



BERNHARD SCHULTE
SHIPMANAGEMENT



highlights

Issue 3 | 2017



India:
A one-stop shop

Technology: Changing the
face of our industry

Leveraging on
digitalisation

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Front cover image: "Odessa anchorage in ice"
by Vladimir Dudnichenko, Chief Engineer

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Welcome



On behalf of the editorial team, I would extend a warm welcome to the third edition of *BSM Highlights* in 2017 which I trust our customers, business partners and colleagues will find interesting and informative.

Two of the feature articles in this edition focus on the positive impact that digitalisation and advances in data processing and information management are having on the maritime industry.

In the first, Bob Maxwell, BSM Singapore's Managing Director, outlines the ways in which the use of digital technologies and increasing automation are enabling improvements in operational safety, reliability and efficiency. This is supported with examples of the work that BSM is progressing, particularly in the area of integrated maintenance management which effectively combines calendar and condition-based maintenance activities.

In the second, Sankar Ragavan, CEO of MariApps Marine Solutions, covers the operational performance benefits that can be achieved through the use of integrated software systems and advanced data collection, processing and analysis capabilities.

Complementing both articles is an overview of the recently enhanced MariApps PAL Voyage module which makes a significant move towards the systematic electronic logging of cargo carriage and vessel performance data, with an emphasis on maximising data quality and reducing the requirement for manual entry and potential error.

Continuing the theme of innovation and continuous improvement, Barri Marshall, Managing Director of the Dive Marine Non-Destructive Testing (DMNDT) business

acquired by Bernhard Schulte in 2016, outlines the specialist inspection, repair, maintenance and training services offered by DMNDT including the use of drone technologies to enhance visual inspection.

The Country profile focuses on the world's fastest growing economy, India, and BSM's comprehensive ship management, crew recruitment, training & development, value-added and support service capabilities based in Mumbai. This concentration of services and highly motivated team in one location provides an exceptional level of customer convenience and underpins BSM India's long-standing customer relationships.

We are proud to feature Captain Laurentiu Sasu, Master of the VLCC *Boyaca*, in the Seafarer profile and his thoughts on leadership and effective team working.

In the 'One BSM' section we are also proud to acknowledge the exceptional talents of our 2016 Gold Award winners who were recently recognised at an event held in Singapore; our first World Maritime University Diploma in Executive Maritime Management graduates; and the winners of our 2017 photography and video competition, with the striking photograph taken by Chief Engineer Vladimir Dudnichenko featured on the front cover of this edition.

Finally, I would like to take this opportunity to acknowledge the contribution made to the development of *Highlights* by Norbert Aschmann during his tenure as BSM Chief Executive Officer.

Please enjoy reading *Highlights* and we would be happy to provide more information on any areas covered that are of particular interest.

Robin Thuillier

Director – Marketing and Business Development

Opinion

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Technological advancements:

Changing the face of our industry

Many people in the maritime industry now believe it is about to undergo a technological change of such seismic proportions that it will alter the business dynamic forever.

The last couple of years have produced much debate about 'intelligent ships', 'unmanned vessels', 'disruptive technology' and the growing realisation that shipping does not exist in a vacuum but is just one part of the increasingly sophisticated global transport chain.

For many, the ultimate goal is 'autonomous' vessels driven by technology and the intelligent use of data, but there is no industry consensus today as to whether unmanned ships are part of the industry's future with most experienced industry observers believing they are some years away.

But there is a strong view that the use of digital technologies will deliver safer and more efficient ships and this is the reality of shipping and its relationship with technology today.

Bob Maxwell, Managing Director of BSM's Singapore-based Ship Management Centre, is one of those who

believes that significant technological change in the industry is coming faster than some suppose.

"Increased automation is certainly coming our way and if it means totally unmanned ships, or a step in that direction, we would be foolish to pretend that it will not happen," he said.

Bob believes the trend towards smarter ships is driven by the need for greater energy efficiency and the rising tide of shipping regulation, as well as commercial pressures.

But he cautions that shipping is a long way off from 'Big Data' where terabytes per minute of data are used to monitor and predict trends.

BSM has been working on the areas of data collection, analysis and interpretation to support decision-making for several years with the goals of further improving operational safety, reliability and efficiency and to make work at sea and ashore more efficient.

Bob believes that data collection must be done in the right way with the correct equipment installed on board and understood by ship and shore staff alike.

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We need to ensure that we give our employees the right tools for the job in the 21st century

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The ability to analyse data, to see trends and then know how to apply solutions to the problems that the data reveals, this could be the role of the seafarer in the near future

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“The number of sensors and measuring devices required to accurately monitor machine and vessel performance is underestimated, and there is also a misperception that this information will be reviewed by humans ashore instead of on board.

Proper digitisation means that computers will do the analysis and produce alerts and reports based on trends, but it does not remove the crew from the process,” he noted.

He believes that problems such as high cylinder temperatures or low oil pressure, for example, will still have to be managed on board until the industry acquires the right predictive technology and has the confidence to rely on it.

“Too often we have seen examples of bearings flagged for change by vibration analysis surveys only for engineers to test them manually and declare they are still OK,” he observed. This usually ends in a machine failure if they are re-used.

BSM has adopted a range of measures aimed at supporting condition-based maintenance activity, with improvements in hull and propeller efficiency being a particular example.

Calendar-based maintenance, used by the industry for years, clearly has its place in the efficient running of vessels but for BSM the move towards enhancing this through the greater use of condition-based maintenance is crucial - which means a greater use of digital technology.

Take for example the in-house developed PAL software system, an integrated ship management software suite, which is used on all BSM-managed ships.

Bob explains, “PAL forms the basis of our planned maintenance management system which includes calendar maintenance with respect to machinery running hours and condition-based maintenance, which is an enhanced system we use with electronic engine indicators.”

A recently introduced PAL Voyage Module is being used to monitor ship performance with the data compared to past voyages so that, “we are able to get a good idea about the macro-level performance of the vessel and provide accurate information on the right timing for propeller and hull cleaning,” he says.

BSM is rapidly moving towards integrated maintenance management and the goal is to increase utilisation of electronic data.

“We are using thermographic surveys, vibration surveys, liner scrape down analysis and lube oil analysis and these will go into our planned maintenance in real time eventually. The intent is to use them all together to produce the best maintenance schedule for cost and reliability purposes.

“The Voyage Module is providing a greatly improved view of vessel machinery and hull performance. Crucially, it also produces reports required for environmental performance for the EU MRV system and other requirements.”



Bob firmly believes that, ultimately, the reduction of administrative burden through using digital ship certificates rather than paper-based ones will make the working life of seafarers easier, as well as ensuring that compliance with regulatory requirements is conducted more efficiently.

“While modern IT has streamlined some aspects of shipboard administration, we are still some way from a true one-point-of-entry system. One of the reasons for this is the industry’s regulatory system, which is not consistent,” he said.

