

CHINA CLASSIFICATION SOCIETY
BUSINESS INTRODUCTION

CCS
CHINA CLASSIFICATION SOCIETY
中国船级社

Safety, Environmental Protection and Creating Value for Clients and Society

Preface

This brochure is aiming to provide the general understanding of CCS Business scope by answering the following questions:

02 ***Who is CCS***

04 ***What do we do***

36 ***Technical Innovation***

44 ***What services do we offer***

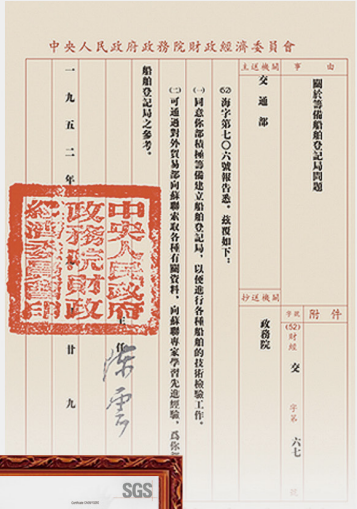
- *The information in the brochure is for the use of reference only*

Who is CCS

67s Years of History

1956	Founded
1960	Started ship Classification
1970	Started Offshore Classification
1973	First Attended IMO Conference on behalf of China
1988	IACS Full Member
1994	CCS Class Notation is accepted by IUA
1996/2006/2016	IACS Chairman




