated the technical standards which are applicable to the river-sea direct transportation ships—*the Provisional Regulations for Statutory Survey of Specific Route River-Sea Direct Transportation Ships* and the *Construction Rules for Specific Route River-Sea Direct Transportation Ships*.

The main contents of the *Provisional Regulations for Statutory Survey of Specific Route River-Sea Direct Transportation Ships* (the regulations) include: firstly, based on the port planning, transportation demand, navigation management, etc., established the service area and navigational conditions required in the statutory requirements; secondly, according to the results of consultation with Maritime Safety Administration of the People's Republic of China, established the technical requirements of survey and certification; thirdly, based on the principle of "river left sea right" (starboard), put forward the drawing mark of load line of river-sea direct transportation ships, which gathered the navigation features of river and sea, ensured the convenience of management and maximized the interests of the shipowner; fourthly, combined the method of "theoretical analysis, numerical prediction and test and verification", revised the basic freeboard of the ship, put forward the requirements of confirming freeboard in the seakeeping tests, solved the problem of rational setting of the ship freeboard; fifthly, based on the features of specific routes, adopted the concepts of risk assessment, formulated firing, rescue, communication, navigation and other equipment requirements; sixthly, based on the feature of the Maritime Labour Convention combining specific routes, evaluated and optimized the requirements of crew cabin equipment. The table of contents of the regulations is divided into six chapters, which are general principles, tonnage measurements, load line, ship safety, the structure equipment for preventing pollution from ships and the crew cabin equipment.

The main contents of the *Construction Rules for Specific Route River-Sea Direct Transportation Ships* (the rules) include: firstly, based on the wind and wave data of actual service area, analyzed and confirmed the wind and wave characteristic parameters, laid the foundation of all work of the research; secondly, based on the conclusion of wave load, formulated the technical requirements of applying load in the rules; thirdly, based on the conclusion of structural strength assessment, formulated the technical requirements of structural arrangement, structure size in the rules; fourthly, based on the conclusion of anchor mooring equipment assessment, formulated the technical requirements of anchorage equipment; fifthly, based on the conclusion of the optimization of mechanical and electrical equipment, formulated the technical requirements of mechanical and electrical parts; sixthly, combined the research and development of drawings material for 20000DWT bulk carriers and 124TEU containers, verified the technical requirements of the rules. The table of contents of the regulation is divided into five chapters, which are general principles, the hull, machinery, electrical installations and control, monitoring, alarm and safety systems.

The contents cover survey and certification, hull, machinery, electrical installations, stability, freeboard, load line mark, maneuverability, etc., apply to the welded structure steel civil bulk carriers and containers which operate on the specific routes from Yangtze River to specific sea area of the east China sea as well as the ship length in greater or equal to 65m and less than 150m. Also, the rules can guide the design, plan approval, construction, operation of the river-sea direct transportation ships, fill the gap of the technical research of river-sea direct transportation ships, apply to the construction demands of Zhoushan river-sea direct transportation service center, provide strong technical support for the development of river-sea direct transportation ships.

The rules for LNG power ships will be published this year

By Chen Lijian

① type G power ship ② type S power ship

In recent years, LNG power ships come into people's vision. It is understood that currently there are about 75 similar ships using natural gas and heavy oil to generate power around the world. These ships not only can provide electricity for its city or islands, but also can transmit the electricity to any area of their countries through the grid. The main existing users of the power ship mainly come from Paraguay, the Dominican Republic, Angola, the Philippines, Pakistan, Lebanon, Indonesia, Iraq, Venezuela, etc. Also, the LNG power ship attracts the attention of China Classification Society (CCS), which started up the research and development work of power ship in June 2016, and planned to publish the relevant rules in the first half of 2017, in order to promote the safety application for power ships.

Power ship is a mobile floating power station equipped with complete sets of power generation and transmission equipment. It can provide power for the industrial zone of nearby water or other ships. It can also be used as the power of small and medium-sized coastal cities, or transmit the power to inland areas through the grid. Generally, the power ship is not self-propelled, which is towed by the tugboat. Also there are a few power ships converted from old bulk carriers, so they have the capability of self-navigation. The power ship does not need complex shipbuilding technology, and the key point lies in the design of the medium and high pressure generator, which is a high value added technology incorporating combination of multi-areas and multi-disciplines. Now, there are two types of power ships. One is used to provide power to the power shortage areas or island, with access to the nearby local grid substation after power generation. We call it type G power ship (to grid); the other is used to provide power to the ship calling at the port, mainly dealing with the problem of emissions

pollution of the port. We call it type S power ship (to ship). According to the different application demands, both types of power ships have big potential to discover at present stage, of which the type G power ship has witnessed more application since the 1990s.

On January 17, 2016, "Zeynep Sultan" was put into operation in Amurang power plant in Minahasa selatan, Indonesia. It was a ship power plant that holds 125000 KW of electricity, which was used to ease the power supply gap of North Sulawesi, Center Sumatra and Gorontalo, and the remaining four ships are still under construction in the shipyard in Turkey. In December 2016, Indonesia state shipyard PAL shipyard and Turkey powership operator Kar Powership signed a power ship shipbuilding agreement, which will build about 80 power ships in the next 5 to 7 years, with a total capacity of 5000 MW. Also, many famous companies pay close attention to this application field. For example, Turkey Kar Powership, in addition to the power ship business in Indonesia, it is also committed to selling ships to the ASEAN regions, and it will take Philippines and Myanmar as the key market on the next step; while Wison Passion Powering Progress announced that it has successfully developed a series of floating power solutions. With "one-step convenient power generation" as the design concept, these new products named after W-FSRP have the function of LNG loading, storage, regasification and power generation. Among them, the smallest power is 10 MW while the biggest can reach 800 MW. It plans to promote the products to the region of southeast Asia, west Africa, the Caribbean, the west coast of India, etc. for meeting the growing power demand in these areas.