Although the industry is transforming he believes its conservative nature means change could be slower than many envisage.

One of the ‘unknowns’ in the application of technology is the rate of change it produces and, with an emphasis on operational enhancement, there will be a continuing need for highly skilled engineers on board to optimise equipment reliability.

“We have no doubt there will be a significant demand for highly qualified and technically competent crew on board our vessels for a long time to come, although their job descriptions will change to suit modern technology and maintenance methods,” he added.

BSM believes that both sea and shore-based personnel must be trained to work with modern, high technology equipment which needs less maintenance but more monitoring.

Bob said, “We need to ensure that we give our employees the right tools for the job in the 21st century and that we set realistic expectations, rather than sticking to the old ‘this is how we used to do it’ mantra.

“BSM is making a conscious move to a Maintenance Management System of which planned, calendar-based maintenance is just a part. Condition-based maintenance will be just as crucial for our business in a very short time and this can only be achieved by the use of digital technologies,” he said.

In tandem with this change, Bob also believes that embracing new technology means seafarers require a new skillset.

“The move towards condition-based maintenance creates the need for personnel who are skilled in monitoring data. The ability to analyse data, to see trends and then know how to apply solutions to the problems that the data reveals, this could be the role of the seafarer in the near future,” he concluded.

Latest News

S.M.C wins first cruise ship newbuild

Schulte Marine Concept (S.M.C), the project management arm of BSM, working together with Bernhard Schulte Cruise Services (BS Cruise), has won its first cruise ship contract with Portugal-based Mystic Cruises.

S.M.C will provide technical consultancy and newbuild supervision services to support construction of the ocean-going luxury expedition cruise ship, *World Explorer*.

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S.M.C's extensive experience with complex projects in major shipyards, a growing portfolio of passenger ships and its international newbuilding expertise were crucial elements in winning the contract.

World Explorer will be built as a 126-metre long expedition cruise ship with a passenger capacity of 200 and a crew complement of 111.

The vessel will meet the latest Polar Code operating requirements and will be equipped with state-of-the-art hybrid power and propulsion technology, which will enable the ship to cruise in environmentally-sensitive areas.

Construction of *World Explorer* has commenced at the West Sea shipyard in Viana do Castelo, in Northern Portugal and she will start cruising during the winter season of 2018.

Containership *Mimmi Schulte* named

The 2,400 TEU state-of-the-art container vessel, *Mimmi Schulte*, was christened on October 10th, 2017 at Eurofruitport's Terminal in Antwerp.

It was an honour to have Dr. Schulte, along with his two sons Johann and Christoph, at the naming ceremony. Further attendees included representatives of the Schulte Group, Euroports Group, the Port of Antwerp, as well as the vessel's charterers, classification society LR and the crew.

The honour of smashing the champagne bottle was given to the vessel's godmother Christina Christoforou of Bernhard Schulte Cyprus. Master Mikhail Kriukov and



the entire crew of *Mimmi Schulte* offered their guests exceptional hospitality on board.

Managed by BSM Hong Kong, *Mimmi Schulte* is the ninth ship in a series of 12 and she was delivered by Yangfan Shipyard on the August 18th, 2017 to her Owners. The vessel is chartered by the reefer operator Africa Express Line (AEL), which belongs to Compagnie Fruitiere.

S.M.C secures Icelandic ferry contract

Schulte Marine Concept (S.M.C) has been awarded a contract from the Icelandic Road Authorities, Vegagerðin, to provide site supervision of a passenger and car ferry to be built in Crist S.A. shipyard in Poland.

The ferry will operate on the route between Landeyjahöfn and Vestmannaeyjar (Westman Islands) which is characterised by very demanding sailing conditions, including strong transversal sea currents at the harbour entry and a water depth limited to 4.5 metres. These conditions demand a high-level of vessel manoeuvrability and seakeeping performance.

The ferry's design was created by JJoannesson ApS in cooperation with Vegagerðin and was further developed by Polarkonsult AS. The vessel will be fitted with a diesel-electric power plant that is supported by an 800-kWh battery pack providing a short-term output of



4.800-kW. Peak power output will be available for high power manoeuvring in the harbour.

The vessel will be operated by a crew of 10 and accommodate up to 390 passengers in the winter and 540 in the summer when the outdoor terrace is accessible. The new ferry will be delivered in June 2018 and will replace *Herjólfur* which was built in 1992.

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Babcock Schulte Energy Joint Venture

The Schulte Group and Babcock International Group signed a Charter in July outlining the conduct that will underpin the development of a new joint venture entitled Babcock Schulte Energy (BSE).



The nominated representatives of both organisations, Ian Beveridge, CEO of Bernhard Schulte, and John Howie, CEO of Babcock International - Marine, have committed to a mandate of honesty, accountability and responsibility in the development of safe, sustainable and high value business in the energy sector.

The Schulte Group and Babcock International are developing a number of LNG supply related projects under the BSE joint venture which will combine the strength of both companies to achieve new business in this developing sector.

One such project is the design and development of a Gas Supply Vessel (GSV), with the first jointly-owned 7,500m³ vessel currently under construction at Hyundai Mipo Shipyard.

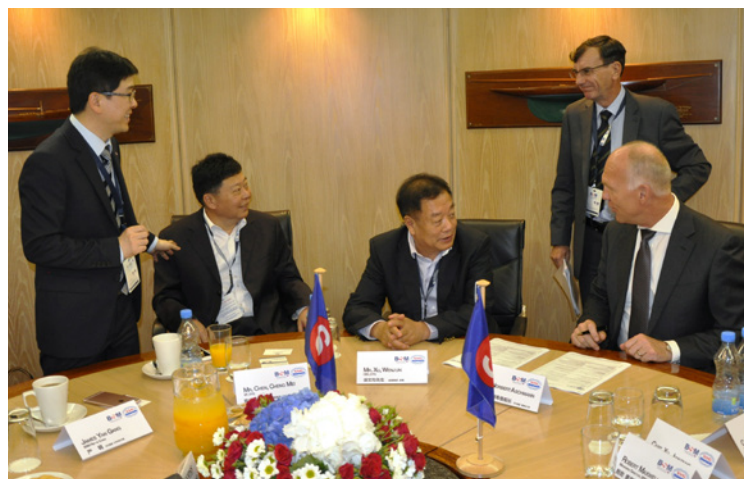
Partnership with XYG grows

Representatives from Xin Yuan Enterprises Group (XYG) recently visited Cyprus together with Bob Maxwell, Managing Director of BSM Singapore, and James Yan Gang, BSM External Representative in China, to discuss wider cooperation between the two Companies.