中央人民政府政務院財政經濟委員會

由 事 關於籌備船舶登記局問題

主送機關 交通部

抄送機關 政務院

附件

(52)財經交字第六七

62海字第七〇六號報告悉，茲覆如下：

(一)同意你部籌備建立船舶登記局，以便進行各種船舶的技術檢驗工作。

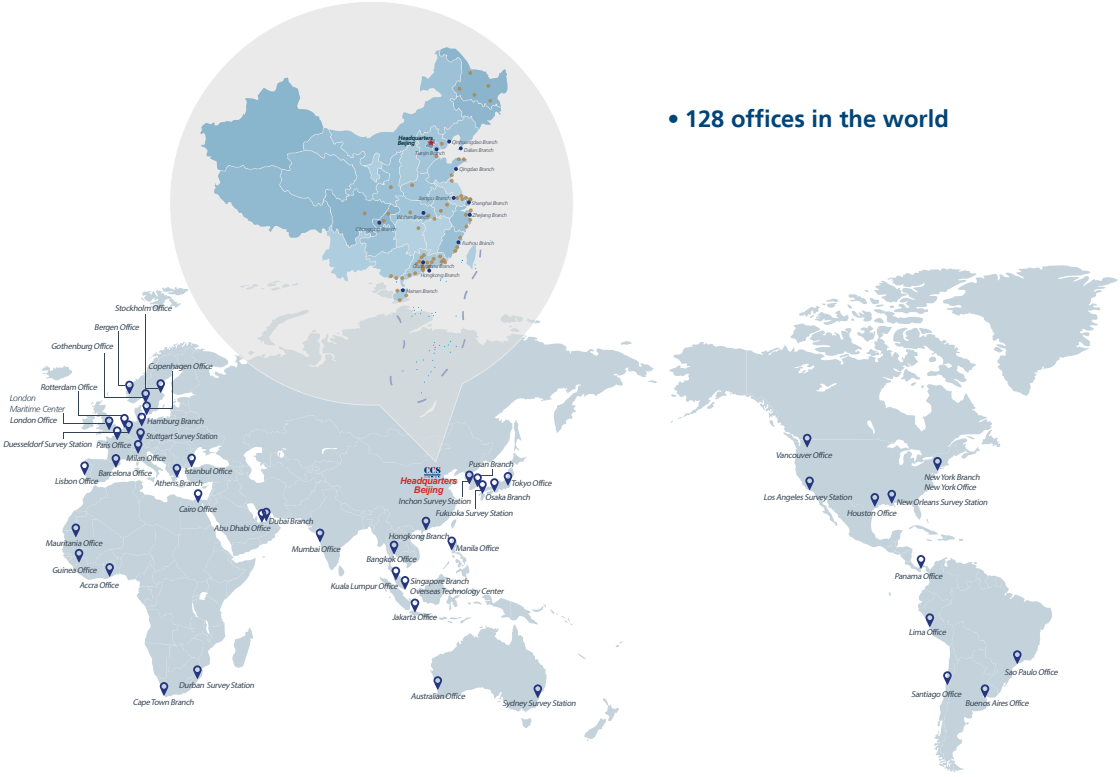
(二)可通過對外貿易部向蘇聯索取各種有關資料，向蘇聯專家學習先進經驗，爲你

船舶登記局之參考。

一九五二年 廿九



Service Network Covers all Over the World

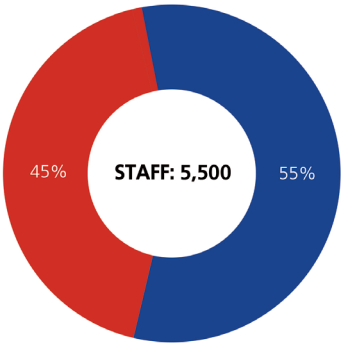


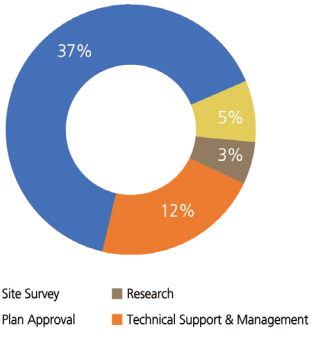
- 128 offices in the world

Human Resource

Staff with bachelor degree and above 90%

Staff with senior and above technical titles 76%





What do we do

● MARINE



● OFFSHORE



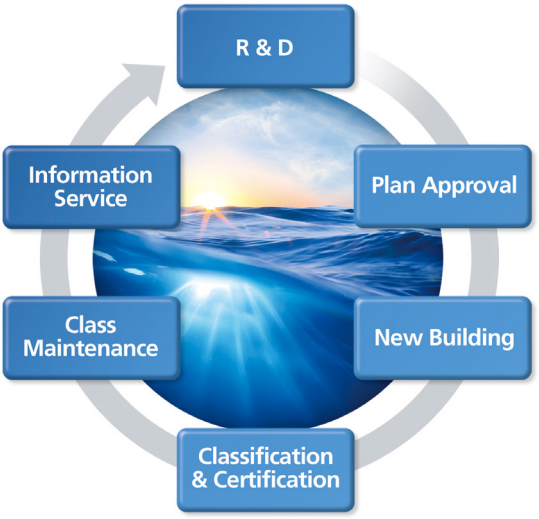
● INDUSTRY



● TECHNICAL INNOVATION

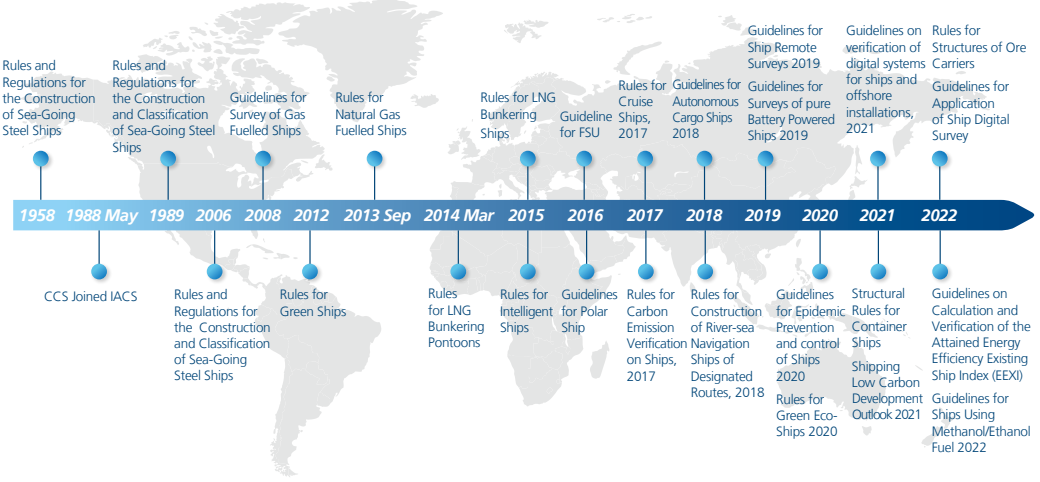


Marine–Full Life Circle



◎ R&D:

Performance – Technology Millstones



+ constant and High ratio of investment in R&D
+ Setting the advanced rules and standards which cover all ship types , and is highly recognized and accepted globally
+ Being Creative , by understanding customers' needs and cooperating with industry, CCS is Willing to be a pioneer and brave to be the world leader in technology

Drive on Technology — Being Self-Dependent

New Rules

- Rules for Classification of Mobile Offshore Units, 2023
- Guidelines for Application of Structural Extreme Corrosion Limit and Renewal of Mobile Offshore Units, 2023
- Guidelines for Survey of Anti-Fouling Systems on Ships, 2023
- Guidelines for Survey of Marine Wind-Rotor Assisted Propulsion System, 2023
- Guidelines for Offshore Telescoping Gangway, 2023
- Guidelines for Survey of Offshore Basket, 2023
- Guidelines for Survey of Pollution Prevention for Offshore Production Facilities, 2023
- Guidelines for Survey of Fiber Ropes for Offshore Position Mooring System,2023
- Guidelines for Survey of Structure and Equipment Monitoring Systems for Mobile Offshore Unit and Offshore Installation,2023
- Rules for Classification of Offshore Floating Installations
- Technical Guidelines for Structure Analysis of Deepwater Jacket,2023
- Rules for Liquefied Natural Gas Bunkering Vessel, 2023
- Guidelines for Polar Ship,2023
- Guidelines for Survey of Intelligent Cargo Management of Chemical Tankers, 2023
- Guidelines for Integrated Offshore Wind Turbine Floating Transportation and Installation Units,2023
- Guidelines for titanium alloy high-speed surface crafts, 2023
- Guidelines for Structure of Non-high-speed All-aluminum Alloy Sea-going Ships 2023
- Rules of Inland Waterways Green Ships, 2023
- Guidelines on Survey for the Intelligent Engine Room of the Ship, 2023
- Guidelines on Survey for the Intelligent Energy Efficiency Management of the Ship, 2023
- Guidelines for Survey of Ships Using DC Integrated Power System, 2023
- Guidelines for Marine Methanol Fuel Bunkering Operation,2023

New Technology

- Research and application of intelligent ship/unmanned ship technologies
- Research and application of new survey technologies and equipment
- Rules for Green Eco-Ships and service
- Application of clean energy on water
- Energy efficiency assessment&verification and intelligent management

New Software

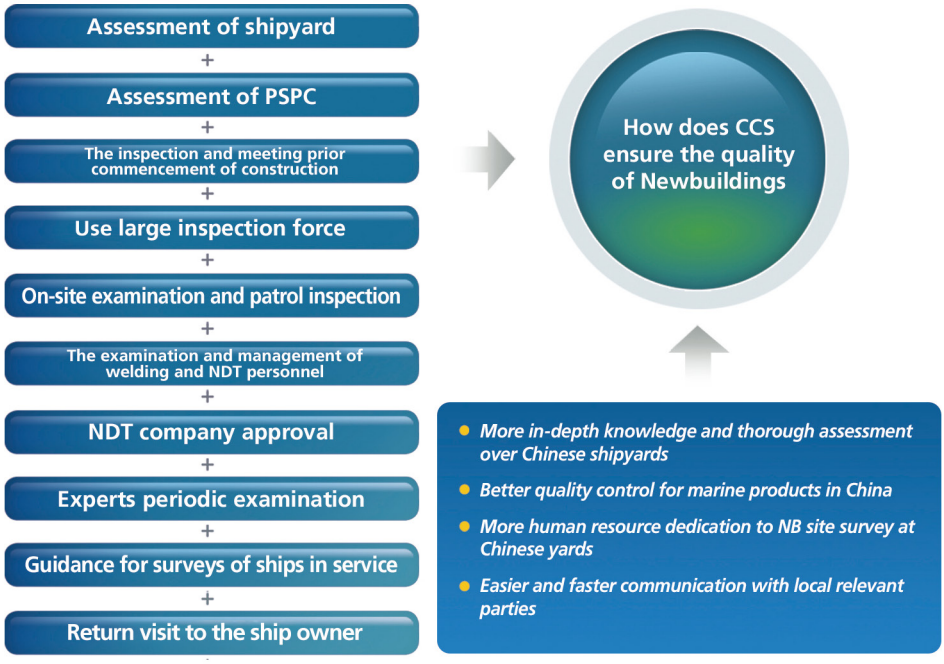
- CSR-H calculation software
- 3D ship engineering calculation software system
- 3D wave load calculation and fluid software
- Advanced buckling analysis software of ships and offshore structures
- Fracture mechanics fatigue analysis software

