



MARITIME REVIEW

A PUBLICATION OF THE MARITIME LEAGUE

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Jul - Aug 2019

SHOW THE FLAG

Also Inside:

- ▶ **Engaging with China**
- ▶ **Coast Guard Present newly acquired Rescue Assets**
- ▶ **The Missing Maritime Zone**
- ▶ **The Port Management Office of Zamboanga del Norte**

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About the Cover:
A Philippine flag on display during the 121st Philippine Independence Day celebration.



MARITIME EVENTS CALENDAR

JULY '19

- 3-4 PTG COUNCIL MEETING 2019 (THREADNEEDLE ST, LONDON, UK)
 4-5 CMG COUNCIL MEETING 2019 (THREADNEEDLE ST, LONDON, UK)
 7-9 TORONTO VINTAGE BOAT SHOW (RESIDENCE INN BY MARIOTT GRAVENHURST MUSKOKA WHARF, GRAVENHURST, CA)
 9-11 BLACK SEA PORTS AND SHIPPING 2019 (HOTEL DE MAR MAMAIA, CONSTANTA, RO)
 10-11 MASG COUNCIL MEETING 2019 (THREADNEEDLE ST, LONDON, UK)
 11-12 2ND INTERNATIONAL CONFERENCE ON SMART & GREEN TECHNOLOGY FOR SHIPPING AND MARITIME INDUSTRIES (GLASGOW, UK)
 20-21 WIND & WATER BOAT SHOW (MARINA GDYNIA, GDYNIA, PL)
 20-21 WINE COUNTRY CLASSIC BOAT SHOW (DEPOT PARK, 7 WATER ST, HAMMONDSPORT, NY, USA)
 22-23 WEST AFRICAN PORTS AND RAIL EVOLUTION (LANDMARK CENTRE, LAGOS, NG)

26 MARITIME FORUM #147 (NATIONAL COAST WATCH COUNCIL (NCWC) MABINI HALL, MALACAÑANG PALACE MANILA)

AUGUST '19

- 1-5 AUSTRALIA INTERNATIONAL DIVE EXPO AIDE 2019 (INTERNATIONAL CONVENTION CENTRE SYDNEY, SYDNEY AU)
 2-5 DALIAN INTERNATIONAL BOAT SHOW DBS CHINA (DALIAN XINGHAI BAY MARINA, DALIAN, CN)
 10-13 NAPLES ANTIQUE AND CLASSIC BOAT SHOW (NAPLES CITY DOCK, NAPLES, USA)
 13-15 16TH MARINETECH SOUTH AMERICA (SULAMERICA CONVENTION CENTER, RIO DE JANEIRO, BR)
 18-20 NATIONAL OUTDOORS FISHING AND BOATING EXPO 2019 (MELBOURNE SHOWGROUNDS, MELBOURNE, AU)
 20-22 INDONESIA MARINE & OFFSHORE EXPO 2019 (SWISS-BELHOTEL BAY, BATU AMPAR, ID)

23 MARITIME FORUM #147 (PHILIPPINE PORTS AUTHORITY (PPA))

- 18-20 CRUISE SHIP INTERIORS EXPO 2019 (MIAMI BEACH CONVENTION CENTER, MIAMI, FL, USA)

SEPTEMBER '19

- 3-6 SPE OFFSHORE EUROPE (ABERDEEN EXHIBITION AND CONFERENCE CENTER, ABERDEEN, UK)
 3-6 GREENTECH IN SHIPPING USA 2019 (BLUE LAGOON DRIVE, MIAMI, FL, USA)
 10-12 SHIPPING, MARINE SERVICES & OFFSHORE FORUM (ONE MOORGATE PLAZA, LONDON, UK)
 10-12 48TH TURBOMACHINERY AND 35TH PUMP USERS SYMPOSIA (GEORGE R BROWN CONVENTION CENTER, HOUSTON, TX, USA)
 11-13 SEATRADE EUROPE (HAMBURG MESSE, HAMBURG, DE)
 14-19 MAST ASIA (MAKUHARI MESSE, TOKYO, JP)
 17-19 MARINE MILITARY EXPO (QUANTICO STATION, QUANTICO, USA)
 17-19 GASTECH 2019 (JAKARTA INTERNATIONAL EXPO, JAKARTA, ID)
 17-19 SHIPPING TRANSFORMATION ASIA 2019 (NOVOTEL CLARKE QUAY, SINGAPORE, SG)
 17-20 NEVA 2019 (EXPOFORUM CONVENTION AND EXHIBITION CENTRE, SAINT PETERSBURG, RU)
 18-21 MARINETEC INDEONESIA (JAKARTA INTERNATIONAL EXPO, JAKARTA, ID)
 19-20 LNG NORTH AMERICA CONGRESS 2019 (HOUSTON, TX, USA)
 23-25 SEATRADE OFFSHORE MARINE & WORKBOATS (ABU DHABI NATIONAL, ABU DHABI, UAE)

25 MARITIME FORUM #149 (NATIONAL DEFENSE COLLEGE OF THE PHILIPPINES (NDCP))

- 25-26 GLOBAL SUSTAINABLE SHIPPING AND PORTS FORUM (KONGENS NYTORV 34, COPENHAGEN, DK)

OCTOBER '19

- 2-3 OILCOMM AND FLEETCOMM 2019 (HOUSTON MARIOTT WESTCHASE, HOUSTON, TX, USA)
 7-8 DEFENCE SAFETY CONFERENCE 2019 (COPTHORNE TARA HOTEL, SCARSDALE PLACE, KENSINGTON, LONDON, UK)
 7-9 OFFSHORE ENERGY EXHIBITION AND CONFERENCE 2019 (RAI AMSTERDAM EUROPAPLEIN 2-22, AMSTERDAM, NL)
 8-9 4TH INTERNATIONAL GREEN AND SMART SHIPPING SUMMIT (MAINPORT BY INNTEL HOTEL, ROTTERDAM, NL)
 5-9 INTERFERRY 2019 (INTERCONTINENTAL LONDON, LONDON, UK)
 10-12 CHINA INTERNATIONAL LOGISTICS & TRANSPORTATION (SHENZHEN CONVENTION & EXHIBITION CENTER, SHENZHEN, CN)
 17-18 3RD ANNUAL SEADATA CLOUD (SHENZHEN CONVENTION & EXHIBITION CENTER, SHENZHEN, CN)
 17-19 GLOBALHAB 2019 (VICTORIA CONFERENCE CENTER, VICTORIA, BC, CA)
18 MARITIME FORUM #150 (NATIONAL DEFENSE COLLEGE OF THE PHILIPPINES (NDCP))
 21-22 EUROPEAN LNG INFRASTRUCTURE DEVELOPMENT SUMMIT (BARCELONA, SP)
 21-23 NORTH AMERICAN GAS FORUM 2019 (THE WESTIN WASHINGTON DC CENTER, WASHINGTON DC, USA)
 24-26 SHIPTEC CHINA (DALIAN WORLD EXPO CENTER, DALIAN, CN)
 13-15 OIL AND GAS VIETNAM (PULLMAN VUNG TAU, VUNG TAU, VN)

NOVEMBER '19

- 1-3 SHIPPING & LOGISTICS INDIA (CHENNAI TRADE CENTER, CHENNAI, IN)
 5-6 FUTURE FUELS FOR SHIPPING SEMINAR (INTERNATIONAL MARITIME ORGANIZATION BLDG, LAMBETH, LONDON, UK)
 5-7 EAGC - EUROPEAN ANNUAL GAS CONFERENCE 2019 (2 RUE SCRIBE, PARIS, FR)
 18-20 EUROPORT 2019 (ROTTERDAM AHOY, ROTTERDAM, NL)
 12-14 HWY H2O CONFERENCE (HILTON TORONTO AIRPORT HOTEL & SUITES, MISSISSAUGA, CA)
 13-15 OIL & GAS VIETNAM 2019 (PULLMAN VUNG TAU, VUNG TAU, VN)
 19-21 LATIN AMERICAN CONGRESS OF PORTS (INTERCONTINENTAL MIAMI, MIAMI, FL, USA)
 21-23 PACIFIC MARINE EXPO 2019 (CENTURYLINK FIELD, SEATTLE, WASHINGTON, USA)
22 MARITIME FORUM #151 (DEPARTMENT OF TRANSPORTATION (DOTR))
 26-27 TANKER SHIPPING & TRADE CONFERENCE (AMBA HOTEL MARBLE ARCH, BRYANSTON STREET, LONDON, UK)
 28-29 LNG & LPG SHIPPING SHIP/SHORE INTERFACE CONFERENCE (LONDON, UK)
 28-29 STRATEGIC CONGRESS ON OIL, LPG, LNG AND PETROLEUM SHIPPING, REFINING, AND TRADING (ST PETERSBURG, RU)

DECEMBER '19

- 3-5 MARITIME PORT SHIPPING EXPO (INTERNATIONAL CONVENTION CITY BASHUNDARA, DHAKA, BD)
 3-6 THE CWC 20TH ANNUAL WRLD LNG SUMMIT AND AWARDS NIGHT (ROME CAVALIERI, ROME, IT)
 3-6 MARINETEC CHINA 2019 (SHANGHAI NEW INTERNATIONAL EXPO CENTRE, SHANGHAI, CN)
TBD MARITIME FORUM #152 (UNIVERSITY OF THE PHILIPPINES-INSTITUTE FOR MARITIME AFFAIRS AND LAW OF THE SEA (UP-IMLOS))
 20-22 ICSA INTERNATIONAL CONFERENCE (UNIVERSITY OF NOTTINGHAM NINGBO, NINGBO, CN)



"SHOW THE FLAG"

by VAdm Emilio C Marayag Jr AFP (Ret)

"Let us respect, honor and revere our Philippine Flag!" was President **Fidel V Ramos'** concluding line in his Maritime Review article three years ago after he graced a few weeks earlier the 118th Anniversary of the **Battle of Alapan** that took place on 28-May-1898 in Imus, Cavite. After this victorious battle of Filipino revolutionary forces against Spanish troops, General Emilio Aguinaldo unveiled the Philippine Flag that he himself designed. A hundred years later, centennial President Ramos signed the **"Flag and Heraldic Code of the Philippines"** to give the flag more meaning and significance, as the national symbol of sovereignty.