In view of the research and practical application experience on LNG storage tank, gas supply system, LNG transportation, transfer, filling, LNG ships' mooring, etc. for many years, and with the implementation of the domestic emissions control area, more and more ports consider to adopt LNG as the fuel power, provide power to the ship which calls at terminal, even to a certain area. LNG power ship is one of the solutions for the problem of air pollution in the port city, especially a flexible solution for the emission pollution caused by ships in the port of the emissions control area. In addition, Shanghai port, ENN Group and other units put forward to build power ships. Therefore, in order to meet the requirements of the industry, CCS put forward the plan of publishing the LNG power ship rules in the first half of 2017. It is expected to provide a full set of LNG power ships solutions for the industry, and put forward the detailed guidance for system design, equipment type selection and using requirements, to form a LNG power ship survey guidance of CCS.

From the 1990s to now, there has been application demand for power ship in some parts of the world. In most cases, a professional company adopts EPC (Engineering Procurement and Construction) project to build and manage. CCS considers that, the main advantages of power ship are: firstly, compared with traditional onshore power solutions, because the power ship is built in shipyard, building efficiency is high and the cost can be controlled. The production cycle is short (the construction cycle for onshore power plant is usually for 4 ~ 5 years, while that of the power ship is only for 14 months); secondly, the power ship can minimize land occupation, without a number of basic matching facilities, and the approval process is less complicated than that of onshore power plant; thirdly, the power ship can be acted as EPC project, completely operated by professional companies from feasibility study to project delivery, thus largely reducing the workload of end users; fourthly, it can be arranged rapidly, therefore fast meeting the power demand from any area of the world; fifthly, it can use a variety of fuel, fully adapted to the difference of different fuel resources. Generally, choosing the most economical fuel complying with local environmental policies, and next choosing according to local conditions; if the storage of main fuel placed on shore, usually choosing the local fuel, such as coal, LNG, crude oil, which is mainly based on price factors. Also, more selections are available. For example, choosing economic fuel according to shipping; sixthly, the building cost is high at the initial stage, but as the time passes and more ships are built, the construction cost will reduce gradually; seventhly, power ship can move by itself, so there is no need to worry about the redundant investment. Generally the economic benefit of long-term lease is good; eighthly, the technology is mature. MAN and Wartsila have actual cases.

Power ship can quickly fill the power gap of the area. Although it is not a complete solution for the construction of regional power grid, it can provide a buffer time. It has a good market prospect in island and the infrastructure backward area. At present, there is no relevant domestic design and construction experience. Therefore, CCS will develop the service capability for LNG power ship through research and guide the application of new technology for LNG power ship's design and construction and provide design guidance.

The *Rules for Cruise Ships* formally entered into force

By Gu Yajuan

On January 1, 2017, the *Rules for Cruise Ships* of CCS formally entered into force. The research and development of the rules was carried out mainly based on policy, market and technology.

Firstly, the strategy of "Made in China 2025" put forward 9 tasks, 10 key areas and 5 major projects, among them, 10 key areas include marine engineering equipment and high technology ships. At the same time, the State Council, the Ministry of Transport, China National Tourism Administration and other ministries also introduced policies related to cruise ships, aimed at promoting the development of China's cruise industry.

Secondly, from the view of the market, as the fastest growing fields of the international tourism, traveling by luxury cruise has the most growth potential in the international tourism market, and it has maintained a rapid growth in recent years. Especially, China has become the most dynamic and potential cruise market in the world. It is predicted that more than 10 million people will choose cruise tourism annually by 2035, with 2000 people per cruise ship, and 50 voyages each year. At that time, the demand of the Chinese market will be at least 100 ships, that is to say the growth of cruise ship of domestic market will remain at about 5 each year. At the same time, the existing ship design cannot meet the demand of Chinese traveling, so increasing the cruise ship which can meet the demand of Chinese tourists and their growth is an urgent problem to solve.

Thirdly, from the view of technical background, in terms of

cruise shipbuilding, at present, cruise design, construction and matching industrial chain are mainly concentrated on 4 big cruise shipbuilding shipyards in Europe, but Asian shipyards in countries including China, Japan and Korea do not have the capability of designing and building cruise independently. At present, China cruise industry is cultivating the local cruise industry chain actively. China Classification Society (CCS) should play its unique role, research related core technology, establish the cruise rules technology standard complying with Chinese cultural characteristics and tourists demand, provide technical support to China's cruise design and construction, and promote the development of China's cruise industry.

The research of CCS *Rules for Cruise Ships* was carried out on the basis of a large number of studies and sufficient technical reserves.

In 2009, CCS set up a project and carried out *Technical Research for Alternative Design*, carried out research and developed the *Guidelines on Alternative Design And Arrangements for Fire Safety*. The development of this research work, strived for the right to speak for our country's work in IMO: in 2014, based on the analysis results of CCS personnel evacuation, our country put forward the point of evacuation analysis based on fire conditions for the crowded place, and it was adopted by IMO; in 2015, our proposal of life safety criteria contained in the alternative design was adopted by IMO, and become the recommended standard for global implementation.