XYG Chief Executive Officer, Wen Jun Xu, and Vice President, Chengmei Chen, met and held productive discussions with BSM Chief Executive Officer, Capt. Norbert Aschmann; Chief Financial Officer, Sebastian Hardenberg; Fleet Personnel Director, Giles Heimann and Hanseatic Chartering Managing Director, Michael Kazantjis.

The XYG representatives also took the opportunity to visit BSM's Maritime Training Centre in Limassol to view the advanced training facilities and full mission simulators.

BSM Singapore currently manages five modern asphalt tankers for XYG and their associate Company, Bilsea Group, with a further two tankers to be taken into management by the end of the year following the contract signing in Cyprus.



BSM stays ahead on OPEX performance

The Boston Consulting Group (BCG), a world-leading management consulting company, conducts an annual benchmarking study across a range of ship types and sizes which compares participants' daily vessel operating expenditure (OPEX) against the overall average OPEX for each vessel segment.

Forty-five leading shipowners and managers, including BSM, participated in this year's study. Each vessel's OPEX comprises of five cost categories; crew and crewing-related costs, lubricating oil, maintenance and repair, consumables and insurance.

In 2017, BSM submitted the 2016 annual OPEX of 288 managed vessels which were benchmarked against

the BCG OPEX average across almost 2,800 vessels. BSM's average OPEX performance is 9% below the sample average.

For the fourth consecutive year, BSM has continued to demonstrate an average OPEX significantly below BCG's sample average. With a cumulative sample size of 9,000 vessels, of which BSM submitted data for 954 ships under management, the Company's average OPEX is 10% below the sample average.

This consistently strong performance is a result of operational excellence delivered through BSM's extensive ship management knowledge and experience, combined with purchasing economies of scale.

Schulte Group acquires office building in Singapore

The Schulte Group has completed the acquisition of a nine-storey office building in Singapore with a gross floor area of 41,800 square feet (3,880 square metres).

The new building will house Bernhard Schulte (Singapore) Holdings, BSM Corporate, BSM Singapore and MariApps Marine Solutions personnel and provide serviced apartment accommodation for visiting Group employees. Previously named 'The Prospex', the building has been renamed to 'Bernhard Schulte House.'

The Schulte Group's first real estate investment in Singapore was made in the mid-2000s through the purchase of a single floor in Suntec City and conversion into office space. This was subsequently sold, and the Group moved into two floors of the Gateway East building in Beach Road to meet a growing requirement for additional space.

The acquisition and development of Bernhard Schulte House will provide for the future growth and expansion of the Group's entities in Singapore and establish a co-located regional centre. It also supports the Government's intent to further strengthen the maritime

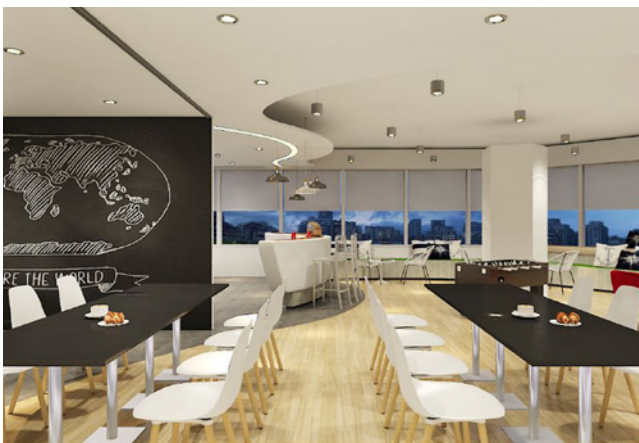
industry cluster and reinforce Singapore's position as a global maritime and financial hub.

Bernhard Schulte House is centrally located at 108 Middle Road, a prominent corner of the Bugis district renowned for its traditional heritage, and is within walking distance of the current office location.

Bernhard Schulte Singapore and MariApps are planned to move into the new premises by mid-January 2018, with BSM Singapore and BSM Corporate personnel moving in by the second quarter.



Designer's impression of BS House facade



Designer's impression of employee lounge



Designer's impression of BS House entrance

BSM participates in

‘Sea Change’ programme

BSM has recently participated in the development of ‘Sea Change,’ an informative programme produced by the UK Chamber of Shipping and ITN Productions. The production explores the importance of the UK shipping industry with the help of industry leaders, including BSM, who discuss the importance of safety at sea and how it can be improved through the right training and technological advancements.

BSM’s contribution took place in the Newcastle office where senior managers shared their expertise with an ITN Productions reporter.

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David Furnival, BSM’s Chief Operating Officer, provided an overview of the Company’s approach to efficient vessel operations with an emphasis on safety, enforcement of regulations, tailored training modules and simplified procedures that focus on the processes on board. Neil McNeil, Managing Director of BSM

British Isles, spoke about BSM’s reach as a global organisation and the Company’s ability to provide responsive, locally based support.

‘Sea Change’ further explores the environmental impact of the shipping industry and solutions that are being developed to underpin positive change. Angus Campbell, BSM’s Corporate Director of Energy Projects, and John Eltringham, Project Director, contributed by outlining the work in progress to support the increasing adoption of LNG as a marine fuel through the Schulte Group and Babcock International joint venture, Babcock Schulte Energy, and Gas Supply Vessel design and development.

The ‘Sea Change’ production features key industry interviews and news-style reports and premiered at a UK Chamber of Shipping launch event held in London on November 7th.



Wellness at Sea application

BSM proudly sponsored the latest version of the Sailors' Society's Wellness at Sea application for seafarers, aimed at combatting high rates of cardiovascular conditions and mental health disorders among seafarers.

Enhancements to the free application provide users with a range of healthy living tips and exercises to help monitor and maintain their physical and mental health at home, in port and at sea.