◎ Plan Approval & New Building

+ Serve Hundreds of main shipbuilding enterprises in China
+ Quality ensured by high quality standards, superior quality control, professional team



+ Highest ratio of site surveyors for classed ships
+ Highest ratio of technical supporting staff
+ More professional on qualification
+ High education level of technical staff



◎ Marine Products



Flag States Authorization

Authorized by 61 states and regional governments





Fleet Growth

By Mar of 2023, CCS fleet owns 34390 vessels,with 188.4 million GT in total and there are 6086 ocean-going ships, with 149.2 million GT and average age 9.7 years.

Among IACS members, CCS is the class society:

most amount

+ The youngest average age for classed ocean-going ships, reducing from 14.5 to 9.7
+ The fastest growing in Gross Tonnage, with almost 10 times increase in last decade

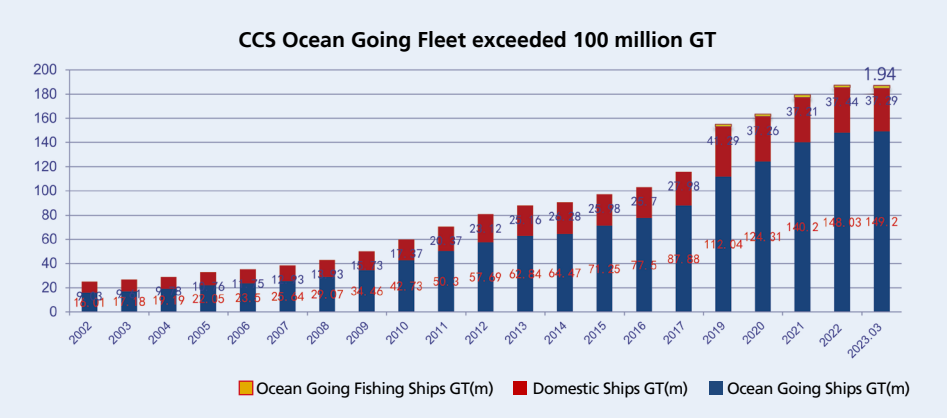
The total gross tonnage for ocean-going ships ranks NO. 5 (Resources: CLARKSON).

◎ RANKING

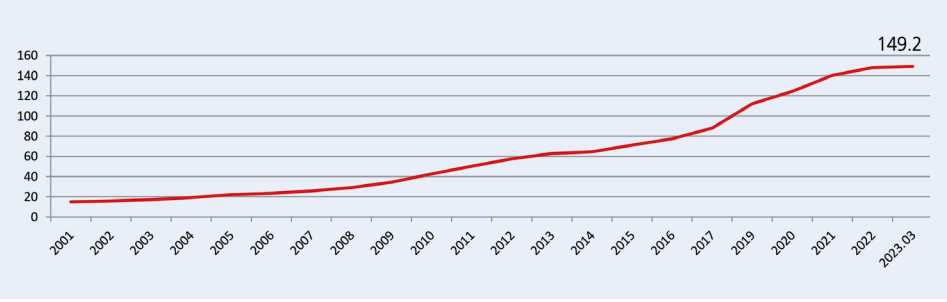
5	1	2	4	4
IACS International Association of Classification Societies				
	World Ranking of VLOC	World Ranking of BC	World Ranking of VLCC	World Ranking of VLCS



CCS Fleet Growth



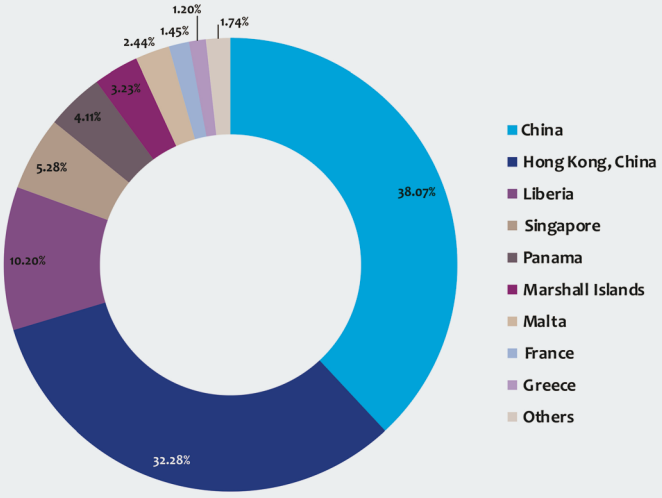
The Fastest Growth Ocean- going Fleet (GT.m)