In 2012, CCS set up a project and carried out the *Special Technical Research of Large Passenger Ship*, including the requirements of "safety return to the ports of passenger ships", fire detection, smoke control and fire-extinguishing technology for special structure places of large passenger ships, such as theaters, restaurants, shopping malls, atrium and other large spaces, shops, casinos, cafeterias and other flat large spaces, as well as corridors, sightseeing corridors and other narrow and long means of access; developed the guidelines for personnel evacuation for the crowded place of large passenger ship.

In 2013, CCS set up and carried out the *Key Technical Research for Luxury Cruise*, studied for ship hull structure longitudinal strength, local strength, the whole ship finite element assessment, fatigue strength, hull vibration and noise, mechanical and electrical equipment and fire protection.

Subsequently, CCS carried out the *Survey Guidance for Cruise Operation, Structure Design Technology and Hydrodynamic Performance Research for Midsize Luxury Cruise Ship* of Ministry of Industry and Information Technology (MIIT) and other projects.

Through several years of concentrated research, CCS gradually mastered the key technology of cruise, basically completed the technical accumulation of cruise.

With the demand of cruise design and construction increasing gradually in our country, CCS set up cruise technology special research team in 2015, based on the research results of CCS, carried out new research combined with the technical demand of domestic cruise development. In addition to ship safety technology, the research team carried out research on the comfort and leisure experience requirements of tourists, design and construction technology requirements of personnel health and safety.

The research team studied a large number of requirements of international technical standards and port state government, such as the operation safety, fire protection, environmental protection, health and security of CLIA Policy; the rating standard of the world's most authoritative cruise rating magazine Berlitz includes 6 categories, 400 rating standards with total scores of 2000. The 6 categories are ship, living, food, service, entertainment and cruising experience. Besides,

the team also consulted *International Health Regulations* (2005), *Provisional Technical Advice of Survey and Issuing Ship Sanitation Certificate* issued by World Health Organization (WHO), the USCG requirements of the homeport cruise and port cruise entry into the United States waters, and vessel sanitation plan (VSP) of the United States public health service and disease control center, and the US cruise security and safety act, etc.

At the same time, we analyzed the relevant standards in China, including the *Division and Evaluation of Tourism Hotel's Star Rating*, the *Division and Evaluation of Inland Waters Tourism Hotel's Star Rating, Indoor Air Quality Standard, National Standard for Indoor Environment, and Regulations for Residential Design*, etc.

Through the above research, and practical survey, examination, calculation and analysis, we finally competed the research and development of the Rules for Cruise Ships.

In the process of the development and verification of the *Rules for Cruise Ships*, CCS obtained strong support from domestic industry including shipowners, shipyards, design units, etc. CCS also carried out extensive cooperation with international famous cruise design companies, and these partners gave strong support for the development of this rules. Emphasizing requirements for the passenger's safety, defining that design requirements for the cruising experiences and sanitation ensurance of passengers are the principles of the development of the *Rules for Cruise Ships*. Based on this principle, the *Rules for Cruise Ships* introduced the cruise notations Cruise, cruising experience design index notations CEDI and sanitation ensurance design index notations SEDI. The Cruise notation defines that the cruise should meet the requirements of ship hull, fire protection, stability, life saving, etc. CEDI index can reflect the leisure ability that can be provided by cruise hardware, which can be ensured at the stage of cruise design and construction. CEDI consists of passengers occupation Ox, passengers comfort index Cx and passengers leisure facilities Fx, among them, x is divided into 3,4,5 levels. Similarly, SEDI index is the capability of safeguarding the sanitation and safety of passengers which is established at the stage of design and construction, which is divided into 3,4,5 three different levels.

Based on the existing research results and related technical abilities, CCS can provide technical services of cruise ship, luxury passenger ships, luxury passenger ro-ro ships for customers: firstly, for the customer who applies for Cruise notations, provide ship type development, design, plan approval and survey services based on the requirements of this notation, including structure strength calculations, stability calculation, etc.; Secondly, for the customer who applies for Cruise CEDI (Ox, Cx, Fx) notations, provide ship type development, design, plan approval and survey services based on the requirements of this notation; thirdly, for the customer who applied for Cruise SEDI (x) notation, provide ship type development, design, plan approval and survey services based on the requirements of this notation; fourthly, provide alternative design technology and plan approval support services for the ships which have requirements on fire protection and life-saving alternative design; fifthly, provide calculations and evacuation analysis based on fire dynamics for the design scheme which need advanced evacuation analysis.

The release of the *Rules for Cruise Ships* does not mean CCS ended this aspect of the work. It is a new start. CCS will cooperate with national design, construction, product and other related cruise industries, in the process of building China's cruise industry, establish and improve continuously related technology and standards which meet the demands of China cruise, jointly promote the development of cruise industry, provide better service to the growing demands of China's passengers for cruise travel.

Basic requirements and implementation of *BWM Conventionn*

By Wang Huifang

According to the condition of entry-into-force of *BWM Convention* (being acceded by at least 30 countries, whose merchant tonnage should account for more than 35% of the world's tonnage, and 12 months after the conditions are met), On Sep.8th of 2016,with Finland acceding to the *BWM convention*, the merchant tonnage of nations of *BWM Convention* contracting parties has reached 35.14% of the world's total merchant tonnage, thus meeting the entry-into-force condition. The *BWM Convention* will come into force on Sep.8th of 2017.