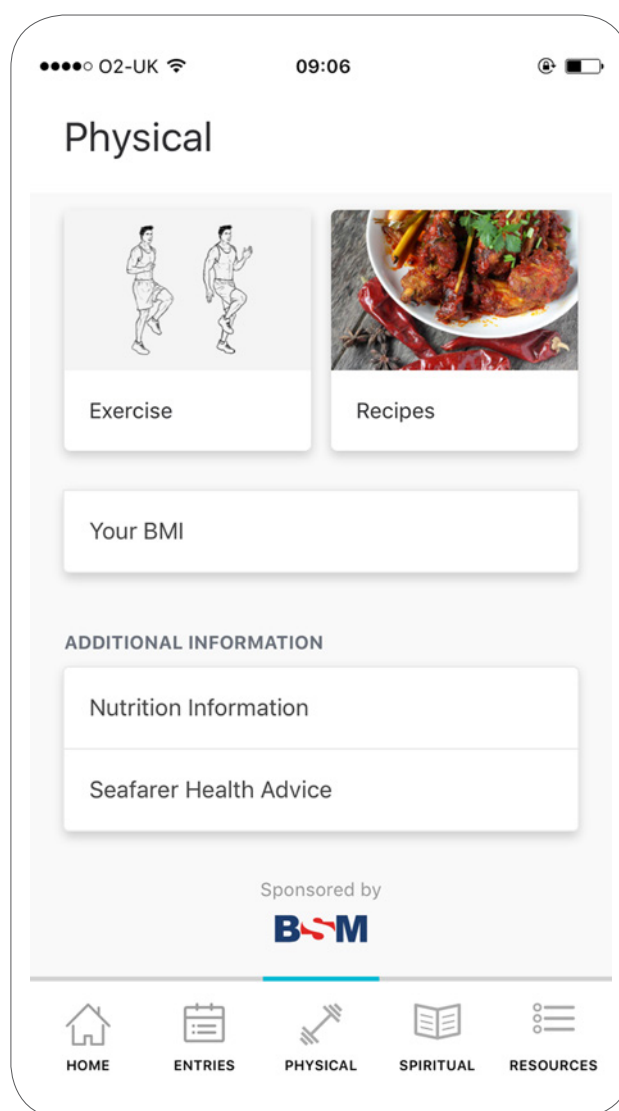
Recipes, supplied by Seachef, BSM's hospitality services business, cater for a wide range of nationalities and provide a variety of healthy dishes. The exercise section, supplied by WorkoutLabs, includes short workouts and longer exercises that can be done during breaks or on shore leave.

Both Android and iPhone compatible, the Wellness at Sea app offers interactive challenges on five key elements of wellbeing - social, emotional, physical, intellectual and spiritual - and users receive daily feedback enabling them to monitor their progress. It also holds port directories and contact details for services offered by maritime welfare organisations, and enables users to track their journey using AIS data provided by MarineTraffic.

Sandra Welch, the Sailors' Society Deputy CEO and Director of the programme said, "The wellbeing of the world's seafarers is paramount to us and we hope that the newest additions to the app will enable users to further monitor their fitness and, in turn, help to minimise poor health or incidents at sea."

The new elements featured in the application are timely, with annual statistics from the Maritime and Coastguard Agency detailing cardiovascular conditions, obesity, diabetes and depression among the most common reasons for seafarers failing their medicals.

Giles Heimann, BSM Corporate Director of Fleet Personnel, commented, "Our people are at the core of everything we do which is why BSM places a high value on crew welfare. Our support for the Wellness at Sea app reflects our appreciation for the professional work that seafarers carry out, and our commitment to helping them maintain healthy lifestyles both on board and ashore."



BSM supports Maritime Cyprus 2017

A strong supporter since 1989 of the internationally renowned, biennial 'Maritime Cyprus' conference, BSM participated again this year as an exhibitor at the event held in Limassol between October 9th - 11th.

The theme of the conference was Shipping: 'Yesterday's World, Tomorrow's Today' and attracted distinguished speakers and over 850 shipping industry attendees from 35 countries.

The BSM exhibition stand was visited by the Cypriot Minister of Transport, Communications and Works, Mr. Marios Demetriades; the General Secretary of the International Maritime Organisation, Mr. Kitack Lim; European Transport Commissioner, Mrs. Violeta Bulc together with senior-level representatives from the shipping industry, customers, partners and maritime media.

BSM also hosted a hospitality event in the new Limassol marina which was attended by over 200 guests including customers, business partners,

representatives from the Department of Merchant Shipping of Cyprus, the Cyprus Shipping Chamber, the Cyprus Union of Shipowners and BSM employees.

The reception was addressed by BSM's Director of Marketing and Business Development, Robin Thuillier, and Chief Executive, Capt. Norbert Aschmann, and included a stunning set of performances by the electric string quartet, Fortissimo.



Delivering a cleaner fuel

The operational challenges of delivering a cleaner marine fuel were addressed by Angus Campbell, BSM's Corporate Director – Energy Projects, at the Gas Asia Summit recently held in Singapore.

During the 'Technical and Operations of Small-Scale LNG and LNG Bunkering,' session, Angus outlined



the increasingly stringent IMO and European Union limits on sulphur oxide, carbon dioxide and particulate matter emissions that will restrict fuel choices over the next five years. These will accelerate the move to cleaner-burning fuels, such as LNG, with a concurrent need for new technologies and LNG fueling infrastructure in all major bunkering hubs.

BSM, working with Babcock International, has developed an innovative Gas Supply Vessel that will supply LNG to other vessels and shore-based facilities.

In parallel, BSM is also working with the Society for Gas as a Marine Fuel (SGMF) to support the development and adoption of uniform operating standards.

Study Now, Pay Later programme

BSM, working in partnership with the University of Cebu – Maritime Education and Training Centre (UC-METC), provides high school students with a 'Study Now, Pay Later' (SNPL) scholarship programme; an educational programme designed to develop core seafarer skills.

The students selected for the three-year programme possess passion, intellect and perseverance. They enter a challenging and immersive environment to gain skills and values that allow a smooth transition into the seafarer workforce.

To formally mark the end of the current SNPL programme, BSM hosted their annual 'Pinning of the Anchor Hop Graduating Ceremony' at Casino Español, Cebu City, which was attended by BSM



representatives based at the Crew Service Centre in Manila, University Officers and proud parents of the graduates.

The ceremony highlighted the hard work and perseverance of the cadets whilst in school and signified the start of a new journey ahead.

BSM India: A one-stop shop

According to the World Bank, India remains the fastest growing economy in the world. With strong economic fundamentals and many reforms currently on track, analysts expect the country to continue its positive development.

One of the drivers is the so-called Sagarmala project. With the development of major port clusters linked to industrial zones, the construction of inland waterways and new highways as well as the upgrade of existing roads, this initiative is set to change the maritime industry in the country.

“There is something in the air,” says Sanjeev Sharma, Managing Director of BSM India, when describing the current atmosphere in the country’s maritime industry. “India has seen a year-on-year cargo growth of 4.5% in the last year, but the maritime and transport market

is not yet very mature. This puts experienced service providers, such as BSM, in a prominent position to play a key role in the country’s further development.”

Sankalp Shukla, Director of BSM India’s Crew Service Centre, elaborates: “About 7% of consumer costs are attached to transportation. Projects under the scope of Sagarmala will contribute to lowering these costs as the infrastructure will be improved. This will further boost the Indian economy. On top of this, it will kick-start ship construction in India. We will see many additional ports, and this will lead to more coastal shipping as a consequence.”

In Mumbai, BSM India’s offices incorporate a Ship Management Centre (SMC), Crew Service Centre (CSC) and Maritime Training Centre (MTC) under the same roof. Other value-added and support services, including Seachef, Eurasia Travel Network, Central



“ *Indian seafarers and shipping professionals have proved their worth in international shipping* ”

Purchasing, Global Service Centre and IT services are also located on the same premises.