The flag General Aguinaldo displayed in the **Battle of Alapan** was the same flag that he unfurled when he declared Philippine Independence Day on 12-June-1898 in Kawit, Cavite. Inspired by the flags of Cuba and Puerto Rico and while on exile in Hongkong, the General asked Marcela Mariño de Agoncillo, her daughter, Lorenza, and Delfina Natividad to sew the Philippine Flag. He brought it home a few weeks before the battle.

Aguinaldo's flag design encapsulates the cultural and social inclinations of the nation. The white equilateral

triangle at the hoist part represents liberty, equality and fraternity as well as the figure symbol of the Katipunan, or Kataas-taasan, Kagalang-galangang, Katipunan ng mga Anak



ng Bayan (Supreme and Venerable Association of the Children of the Nation). The three yellow stars within the triangle stand for the three major island groupings of the country –Luzon, Visayas and Mindanao. The sun portrays unity, freedom, democracy and sovereignty while its 8 rays depict the 8 provinces that originally rebelled, under a central leadership, against Spain –Manila, Cavite, Bulacan, Laguna, Batangas, Pampanga, Tarlac and Nueva Ecija. The blue horizontal stripe at the top signifies peace, truth and justice while the red stripe at the bottom means patriotism and valor.

Unlike many countries that use another flag for wartime, the Philippine flag signals open hostilities against a foreign aggressor by displaying the red stripe at the top of the flag. This happened during the Filipino-American War in 1899-1902, the Japanese invasion in 1941-1942, and the Philippine Liberation in 1944-45.

The current **Flag Law** lists down the circumstances on the proper placement, handling, use and disposal of the Philippine Flag. It also enumerates sanctions for dishonoring and disrespecting the flag. However there is one aspect that the law probably missed: displaying the flag beneath the surface of the sea as what was done on 12-June-2017 at the shallowest portion of the Philippine Rise off Quezon province. Two legislators joined defense and military officials witnessing the planting of a standard-sized laminated fiberglass Philippine Flag 72 meters below sea level. With no other claimants, this move appears more for publicity than for a substantive maneuver.

This action may have been inspired by two similar but separate events. In 2007, a Russian submarine with a Parliamentarian onboard, placed a titanium-made Russian flag in Lomonosov Ridge in 2007 in the Arctic Ocean floor 4,261 meters from the surface, to strengthen its claim against Denmark and Canada. Three years later, China did something in an undisclosed location in South China Sea 3,760 meters below, using 2 submersibles with a top marine scientist aboard for the same reason: to claim ownership or rights. A Canadian political professor referring to the Russian initiative revealed that putting a submerged marker, such as a flag, in the Arctic Ocean has no international legal effect, and termed it "legally insignificant."

Another important aspect in the **Flag Law** is the use of flag collar pins. Popularized by former US President Richard Nixon in late 60s, senior government officials attending international events wear flag collar pin to identify the country they represent. In the Philippines, the **Flag law** authorized the wearing collar pins not only by government officials by other Filipino citizens. Indeed the proper use of collar flag pins indicates respect to the country and its people. It is sad to note, however, that at one time in the recent past, many high government officials wore yellow ribbon pins instead of the flag pin. Some viewed this as unpatriotic, disrespectful to the flag, and politically divisive.

Given the country's archipelagic configuration and vast maritime domain the **Philippine Navy** and the **Philippine Coast Guard** often "*show the flag*" seaward of the territorial waters and the contiguous zone, and up to the fringes of the Exclusive Economic Zone (EEZ) –not to exercise sovereignty but to assert the sovereign rights vested by the UN Convention on the Law of the Sea and Philippine laws. In the past, these two maritime forces termed their watch-keeping

missions in those areas as "*sovereignty patrols*."

Those sea patrols deter poaching and illegal, unregulated and unreported fishing, prevent unauthorized exploitation of seabed minerals and energy sources, and dissuade transnational crimes and other illegal activities like marine pollution and environmental degradation. Apart from maritime law enforcement, they could render assistance to distressed vessels and conduct search and rescue operations. The constant presence of seagoing forces in the EEZ contributes to the safety and security of the merchant ships and fishing vessels, thus assuring the freedom of navigation. This freedom enhances trade and commerce that in turn bring about progress and prosperity to the peoples of this planet.



Relatedly, the country's UN Peacekeeping Contingents in some parts of the world proudly display the Philippine flag that they pledge allegiance to. These peacekeepers live by the core values of honor, loyalty, valor, duty and solidarity. They took their oath, and affixed their signature, to uphold and defend the Constitution, abide by the laws of the land, and follow the orders of the duly constituted authorities.



The men in uniform respect and honor the national flag as the rest of the Filipino and their civilian leaders do. To revere the Flag requires a little more sacrifice: to be united in thought and action, to be just and fair in dealing with fellowmen, to be truthful in relationships with all sectors of the society and international community, and to be valorous in defending the country's sovereignty. 🇵🇭

ENGAGING WITH CHINA

by Commo. Carlos L Agustin AFP (Ret)



The 2018 National Security Strategy of the United States revealed a change in posture, tacitly stated by Christopher Preble in his article *"The Benefits of Engaging with China Far Outweigh the Costs and Risks"* (30-January-2019) in *The National Interest*:

The assumption that engagement with rivals and their inclusion in international institutions and global commerce would turn them into benign actors and trustworthy partners ... turned out to be false.

In the same article on *The National Interest*, Preble, citing Tom Wright's book, *"All Measures Short of War,"* expressed Wright's view that,

... globalization was the most powerful idea of the 1990s and 2000s. In those days, foreign policy experts and corporate CEOs believed that "as countries embraced globalization, they would become more 'responsible' members of the liberal international

order and would, over time, liberalize domestically.

Globalization was accepted wholeheartedly by the Philippines since the Ramos administration, and may I dare say that we were "gung ho" about it, akin to shooting ourselves in the foot.

Prof **Kanishka Jayasuriya** of **Murdoch University**, Perth, Australia discusses in his article the termination of this engagement (*"The United States is past engaging with China,"* East Asia Forum, 30-May-2019). He describes the executive order issued by President Donald Trump as *"another blow to China as a potential strategic technology competitor to the United States and follows in the wake of the 25 per cent US tariff on a broad swathe of Chinese goods,"* and adds:

This is more than a resetting of the trade relationship between China and the United States. US policymakers have sought to engage and integrate China into the global economy via global trade rules and institutions since the 1980s.

"The trade war has caused American exporters to lose market share in China," a Chinese government official says in defending Beijing's position. Photo: Reuters/South China Morning Post

Past US administrations based their China policies on the assumption that China's economy will move to a more liberal market order via institutional adjustments imposed through global rules. These strategies led to a complex and intertwined relationship between the United States and China. The changes signaled by Trump's executive order reflect a post-engagement policy supported by the US security community. A significant element of this post-engagement policy is the overt disregard for the WTO rules, which have been a US political project since the Cold War.

A key element of this post-engagement policy is the reconfiguration of security and economics within both trade and strategic policy. The integration of China into the economic order was originally premised on the primacy of a US-based security order in the Asia Pacific. This has been challenged on two fronts. One is the emergence of Chinese political and economic projects such as the **Belt and Road Initiative**, seen as a challenge to US dominance. The other is the **strategic assertiveness of the Chinese military**, particularly in the South China Sea.

The complexity of the relationship revolved around perceived conflicting influences introduced by respective goals and strategies involving the US pivot to Asia on the security side and the **Trans Pacific Partnership (TPP)** on the **economic side** vis a vis **China's transgressions on the South China Sea** and the **Belt and Road Initiative (BRI)**.

As a China watcher since the '60s and a CBM player of long standing, I wish all these woes would go away. I remember very clearly the developments coinciding with the fall of Soviet communism and the later collapse of the USSR. I noted in a visit to Russia and the Soviet countries along the Black Sea in 1984, and the kind of development I saw. I thought that once the USSR opened up and became a market economy, it would easily catch up with the West as I wondered in awe about the infrastructure I saw on the Soviet countryside.