Two methods can be adopted for ballast water management: ballast water replacement and ballast water treatment. Ballast water replacement includes: sequential method, overflow method and dilution method. Ballast water replacement corresponds to D-1 discharge standard and ballast water treatment corresponds to D-2 discharge standard. Generally the BWMS is necessary to kill different kinds of aquatic organisms. Some other alternative measures are under research. For instance, potable water which meets D-2 standard can be used as ballast water.

Table 1 implementation schedule of D-2 standard

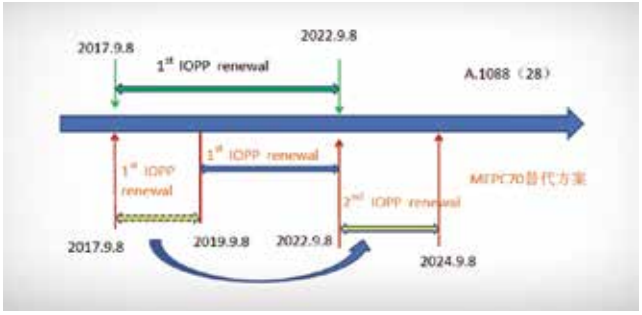
Time of construction	Ballast water capacity	Compulsory implementation data
Before Sep. 8th of 2017	all	On 8 Sep. 2017 or on the first IOPP renewal survey after that
Sep. 8th of 2017 or after	all	At the time of delivery

Table 2 implementation schedule of D-2 standard(alternative solution)

Construction time	Ballast water capacity	Compulsory implementation date
Before Sep. 8th of 2017	all	In case of the first IOPP renewal survey which should be done on Sep. 8th of 2017 or after but is completed after 8th Sep. 2019, then the implementation date should be 8th Sep. 2017 or coincide with the first IOPP renewal survey after that
		In case of the first IOPP renewal survey which should be done on Sep. 8th of 2017 or after but is completed prior to 8th Sep. 2019, then the implementation date should be 8th Sep. 2017 or coincide with the second IOPP renewal survey after that
Sep. 8th of 2017 or after	all	At the time of delivery

D-2 standard implementation schedule is worthy of attention. Ballast water replacing is an interim measure. The final management target is to discharge ballast water which meets D-2 standard after treatment. To implement D-2 standard, *BWM Convention* stipulates time windows for D-2 standard implementation for newly-built and existing ships. Due to deferred implementation of BWM, IMO passed the resolution of A.1088(28) which has modified the implementation time of D-2 standard for ships built in different years and ships with different ballast water capacities, mainly based on the framework of convention. With the date of coming into force of the convention determined, the resolution can be summarized as follows: ships built before the date should meet D-2 standard upon changing the certificate of IOPP for the first time; ships built after the date can be deemed as newly built ships, which should meet D-2 standard at the time of delivery. See details in table 1. At the meeting of IMO MEPC70, alternative text of D-2 standard implementation schedule was deliberated and approved, see details in table 2.

Comparison of the two solutions:



MEPC70 alternative solution deferred the installation time of MWMS to the second IOPP certificate renewal period for ships which need to change certificates in two years after the implementation of the convention. The alternative solution is not the final decision. IMO will discuss and make final decision on MEPC71 meeting in July of 2017. Interested parties should follow the meeting outcome.

Ballast water convention documents include ballast water management plan and ballast water record. To meet requirements of ballast water convention, a BWMP made according to MEPC.127(53)

solution is necessary and should be approved before the first time of applying for inspection certificate. Ships in services with BWMP made according to A.868(20) resolution should renew BWMP according to MEPC.127(53) resolution and apply for approval. BWR is ballast water record to record ballast water operational requirements.

For aspect of ship certification and inspection, ships of 400 gross tons or above(excluding floating platforms, FSUs/FPSOs) need to be inspected according to the convention(initial survey, renewal survey, annual survey, intermediate survey and additional survey) and obtain a international ballast water management certificate. ships of less than 400 gross tons should meet requirements made by competent authorities.

IMO proposed *Applicability Explanation for MOUs of BWM Convention* (BWM.2/Circ.46), clarified MOUs should accord with BWM convention. An IBWMC is also needed based on clauses of E-1 and E-2 of the convention.

According to the ballast water convention, ships within the application scope should hold IBWMCs after the effective date of the convention. Ships in services should be inspected and certificated before Sep. 8th of 2017. IMO proposed BWM.2/Circ and promoted governments of ballast water convention contracting parties to inspect the certificate ships. “Certificate will take effect on effect data of convention” should be indicated on the certificate.

With regard to PSC, the 9th clause of ballast water convention entitles the port states to inspect ships and take examples. It is feasible to take sample of ballast water to determine whether the ships meet requirements of D-2 standard. Post states should inspect ships according to Post State Checking Guide Rules passed in MEPC.252(67) resolution. It is noted that no matter whether BWMS is installed on ship, PSC should based on D-2 standard conformity.

CCS specifically recommends several aspects for the attention of the industry after the ballast water convention taking into effect.

Firstly, it is about D-2 standard implementation schedules. Which one of the two schedules respectively based on A.1088(28) resolution and MEPC70 meeting is unpredictable. Ship owners should reasonably install BWMS with full consideration of fleet scale, ship situation, BWMS situation and dry dock situation.

Secondly, it is about IBWMC. Without a transitional period, ships in services should be inspected and certificated before Sep. 8th of 2017. Therefore, it is suggested to apply for inspection and certificate as early as possible. For ships of ballast water convention contacting parties, international ballast water management certificates are necessary; ships of non-contracting states should apply for certificates of compliance.

