

CONTENTS
DECEMBER 2017

2 China Merchants Heavy Industry
PSC Ready

3 Cyber-security
E-certificates
BV joins drones JDP

4 First Gowind® delivered
BV involved in two EU research projects
Largest ever FSRU delivered - Innovative LNG carrier

FOREWORD BY
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China is Bureau Veritas' largest operating country. We have 400 people in our Marine & Offshore Division, and more than 10,000 people across the Bureau Veritas Group in China. So, Marintec, as one of the maritime world's most important events, is very important to us. Recent tough years have not reduced our capabilities. We continue to invest in our people, in R&D, and in projects to provide the highest levels of service in supporting safety, innovation and new technology.

Our Marintec 2017 focus includes:

- Our capability to meet the challenge of environmental regulations and alternative energies like LNG;
- How digital is transforming our industry;
- Cruise shipping and demand for cruise ships built in Asia. BV is able to share its expertise and leadership in cruise ship safety.

So, we look forward to seeing you in Shanghai – please visit our booth (N2F79) where we can share our global expertise as well as our Chinese and French hospitality.

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CMA CGM CONTAINER MEGA-SHIPS GO WITH GAS



Courtesy CMA CGM

CMA CGM becomes the first shipping company in the world to equip its mega-ships with LNG propulsion, following the order of nine vessels to be built to BV class.

The final decision to use LNG as fuel for the new 22,000 TEU containerships was carefully considered, with Bureau Veritas closely involved in feasibility studies, working with the owner, builders and technology providers.

In addition to providing a significant boost to the containership market, the order represents a breakthrough in both scale and use of a membrane containment system. The new ships' bunker capacity, feeding the most powerful dual-fuel engine built so far, will be close to 18,000 m³ – a far higher volume than has been required to date by the LNG fuelled ship market.

Bureau Veritas has supported the project throughout its early stages, providing assistance to ensure the requirements for the safe use of LNG are addressed. An important part of this work involved investigating the feasibility of the design together with shipbuilding group China State Shipbuilding Corporation and GTT, the containment system designer.

Bureau Veritas has extensive experience in addressing the challenges of large containership design and construction. It recently published a technology report ("Ultra-Large Containerships") exploring three topics: optimized cargo capacity and operations; LNG propulsion, including cargo containment and bunkering; and new rules for safer, more efficient hull structures.

The award of class to Bureau Veritas also underlines our leadership in the classification of LNG fuelled ships. BV currently has the largest share for vessels with this type of propulsion.

Further upstream, with growing demand across the entire gas supply chain, Bureau Veritas specialists are involved in a wide range of LNG projects worldwide, covering also the bunkering operations and working closely with LNG suppliers, port authorities and flag states. These range from small-scale LNG vessels to LNG as fuel projects and LNG carriers including 15 ice-class ships for the Yamal project.

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Courtesy CMHI

TARGETING CRUISE RECOGNITION

Earlier this year, SunStone placed an order for four expedition cruise ships to be built at the China Merchants Heavy Industry (CMHI) Jiangsu shipyard near Shanghai, with options for a further six.

For Wallace Yao, General Manager of CMHI, it's hard to overstate the importance of the newbuilding contract: "This is our first cruise ship project, and it's vital that we get it right."

Since 1965, the yard has developed a reputation for constructing high-value ships and offshore projects for international clients. With the SunStone project, it aims to demonstrate to owners that the yard has the skills to build cruise ships to the same high quality.

"A successfully executed cruise project demonstrates the ability of the yard to tackle any sophisticated newbuilding in terms of technical standards, complexity and the number of international suppliers to be coordinated. The SunStone vessels will gain substantial public interest on delivery, and potentially act as a showcase for CMHI's ability to construct cruise ships." Each SunStone vessel will be 104m long and 18.2m wide, with 80-95 passenger cabins accommodating up to 160 passengers. The project brings together an exceptionally international team from the US, China and Europe, with design by Ulstein, interiors by Mäkinen and classification by Bureau Veritas.

"It's an advantage that Bureau Veritas has such a large team in Shanghai. We have a joint team, we are able to

see them frequently, and they help us a lot."