But even with the collapse of Communism, we now know it did not happen there. Democracy had introduced something else in Russia – loosening of control by Moscow had enlivened selfish, corrupt interests to gain much headway, thus good governance had to take a secondary position. They did not see the economic advantage that China correctly perceived, and they did not have cheap labor that became a major engine of growth in China.

China's poverty at that juncture (by the late '80s to early '90s) enabled it to take advantage of cheap labor, its stability (by not following Soviet style democratization) and the new confidence of the West towards China's amiable goals. US industry and commercial interests thought that China was now worth investing in, the way it did with Japan, South Korea, Taiwan and the NICs of Southeast Asia in the '50s through the '70s (I blame US economic managers for not having a strategic plan on this, evidenced by not providing the private sector with some kind of policy). Its rich allies followed suit and China then took a path similar to that of



Japan and Germany decades ago – developing via manufacturing of consumer items initially, and exporting them to the United States and other destinations, creating slowly and later accelerating swiftly, a tremendous imbalance in trade.

Could the China engagement policy, viewed within a US-led international market reform agenda that has both economic and security dimensions, be managed under friendly circumstances? I contend that it can be done, had the developments on the West Philippine Sea not taken a turn for the worse. Here, I have officially declared at a Philippine Senate hearing that I considered “premature”, as I believed then, the filing of the arbitral case was a folly of the Aquino administration during its final 2 years, because it created the situation that led China to successfully test US resolve to preserve the status quo on the WPS. China succeeded in finding out that the US resolve was weak, and thus emboldened it to reclaim and militarize several reefs and shoals.

I was convinced that “premature” was correct when during a discussion with some seasoned Filipino old timers in Beijing in 2017, they asked the same thing. I stated, “Well, we (the Philippines) filed the case because China insisted that it had indisputable sovereignty.” The learned response is, “Well, that is what negotiation is all about; you declare your maximum position at the outset and try not to give in.”

Indeed, as I have stated in several fora, the single most important cause of instability in East Asia today has been China's intransigence with respect to the South China Sea claims. Despite the early gains in CBM that nevertheless just resulted in a stand-off but which could have been peacefully handled with the participation of that ingenious organizational device called the ASEAN Regional Forum, or just the ASEAN plus 3; or merely ASEAN plus one, the Elephant in the Room.

I really have not lost hope on this. The earlier we get the ASEAN countries to agree to discussing this, and, China acceding to come to terms –and not take on its neighbors in seeking revenge for centuries of injustice from Western and Japanese domination– the better it would be for the world. 🇵🇭



COAST GUARD PRESENTS NEWLY ACQUIRED RESCUE ASSETS

by PCG News

As part of the **Philippine Coast Guard's (PCG)** capability development program, newly acquired rescue boats, vehicles and other equipment were presented yesterday, 30-May-2019, to beef up the agency's readiness for the expected threats of typhoons that may hit the country this year.

During the blessing and launching ceremony at the **PCG** Headquarters yesterday, the **PCG** Commandant **Admiral Elson E Hermogino**, together with senior officers of the Coast Guard, inspected 20 **aluminum boats**, 20 personal **watercrafts** (jet skis), rigid hull **inflatable boats**, and **Hilux** pick-up trucks. **Admiral Hermogino** said the **PCG** is expecting the delivery of additional 73 units of **rubber boats** with outboard motor, 11 (7-meter) rigid hull **inflatable boats**, and 40 (35-footer) small **patrol boats** by September this year. Meanwhile, out of the 180 pick-up trucks, 112 will be delivered in June.

The new rescue assets, which will be manned by the **Coast Guard Special Operations Force** and rescue personnel, will be distributed to PCG units nationwide particularly in areas identified as flood-prone.

Admiral Hermogino expressed his appreciation to President Rodrigo Duterte and DOTr Secretary Arthur Tugade for the continuous support to the capability enhancement programs of the PCG. He said these assets would vastly improve the services of the organization to the Filipino people particularly in saving lives and responding to disasters.

On PCG's "Oplan Kahandaan" in relation to the rainy season, the Commandant said that all Coast Guard units nationwide have been directed to prepare and initiate proactive measures to prevent/minimize the loss of lives and properties from maritime and land-based accidents.

The directive provides that all rescue units nationwide such as disaster response and quick reaction teams composed of divers, rescue swimmers, paramedics and K-9 units should be on highest level of readiness at any given time.

In addition, safety inspectors should exercise extra vigilance in undertaking maritime safety-related measures such as intensifying inspection of ships prior departure; ensuring vessels have no unauthorized passengers in conformance with the allowed passenger capacity onboard to avoid overloading of vessels; checking of life jackets and fire-fighting equipment; strengthening its public awareness campaign to highlight safety during inclement weather especially to the fishing community; and non-patronage of colorum inter-island watercrafts.

All Coast Guard units nationwide are also tasked to coordinate and encourage operational cooperation with other government agencies such as the Armed Forces of the Philippines, Philippine National Police, **National Disaster Risk Reduction and Management Council**, as well as the **Philippine Red Cross**, to ensure community safety. ⚓



Photos Courtesy of Philippine Coast Guard



Columbia Ship-management's Performance Optimization Control Room was officially opened in December 2018. Photo Credit: Columbia Ship-management, Cyprus.

THE THREE P'S OF VESSEL PERFORMANCE OPTIMIZATION

by Vessel Performance Optimization (VPO News)

Columbia Ship-management has a vision for fully connected vessels with near real-time information exchange, strengthened processes, decision-making, and value creation for customers through end-to-end voyage optimization. **Pankaj Sharma, Columbia Control Room manager of Columbia Ship-management** believes that three aspects are critical to achieving this vision – implementing a scalable platform, ensuring the right people are working for you, and facilitating robust processes of business.

High-speed data at competitive prices is facilitating the rapid digitalization of the shipping industry. The quantity and quality of data available today has dramatically changed the ability for ship and shore to communicate, but the most critical change it has brought, according to **Sharma**, is the way vessels are operated. In-depth insight into ship performance is possible thanks to advanced digital technologies that measure, report, and analyze a vessel's operation at any given time.

While this kind of feedback is critical to improve the safe and efficient operation of a vessel, **Sharma** says that having the correct platform, the right people, and the necessary processes are the determining factors when it comes to maximizing vessel performance.

The Platform. The first component to improving vessel performance is to ensure a scalable, integral, and smart platform is in place. Various data are being generated far more quickly than previously, and this requires a constant reassessment of the operational situation. *"You have to go through a test of value*

to know what you're doing, why, and how you're doing it to really understand where gains can be made," **Sharma** explained to delegates attending **VPO Global Forum** in Cyprus. A digital platform that aims to help with decision-making needs to be able to adapt to whatever environment it is being operated in, and continuously improve on processes of a job.

The platform has to be smart and drive a proactive nature among workers. *"Whatever we are shown, whatever we visualize, it has to make us proactive. It has to create leading indicators, such as alerts, that show us there has been a change. We need to be given information in real-time. Information that helps us know when, where, and how to intervene,"* explained **Sharma**.

A platform also requires smart techniques to manage the increasing amounts of data generated. "While you can generate a lot of data today, you need smart techniques and machine learning to predict trends almost instantly, that would have taken a long time to predict years ago. In **Columbia's** new performance Control Room, which opened in Cyprus in December 2018, self-correcting models and machine-learning enable comparison of years of historical data with real-time data to predict vessel performance trends in a matter of minutes, compared with the decades it would have taken to provide this several years ago.

The People. In addition to having the right platform in place, ensuring that the right people are doing the right thing is essential. The right people will be the ones that are skilled, but also have a positive attitude and motivation towards the task at hand, and have a desire to contribute to the current

mission, whether that be fuel performance, safety, or any other aspect of a vessel's operation. "People who understand why an improvement needs to be made are more likely to be motivated to implement the changes," **Sharma** stated.

However, this understanding and motivation often stems from having the right support. "Support is essential," **Sharma** confirmed. At the **Columbia Control Room**, which is open 24/7, experts are constantly giving advice to the captain and his team. **Sharma** refers to this as 'A proper support system'. "Say there is one captain onboard and he is trying to make a decision that he is not fully sure about. What does he do?" Via **Columbia's Control Room**, a captain in such a situation can get access to the opinions of other captains to help with his or her decision making. According to **Sharma**, this kind of approach and shared knowledge provides support for onboard crew responsible for the vessel's operation, but it also encourages a culture of 'why' and 'how' thinking.

Speaking at the **VPO Global Forum**, **Sharma** said that he believes it is important for people to constantly assess whether they are moving in the direction they want. They must ask themselves, "Are we moving in vain? Are we making anyone's life easier? Are we helping our technical department get more information more quickly? And are we helping our marine department do a quick analysis of what just happened onboard? You have to assess the value of what you are doing, why you are doing it, and the need for doing it."

The Processes. Optimizing your processes is "very important but easily to forget about once you have the system and the people in place." Robust processes are key for end-to-end optimization and an understanding around why a platform is being developed and how it is going to deliver value is essential.