It should be nted that inspection and certification ahead of schedule for ships in services are uncorrelated with installation of BWMS. The time of installing BWMS is the time of meeting requirements of D-2 standard. Before meeting requirements of D-2 standard, ships should meet requirements of D-1 standard. Therefore, ships applying for inspection and certification ahead of schedule should just meet requirements of D-1 standard.

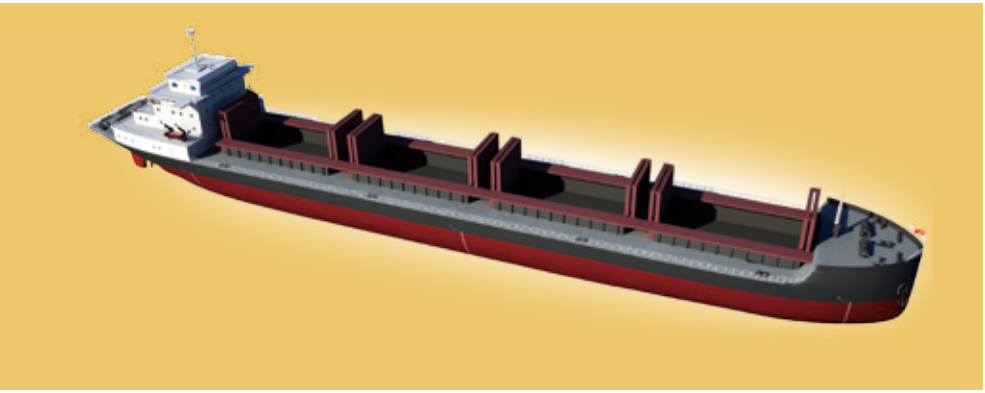
Ships without BWMP or with BWMP but without the approval of competent authorities or ROs should timely submit BWMP for approval. BWMPs which have been approved based on A.868(20) are still effective before being installed onboard ships,and re-approval is not necessary.

Thirdly, type approval and installation of BWMS. BWMS developed to meet requirements of D-2 standard need to be approved by competent authorities according to Ballast Water Management System Approval Guideline. IMO passed the G8 Guideline in MEPC.174(58) of 2008 and modified G8 Guideline in MEPC.279(70). The application schedule of G8 Guideline is as follows:

Competent authorities should use the modified G8 Guideline to conduct type approval as soon as possible, but not later than Oct. 28th of 2018; BWMS installed on Oct. 28th of 2020 or later should meet requirements of modified G8 Guideline; BWMS installed before Oct. 28th of 2020 should be approved according to MEPC.174(58) or modified G8 Guideline.

The river-sea going concept ship: 20000 ton cargo ship operating between Zhoushan and Maanshan

By Zhang Wei, Cao Wenjun & Wang Na



Based on establishment of technical standards for river-sea going ships, and by adhering to the principle of "seaworthiness, port-adaptable, goods-adaptable", China Classification Society (CCS) together with the industry has developed the river-sea going bulk cargo ship of 20 thousand tons which is safe and energy efficient. Its cargo capacity, energy efficiency and economic performance have been greatly improved as compared with current excellent sea-going ships.

Ship type demonstration

The basic configuration of the concept ship jointly developed by CCS and the industry has been determined based on logistics, market, shipping and other environmental conditions and through demonstration of economy.

First of all, in terms of operation environment, by investigating and researching on the meteorological and hydrological departments, port and dock, information such as the wind wave information of Ningbo Zhoushan waters to the mouth of the Yangtze River, Ningbo Zhoushan waters, and the mouth of Yangtze River to Magang and Wugang navigation and bridge conditions, the port condition of Magang, Wugang, Ningbo and Zhoushan have been collected.

Secondly, in terms of market environment investigation, by investigating shipping companies and port related units, we get hold of the situation of China's iron ore imports, demand and transport, freight rate between Magang routes and Wugang routes, the level of cost efficiency, and construct capability of coastal shipyard, the difference between price of ship construction level and price of secondhand ship market etc.

In addition, the scale of the ship has been demonstrated. According to the analysis results of the above market, port and navigation conditions, on the route from Ningbo, Zhoushan to Ma'anshan, the largest plane scale of target research ship can be considered as 150 x 25 meters, draught of 8.9m, and storage capacity over 20 thousand tons. The length between perpendiculars is 148-150m, width is 23-25. Through the economic demonstration, we determined the basic outline of the ship, the length, the beam, deep draft is respectively as 150 x 24 x 11.8 x 8.9 (m).

Optimization work

Optimization is also an important part to develop concept ship. Based on the scale of the ship, we calculated and analyzed in line with aspects such as ship linetype, efficiency boost and energy saving appendage, and researched and developed the target ship type.

The first is ship type optimization. According to matching principle of engine paddle, on the premise of meeting propeller arrangement, we selected and matched the propeller according to the main motor power and rotate speed; to target ship type, based on we uses parameterization ship type to generate tools and develop linetype optimization in CFD.

The second is the measures for efficiency optimization. Based on the results of above linear optimization, applicable fore pattern and tail type had been determined; according to design method of circulation theory, open water efficiency of the propeller had been improved; in order to ensure the ship's control ability, the flap type rudder, a high efficient operating control had been used to improve mobility of ship in its navigation and flexibility of ship leaving dock.

The third is the intelligent loading system. The technical scheme of the intelligent system of navigation has been completed, the technical requirements and related equipment have been clarified, to optimize the speed of each segment and ensure the safety and energy efficiency of the ship.