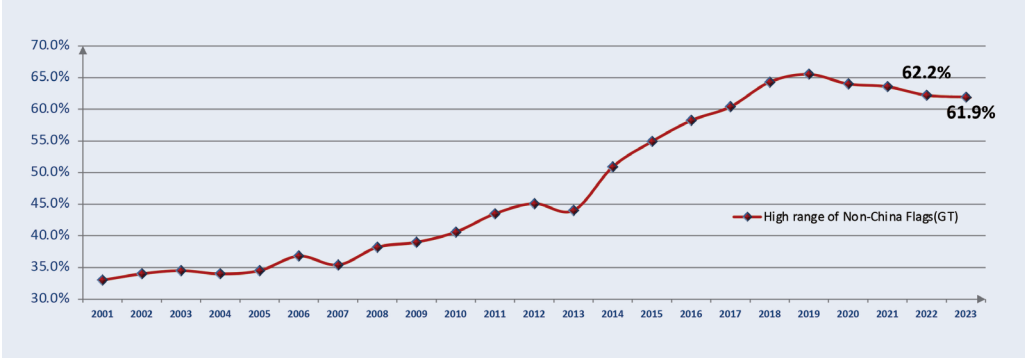
The Youngest Ocean- going Fleet of IACS Members (Age. Years)



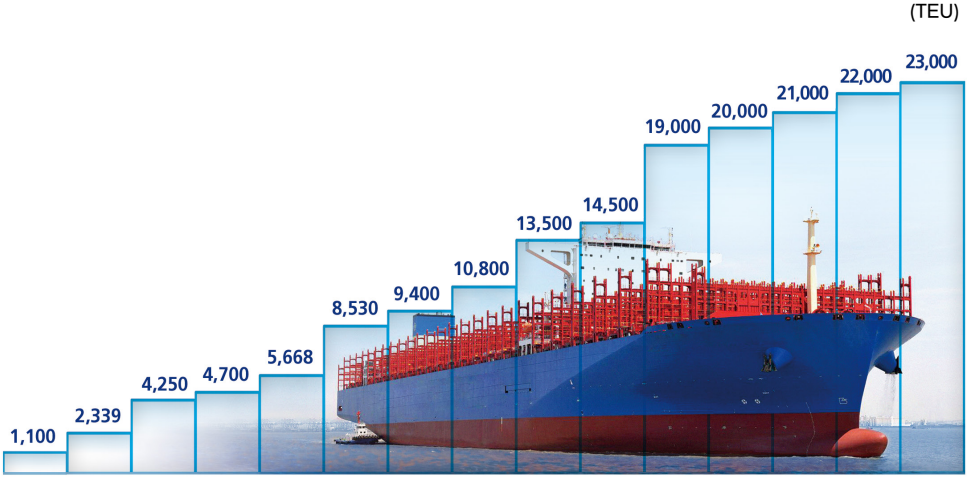
CCS Ocean -going Fleet Flag (by GT)



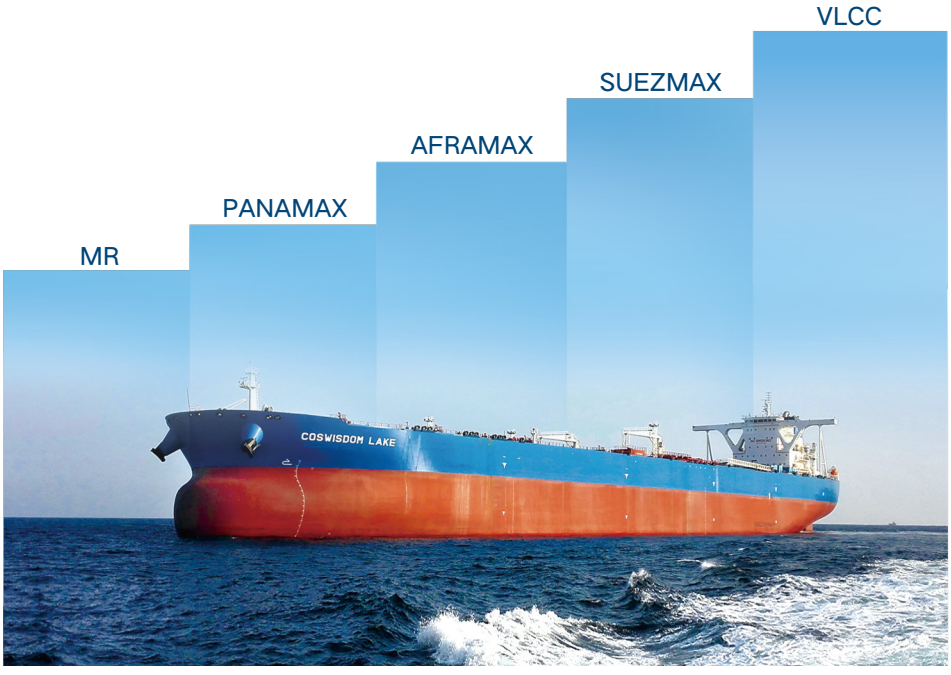
High Ratio of Non-China Flags



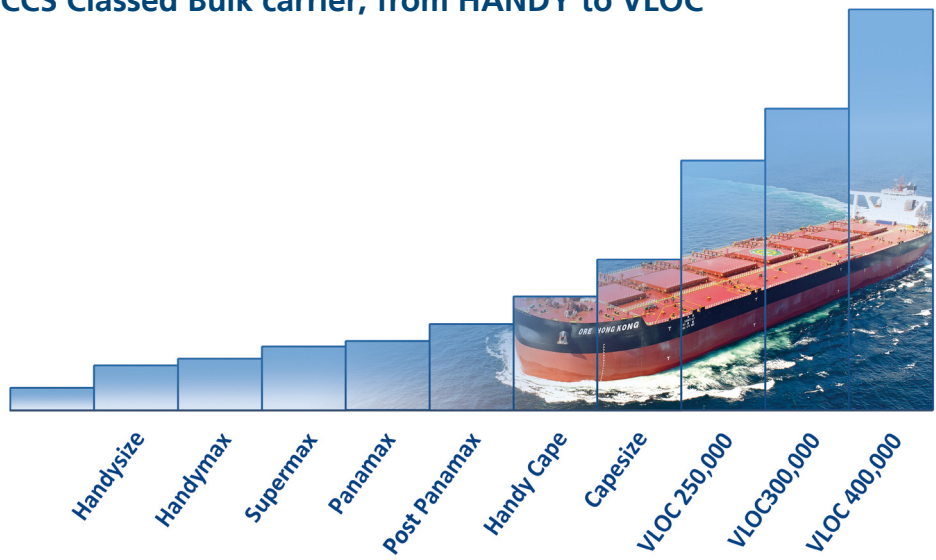
◎ CCS classed containership, from HANDY to ULCS.