Often there is this idea that once you have the information in place, you can figure out where to go from there. You can work out what you will do with the data and how you will use it to improve vessel performance. But this isn't the right way to work in **Sharma's** eyes. All of this should be figured out beforehand and factored into the budget.

Sharma believes that capturing data to obtain insight into engine performance and fuel consumption is only useful if you analyze the data smartly. And simplify it. He explained that often there is too much data and it is too complicated. "Simplifying data means to understand what is going right and what is going wrong. You need a traffic light system where you begin by focusing on the things you want to see, largely related to compliance, and then you look in detail at hull performance, propeller performance, etc. Compliance is a huge cost, so you need to simplify the data and see simply what it means for compliance."

Once the data is simplified, there is the advantage of actually being able to understand it and then use it to optimize performance. This is the first stepping-stone in developing a platform that will aid in performance optimization. "We need to know the reason why we are developing a platform and how it is going to deliver value," **Sharma** explained.

Columbia Ship-management's Performance Optimization Control Room was officially opened by Ms. **Natasa Pilides**, Cyprus Deputy Minister of Shipping, who referred to "the growth of Columbia and the quality of its operations as a result of the excellent culture, and the extremely high calibre and the hard work of its people." The Control Room will deliver faster decision-making and greater visibility by using modern technology to optimize vessel safety, security, and fuel consumption. ⚓

WHAT IS SEASPEAK?

by NOAA



Whether on the high seas or at port, misunderstood communication can lead to serious and even dangerous situations. "Seaspeak," the official language of the seas, helps to prevent miscommunication.

Seaspeak is the official language of navigators the world over. As the official language of the seas, **Seaspeak** helps to prevent any form of miscommunication. And since miscommunication can easily lead to serious and dangerous situations, seafarers use a specific language to prevent nay accidents from happening.

Have you ever wondered how crews on ships at sea communicate? Nowadays, crews consist of men and women from all over the world, and often, a single ship's crew comes from a number of different countries. But that was not always the case. Back in the 1960s, the United States and the United Kingdom dominated ocean traffic, and 80% of ships' crews were native English speakers. By the end of 1970s, however, the situation had reversed, and today, 80% of ship's crews do not speak **English** as a first language.

So what happens when a ship captain needs to communicate to their crew, to another ship, or to shore? Whether on the high seas or at port, misunderstood communication can lead to serious and even dangerous situations. To avoid such confusion, in 1983 a group of linguists and shipping experts created a new system of communication called Seaspeak.

English was chosen as the principle lexicon for **Seaspeak** because it was the most common language spoken on ships at that time, and it was also the language of civil aviation. In 1988, the **International Maritime Organization (IMO)** made **Seaspeak** the official language of the seas.

Seaspeak defines the rules of how to talk on a ship's radio. The number of words is limited to ensure that messages and conversations are short and clear. 8 words, called **message markers**, precede each sentence. These words are: *Advice, Answer, Information, Instruction, Intention, Question, Request, and Warning.*

An important rule of **Seaspeak** is that numbers made up of two or more digits are spoken in single digits. For example, the number 33 is spoken as "three three" and the time 9:33 a.m. is spoken as "zero nine three three." **Coordinated Universal Time**—the primary time standard or international time scale by which the world regulates clocks and time—is always used at sea. ⚓

THE MISSING MARITIME ZONE

By Julius A. Yano, J.D., LL.M.

Not all the maritime zones of the 1982 United Nations Convention on the Law of the Sea (LOSC) are automatically ascribed to a State.

The LOSC provides, among others, the different maritime zones as we know them. Among these are the Territorial Sea, Contiguous Zone, Continental Shelf and the Exclusive Economic Zone (EEZ). It is important to note – a point often overlooked – that not all of these zones are automatically generated in favour of a State. Thus, where it is necessary, a claim should be made if a State desires to have the relevant zone and be able to exercise the powers in relation to said zone.

As regards the Territorial Sea, it was held in the *Grisbadarna case (1909)* that 'maritime territory is an essential appurtenance of land territory'. Thus, as Judge McNair stated in the *Anglo-Norwegian Fisheries case (1951)*, 'The possession of this territory is not optional, not dependent upon the will of the State, but compulsory.' This idea would be echoed by Judge Fitzmaurice in the *Fisheries Jurisdiction case (1973)* as he discussed the responsibilities in relation to maintaining such maritime territory.

As regards the Contiguous Zone where limited jurisdiction is granted unto a coastal State, a claim to such zone is necessary. Professors Churchill and Lowe in fact explain that '[...] the contiguous zone is not automatically ascribed to the coastal State'.

As regards the Continental Shelf, the *North Sea Continental Shelf cases (1969)* teach that it constitutes a natural prolongation of the land territory such that the rights of a coastal State in respect of such area exist ipso facto and ab initio. Such rights are inherent to the State.

As regards the EEZ, that a claim to said zone is necessary is expressed in the Judgment in the *Libya/Malta case (1985)* where it is stated that 'although there can be a continental shelf where there is no exclusive economic zone, there cannot be an exclusive economic zone without a corresponding continental shelf.' This court dictum explains that the Continental Shelf, but not the EEZ, is automatically ascribed to a State.

A review of Philippine legislation shows that the Philippine State does not have a claim to a Contiguous Zone where 'the coastal State may exercise the control necessary to [] prevent infringement of its customs, fiscal, immigration or sanitary laws and regulations within its territory or territorial sea; [and to] punish infringement of [such] laws and regulations committed within its territory or territorial sea.' (Article 33 para. 1, LOSC).

Herein, the contributor believes that this matter is perhaps something that the government should look into. Thus, the pertinent communication, reproduced hereunder, has been respectfully made to the relevant government office for its consideration.

30 May 2019

Sir:

I wish to respectfully refer to your office a matter concerning the Contiguous Zone. As we know in international law, the Contiguous Zone, like the Exclusive Economic Zone, is

dependent upon an express claim by the coastal state of such zone. This idea can be contrasted with the concept of the Continental Shelf – that the rights of a coastal state in respect hereof "exist ipso facto and ab initio", following the judgement of the International Court of Justice in the 1969 North Sea Continental Shelf cases. Certainly, such concept is already a conventional rule embodied in Part VI of the 1982 United Nations Convention on the Law of the Sea.

Whilst we have Presidential Decree No. 1599 of 11 June 1978 in regard to our claim to an Exclusive Economic Zone, there appears to be no specific proclamation or legislation on our claim to a Contiguous Zone. The mention of a Contiguous Zone in Republic Act No. 7942, in my humble opinion, might not suffice under international law, especially if we take into account the fact that it fails to make reference to the particular and limited law enforcement powers granted onto a coastal state under the Contiguous Zone regime. In fact, the Summary of Claims published online by the United Nations-Division on Ocean Affairs and Law of the Sea (DOALOS) does not indicate a Philippine Contiguous Zone.

In view of the foregoing, if it is the desire of the Philippine State to have a Contiguous Zone and to be able to exercise the control necessary to prevent and punish violations of our customs, fiscal, immigration and sanitary laws beyond our territorial sea, it is my humble submission that an express claim or declaration should be made in regard hereto. Subsequently, it is suggested that the pertinent communication be made to the DOALOS so that such claim will be recorded and reflected in their database.

I thank you for your consideration of this correspondence. With all my best wishes for you and the country, I am

Very truly yours,
(Sgd.) Julius A. Yano

12 July 2019

Sir:

I thank you for your 18-June-2019 letter in relation to which I am submitting this reply.

In view of your pleasant advice, there is no doubt that any issue on the supposed Contiguous Zone of the Philippines is properly addressed by your office. In any event, please allow me to provide the following comments as further contributions to the discourse:

A scrutiny of copious texts on the Contiguous Zone reveals that the 'declaration' referred to by some commentators in relation to the Contiguous Zone is in the sense of 'publication' for which there is indeed no requirement under international law. Such 'declaration', however, should not be understood in the sense of 'claiming'.

In fact, the development of the Territorial Sea regime demonstrates the need to claim a Contiguous Zone as well as the reason some States do not declare such zone – in 1958 at UNCLOS I, whilst States failed to settle the issue on

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the breadth of the Territorial Sea, they were able to set the maximum limit of the Contiguous Zone at 12nm. Thus, if a State claimed a 3nm Territorial Sea – the norm at the time – it could still enforce its limited jurisdiction up to an additional 9nm of Contiguous Zone; further, if a State claimed a 9nm Territorial Sea, its limited jurisdiction could still be exercised beyond no more than 3nm from the outer limits of its Territorial Sea; finally, if a State claimed a Territorial Sea of 12nm, there would be nothing left for its Contiguous Zone. At the conclusion of UNCLOS III in 1982, it was finally resolved that the breadth of the Territorial Sea should not be more than 12nm, the same distance fixed as the maximum limit of the Contiguous Zone 24 years earlier.