The characteristic of ship type

On the basis of demonstration and optimization, combined with the owner's demand, requirements of layout and the route, we developed the river-sea navigational bulk cargo ship of 20 thousand tons, and the real truth of the concept ship has been disclosed.

Principal dimensions of ship type

The river-sea going concept bulk cargo ship is suitable for the river, sea, and is advanced and economic.

In terms of it's being suitable for river, the ship has three major characteristics: firstly, the ship draught meets the requirements of water depth from Zhoushan to Ma'anshan, the ship can get through Nanjing Yangtze River Bridge by ballast and topple mast; secondly, the ship in 150m and 130m length combined the length of current docks and berths; thirdly, R&D ship type has improved 10% of average load than similar good ship, which is adapted to the demand of iron ore.

In terms of it's being suitable for sea, compared with the coastal area, the wind and wave conditions in Zhoushan are relatively good. The design of R&D ship is adapted to Zhoushan special sea storm conditions. In addition, the ship has good wave resistance by preferable stem and reducing rolling device.

In term of it's being advanced, the ship has seven characteristics. Firstly, the R&D ship type uses straight cylindrical bow and stern ball low resistance line to improve pressure distribution of ship flow field, achieving about 3% of the drag reduction effect; secondly, R&D ship uses front conduit and vortex suppression fins to achieve about 4% of energy saving effect; thirdly, R&D ship uses the theory propeller which is matching flow distribution field in stern, making engine and propeller match more reasonable, the efficiency of ship propulsion has been increased by about 2%, and cavitation and vibration performance have also been improved.

Fourthly, the R&D ship type adopts flap type rudder, whose effect can be increased by more than 50%. Fifthly, the ship uses load and strength design method, combined with the structural optimization, making the cross-sectional area decreased by 5%, and steel weight reduced to 500 tons; Sixthly, use intelligent loading and speed device and optimize navigational speed in each leg to realize 8% of comprehensive average energy saving; Seventhly, R&D ship type will provide reserve space for the LNG green power system to meet the policy of emission control.

In terms of being economic, the economic performance of the ship type developed has been greatly improved compared with the current excellent ship type, such as in the aspect of load capacity coefficient, push loading capacity of unit power, internal rate of return, with oil consumption per kilometer, EEDI, cost per ton having been dramatically decreased.

According to the research results of the concept ship type, the Zhoushan Municipal People's Government commissioned the Zhejiang Xin Hai ship design and Research Institute to complete the design work of ship type technical drawings. Currently, CCS Wuhan Plan Approval Center is evaluating the ship's drawings and information. The ship is expected to start construction in the first half of 2017, the construction and operation of the ship will effectively test the reasonability of the ship's technical standard and advancement of the concept ship.

CCS ship energy efficiency intelligent management solution

By Sun Yonggang

Coping with climate change has become the critical focus of international politics and economics, the international community, governmental authorities and industry organizations have taken corresponding measures to reduction of greenhouse gas emissions and improvement of energy efficiency.

The International Maritime Organization (IMO) formally incorporated the energy efficiency measures for ships into the MARPOL Annex VI at the 62nd session of the Marine Environment Protection Committee (MEPC) in July 2011. For the first time, technical emission reduction measures (EEDI) and operational reduction measures (SEEMP) were adopted into MARPOL as mandatory requirements, after which all the topics of MEPC were related to ship energy efficiency and related data collection mechanism. In 2016, IMO MEPC 69 finally approved the global ship fuel consumption data collection mechanism, and later at the 70th session of MEPC in October 2016 ship fuel consumption data collection system was officially adopted into MARPOL Annex VI amendment, which will come into effect on 1st March, 2018. According to the requirements of the amendment, ships of 5000 GT or above shall, on or before 31st December 2018, formulate a plan for ship fuel consumption data collection in accordance with the requirements of Part II in the SEEMP Guidelines and include it into the SEEMP.

On 1st July, 2015, EU-Regulation on the Monitoring, Reporting and Verification of Carbon Dioxide Emissions from Maritime Transport and amending Directive 2009/16/EC entered into force. The Regulation covers the development of monitoring plans, monitoring implementation, monitoring reports and verification and many other links. The ship shall form an annual report by monitoring and calculating fuel consumption, greenhouse gas emissions and relevant information during operation. After verification by a third party, the report shall be submitted to the European Commission and to the authorities of the flag states at the stipulated time limit. Energy efficiency data monitoring is the key to implement the Regulation and is the primary problem faced by ships involved in the EU routes.

Basing on the requirements of the international community,

government authorities, industry organizations and shipping enterprises to improve energy efficiency management level, with the purpose to satisfy the requirements of ships energy efficiency data collection and automatic analysis optimization, China Classification Society (CCS) and China COSCO Bulk Shipping (Group) Co., Ltd. (now known as COSCO Shipping Bulk Co., Ltd.) jointly developed the software product "Ship energy efficiency online intelligent management system".

Ship energy efficiency online intelligent management system can automatically collect and monitor the operating parameter data of ships' energy-consuming equipment like main engine, auxiliary engine and boilers and navigation equipments like shaft power equipment, GPS, anemoscope, log, tilt meter and depth sounder, and carry out real-time data synchronization with shore-based systems. Through intellisense, automatic collection and online monitoring of navigational state, equipment operation data, energy consumption and emission data, basing on key techniques of AHP, DM and intelligent optimization, utilizing key technologies of large data processing, numerical analysis and simulation optimization, building analytical model analytical process based on ships' historical data, realizing ships and shore-based systems synchronously perform functions of monitoring on navigation and energy-consuming equipment, warning of Emission Control Area (ECA), energy management and energy efficiency analysis and evaluation and decision aiding, establishing an integrated intelligent solution aiming at optimum shipping energy efficiency considering aspects of ship operation guidance, navigation performance assessment advice and shipping management decision-making respectively to meet the relevant parties' higher management requirements on ships energy efficiency. At present, the system has been installed in more than 60 bulk carriers, ships and company management personnel can grasp the status of ship energy efficiency in real time and give guidance for ship operation in accordance with the energy efficiency indicators.