“The fact that BSM India offers a high concentration of services in one place leads to more convenience for our customers. Time is money and customers appreciate our ability to coordinate activities very quickly. We are able to act as a ‘one-stop shop’ for our customers,” explains Sanjeev.

When it comes to training only the best is good enough. Whilst the IMO requires all seafarers to complete

training based on the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), BSM has gone beyond this. The Company has identified gaps in the scope of STCW and developed additional training to complement it, including a number of simulator based courses developed at Group level to ensure uniform standards of delivery at all training locations.

“Safety comes first and this is absolutely crucial for BSM,” Brijendra Srivastava, Director of BSM’s Maritime Training Centre in Mumbai, emphasises. “This is why



Brijendra Srivastava, Director Maritime Training Centre (India); Sanjeev Sharma, Managing Director (BSM India) and Capt. Sankalp Shukla, Crew Service Centre Head (India-Mumbai)

our experienced faculty members have examined the framework of the STCW and developed some additional elements in liaison with our Corporate and other Maritime Training Centre colleagues to ensure comprehensive and consistent training for all ranks.”

The Mumbai facility features state-of-the-art simulators for engine and bridge operations, as well as LNG & RT Flex engine simulators for specialised training. Training courses cover the needs of cadets and trainees through to Master and Chief Engineer levels.

Companies including Chevron, BW Maritime and Shell have taken advantage of BSM’s facilities which is testimony to the high level of training provided.

One of India’s key advantages is the fact that doing business in the country is very cost-effective, which is especially beneficial when it comes to ship management activities.

With more than 4,000 seafarers on board or ashore, CSC India is the second largest man-power supplier within BSM with six offices in major locations. Mumbai is the head office, with other locations being New Delhi, Chennai, Kochi, Bihar and Kolkata.

“Indian seafarers and shipping professionals have proved their worth in international shipping,” Sanjeev explains. “They play a major role for on board and shore based shipmanagement activities around the world. India is the seventh largest provider of human resources in the maritime industry, but we take particular pride in the fact that India is the largest provider of senior officers to ships operating around the world.”

“As a consequence of the Sagarmala project, more crew will be required to run vessels employed in coastal trades, and BSM India is well equipped to cater for this demand,” Brijendra added.

BSM India has a proven track record of providing high quality services to a range of vessel types, including dry bulk carriers and Very Large Ore Carriers (VLOC), container ships and chemical tankers, and acts as a third-party ship manager for different types of owners.

Some owners come from a shipping environment, but others have diverse backgrounds such as the mining, steel, or financial industries. Since shipping is not these customers’ core business, it is vital for them to be able to rely on an experienced ship manager.

“ *The fact that BSM India offers a high concentration of services in one place leads to more convenience for our customers* ”

Going forward, BSM India has identified the tanker and VLOC sectors as having great potential to increase business activities and Sanjeev is confident that “with many things happening in the country’s maritime industry, we will be able to take up opportunities as they happen too”.

BSM is renowned for its newbuilding supervision, development of specific training programmes, supply of qualified crew and ongoing management of the Valemax VLOCs.

With a deadweight of 380,000 to 400,000 tons, these vessels are the largest bulk carriers ever constructed, measured by deadweight tonnage or overall length, and carry large volumes of iron ore between Brazilian and Asian or European ports.

“Some of our customers have trusted us to safely and effectively manage their ships for over two decades, with Mitsui O.S.K. Lines and BSM India having a business relationship of 25 years. Today we have a

broad customer base of 15 ship owners including companies such as the COSCO Group, Hong Kong Ming Wah, Vale and Tomini Shipping, and we take great pride in not having lost a single customer due to performance-related reasons,” said Sanjeev.

The Indian maritime industry is changing and BSM India is well equipped to capitalise on business opportunities and meet the requirements of new customers as they arise. The team is very motivated and the Company places great emphasis on team building and cultural activities.

This is not only popular with employees, but with their families as well. “Our people interact outside of work, and this creates a special energy,” Sanjeev, Sankalp and Brijendra agree.

BSM India has clearly proven that its personnel are not only qualified to the highest standards possible, but that everyone enjoys their work - something that cannot be trained.

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Seafarer profile:

Captain Laurentiu Sasu



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The attraction of being a modern seafarer caused Captain Laurentiu Sasu to give up his dream of becoming a surgeon and choose a life at sea instead – a choice that Laurentiu has never regretted.

After a decade with BSM, the graduate of the Mircea cel Bătrân Naval Academy in Constanta is now Master of the 320,557 dwt VLCC *Boyaca*. He is a down-to-earth, practical Captain who believes in leading by example and is one of an increasing number of hands-on, experienced leaders across the BSM fleet.

VLCC *Boyaca* was built at Bohai Shipbuilding Heavy Industries in China and is 71 metres in height from the bottom plate to the top mast, with a draft of 22.6 metres.

The high level of responsibilities which he has as Captain makes the work both challenging and fulfilling. “A Master is expected to know everything about his vessel, from how it manoeuvres to the cargo and engine room operations and even the expected path of typhoons, hurricanes and ocean currents. Being Master of this

supertanker is a thrilling experience and a matter of great pride,” says Laurentiu.

His focus stays on leading his officers and crew, while at the same time maintaining BSM’s consistently high standards.

“BSM’s core values and objectives complement my own strengths and enthusiasm. Working in a congenial environment with a multicultural crew makes the job seem easier, despite the commercial pressures.”

He notes that meeting safety and regulatory requirements and completing tasks on time are among the key aspects of the role of which he is most proud. A structured organisational environment further assists Laurentiu to meet the requirements of the vessel’s owner.

“On board teamwork is backed up by a professional support team ashore. There is an intense will to do things right and acknowledge the great job performed by those parties on board and ashore,” he adds.

“ BSM’s core values and objectives complement my own strengths and enthusiasm ”

A Company veteran, Laurentiu believes the Group’s strength is built on its core values of mutual trust, integrity and transparent communication.

He also believes that a major reason why BSM maintains its industry leadership position is because of the continuing investment made in the provision of quality training and education for its seafarers. This is something Laurentiu says he has benefitted from personally.

“I have found the ongoing training to be highly beneficial. BSM supplements basic training with specialist courses conducted at dedicated maritime training centres equipped with the latest technology, such as advanced bridge and engine simulators, and through regular seminars available worldwide,” he says.

He acknowledges that life at sea can still be lonely and social isolation is a major concern for the health of seafarers. Consequently, and whilst not always easy, it is essential to build strong relationships on board to develop the team.

A particular aspect of life at sea is the need to maintain focus on the job when news from home reaches the bridge of the ship.

Laurentiu recalls the arrival of his first son. “I was on board when I got the news, just before a mooring operation. The mixture of exuberance along with the pain of being away cannot be described in words,” he says.

Despite the challenges, Laurentiu proudly maintains professionalism on board and remains conscious of his role as a BSM leader and role model.