In view of the recognition under the modern law of the sea of a broader Territorial Sea over which a coastal State has sovereignty, some States no longer see the need to claim a Contiguous Zone. (In addition, owing to the development of the concept of the Exclusive Economic Zone, some States think it redundant to still claim a Contiguous Zone. This view, as we know, is however inaccurate given that the two zones serve different purposes.) Hence, further exercise by a coastal State of Contiguous Zone powers beyond the erstwhile maximum limit of 12nm up to 24nm from its baselines per the 1982 Law of the Sea Convention (LOSC) will have to be premised on the claim to such zone.

Given this historical backdrop, the statement by some commentators to the effect that a State 'is not obligated to declare a contiguous zone' could only mean that it is not mandatory for a State to establish such zone. It hardly suggests that the default scenario or presumption is in favour of the existence of such zone such that a claim or 'declaration' can be dispensed with.

Thus, the National Territory provision in the 1987 Philippine Constitution might be of scant assistance, given that there has not been a Philippine claim to a Contiguous Zone. The Philippine Mining Act of 1995 unfortunately focusses on the 'submerged lands within the contiguous zone' and not on the relevant law enforcement powers. One cannot help thinking that the idea of the Contiguous Zone in said Act might be a conflation with the concept of the Continental Shelf which is altogether different.

Indeed, a Philippine Maritime Zones Law will clarify the issues on these maritime zones. Considering however the concern that such law could run contradictory to the present Constitution – an argument raised, albeit prematurely perhaps, by the Petitioners in *Magallona v. Executive Secretary* – we can anticipate obstacles to the enactment of such a law.

As the Philippines moves to comply with its international obligations under the LOSC, it will inevitably have to surrender certain powers that it might have had previously. Thus, it is respectfully submitted that a claim to a Contiguous Zone shall serve to somewhat compensate for such a surrender so that the Philippines is still able to possess and exercise certain powers in areas beyond its Territorial Sea.

I am grateful for the opportunity to have expressed my views on this matter. I am, dear sir,

Faithfully yours,
 (Sgd.) Julius A. Yano



MARITIME NAVIGATION: A LOST ART?

by Timothy Muelder



Navigation by definition is the process or activity of accurately ascertaining one's position and planning, and following a route. Also, navigation is a field of study that focuses on the process of monitoring and controlling the movement of a craft from one place to another.

The past few years have recorded many global maritime incidents, collisions, groundings, and sinkings. The Philippine waters were not spared the catastrophes, although **MARINA** has made strides in reducing the number in local waters.

Studies have shown bridge communications, distractions, and high reliance on electronic devices is a common denominator for many of the incidents.

The **USS Guardian** ran aground on **Tubbataha Reef** about 80 miles southeast of the western island of Palawan. An investigation report stated a faulty electronic chart was a leading cause. There have also been rumors of GPS navigation systems being hacked to disrupt safe navigation of maritime vessels. I do not believe this has ever been confirmed.

There have been many other incidents at sea, on a global scale, attributed to poor navigation and bridge practices such as cell phone use on the bridge, much paperwork and reports to be completed, usage of electronic charts, and GPS—all actually preventing watch standers from looking out the window.

I was on a small cruise ship in Greece a number of years ago and toured the bridge. I noticed one seaman standing front and center at the bridge window never taking his eyes off the horizon over the bow.

The other officers on the bridge were going about performing their duties occasionally going out on the bridge

wings to sweep the horizon 360 degrees with binoculars.

One other thing I noticed was a nautical chart on the table with a "dead reckoning" plot of the course we were on and projected out to where we were going.

It also had bearing sightings from known navigational aids for checking our actual position. The electronic chart, auto-pilot, and GPS were also there but these seamen also knew and did things the "old school" way.

I am a firm believer of "old school." Electronic devices are convenient and for the most part reliable and accurate. But, what if they fail? Electricity and salt water/air don't mix very well so being prepared is the prudent way to avoid an incident. In my case, I've never gotten proficient using a sextant for noon sun sightings and celestial navigation as I'm mostly on coastal waters and not trans-oceanic voyages so I never found the need.

When I took the **Greek Captain's License Exam**, I brought my own tools for the navigational portion. I confess it's been quite some time since I've used them but I do get them out occasionally to clean and polish the brass.

I would hope in all maritime schools navigational training will include bearing-taking, dead reckoning course plots, sextant use, and use of actual maritime charts in tandem with the use of electronic navigation aids to produce a well-balanced and proficient navigator. Knowing both where you are and where you're going is key for a safe voyage.



About the author: Timothy Muelder is a retired Facilities Manager of the U.S. Department of State.

**South China Sea
Major Crude Oil Trade Flows
Millions of barrels per day
2011**



STRANGLING GLOBAL SHIPPING

by Timothy Muelder

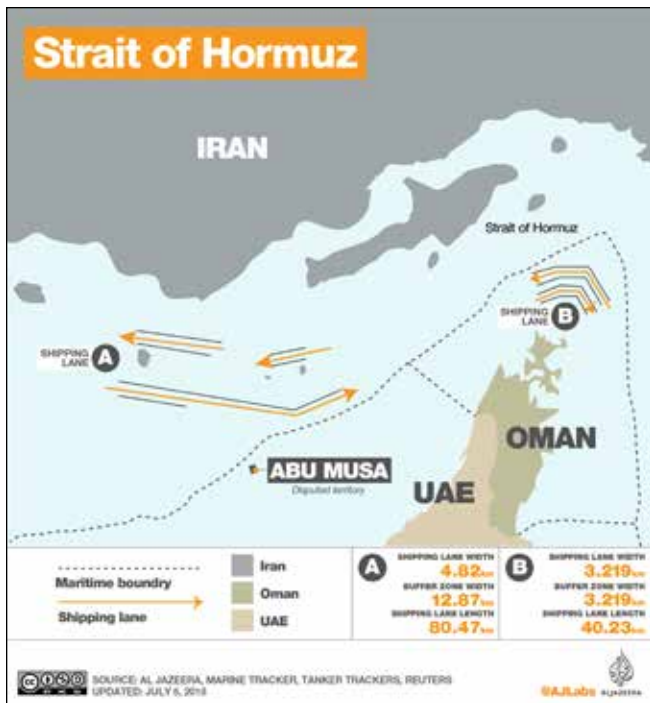
Recent events in the **West Philippine Sea** as well as other incidents involving shipping lanes, ferry crossings/sinkings, oil discharges into open water, and attacks on vessels, should have brought the attention of the global maritime industry. In monitoring the news, I see it has not.

This spiked my curiosity as to why and what would happen if global sea lanes were disrupted for an extended period of time. I focused on the eastern global hemisphere.

What I found, in multiple areas, were two areas of potential importance: the **Strait of Hormuz** and the **Malacca Strait**.

The **Strait of Hormuz** links the Arabian Gulf to the Gulf of Oman. It is only 21 miles wide and 20% of global oil is transported through the strait averaging 14 tanker ships a day.





Recent events involved two Japanese vessels suffering explosions that were blamed on Iran. Iran has denied any involvement although in the recent past Iran has threatened to close the **Strait of Hormuz** to any traffic, flexing its muscle to the world. In retaliation to the accusation, Iran shot down a U.S. unmanned drone monitoring the area. Tensions in the area remain strenuous but stable. There have been many multiple country incidents in the sea lanes traversing the **Strait of Hormuz**. This could pose an enormous impact in Asia since much of the **Strait of Hormuz** traffic heads towards the **Malacca Strait**.

Without a doubt, the Malacca Strait is the most important sea lane on the globe. It is 550 miles long and only 2 miles wide at its narrowest point, passing Indonesia, Malaysia, and Singapore. It connects the Indian Ocean with the Pacific Ocean through the **West Philippine Sea**, China Sea, **East Philippine Sea** and Java Sea, linking all Asian countries for energy, durable goods, and product materials for all Asian markets before heading further to the East towards Oceania.



There are approximately 94,000 vessels that transverse the **Malacca Strait** annually. Much of the traffic involves the vessels traversing from the **Strait of Hormuz**. Terrorism, Piracy, Human Trafficking, and Shipwrecks are an unfortunate legacy of the **Malacca Strait**.

Any disruption to the orderly movement of vessels through the **Malacca Strait** will have significant impact on the countries bordering the **West Philippine Sea**, the China Sea, as well as further to the East.

The recent militarization of Islands in the **West Philippine Sea** pose another point of concern as that adds another potential area of disruption to the orderly flow of maritime traffic through the area. It is understandable that many are concerned regarding the intrusion, with a degree of aggression, into the territorial sovereign waters of the Philippines with militarization of some islands. This is a major Philippine concern.

It would be prudent to have a global, consorted and comprehensive, expanded view of the developing maritime issues against the related global impact should one entity gain control of the most important waterways for commercial shipping. Under this scenario, any disruption in the global maritime traffic will have significant impact on all nations.



About the author: Timothy Muelder is a retired Facilities Manager of the U.S. Department of State.