This proximity is crucial, as the project brings a number of challenges. As expedition cruise vessels, operating in Arctic waters, the four ships will have a Polar Class notation, and must be able to proceed to a port under their own power following an incident (Safe Return to Port).

"We are really looking to Bureau Veritas to be our guide and coach on this project as it's our first cruise ship. They have a vast experience in cruise ship design and construction, and in handling large complex projects." CMHI is pleased with the relationship to date: it has sent drawings for approval and Bureau Veritas has already provided suggestions.

"Trust between partners is important to deliver the contracted vessels on time and on budget. Bureau Veritas is a good partner for us – we've worked with them previously on repairs and conversion projects, but this is the first new construction project at our Jiangsu site. We're really looking forward to working with them to make this project a success."

Looking ahead, CMHI is aiming to leverage its experience with the project team to develop a recognized expertise in cruise ships:

"We see huge potential in the cruise ship market, which in China alone is seeing growth of 7% each year. It's important to us to expand our business and there are some really exciting opportunities out there."

www.cmindustry.com.hk



Wallace Yao
General Manager,
CMHI

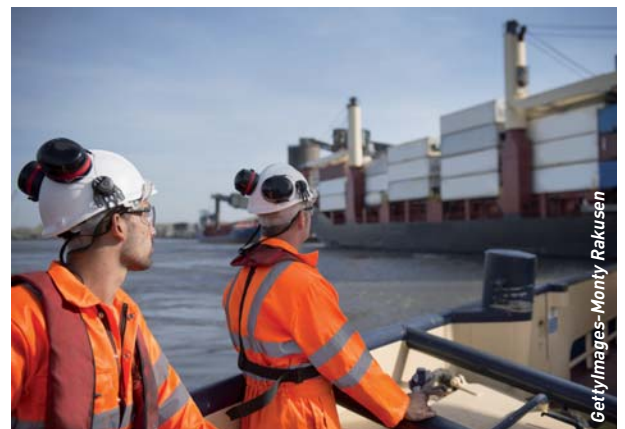
PSC READY APP PREPARES SHIPS FOR PORT STATE CONTROL INSPECTIONS

In early 2018 Bureau Veritas is launching an interactive app to support captains, crews and fleet managers in preparing vessels for port state control inspections. The app is currently being tested with a few pilot shipowners prior to making it generally available.

PSC Ready helps prevent port detentions and enables easy verification of compliance with IMO regulations. It enables users to prepare for port state control inspections, and identify the main risks by comparing statistics on top deficiencies. Users can stay up-to-date with PSC and campaign news to better plan inspection activity.

The app facilitates self-inspections by providing users with Bureau Veritas checklists. Moreover, shipowner users can create tailor made checklists or define specific inspections based on the concentrated inspection campaigns organized by MOUs. Once an inspection has been performed, ships and fleet managers are able to analyze the results, follow up with corrective actions and share reports.

PSC Ready will be accessible via phone, tablet or desktop and available for download for both iOS and Android. michael.valkov@bureauveritas.com / eva.peno@bureauveritas.com



GettyImages-Monty Rakusen

BUREAU VERITAS ISSUING E-CERTIFICATES FROM DECEMBER 2017



Bureau Veritas is expanding its digital capability with class and statutory survey certification. Flag States, ship owners and managers will be able to select electronically signed documents for their certificates, commencing with pilot Flag States in December 2017 prior to a global roll-out early 2018. The e-

certificates, developed in compliance with IMO guidelines, enable stakeholders to reduce administrative time and cost as well as improving accuracy. They also eliminate problems related to the loss or damage to original certificates and they are more secure than paper documents as they cannot be modified without invalidating the signature. And port state authorities are able to verify their authenticity and validity through the Bureau Veritas secure web site, directly connectable via a QR Code unique to each certificate.

The e-certificates will be securely stored and easy to share, delivered by email and available on the My Veristar app and through the Veristar Info desktop portal.

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BUREAU VERITAS JOINS DRONES JDP

Bureau Veritas has joined RECOMMS (*Remote Evaluation of Coatings / Corrosion on Offshore Machinery and Marine Structures / Ships*), a joint development project (JDP), to develop drones with the capability to inspect steel structures in enclosed spaces such as cargo areas and ballast tanks.



The JDP's primary objectives are to develop a steady, stable and reliable drone capable of following programmable flight paths, using 3D simulator ship specific training programs developed alongside the drone design.