◎ CCS Classed Oil Tankers, from MR to VLCC



◎ CCS Classed Bulk carrier, from HANDY to VLOC



◎ Other Types of Ships



• Car Carrier



• Salvage Vessel



• Semi-Submersible Ship



• Lifting Vessel

◎ New Classed Ships



- First VLCC with four rigid wing sails "NEW ADEN"



- First VLCC with LNG dual-fuel "YUAN RUI YANG"



- 14,000TEU COSCO/OOCL New generation VLCS



- China first 210,000 DWT Newcastle-type upgraded intelligent bulk carrier "SHANDONG NEW ERA"



• 85,000DWT optimized Kamsarmax Bulk Carrier "SDTR DORIS"



• 174,000 cubic meters LNG carrier "SHAOLIN"



- First batch of Intelligent LNG-fueled Stand-by vessels "HAI YANG SHI YOU 542/547"



- First Asian cylindrical FPSO



- Asia first deep-water aqueduct "Haiji One"



- First China-made 400k DWT Intelligent VLOC



- World's First VLCC with Wind Assisted Propulsion by Rigid Wings



- So Far The Largest Containership 23,000TEU



- CMA CGM 23,000TEU Series Dual-Fuel Powered Container Ship



- MAERSK 2,200TEU Series Container Ship



- SEASPAN 12,200TEU Series Container Ship



• Green VLCC "CS HUNAN VENTURE"



• The First Ship of MR-Type Chemicals/Tankers Series"SOLAR SALLY"



• China's First Dynamically Positioned Shuttle Tanker "BEI HAI XIN XI WANG"



• 325,000 DWT Intelligent VLOC "NANSHA HONOR"



• 210,000 DWT Bulk Carrier"SHANDONG SOAR"



• The World's First New Ship Applies to The Second Generation of Intact Stability Criteria SDTR CELESTE



• The First China-Flagged Cruise Ship, "ZHAO SHANG YI DUN"



• 2,200 CEU PCTC "AN JI 31"



• Yangtze River New Generation of Intelligent & Green Cruise Ship "HUA XIA SHEN NV 3"



• Super Capacitor-Powered Ferry "XIN SHENG TAI"



• Refrigerated Fish Carrier for Unrestricted Service "FU YUAN YU YUN 266"



• China's Independent Design and Manufactured of Deep-Sea Manned Submersibles "FEN DOU ZHE"



• The World's First Deep-Water Semi-Submersible Production Oil Storage and Offloading Installation "SHEN HAI YI HAO"



• China's First Independent Design and Construction of Deep-Water Semi-Submersible Drilling Rig "SHEN LAN TAN SUO"



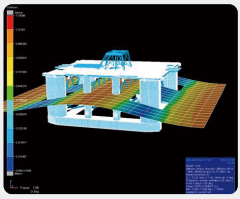
• The World's Largest and Asia's First Offshore Converter Station, "Ru Dong Offshore Converter Station"

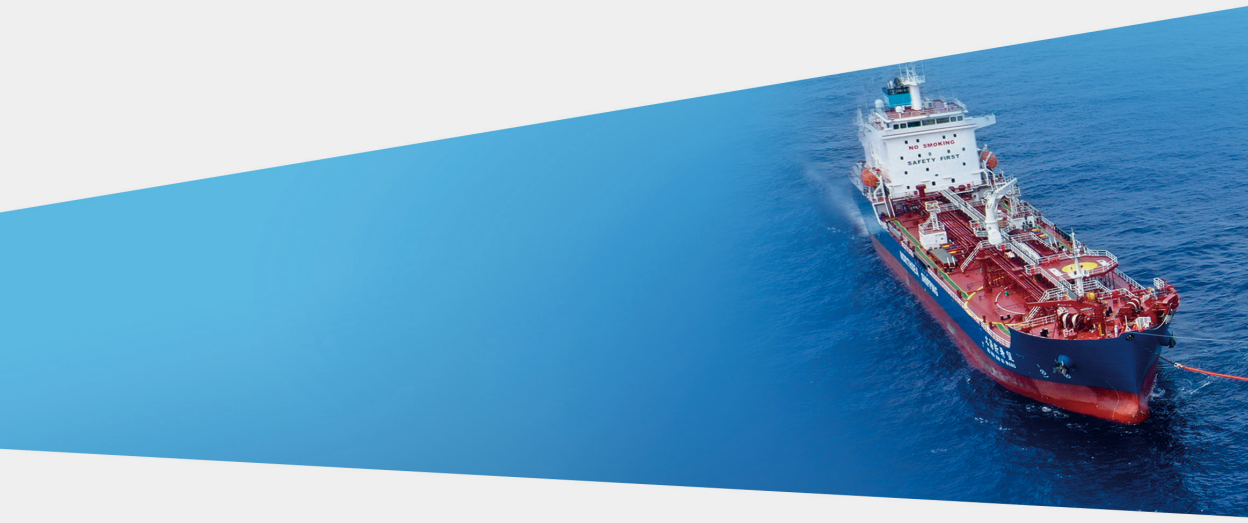


• China's First Floating Offshore Wind Turbine "San Xia Yin Ling Hao"

Offshore

◎ Full Range of Services, Full Life Cycle

Design	Construction	Operation	Decommissioning
			
Pre-Contract Service Front-End Engineering Design Review Design Review Evaluation Structure Analysis	Builder Evaluation Construction Survey Towing Survey	In-service Survey Emergency Response Service Asset Maintenance Management	Concept Evaluation Asset Regeneration / Replacement Site Survey



◎ Scope of Services

+ Mobile Offshore Units
+ Fixed Offshore Installations
+ Floating Production Storage and Offloading Units (FPSOs)
+ Single Point Mooring Systems
+ Artificial Islands and Oil & Gas Treatment Terminals
+ Equipment and Materials
+ Clean Energy
+ Fishery Facilities