Leveraging on digitalisation

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Integrated software solutions and digitalisation are the way forward for the shipping industry.

Through the collection and analysis of data generated and gathered from day-to-day operations, ship managers are able to take actions to enhance operational efficacy and efficiency and shipping companies can gain a better understanding of how their valuable assets are performing.

Data management, and 'big data' in particular, has been described as the future by many in the industry but coming to terms with what are relatively new ideas in shipping is challenging.

This is where the software developers at MariApps Marine Solutions, part of the Schulte Group, have been busy continuing to develop solutions that make an impact.

While MariApps is relatively new in the field, its strong partnership with Bernhard Schulte (BS) and Bernhard Schulte Shipmanagement (BSM) is helping to attract major industry names to the Company's growing customer base.

MariApps Chief Executive Officer, Sankar Ragavan, says, "We are getting good traction in the market because of

our strong connection to ship managers and ship owners. Many ship management companies find our product attractive because it has been built and developed based on direct feedback from functional experts."

As a result, MariApps is helping the shipping industry to make sense of big data through effective data analytics.

"Big data involves collecting all the available information within a company. What is key is to decide on what to do with all this data. For example, a company can review its insurance, crew, health and safety data over a five-year period and through the application of relevant analytics can discover behavioural patterns. The company would then be able to see the circumstances behind incidents occurring on board and the personnel involved at the time."

Singapore-based MariApps now serves BSM and twelve third-party customers from offices in Cyprus, Germany and India.

The customer base includes CMA Ships, part of the Marseille-based container carrier group CMA CGM, who recently signed a contract to implement MariApps' flagship PAL e3 solution across its offices and on more than 170 vessels.

During the signing ceremony, Ludovic Gerard, Executive Vice President of CMA Ships, said, “CMA Ships is expecting a smooth implementation so that we can quickly move to a single, integrated solution across the organisation.”

PAL e3, built with the latest Microsoft technology, is a fully web-based Enterprise Resource Planning (ERP) software suite developed for the shipping industry. It offers a single solution for ship managers and ship owners, enabling them to communicate with and track their vessels, review documents, train employees and remain fully updated on the status of survey reports.

Sankar, who has more than 20 years experience in the IT industry, explains, “Before maritime enterprise resource planning, companies used different solutions sourced from different vendors for different functionalities. This resulted in many cases in negative productivity gains because of the need to deal with different systems and different suppliers.

“Users were unable to share data between these functionalities because different data formats were stored in different places. An effective ERP system not only brings all of the available data together, but also provides full transparency.”

Users benefit from having a web-based system available at their fingertips which enables critical vessel-related information to be fully accessed at anytime, anywhere via the web or a mobile device.

The PAL e3 solution covers all areas of ship operations and crew management. It offers ship owners and ship managers complete access to their vessel, crew, financial and Planned Maintenance System (PMS) data together with operational reports and ‘drill-down’ capabilities. Its user-friendly, customisable dashboards and alerts-driven approach facilitates data-driven decision making.

“We are one of the few companies that customise solutions for our clients, whether they are a small or large ship manager,” adds Sankar.

Whilst a web-based system can open the door to a potential cyberattack, having a robust security strategy will minimise such a threat.

One strategy MariApps employs in this respect is to work only with the most reputable partners to act as the cloud host. In addition, proactive security policies that identify

clearly what should, and should not be done, in the office are strictly enforced.

“We have security in place to block access at the entry level. We also have security consultants working with our partners, such as Microsoft, to enhance the security of our system. Our officers are well-trained to ensure that they are aware of the practices that could introduce viruses to the system, and make it prone to hacks,” says Sankar.

MariApps is continuing to focus development efforts on further enhancing its products for the benefit of both current and future customers.

One aspect of the work being undertaken is to incorporate the ‘Internet of Things’ (IoT) into the PAL ERP system.

The IoT involves different equipment and systems on board a ship communicating and sharing data with each other. An example of this interaction would be a vessel owner who has several vessels calling at the same port within a week. Each piece of intelligent equipment on board the first ship to call at the port would gather an extensive array of data about sailing conditions, berthing conditions, etc. and would communicate this information back to the intelligent equipment installed on the various vessels calling at the same port that week.

The IoT allows technologies to “talk to each other” and work hand-in-hand to improve operational efficiency.

Sankar emphasises the need to continually improve. “No solution is ever completely finished and we will continue to upgrade our ERP solutions based on the feedback from our customers and support provided by the Schulte Group.”



Sankar Ragavan, Chief Executive Officer, MariApps

PAL Voyage v4

MariApps Marine Solutions recently released PAL Voyage v4 with new enhancements and functionalities focused on three key areas: data quality, cargo carriage and vessel performance.

PAL Voyage is a reporting tool that captures vessel data related to voyage planning and execution, with the updated version providing a significant move towards systematic electronic logs that reduce manual data entry and the potential for human error.

Ensuring a high standard of data quality has been one of the main challenges in the development of PAL Voyage and resultant analysis of voyage-related data. With increasing regulatory requirements, including the EU Monitoring, Reporting, Verification (MRV) regulation, vessel reports will be subject to official third-party audit which makes accurate logging of information critically important.

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To avoid incorrect input at the point of data entry, ship-specific validations have been introduced to prevent various incidents, such as a vessel reporting an incorrect quantity of bunkered fuel relative to its fuel tank size, from occurring. Mandatory entries in critical fields and the use of drop-down menus instead of free text will also reduce errors and make reporting easier. Finally, each ship's reporting forms will be tailor-made to its exact specifications (vessel type and arrangement).

Exceptional care was taken in the development of the cargo carriage functionality. Through the 'Cargo Operation' facility, vessels will be able to log all aspects of the cargo loaded or discharged, attach any accompanying documentation and allocate the cargo to the corresponding tanks/holds. Through the 'Cargo Daily' reports, all relevant measurements will be checked against the voyage requirements with automated alerts on pre-specified limitations.

In PAL Voyage v4 'Performance' is captured in more detail. An enhanced visual representation of how the vessel is moving through the water is provided via a noon 'snapshot' approach. In an active diagram, all prevailing conditions at the time of reporting are captured so that necessary corrections can be applied. This also allows assessment of the ship's hull and propeller performance over time in accordance with Charter Party obligations. In parallel, the new 'Machinery' tab will clearly represent the Engine Room's operation.

PAL Voyage has made substantial progress towards the ultimate goal of a fully automated reporting system and replacement of manual data entry, thereby freeing up valuable Officer time on board, and continues the Schulte Group's focus on innovative, value-added product development.