Relying on the service product, CCS has clearly put forward additional notation (EOM) for the ship energy efficiency online real-time integrated monitoring. It is the first classification society to award additional notation of ship energy efficiency online integrated monitoring, and put forward a package of energy efficiency management solution. Ships that awarding EOM additional notation can get the notation if it passes strict installation and trial validation and satisfies the requirements of standardized testing, which will enhance the core competitiveness of the ship in the international market and improve enterprises' sense of social responsibility to practice energy conservation and emission reduction.

At present, the ship energy efficiency has been gradually changed from information to intelligence in the ship's life cycle, which is characterized by the collection, storage and association analysis of various formats of data, being large data-based on large data and forecasting technique-centralized, through the integration of internet information and entities to build a ship-shore intelligent information service system, with which to achieve ship-shore information sharing and break asymmetrical information problem, build integrated framework of information technology and entity to realize energy efficiency intelligent decision-making based on large data, and create new value for shipping enterprises.

If you have any requirement, please kindly contact:

Department: CCS Energy Efficiency Service Group
Contacts: Mr. Wei Maosu, Mr. Sun Yonggang
Tel: 010-58112439、58112065
Email: es@ccs.org.cn

CCS launched certification service for offshore engineering software

By Tang Guangyin, Chen Hailong & Li Hongtao

Computer has become the necessary means to support today's marine engineering design. The targeted professional software development has become a weapon which can improve efficiency and solve engineering problems. Along with the transformation from "manufacturing power to creative power", in recent years, many domestic marine engineering companies and research institutes actively researched and developed professional software which held independent intellectual property rights and have played a very important role in promoting the development of national marine engineering projects. In the process of one commercial software being accepted by the industry, validation is a very important step. When a software design or a product is completed and purchased, it means this design has been accepted formally, and its principle, function requirements, algorithm, precision have been reviewed, and meet the requirements of laws, regulations, guidelines or other criteria of the marine engineering industry.

When a new software design or product was put forward, but cannot find related regulations or guidance documents, the most convenient way is to ask classification society for help, identify the most suitable standards or guidance from the exiting standards. Especially, when the most appropriate standards or guidance cannot be found, classification society can formulate related regulations or guidance according to the situation. In order to meet the demands of the industry, CCS exerted accumulated experience and technical advantages in marine engineering industry, and the advantages on standard formulating, carried out extensive cooperation with related companies and institutions in the industry to provide marine engineering special software certification service for new software products in the field of marine engineering.

This service aims to provide certification service covering all stages for new marine engineering special software, basically covering the whole life cycle of the development of marine engineering software ranging from the function requirements of software, development principle, technical route, algorithm to validation case review, etc. At the beginning of establishing the project of software development certification, professional engineers will get involved in the process of software development, communicate with the development units on market demand of the software and practical problems of the software, then put forward suggestions and give advice for the function of the software; carry out a series of tracking and witness of the overall structure, principle, algorithm, input and output of the software, and recheck computation for the case of the software when necessary, to ensure the accuracy of the software. After a series of assessment and witness, the AIP certificate for the software products will be issued on ensuring that the software meet the certification requirements, issue, providing support for the promotion and use of the software in the industry.

Although this service is still in the early stage, it has attracted the attention of the customers of marine engineering industry. As the domestic professional marine engineering technical service company, COTEC entrusted CCS to carry out feasibility recognition for their software based on the "pipe laying real-time analysis system", the service contents include: data acquisition for comprehensive demonstration system, data conversion and input project, type, etc; the rationality and regulation suitability for certification system calculation analysis process, to achieve the target of carrying out feasibility certification for the system in the end.

With more and more professional demand for the domestic marine engineering industry, the number of professional and customized software will increase, and will create more demand for certification of the software. We will promote this service together with related companies in the industry through further promotion to support more research and development and promotion of domestic independent innovation software products.

Nondestructive testing escorts large-sized vessels

By Gao Yifei

In recent years, the trend of large-sized and super large-sized vessels has become increasingly apparent. At the same time, along with large-sized, complicated and high-end vessel, the use of lots of new material, new structure and new technique has put forward many challenges that are difficult for the traditional nondestructive testing technology to resolve. Nondestructive testing technology innovation has become extremely urgent.

It is well known that a large ship is composed of tens thousands of welded components. Relevant data shows that welding defect is one of the main reasons of ship fracture accidents happened in recent years. Particularly, with the development of large-scale ships, the steel plate is thicker, the strength of materials is higher and the structure design is more and more complex, hence the demand for construction quality is higher. The painful lesson of "MOL Comfort"fracture and sinking keeps reminding the ship manufacturing industry of the urgency of introducing advanced nondestructive testing technology to ensure the safe operation of large ships.