◎ Service Products

+ Classification
+ Certification
+ Statutory Survey
+ Rules and Guidelines
+ Technology Services
+ Risk Assessment



◎ Performance:

Classed Fleet



480+ Fixed Production Platforms and 5,000+ km pipeline



90+mobile offshore drilling units



50+ Offshore wind farm installations



18 FPSOs

Major Player in Offshore Market



70+ Offshore wind turbine installation units



10 Certified Oil & Gas Terminals



60+ deep-sea aquaculture installations



Other offshore new economy installations

Typical Drilling Rig under CCS Classification

HYSY981



Type of Rig: ExD
Operation Water Depth: 3000m

HYSY982



Type of Rig: A5000
Operation Water Depth: 1500m

HYSY941/942



Type of Rig: JU2000E
Operation Water Depth: 400feet

HYSY936/937



Type of Rig: CJ46
Operation Water Depth: 350feet

CPOE9/10



Type of Rig: L780
Operation Water Depth: 300feet

SAHAR-I / II



Type of Rig: DSJ300
Operation Water Depth: 300feet

CCS Services for Wind Farm and Fishery Facilities



- Classification
- Technical support
- Certification
- Technology Services



- Certification
- Verification
- Technology Services
- Classification

● Industry: Certification and Supervision

◎ Business Scope :

- System Certification(Quality, Environment, Occupational Health &Safety, Energy, Railway Industry, etc.)
- Product Certification(Wind Power, Rail transit, Transportation, etc.)
- Corporation GHG Verification (ISO 14064,VER/VCS, GS Validation/ Verification, etc.)
- Energy Conservation and Emission Reduction Research
- Industrial Product Inspection
- Container Inspection
- Safety Business
- Risk Management
- Relevant Testing and Training Service

Performance

+ The leader in China's wind energy certification



+ International Railway Industry Standard Certification and Transportation Product Certification



+ Energy Management System Certification



+ Container Inspection



+ Energy Conservation and Emission Reduction Service



+ "Ke Xue (Science)" and "Xue Long" Won the Service Achievement Award for 3rd National Excellent Equipment Engineering Supervision Unit



+ Dongshuimen Yangtze River Bridge supervision project in Chongqing won the Municipal Gold Award





Technical Innovation

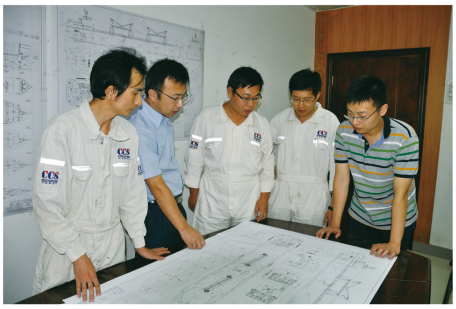
● Intelligent & Digital Technology

◎ Intelligent Technology

a. Risk Assessment of Intelligent Ships and Systems

Leveraging on years of research achievements on intelligent ship safety as well as practical engineering experience, CCS carries out risk assessment of systems, equipment and trial voyage of intelligent ships:

1. Failure mode and impact analysis (FMEA) of intelligent ship system and equipment in design, production and application stage





2. Intelligent ship complex system safety analysis based on System Theoretical Process Analysis (STPA)
3. Risk control measure verification based on virtual simulation fault input
4. Assessment of equivalent alternative/exemption of rules and regulations for intelligent ships
5. Assessment of intelligent ship test, application, operation schemes and safeguard measures

b. Test and Verification of Intelligent Navigation Systems of Ships

Services mainly include:

+ Maritime autonomous navigation system test and verification
+ Ship collision avoidance warning equipment test and verification
+ Intelligent ship navigation system test and verification

Multiple tests and verifications of intelligent navigation systems:

+ Simulation test of intelligent navigation systems of large carriers
+ Simulation test of intelligent collision avoidance warning equipment
+ Test and verification of autonomous navigation of unmanned crafts

◎ Digital Technology

a. Digital System Certification for Ships and Offshore Installations

Services include:

+ Principle approval of digital system for ships and offshore installations
+ Digital system process conformity certification for ships and offshore installations
+ Digital system application capability certification for ships and offshore installations

b. Digital Twin Approval and Verification for Ships and Offshore Installations

While focusing on study into standardized application of digital twin technology in the industry, CCS carries out:

+ Exploration of application scenarios of digital twin technology in the industry
+ Establishment of digital twin technology application demonstration platform
+ Establishment of assessment scheme to assess functional ability of digital twin system

CCS also provides related technical support as follows:

+ Verification of health assessment and condition based maintenance methods based on digital twin technology
+ Evaluation of functions of digital twin system for ships and offshore installations
+ Certification of digital twin system for ships and offshore installations
+ Digital twin technical service for ships and offshore installations

c. Data Quality Assessment for Ships and Offshore Installations

Data quality assessment is applicable to data stored in shipboard systems. Assessment will be made by selecting appropriate assessment indicators from the 15 characteristics and 63 measures of the data according to the assessment process. Shipowners and ship management companies may apply for trial assessment of the quality of the existing data stored on ships and offshore installations.

d. Data Security Risk Assessment for Ships and Offshore Installations

Data security risks for ships and offshore installations are addressed via:

+ Ship data classification and grading assessment
+ Ship data security and safety risk assessment
+ Ship data management maturity assessment

◎ Cyber Security Technology

a. Ship Cyber Security Monitoring and Situational Awareness

All-weather and all-round cyber security situational awareness for ships to enhance security safeguard and resistance capabilities of ship cyber systems:

+ Ship cyber security monitoring
+ Monitoring and analysis of cyber security for management companies
+ Pre-warning of ship cyber threat



b. Technical Support to Improve Cyber Security System for Ships and Management Companies