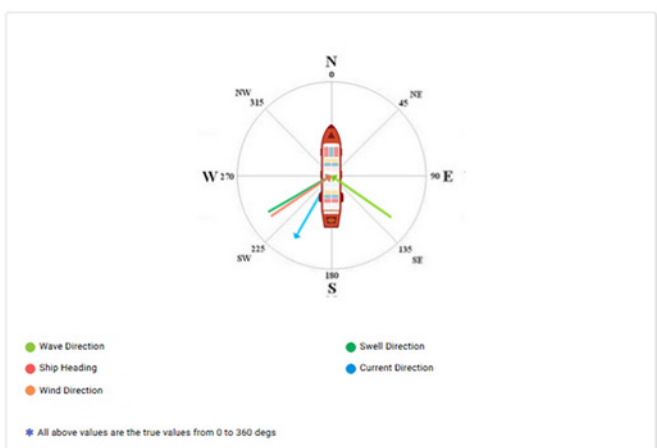
'Noon Report': visual representation of vessel moving through the water

Distance(since last report)	
Over Ground	Through Water
<input type="text" value="320.00"/> nm	<input type="text" value="325.00"/> nm
Speed Over Ground	Speed Through Water
<input type="text" value="13.91"/> knots	<input type="text" value="14.13"/> knots

Slip Details	
Apparent	Real
<input type="text" value=""/>	<input type="text" value=""/>

Please enter all values below as instantaneously observed at time of reporting – not period averages

Measure Points	Value	Unit
Air Pressure	600	mbar
Air Temperature	45	C
Draft Aft	7.5	mtrs
Draft Fore	10.5	mtrs
Ocean Current Direction	270	degrees
Sea Water Depth	16	m
Sea Water Temperature	35	C
Ship's Displacement	160786	MT
Speed Over Ground	12.5	knots
Speed Through Water	12	knots
Swell Direction	240	degrees
Swell Height	6	mtrs
Swell Period	23	s
Total Ballast Onboard	45689	MT
True Current Speed	12	knot
True Wind Direction	236	degrees
True Wind Speed	14	knots
Wave Direction	125	degrees
Wave Height	7	mtrs
Wave Period	22	s



Bernhard Schulte expands

its range of services

Dive Marine Non-Destructive Testing (DMNDT), Bernhard Schulte's newest acquisition, specialises in inspection, repair and maintenance (I.R.M) as well as training services for the oil & gas, marine, petrochemical and renewable energy sectors. Based in Singapore, DMNDT was formed in 2012 as part of the Dive Marine Group and purchased by Bernhard Schulte in 2016.

An IRATA (Industrial Rope Access Trade Association) member, DMNDT provides unique, safe and cost-effective "Alternative Access Solutions," such as rope access, web deck, web net and portable and mobile work platforms, which allow safe access and execution while working at height.

These extensive capabilities are based on a wealth of experience that is complemented by industry best practices, accreditation and ethics. The Company's hard work has paid off, with a series of safety awards being presented by their customers over the past three years.

Significantly, these accolades have been earned during a time of recession in the shipping industry, which Barri Marshall, DMNDT's Managing Director, describes as a trial that has been "immensely challenging but also rewarding."

"Our primary skills enable us to support a varied range of I.R.M work scopes throughout any stage of an asset's life, with our commitment to excellence providing our dedicated team with the drive to maintain a positive and professional approach to meeting objectives."



*Barri Marshall
MD, DMNDT*

Crucial to DMNDT's success has been a focus on continuous improvement and development which has been recognised through multiple certifications including IRATA, Lloyds UTM Hull Structures, ABS UTM Hull Structures, DNV 402A UTM Hull Structures, DNV 402B Program – Offshore Structural Components and Bizsafe Level 4.

As a result, DMNDT has secured contracts with several oil & gas majors including an exclusive five-year IRM contract with the Petrochemical & Refineries located at Jurong Island, Singapore.

"We are exploring further opportunities to enhance safety, productivity and cost saving for our customers through advancements in technology. This complements our suite of core services by applying an innovative approach to visual inspection through drone technology and leading-edge software," said Barri.

Inspection, Repair and Maintenance services:

- Industry classification and CAP surveys (close-up, special, intermediate)
- Thermographic surveys
- Conventional and advanced NDT inspection methods
- API inspection, pipes, vessels and storage tanks (510, 570 & 653)
- Welding and fabrication
- Insulation repairs, cladding and fabric
- Electrical installation and inspection (insulation, HIPOD, CompEX)
- Mechanical engineering
- Heavy lifting and rigging
- Remedial painting
- Tensioning and hydro-tightening
- Hot Zone Habitats (specific for zones 1 and 2)

One BSM

WMU graduation ceremony 2017



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Leading a maritime business to success in an industry that is constantly changing, requires a highly skilled workforce and a comprehensive understanding of technical and regulatory developments to stay ahead.

To achieve this goal, BSM signed a five-year partnership agreement in 2016 with the World Maritime University (WMU) and DNV GL to support a postgraduate diploma in Executive Maritime Management.

The programme was welcomed by BSM employees who appreciated the benefits of this partnership, with 13 students from across the Company enrolling in the programme. Through hard work and dedication, all of the BSM students successfully completed their studies and were awarded their post graduate degree.

Through this diploma, BSM offers the opportunity for career development and equips current and future managers with the skills and capacities to more effectively manage the demands of today's industry. Drawing on the WMU's academic and research expertise and DNV GL's best practice experience, the diploma addresses topics of critical importance in the maritime industry.

The programme is delivered on an e-learning platform and supported by video recorded lectures, self-assessment tests, access to the WMU e-library and discussion forums to connect with fellow students and instructors directly.

Congratulations to the successful BSM students who were recognised at the graduation ceremony held in Malmö, Sweden, during November.

First BSM Gold Awards ceremony

The 2016 *BSM Gold Awards* ceremony took place on the evening of Tuesday 12th September in Singapore, with the 12 award winners having the opportunity to meet and socialise with colleagues from around the world during their four-day visit and participate in a variety of activities.

One particularly meaningful activity was a visit to the Muscular Dystrophy Association (MDA) where the award winners spent time sharing information about their diverse cultural backgrounds with residents under the care of the MDA. This was also a special experience for the residents who were able to learn about different cultures first-hand. The participants each revealed something special about their home country, such as a salutation or a few basic words in their native languages, and some performed traditional dances for the enjoyment of all those present.

The final evening was dedicated to the Awards' ceremony dinner which was attended by BSM's

Management Board, Ship Management Centre Managing Directors, Corporate Directors and Bernhard Schulte representatives based in Singapore.

The dinner was followed by the awarding of a customised trophy presented by Capt. Norbert Aschmann, BSM CEO, as well as screening of personal testimonial videos prepared for each winner.