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AUSTRALIA FUNDS WORLD'S FIRST OFFSHORE BLUE ECONOMY PLATFORM

by Australian Maritime College

The **University of Tasmania** will lead the largest ever **Cooperative Research Centre (CRC)**, bringing together expertise in seafood, renewable energy, and offshore engineering to transform Australia's blue economy. The **Blue Economy CRC** aims to drive an evolution in marine-based industries, unlocking enormous economic, environmental and technological benefits. The \$329 million research project is a 10-year collaboration between 45 national and international partners from industry, research and government, underpinned by a \$70 million cash investment from the Federal Government. The Tasmanian Government is also a supporting partner, which has been a key factor in gaining local industry involvement. Vice-Chancellor Professor **Rufus Black** said the Launceston-based **Blue Economy CRC** would build on Tasmania's and the University of Tasmania's distinctive strengths in aquaculture and marine ecology, offshore engineering and marine renewable energy.

"This is big blue sky thinking fused with practical impact research to answer one of our planet's most critical questions: how can we sustainably feed and power ourselves from the world's oceans," Professor Black said. The Blue Economy CRC imagines a future where integrated seafood and renewable energy production systems operate offshore and where the community and industry have confidence they are safe, reliable, efficient and environmentally responsible. "This work will leave a compelling legacy of high-impact research, a competitive advantage for Australian industry, and innovation, collaboration and leadership on a global scale. And it will further solidify Northern Tasmania as an important hub for marine engineering and ocean renewable energy – a place where we can imagine new futures and chart a course to reach them."

The **Blue Economy CRC** head office will be hosted at the

University of Tasmania's Launceston campus, supporting a research community of 50 PhD students and 50 postdoctoral research fellows throughout Tasmania, and with partner organizations nationally and internationally. **Blue Economy CRC** Research Director, **Australian Maritime College** Professor **Irene Penesis** said the program was unique in bringing together aquaculture, renewable energy, and offshore engineering. *"Australia has the world's third largest exclusive economic zone and is positioned adjacent to the largest markets for seafood and energy," Prof. Penesis said. "But with over 80% classified as offshore, industries must be enabled to move from the coast zone into more exposed operating environments before we can secure this major opportunity for the nation. The CRC will translate new developments in science and technology into commercial activity in ways that support our industry partners to create advantage in this evolving market."*

The focus of the first 5 years of the program will be developing and testing new offshore aquaculture and renewable energy technologies, which will then be brought together on a single platform to demonstrate the economic and environmental benefits of co-location. *"The offshore research platform will act as a living laboratory where we can vertically integrate renewable energy and aquaculture technologies with other engineering activities, such as autonomous and remotely-operated vehicles, in a proof of concept for how we could operate in the future," Prof. Penesis said. "It will be the first offshore research platform of its kind in the world and we're confident that it will deliver ground-breaking research alongside commercially viable new materials, concepts, prototypes and monitoring systems – all informed by best practice and delivered in an environmentally sustainable way."*

While the solutions will be developed in the immediate term for the Tasmanian offshore environment, the involvement of international partners will help move the development of new technology to global markets.

The **CRC** is expected to generate more than \$4 billion for the national economy. **IMAS** Professor **Stewart Frusher** said the development of new environmental guidelines and policies was an integral part of the research program. *"CRC provides a unique opportunity to simultaneously support policy development, environmental monitoring and management while securing sustainable and ethical industry expansion," Prof. Frusher said. "Australia has a global reputation for quality, safe and sustainable seafood and management of its marine natural resources and biodiversity. The CRC will provide governance for the new industry capability to position Australia as the market leader in this burgeoning area."* ⚓



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ELECTRONIC INFORMATION EXCHANGE NOW MANDATORY FOR PORTS

by IMO News

A mandatory requirement for national governments to introduce electronic information exchange between ships and ports came into effect on **8-April-2019**. The aim is to make cross-border trade simpler and the logistics chain more efficient, for the more than 10 billion tons of goods which are traded by sea annually across the globe.

The requirement, mandatory under **IMO's Convention on Facilitation of International Maritime Traffic (FAL Convention)**, is part of a package of amendments under the revised Annex to the **FAL Convention**, adopted in 2016.

"The new FAL Convention requirement for all Public Authorities to establish systems for electronic exchange of information related to maritime transport marks a significant move in the maritime industry and ports towards a digital maritime world, reducing the administrative burden and increasing the efficiency of maritime trade and transport," IMO Secretary-General **Kitack Lim** said.

The Facilitation Convention encourages use of a "single window" for data, to enable all the information required by public authorities in connection with the arrival, stay and departure of ships, persons and cargo, to be submitted via a single portal, without duplication.

The requirement for electronic data exchange comes into effect as **IMO's Facilitation Committee** meets for its 43rd session (8-12 April). Alongside other agenda items, the Committee will continue its ongoing work on harmonization and standardization of electronic messages. Phase one of the review of the **IMO Compendium on Facilitation and Electronic Business**, including the data elements of the **FAL Convention** is expected to be completed and the revised **Guidelines for setting up a single window system in maritime transport** are set to be approved.

The **IMO Facilitation Committee** will also receive an update on a successful **IMO** maritime single window project, implemented in Antigua and Barbuda, with Norway's support. The source code developed for the system established in Antigua and Barbuda will be made available to other interested Member

States. A presentation on the system will be made during the **IMO Facilitation Committee**.

The **FAL Convention**. The main objective of the **IMO's Convention on Facilitation of International Maritime Traffic (FAL Convention)**, adopted in 1965, is to achieve the most efficient maritime transport as possible, looking for smooth transit in ports of ships, cargo and passengers.

The **FAL Convention**, which has 121 Contracting Governments, contains standards and recommended practices and rules for simplifying formalities, documentary requirements and procedures on ships' arrival, stay and departure.

Under the **FAL Committee**, **IMO** has developed standardized **FAL** documentation for authorities and Governments to use, and **FAL Convention** urges all stakeholders to make use of them.

The **IMO Standardized Forms (FAL 1-7)**. The **Facilitation Convention** (Standard 2.1) lists the documents that public authorities can demand of a ship and recommends the maximum information, and number of copies that should be required. **IMO** has developed **Standardized Forms** for 7 of these documents.

They are:

- ◆ IMO General Declaration
- ◆ Cargo Declaration
- ◆ Ship's Stores Declaration
- ◆ Crew's Effects Declaration
- ◆ Crew List
- ◆ Passenger List
- ◆ Dangerous Goods

Five other documents are required — on security, on wastes from ships, on advance electronic cargo information for customs risk assessment purposes, and 2 additional documents under the **Universal Postal Convention**, and the **International Health Regulations**.

Under the requirement for electronic data exchange, all national authorities should now have provision for electronic exchange of this information. 📍

NEW APP TO HELP SAVE MILLIONS LOST ON REJECTED DEMURRAGE CLAIMS

A new app developed by a specialist demurrage analyst hopes to save the oil and tanker industry millions by simplifying the demurrage claims process. Digital Ship spoke with the creator of the app, Ms Leena Asher to find out more.

In the oil and tanker industry, millions of dollars are being lost due to the rejection of demurrage claims as a result of delays in submission beyond the agreed time frame.

Demurrage is a simple calculation of over use of time over and above what has been agreed between oil tanker owners and charterers. A demurrage claim is made by a shipowner to a charterer if the loading/unloading is delayed and if the owner is breaching the laytime as stated in its charter party contract.

However, speaking to Digital Ship, Ms Asher, a specialist Demurrage Analyst, said that claims are being rejected because submission is made after the agreed time bar, something that is not an unusual occurrence.

A claim can fail or be rejected if not made within the allocated time period, sometimes in as little as 90 days in the

tanker industry, or if the correct documentation does not accompany the claim. This can leave shipowners at a significant loss. "The demurrage industry in itself is worth millions of dollars," Ms Asher said.

Shipowners, therefore, have to be extremely careful when submitting a demurrage claim, ensuring they have the correct documentation and do so within the time period to minimize the chance of it being rejected.

Realizing the problems shipowners were facing and the losses tied up in submitting late claims for demurrage, Ms Asher developed an app that calculates demurrage claims on the go and without access to their usual systems, helping to save the

oil and tanker industry significant costs. To calculate demurrage using the I-Demurrage app, the user inputs 5 fields, and the calculator then works out the demurrage, and emails the results back to the user.

Ms Asher explained to Digital Ship that she noticed there was a gap in the market for a technology that could help to reduce these delays in demurrage claim submissions and the losses associated with rejected claims.

"I have been traveling between offices and carry my work along and I realized I was not always close to my systems and in the office environment to prepare the calculations and send out the claim. This is when I realized with almost every activity

available on the mobiles today, there was no app for the demurrage industry. That began the start of the I-Demurrage journey," Ms Asher told us.

While Ms Asher has been developing the app since May 2018, her background spans more than 20 years working alongside one of the largest oil companies in upstream and downstream operations. "My background did certainly help me



Leena Asher, specialist demurrage analyst and creator of I-Demurrage app. Photo Credit: Digital Ship.

to identify the gap initially," Ms Asher explained.

There were some challenges in developing the app, largely "designing the calculations that would work in the background," Ms Asher told us. "Every morning I would start with a clear mind to improve where I had left it the previous day. It took me several tests before I was satisfied with the final product."