+ Management system analysis and service to ships and management companies
+ Construction and improvement of company shore-based or ship-end cyber security management system
+ Cyber security awareness and skill enhancement of staff, and related training drills
+ Training courses on cyber security management system

c. Cyber Security Risk/Safety Assessment for Ships and Management Companies

+ Company shore-based cyber security risk assessment
+ Company shore-based cyber safety assessment
+ Ship cyber security risk assessment
+ Ship cyber safety assessment

◎ New Survey Technology

a. New Survey Technology Research and Promotion

Services:

+ New survey technology research
+ New survey technology promotion

Services concluded:

+ 5G+ real-time remote survey of ships
  "5G/4G/VSAT+ AD hoc networking" communication in the enclosed space of ships
  "AR glasses/smart phone/UAV" supported remote survey data collection
  Ship-to-shore coordinated scenario-based remote survey system application promotion
+ Image identification of hull structural defects

b. New Survey Technology Evaluation and Verification

Services:

+ New survey technology evaluation and verification

Service concluded:

+ Remote survey software approval

c. New Ship Survey Equipment Research and Promotion

Services:

+ Development of new survey equipment
+ Promotion of new survey equipment

Service concluded:

+ Application and standard study into intelligent UAV for ship survey

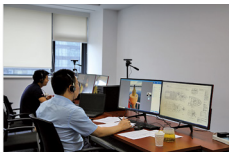
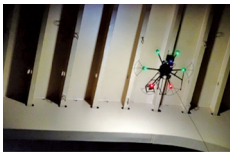
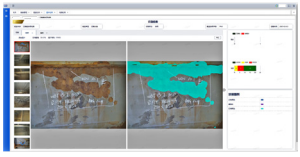
d. New Ship Survey Equipment Evaluation and Verification

Services:

+ New ship survey equipment evaluation and verification

Service concluded:

+ Approval of intelligent safety helmet, unmanned aerial vehicle and robot used for ship survey



● Green Technology

◎ Shipping Ecology & Health

a. Greenhouse Gas Emission and Energy Efficiency Assessment for Ships

1. CCS provides to the industry services related to energy efficiency and GHG emission reduction.

1) EEXI/CII evaluation service for ships, mainly including:
   + EEXI calculation, evaluation and pre-verification
   + CII calculation, rating and pre-verification
   + Evaluation and pre-verification of technical measures to improve EEXI and CII for ships
   + Preparation of EEXI technical files

2) CCS has developed online EEXI and CII evaluation system. For details, please visit http://eship.ccs.org.cn/

3) EEXI/CII compliance and technical service for fleet, including:

+ EEXI/CII technical service for ships
+ EEXI/CII evaluation program related service for ships
+ Analysis of EEXI/CII impact on single ship and fleet
+ Analysis and verification of measures to improve EEXI/CII for ships

2. Rightship GHG rating service

+ EVDI computing for existing ships
+ Minimum propulsion power assessment
+ RightShip GHG rating evaluation
+ EPL management plan
+ EPL witness survey
+ Analysis and verification of rating improvement measures

3. Technical services related to EU GHG emission reduction from shipping

+ To verify ship's emission monitoring plan and evaluate emission data according to EU-ETS requirements
+ To evaluate the through-life emission intensity of ship fuel, and calculate "compliance balance" and fines according to Fuel EU Maritime requirements
+ To calculate and verify carbon footprint of ships covered by CBAM

Technical service related to Shipping and Shipbuilding Carbon Emission Reduction Scheme

To further enhance their core competitiveness in the context of green and low-carbon development of the industry, CCS provides technical services to the industry:

+ Related technical service and impact analysis of domestic and foreign policies and regulations
+ Carbon emission status analysis and emission data processing
+ Carbon emission prediction model construction
+ Carbon footprint accounting during ship construction
+ Carbon reduction technical measures and applicability analysis
+ Carbon emission reduction route construction and analysis

+ Core technologies, industrial opportunities and business strategies for green and low-carbon development of shipping/shipbuilding enterprises

Intelligent Energy Efficiency Management for Ships

The main functions of the online ship energy efficiency intelligent management system are:

+ Real-time monitoring of ship energy efficiency data
+ Monitoring of the operation status of ship's major energy-consuming equipment
+ Management of ship fuel
+ Calculation and comprehensive analysis of ship energy efficiency index
+ Evaluation of ship energy efficiency
+ Decision-making assistance to ship energy efficiency improvement



2021 Low-carbon Development Outlook> for Shipping at the Paral



What services do we offer

Based on customer demand and development of the latest technology, CCS has established 19 service products as follow

NO.	Name of technical service	The service object	Service Content Introduction	Service Department
1	(CAP) Condition Assessment Programme	Ship Owner	Condition Assessment Programme (CAP) is an independent and thorough verification to rate the actual condition of the ship (from level one to four: with level one as the best and level four as the worst), based upon detailed inspection and function testing, thickness measurements, strength calculation and performance testing, etc. The purpose of CAP is to provide applicants with a document and statement of ship's actual condition such as structural strength, machinery and maintenance of ship's life, etc.	Classed Ship in Service Department
2	(ERS) Emergency Response Service	Ship Owner	In case of emergency situation of a ship, the ERS database is initiated to provide calculation and analysis of the damage stability, residual strength and oil spillage as requested by the ship owner/ ship management company, so that technical support is provided for rescuing the ship in distress, and reference comments are offered for ship master/ship owner/ship management company to assist them in making the final decision.	Classed Ship in Service Department
3	RightShip GHG Rating	Ship Owner	With the technical services such as applicable energy-saving technical measures, minimum propulsion power evaluation and EEDI calculation for ship owners, the target ship RightShip GHG rating can be improved.	Technology & Information Department
4	Ship cyber security Technology Services	Ship Owner	Provide shipping owner with cyber security service in ship operation and management, including hardware deployment, software test, ship cyber security risk assessment, and technical evaluation,etc.	Science&Technology Innovation and Test Center