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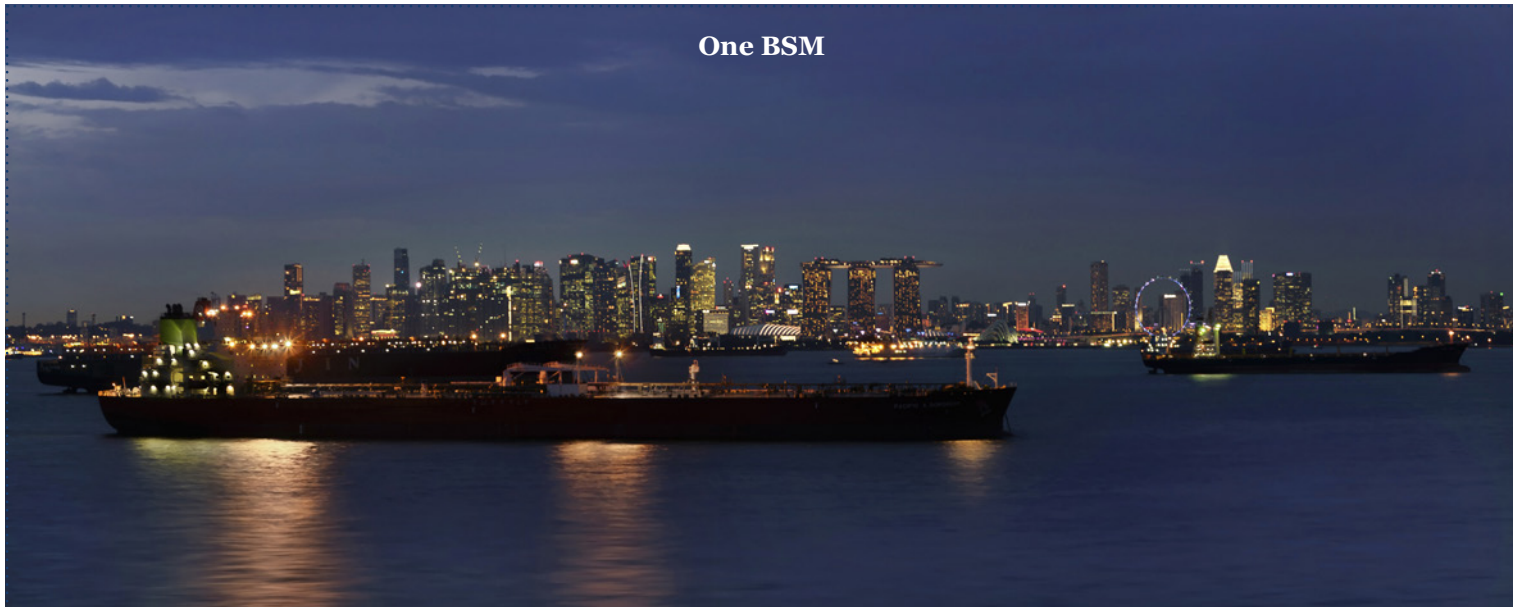


Photography and video competition winners

Following the success of the 2016 photography competition, BSM relaunched its annual maritime-themed photo competition in 2017 with an expanded scope that included video entries. The response was outstanding, with more than 500 photo entries and 30 video submissions made by 200 sea and shore-based employees globally. The submissions were again of exceptional quality and showcased the multi-talented and creative individuals working within the Schulte Group. After a difficult deliberation by the judges, four winners were chosen.

Tied for first place in the photography section was Vladimir Dudnichenko, Chief Engineer, and Sharad Singh, 2nd Engineer. In first place in the video section was Gerardo C. Lindo Jr., Chief Engineer, and in second place was Akshay Sharma, Chief Officer.

The winning photographs demonstrate the picturesque beauty of the shipping industry, while the winning videos provide a glimpse into the life of seafarers around the world.



First winner photo (left page): **Vladimir Dudnichenko**
CSC Ukraine - Chief Engineer

When asked about his inspiration Vladimir said, "First of all, I would like to say a big thank you to my daughter Carolina. It was her idea and push that got me to send the photos. I have a large collection of marine-themed photographs and together we chose four to share. Thanks to such a good result, I will continue to delight you with beautiful photos."

First winner photo (above): **Sharad Singh**
CSC India - 2nd Engineer

Sharad said, "Finance, Entertainment and Shipping are so symbolic to Singapore that I wanted to capture the essence of each within a single frame. To create such a stunning scene I had to wait for that moment when the city lights had just come on and the sky was lit just enough at twilight to capture the pleasant hues and colour tones."



First winner video: **Gerardo C. Lindo Jr.**
CSC Philippines - Chief Engineer

"I hope it will inspire other colleagues on board, personnel ashore and those planning to be a seafarer. No matter how difficult and challenging the work on board the vessel, it will be easy to accomplish any task if there is unity and harmony. That was how I came up with the title 'A Glorious Environment Releases All Stress' as it shows how the crew laugh and smile each day. I would also like to thank all the officers and crew involved in the video for the positive impact they make to the environment on board."



Second winner video: **Akshay Sharma**
CSC India - Chief Officer

Akshay described his inspiration. "This was the yard delivery of the biggest containership built to date. That in itself was a great inspiration for me, and I decided to capture each and every possible moment to cherish it throughout my life. All the tasks captured can only be seen during the taking over of a vessel from the shipyard. This video means a lot to me as it represents my one-month journey with best officers under the management of BSM."

BSM supports innovative minds

BSM proudly sponsored ClimateLaunchpad 2017 as part of a series of Corporate Social Responsibility events.

Comprising 103 start-ups from over 35 countries, ClimateLaunchpad is the world's largest green-business ideas competition. Its mission is to address the

negative impacts of climate change through innovation, invention and entrepreneurship.

BSM participated at the semi-finals and Grand Final, the latter taking place during October in Limassol with Johann Schulte being part of the judging panel.

The two-day event attracted more than 550 people from business, investment and academic fields worldwide and showcased the next generation of successful start-ups.

Elena Pantazidou, BSM Director - HR Shore, emphasised that we are facing serious environmental and social challenges that are destabilising our quality of living, which is why BSM is sponsoring ClimateLaunchpad to bring people together to tackle these issues with entrepreneurial solutions.



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Schulte Summiteers win first place

The BSM *Schulte Summiteers* won two first places in the recent Seamen's Church Institute (SCI) Mountain Challenge by raising US\$23,500 to support the welfare of seafarers worldwide, and having an exceptionally good course completion time.

The hiking course of the SCI Mountain Challenge spans 18 miles through the mountainous wilderness of Western Maine, United States, and 11 miles paddling through the Androscoggin River. This was the third consecutive year that BSM has participated in the event since it commenced in 2013.

This year's Challenge took place over two days and attracted over 150 participants and a total of 50 teams from around the world. The participants comprised a mix of maritime industry personnel including

representatives from ship managers, charterers, cruise ship lines, insurers, bankers, brokers and suppliers. The total amount raised for this important cause was a sum of US\$301,000.



BSM representative, Jens Alers (centre), with Alan Ginsberg (left) and Marcel Krol

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