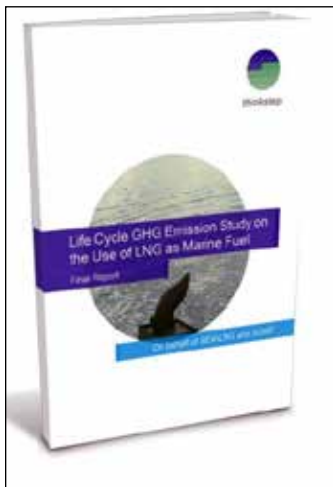
Following the initial development of the app, several peers began messaging Ms Asher and giving her feedback about the app, which led to further developments and its eventual launch. Ms Leena Asher hopes that the I-Demurrage app can help the oil and tanker industry save their demurrage claims from being time barred, and reduce capital losses. 📌

LIFE CYCLE GHG EMISSION STUDY ON THE USE OF LNG AS MARINE FUEL

by Thinkstep

The **Society for Gas as a Marine Fuel (SGMF)** is pleased to announce the results of the Well-to-Wake (WtW) Greenhouse Gas (GHG) Emissions Lifecycle Research Study on the use of LNG as a marine fuel. Independent consultants of Thinkstep specializing in life cycle analysis conducted the study. SGMF and SEA\LNG commissioned the study.

Dr Oliver Schuller, Team Lead Energy & Mobility at Thinkstep stated, "The main goal of this study is to provide an accurate report of the life-cycle GHG emissions from LNG as a marine fuel compared with conventional marine fuels."



The study is **objective**, having been peer-reviewed by a panel of leading academics from key institutions in France, Germany, Japan and the USA.

It is the **most accurate** study of the life cycle GHG emissions and local pollutants from **LNG** as a marine fuel compared with current and post-2020 conventional marine fuels as it is done on a complete **WtW** basis.

The study showed that on an engine technology basis, the absolute **WtW** emissions reduction benefits for gas fuelled engines today compared with HFO-fuelled

ships are between 14% to 21% for 2-stroke slow speed engines; and between 7% to 15% for 4-stroke medium speed engines.

The study is **comprehensive**, using the latest primary data to assess all major types of marine engines and global sources of supply. The following **Original Equipment Manufacturers** provided data for the study:

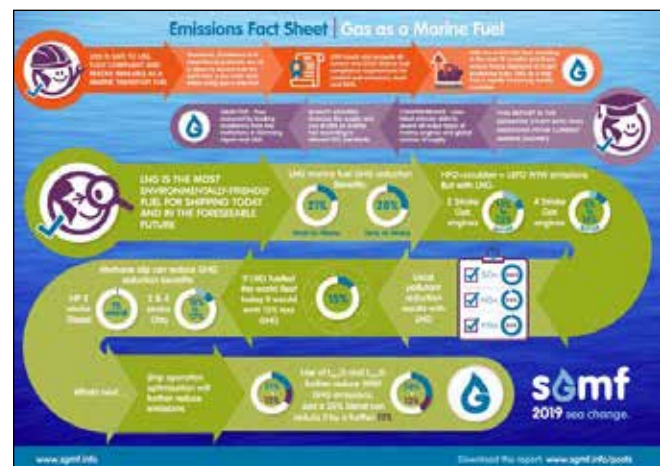
- ◆ Caterpillar MaK;
- ◆ Caterpillar Solar Turbines;
- ◆ General Electric;
- ◆ MAN Energy Solutions;
- ◆ Rolls Royce (MTU);
- ◆ Winterthur Gas & Diesel; and
- ◆ Wärtsilä.

The extensive industry experience and practical knowledge of the **SEA\LNG-SGMF** project oversight team ensured all the data used was the latest and best available.

The study is **quality assured**, as it assesses the supply and use of LNG as a marine fuel according to ISO standards.

Commenting on the report, **SEA\LNG** Chairman **Peter Keller** stated, "The **Life Cycle GHG Emission Study** is a long-awaited


piece of the '**LNG** as a marine fuel' puzzle. It not only confirms what we already knew in terms of **LNG's** immediate impact on air quality, human health and its cleanliness, but clearly highlights the genuine, substantiated GHG benefits of using today's marine engines capable of burning natural gas. Moving from current Heavy Fuel Oil (HFO) to LNG does reduce GHG emissions. LNG does contribute to the International Maritime Organization (IMO) GHG reduction targets. And It is clear that LNG is the most environmentally-friendly marine fuel that is readily available and safe, both today and in the foreseeable future."



Ongoing optimization in supply chain and engine technology developments will further enhance the benefits of **LNG** as a marine fuel. Additionally, **bioLNG** and **Synthetic LNG**, both fully interchangeable with LNG derived from fossil feedstock, offer the potential for significant additional GHG emissions reductions. For example, a blend of 20% **bioLNG** as a drop-in fuel can reduce GHG emissions by 13% more when compared to 100% fossil fuel LNG.

SEA\LNG is a UK-registered not for profit collaborative industry foundation serving the needs of its member organizations committed to furthering the use of **LNG** as an important, environmentally superior maritime fuel.

The **Society for Gas as a Marine Fuel (SGMF)** is a non-governmental organization (NGO) established to promote safety and industry best practice in the use of gas as a marine fuel.

Thinkstep enables organizations worldwide to succeed sustainably. Its industry-leading environmental sustainability software, data and consulting services help businesses drive operational excellence, product innovation, brand value and regulatory compliance. 



WE4SEA SECURES FUNDING TO ROLL OUT UNIQUE FUEL MONITORING PLATFORM

by We4Sea

Dutch maritime start-up **We4Sea** secured funding from **ENERGIQ**, **Mainport Innovation Fund II** and angel investors to accelerate development and roll out of its fuel and emissions monitoring platform. Based in Delft, Netherlands, **We4Sea** has an ambitious goal of saving 1 million tons of CO₂ emissions from ships. Speaking with **Digital Ship**, CEO and cofounder of **We4Sea Dan Veen** explained that the company developed a monitoring platform and Digital Twin to monitor, report, and optimize fuel consumption of any given vessel. Based on just an IMO number and vessel name, We4Sea can start tracking a ship's location, sailing speed, and weather conditions, and then calculate fuel consumption almost immediately.

We4Sea's concept is unique, as it requires no hardware thanks to its **Digital Twin**. With this software-only technology, **We4Sea** can provide highly accurate calculations of a ship's fuel use and emissions to parties that do not have direct access to the ship, such as charterers and providers of ship financing.

We4Sea's performance-monitoring platform allows cargo, fleet and shipowners to follow the performance of their ships and cargo. Based on location and speed data of the ship, combined with meteorological and seastate data,

the instantaneous performance of the ship and each of its components is simulated and displayed. Fuel consumption and emissions are presented and can be calibrated with actual on-board measurements. The performance-monitoring dashboard gives insight in the actual usage of your fleet, the relative performance of your fleet compared to similarly sized vessels, and an overview of well-performing components and "efficiency killers." The performance-monitoring dashboard is the first step towards efficiency improvement.

For a ship with average fuel consumption, savings can add up to thousands of tons of CO₂ emissions and tens of thousands of Euros a year. "We're proud of the growth achieved in recent years, but there's still a wealth of opportunities that will help us improve our product, connect with more customers and expand the market. This is in line with our mission to prevent one million tons of CO₂ emissions from shipping," explained Dan Veen.

Nienke Vledder, **ENERGIQ** fund manager, commented: "ENERGIQ is delighted and congratulates **We4Sea** with the growth investment it secured through Mainport Innovation Fund II, angel investors, and **ENERGIQ**. **We4Sea's Digital Twin** offers customers transparency in fuel consumption, helps them reduce CO₂ emissions drastically, which leads to significant cost savings." 📍

ENI TO BUILD INDUSTRIAL-SCALE OFFSHORE WAVE POWER PLANTS

by ENI Press

The Chief Executive Officers (CEOs) of **Cassa depositi e prestiti (CDP) Fabrizio Palermo; Giuseppe Bono of Fincantieri; Luigi Ferraris of Terna**, and **Claudio Descalzi of Eni**, signed a non-binding agreement today at the Eni HQ in the EUR district of **Rome** to develop and build **Wave Power Stations** on an industrial scale. Eni now operates in 67 countries. The agreement seeks to combine the collective expertise to transform the **Inertial Sea Wave Energy Converter (ISWEC)** pilot project into a project on an industrial scale for immediate application and use. **ISWEC** is the innovative system that converts energy generated by waves into electricity. Eni installed the project at its **Ravenna** offshore site.

Under the terms of the agreement, Eni will share its findings from the **ISWEC** plant pilot project with the joint working group. The **ISWEC**, built in collaboration with the **Politecnico di Torino** and the **Wave for Energy** spin-off, will share its technological,

industrial and commercial expertise with the group, in addition to sharing information on the logistical and technological elements used at its offshore plant. **Eni CEO Claudio Descalzi** commented, "Today's agreement is an important step forward towards building a new production system for renewable energy generated by wave power. This deal is part of our strategic decarbonization plan, and stems

from Eni's focus on research, development and the application of new technologies aimed not only at making traditional operating processes more efficient, but also at driving us to create new business segments in the energy sector. Collaborating with three exceptional Italian companies like CDP, Terna and Fincantieri will enable us to pool distinct skills that each company already possesses and help accelerate the development process of this technology. Our ultimate goal is to explore together the potential for projects to be launched on a grand scale, including abroad."