5	technical service of ship construction files storage		SCF storage services aim to assist the ship manufacturing and shipping industry globally in executing the mandatory requirements of Reg. II-1/3-10 of the International Convention for Safety of Life at Sea (SOLAS) on goal-based new ship construction standards (GBS), which came into effectiveness on July 1, 2016. With full implementation of intellectual property rights, storage services of various ship electronic archives have been carried out externally.	Information Center
6	Ship Vibration Assessment and Control Service	Ship Owner, Ship Yard, Design Company	In order to remove the risk of excessive vibration and noise on board ships, we implement the concept of ship vibration and noise control throughout the entire ship life and provide customers with ship vibration and noise assessment and control service at design, building, and operating stages.	Shanghai Rules &Research Institution
7	Shaft Alignment Service	Ship Owner, Ship Yard, Design Company	Services range from assessment of shaft alignment design and as-built shaft alignment condition to assisting shipyard/ship owner in identification of root cause of the bearing failure and providing solutions.	Shanghai Rules &Research Institution
8	Pipeline Stress Assessment Service	Onshore Oil and Gas Owner, Ship Design Institute, Shipyard, Ship Owner, Ship Management Company and etc.	The stress analysis of water and land pipelines is carried out by CAESARII/START. The pipeline strength, residual strength and the load at the pipe orifice and pipe clamp of important facilities along the way are evaluated, the assessment conclusion is issued, and the improvement measures and suggestions for the risk areas are provided, and the preliminary evaluation report is formed and submitted to the owner.	Wuhan Rules &Research Institution
9	Engineering Critical Assessment (ECA) service	Offshore facility owner and construction company	Safety assessment of fracture failure based on fracture mechanics for steel offshore installations such as jacket platforms, mobile offshore units, offshore floating units and submarine pipeline systems.	Offshore Engineering Technology Center
10	Risk-based Inspection (RBI) service for offshore oil and gas facilities	Offshore facility owner	Through the risk analysis of offshore oil and gas pressure vessels and pressure pipelines, a risk ranking is given to ensure their intrinsic safety. At the same time, providing recommendations about reasonable inspection cycle for the pressure vessels and pressure pipelines.	Offshore Engineering Technology Center

11	Technical consultancy services for marine environment in China seas	owner, operator and designer of offshore facility	The "historical marine environment data query and analysis platform of China and Southeast Asia" is used to query, statistic analyze the sea state data of the target sea area, so as to provide the environmental conditions required for the design and evaluation of offshore installations.	Offshore Engineering Technology Center
12	Stability Assessment and Verification Services of Mobile Offshore Units	Owner and designer of mobile offshore units	The production, which concentrating on safe operation, transformation, emergency response support and aged platform life extension evaluation service to ensure the floating stability of the mobile offshore units meet the specification requirements, is based on the hydrostatic model and verify the results obtained from the professional stability analysis software.	Offshore Engineering Technology Center
13	Mooring analysis and validation service for offshore floating units	owner, operator and designer of offshore floating units	It can be used to evaluate and analyze the ability of mooring system for offshore floating units under multiple environmental loads during their service period. We can provide technical service about mooring system' scientific management and safe operation for style selection, modification, ability improvement and life extension of the offshore floating units.	Offshore Engineering Technology Center
14	Site Specific Assessment of Mobile Jack-Up Units	Owners of jack-up units	Usually, only a few typical operating limits are listed in the operation manual of the jack up units. But during the operation, some environmental condition parameters of the actual site may be greater than the limits specified in the operation manual. In order to confirm the safety and ability of the jack-up unit on this site, this service will be adopted. Site specific finite element model is established based on the site environmental conditions, operation parameters and other data to analyze the overall performance of the jack-up unit,	Offshore Engineering Technology Center
15	Structural state assessment of mobile offshore units	Owners of jack-up units	The finite element model is established according to the relevant regulations, codes, standards and the current state data of the unit, the overall performance analysis, overall strength analysis, kinematic performance analysis, ultimate strength analysis, air gap analysis, local strength analysis in important areas (such as jackcase and legwell area, spudcan, cantilever beam, drill floor, large equipment base, etc.) are carried out to evaluate the structure state of the unit.	Offshore Engineering Technology Center

16	Spudcan insertion and pullout analysis service of Jack-up	Owners of jack-up units	Including three main functions about the insert resistance analysis, pullout resistance analysis and punch-though risk identification, which can realize the reasonable estimates about the insert resistance, pullout resistance of Jack-up Spudcan in different pile insert depths. On the basis of the resistance reasonable estimates, using pile insert resistance curve to complete punch-though risk identification. These can help to accurate prediction Spudcan insert depth, identify difficult of Spudcan pullout and significant risk of punch-though, to ensure safety of jack-up platform in the process of Spudcan insert and pullout.	Offshore Engineering Technology Center
17	Emergency response service for the structure of jack-up units	Owners of jack-up units	In case of accidental damage to the platform structure, emergency response assessment for the structure of jack-up units can be provide at the request of the owner, such as structural strength assessment, stability assessment and damage assessment. By the accurate and efficient completion of the emergency response analysis, reasonable operation suggestions can be provided to owners, to guide the scientific operation of the platform after an accident and formulate a reasonable follow-up work plan.	Offshore Engineering Technology Center
18	Approval in Principle (AIP) for offshore units	Owner of offshore unit	In accordance with relevant rules and standards specified by client, the new-type offshore units developed by shipyards and design companies or Research Achievements are reviewed, then the certificate of Approval in Principle is formed (AIP for short). This technical service is covered all types of offshore units, and between conceptual design and basic design.	Offshore Engineering Technology Center
19	Technical Services for Shipping Carbon Intensity Reduction (EEXI&CII)	Ship companies	1. EEXI calculation, assessment and pre-verification Conducting the energy efficiency analysis of ships/fleets by adopting the EEXI guideline to evaluate the EEXI passing rate, while comparing it with the corresponding types of the global fleet. 2. CII pre-verification Conducting of ship operational carbon intensity rating evaluation, and compare with the baseline of corresponding ship type by adopting the method of CII guidelines. 3. Analysis of technical measures regarding ships/fleets EEXI/CII improvement. 4. Technology Services and training service.	Science&Technology Innovation and Test Center



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