The project is designed to meet the specific requirements for marine classification close up surveys and inspections. Using a drone will reduce risks to surveyors and ship crews, as well as reducing costs, for example by minimizing the need for staging erected for class renewal surveys.

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ADDRESSING THE CYBER SECURITY CHALLENGE

Cyber security has become a major concern for the marine industry. It needs to be addressed appropriately to protect the rapidly growing fleet of connected ships and their software-controlled and integrated systems from cyber-attacks. Against a backdrop of significant cyber security weaknesses in critical technology, lack of insurance coverage for losses caused by cyber incidents and an increase in reporting of such incidents, the objective is to safeguard information, operational technology infrastructure and connected equipment. This is achieved through control of physical access to hardware, protection against harm from networks, data or code injection and awareness training to avoid (intended) malpractice by operators.



Bureau Veritas has developed a holistic approach to support its clients to manage the cyber security challenge. In line with the cyber security framework developed by the US National Institute of Standards and Technology (NIST), the three main steps are: identify to protect, detect to mitigate and recover to improve. As technical standards alone are insufficient, security management and risk analysis are fundamental to building hardware and software security audits and treatment and change management plans. A new series of class notations and technical requirements covering the ship, its onboard systems and the data transfer between ship and shore-based facilities is currently being introduced to support shipowners and managers to keep control of their smart assets and systems.

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NEWS IN BRIEF...

■ Bureau Veritas has introduced a **new class notation** to support shipowners in future-proofing their vessels to meet emissions regulations. NR 644 sets out the technical requirements for the assignment of the **SCRUBBER READY** notation, which may be granted to new and existing ships prepared for later installation of an Exhaust Gas Cleaning System (EGCS) using scrubber(s).

■ Bureau Veritas has recently issued **new Rules for the classification of Floating Storage and Regasification Units (FSRUs)**, building on its extensive experience in LNG. NR 645 applies a unified approach to safety and design challenges and provides clarity on classification requirements. It covers all types of units, from FSRUs operating as a floating terminal for a decade or longer, to flexible units required for shorter periods.



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EGYPTIAN NAVY TAKES DELIVERY OF FIRST GOWIND®

September saw the delivery of the *El Fateh* Corvette to the Egyptian Navy by Naval Group. The team at Lorient shipyard, led by Naval Group CEO Hervé Guillou, rose to the challenge of completing construction in just three years. The corvette is the first in a series of four BV-classed Gowind® vessels. The next three will be built by Alexandria Shipyard under a transfer of technology with Naval Group supervision.

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LARGEST EVER FSRU DELIVERED TO MOL



Courtesy of MOL

MOL took delivery in October of the world's largest Floating Storage and Regasification Unit (FSRU), the BV-classed *MOL FSRU Challenger* from DSME. The Q-Max vessel has a capacity of 263,000 m³ and is equipped with five GTT NO96 containment system tanks. Extensive sloshing analysis and membrane reinforcement was carried out to avoid membrane deformation and enable the tanks to be used at different filling levels.

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TWO EU RESEARCH PROJECTS PROMOTE LIGHTER MATERIALS IN SHIPBUILDING



Courtesy of H2X

Bureau Veritas is involved in two research projects funded by the European Horizon2020-program to develop the use of new materials in shipbuilding. The FIBRESHIP project aims to enable the construction of commercial ships over 50m in length using mainly fibre reinforced polymer (FRP) composite materials. Objectives of RAMSSES, meanwhile, include developing, assessing and validating 13 maritime products, and establishing a materials innovation platform. Both projects are designed to make ships and maritime products lighter, safer, more cost-efficient, and environmentally friendly.

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BUREAU VERITAS CLASSES INNOVATIVE LNG CARRIERS

Bureau Veritas has granted classification and statutory certificates to *SK Audace*, an LNG carrier with cargo capacity of 180,000 m³. The innovative carrier is the first ship to be equipped with Win G&D X-DF engines, and features the largest four membrane cargo tanks ever built. A sister ship, *SK Resolute*, is currently being built at SHI. The two new-generation ships for SK Shipping incorporate improvements identified as part of a detailed energy efficiency optimization JIP.

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Courtesy of DSME

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