The new nondestructive testing technology is usually compared with the five major conventional technologies of ultrasound, radiation, eddy current, penetration and magnetic powder. The emergence of phased array ultrasonic testing and diffraction time difference detection new technologies which represent the nondestructive testing has brought an unprecedented technological change for construction and operation test of large scale and high-end ships. Based on the advantages of efficient inspection, reliable test results and the protection of the test field, phased array ultrasonic testing technology and diffraction time difference detection technology have obtained good application in the ship industry, and have realized high-performance and automated testing.

In order to promote the development of detection technology in shipbuilding industry, China Classification Society (CCS) established a nondestructive testing lab in 2008, focusing on new nondestructive testing technology research and application to constantly improve independent research and development strength and the service level,

through the formation of high-quality team and the introduction of the world's advanced technology and equipment. By engaging in high-end field testing services, development of nondestructive testing techniques for complex structure and new materials, development of testing appliances and software and nondestructive testing technology training etc., it never stops making efforts to promote the application of nondestructive testing technology in shipbuilding industry.

In order to provide high quality and efficient services to clients, with innovated concept, the laboratory put forward new thoughts of service to build up the whole nondestructive testing service industry chain, changing from the traditional way of focusing on a certain point in the application of technology traditionally to making every link of the service linked, thus covering the whole industry chain and providing one-stop testing service to clients. The customers' concerns in the application of new technology are resolved and the application of new technology in the industry are greatly promoted.

Based on the above new thoughts, the nondestructive testing laboratory vigorously strengthens infrastructure and capacity construction. In standard research, the laboratory has become the first domestic institution to carry out research in nondestructive testing technology standards. It has issued 31 technical guidelines and one circular in ship and offshore engineering industry, covering PAUT (phased array ultrasonic testing)/TOFD (diffraction time difference detection technology) and new technology procedure approval, etc. With regard to the development of detecting technology, the lab has completed 12 new testing technology represented by the first domestic steel box girder bridge U rib penetration testing technology, the first domestic 83000 square LPG ship tanks detection process, the first domestic LNG tank 9 Ni / 5 Ni PAUT detection technology, the first domestic plate TOFD&PAUT joint detection technology, and has obtained procedure approval from societies such as CCS/ABS/DNV, LR, etc. With regard to the development of supporting device, it has designed and produced on its own more than 10 kinds of manual/automatic scanning equipment, accessories, which have obtained three patents of utility model and invention. With regard to the development of professional software, it has developed on its own 5 sets of professional software, obtaining 13 software copyrights; In terms of on-site testing services, CCSI lab has become one of the service agencies with the most PAUT III personnel and all kinds of new technology and testing equipment; In terms of qualified personnel training, it is the only professional institution to carry out the PAUT personnel qualification training the only one in China to carry out simultaneously CCS and CSWIP training; In terms of technical consultation services, it has become one of the most powerful, the most comprehensive domestic nondestructive testing technology consultation and service agency.

At present, China Classification Society Industry (CCSI) has applied the new nondestructive testing technology research and development results successfully to the ship, offshore platform, wind power, large-sized bridges and other large steel structure and composite material inspection, and has successfully solved the thorny technical problems that are out of the reach of conventional NDT methods, making huge economic and social benefits for owners.

In the cargo area or the deck of large container ships and large ore carriers, in order to ensure the longitudinal strength of the beam, steel plate of more than 50 mm in thickness is often used. And for this kind of ultra-thick plate, the efficiency of ray detection and defect detection rate will drop greatly, which is unable to meet the quality requirements in the process of construction. By means of TOFD and PAUT joint detection, which not only gives full play to the TOFD characteristics of high rate of the defect detection, but also eliminates the influence of TOFD blind area by use of PAUT, on the one hand, CCSI ensures the quality of the plate area, on the other hand it raises the traditional detection efficiency by 3 ~ 5 times, providing strong technical support for testing key parts of large-sized ship.

In special ships such as deep see operation unit, Jiaolong deep submersible vehicle, LNG ship, LPG ship, stainless steel, titanium alloy, 9Ni/5Ni steel, low alloy steel and other new materials are




incessantly and widely used. Influenced by such factors as coarse material and anisotropy, the result of traditional ray and ultrasonic test method is not good. CCS by using the latest PAUT two-dimensional array detection technology, solved a series of test problems.

In marine stern shaft tube, wind vane tests, CCSI through independent research and development of the automatic scan device, automated detection by combining visualization data interpretation, solved the traditional problems of low testing speed and large amounts of missing inspections, providing technical support for improving the quality of key parts, guaranteeing the construction schedule and reducing safety risks.

Through the accumulation of a large number of field data, CCSI has provided the industry with the butt plate welding, TKY welding, complex structure and new materials testing technology solutions, and has promoted technical progress of the whole industry by formulating and releasing corresponding technical guidelines.

Through ten years of unremitting efforts, the advantages of nondestructive testing technology has gradually been recognized by the industry, more and more people have seen and accepted these safe, accurate and efficient characteristics of new technologies, which in turn have also been applied more and more to different projects. This has played a huge role in improving the construction quality of large-sized and high-end ships and offshore engineering equipment, and has gradually permeated into every aspect of the whole industry.

Based on the development goal of " providing customers with safe, accurate and efficient one-stop nondestructive testing new technical service" and with the development direction of "automation, information and intelligent detection technology" as the breakthrough point, the nondestructive testing laboratory research team has been dedicated to the latest product research and development of detecting technology and services, in the near future, new technology such as guided wave detection, array eddy current testing, acoustic emission testing and structural health monitoring, etc. will step continuously into the shipbuilding industry through the laboratory which plays the role of a window, to provide more efficient fast service for the owners, promote the advance of the ship quality, and provide escort for large-sized ships.