CDP will promote the project with public administrations and institutions involved, and will share its economic-financial skills, also in order to evaluate the most appropriate of financial support forms to the initiative. **CDP CEO Fabrizio Palermo** commented, "CDP's Business Plan is strongly oriented towards sustainable development, in line with the great global trends and the **Sustainable Development Goals** defined by the UN 2030 Agenda. The project is consistent with our strategy and, together with partners Eni, Fincantieri, and Terna, we will be able to contribute in a concrete way to the development of an innovative

Italian technology, and to spread renewable generation sources, for the benefit of the country and the community."

Fincantieri will offer its industrial and technical shipbuilding skills to optimize the executive design, construction and installation phases of the production units. **Fincantieri CEO Giuseppe Bono** remarked: "We are honored to take part in such a large scale project with partners like **Eni, Terna and CDP**. **Fincantieri** is constantly striving to improve naval systems in order to guarantee the highest levels of environmental protection. Therefore, this agreement, that will achieve the industrialization of a device that uses sea power to generate clean energy, is something we are passionate about. We are confident in the all-Italian ability to look at the future."

Terna will develop the study of the best possible options for connecting and integrating the energy production system with the electricity grid, including the integration with hybrid systems made up by conventional production, photovoltaic power stations, and

storage systems. **Terna CEO Luigi Ferraris** said: "With this framework agreement, **Terna** invests in the sustainable innovation for the energetic transition, as we are utterly confident that the company's own expertise can contribute to the acknowledgement of **new renewable energy** sources in order to make the energy system more efficient and sustainable."

In its first phase, the agreement sets out the project's manufacturing



for the construction, installation and maintenance of the **ISWEC**. This phase will lead to the design and construction phases. The first industrial installation will be connected to an Eni offshore production site by 2020. The group will also consider extending the technology to other Italian sites and constructing industrial-sized stations that can supply **fully renewable electricity**, especially near the minor islands. The innovative properties of the **ISWEC** system have demonstrated that the constraints that have so far limited the diffusion of this **wave energy** conversion technology can now be overcome.

Wave Power Stations will be able to make a significant contribution not only to decarbonization processes offshore and onshore, but also they can act as a sustainable support for the reliability of electricity production systems in general, as well as diversification of renewable sources. The present Understanding could be subject to subsequent binding actions that the parties involved will define according to the applicable law, including that which regulates operations among related parties. 📌



SHELL MARINE LAUNCHES SHELL ALEXIA 40 LUBRICANT AHEAD OF IMO 2020

by Shell News

In support of customer preparedness for IMO 2020, Shell Marine is introducing Shell Alexia 40 – a new two-stroke engine cylinder oil specifically for use with engines running on 0.5% sulphur content Very Low Sulphur Fuel Oil (VLSFO).

With a Base Number (BN) of 40, Shell Alexia 40 has been developed to optimize equipment performance and condition as ship owners and charterers prepare for the International Maritime Organization's (IMO) 0.5% global sulphur limit for marine fuels in 2020. Shell Marine expects most of the world's shipping fleet will aim to comply with IMO 2020 by switching to fuels with a sulphur content of 0.5% and below.

"Shell Marine can help ship owners and charterers be prepared as the world moves to a low emissions future. As a trusted partner, we will help our customers to have the right lubricants in the right place at the right time to take the uncertainty out of fuel selection," said Joris van Brussel, Shell Marine Global General Manager.

After extensive testing at Shell's Marine & Power Innovation Centre in Hamburg and working closely with original equipment manufacturers, Shell Alexia 40 has undergone thousands of hours of trials on board four ships with the latest engine types, using representative IMO 2020-compliant fuels, to verify performance at sea. The new product will be available for use in Singapore from 01-June-2019 and gradually introduced to other main supply ports within Shell Marine's global network such as the US, China, United Arab Emirates, and the Netherlands before 01-January-2020.

"Owners transitioning to post-IMO 2020 marine fuels era need peace of mind over the condition and performance of their engines. To remove any uncertainty, Shell Alexia 40's performance has been fully tested on representative VLSFOs and engines for the operating conditions owners will actually face," said Shaw Siang Hew, Shell Marine Regional Sales Manager for ASEAN and South Asia.

The launch of Shell Alexia 40 will coincide with an introduction of the new Shell Alexia two-stroke engine oils portfolio,

highlighting the relationship between fuel grade and recommended cylinder oil BN after the implementation of the IMO's global sulphur limit for marine fuels in 2020. All Shell Alexia grades are fully miscible and compatible with the existing portfolio.

The 5 products in the Shell Alexia portfolio are now directly branded by BN as Shell Alexia 25, 40, 70, 100 and 140 to minimize errors on board, and maximize opportunities to align lubricant selection with the fuel in use. For example, Shell Alexia 25 is recommended for 0.1% Ultra Low Sulphur Fuel Oil/LNG, while Shell Alexia 100 and 140 are recommended for owners preferring to operate on HSHFO with exhaust gas scrubbers.

"Post-IMO 2020, it is imperative for engine performance that customers can rely on the cylinder oils they choose," said Joris van Brussel. Shell Marine also recognizes that cylinder oil technical services tailored to the needs of owners are critical to the successful management of engine performance. "Lubricant condition tools, such as Shell LubeAnalyst and Shell LubeMonitor, will be vital for managing engine performance, but also for optimizing lubricant feed rates and costs," added Joris van Brussel.

Shell provides lubricants for the marine industry through its Shell Marine business. It serves over 10,000 vessels, ranging from large ocean-going tankers to small fishing boats in over 700 ports across 61 countries. The advice and technical services provided help its customers achieve maximum value from using its lubricant products across all types of machinery and equipment on a ship.

Royal Dutch Shell plc is incorporated in England and Wales, has its headquarters in The Hague and is listed on the London, Amsterdam, and New York stock exchanges. Shell companies have operations in more than 70 countries and territories with businesses including oil and gas exploration and production; production and marketing of liquefied natural gas (LNG) and gas to liquids; manufacturing, marketing and shipping of oil products and chemicals, and renewable energy projects. ♻️

MACGREGOR BUILDS FIRST FIBER ROPE OFFSHORE CRANE



MacGregor, part of Cargotec, has completed the construction of the first **fiber-rope offshore crane** on the market. The company says that its new **FibreTrac** crane is able to exploit its full lifting capacity because fiber rope weighs virtually nothing in water, so no additional load is experienced by the crane, regardless of the length of rope used during load handling operations. In contrast, **steel wire-rope cranes** have to support the extra weight of every foot of cable.

"In practical terms, this means that a smaller crane and vessel can be used for more assignments, and owners are able to bid on a wider range of contracts," said **Høye Høyesen**, VP, Advanced Offshore Solutions, **MacGregor**. "The ability to use smaller vessels for deep-water projects will also drive down the cost of these operations and give our customers a stronger competitive edge."

The **FibreTrac** crane has a 150-ton safe working load (SWL) capacity, and incorporates an advanced rope monitoring and management system that maximizes rope lifespan and provides clear lift line status information for the operator at all times. MacGregor says that it is a combination of existing, proven technologies, and will give offshore operators a new edge, and is designed to comply with DNV GL regulations.

"The project to build, certify and validate the MacGregor **FibreTrac** crane is the result of our confidence in its potential," says **MacGregor VP Høyesen**. "We strongly believe in the advantages

that it will deliver to our customers."

"**FibreTrac** uses existing, proven technologies combined in a new application that offers deep-water load handling operators a simple pathway to some of the most significant cost-saving advantages seen in decades."

"In practical terms, this means that a smaller crane and vessel can be used for more assignments, and owners are able to bid on a wider range of contracts," **Høyesen** added. "The ability to use smaller vessels for deep-water projects will also drive down the cost of these operations and give our customers a stronger competitive edge."

"Feedback from the event was extremely positive," VP **Høyesen** continues. "We were able to present the finished crane to demonstrate how the shift from **steel-rope** to **fiber-rope** in offshore cranes is technologically possible and how the crane delivers substantial cost benefits to owners, particularly for deep-water projects."



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ØRSTED AND WINDSERVE ORDER MORE WORKBOATS FOR U.S. WIND FARMS

by Ørsted News

Offshore wind farm company **Ørsted** and U.S.-based offshore wind support operator, **WindServe Marine**, are partnering to build two new **crew transfer vessels (CTVs)** for the budding **Jones Act** wind market. **CTVs** are the workboats that carry workers to and from offshore wind towers for construction, maintenance and operations, and the new builds will be the second and third of their type in America.

North Carolina-based firm **U.S. Workboats** will build one hull, which will be used for the **Ørsted / Dominion Energy-sponsored Coastal Virginia Offshore Wind Project**, a small pilot project with two turbines. The second hull will be built at **Sensco Marine** in Rhode Island, and will be used for the **Ørsted / Eversource-sponsored Revolution Wind project** for southern Rhode Island and Connecticut. The first boat is under construction at **U.S. Workboats**. It will be delivered next year.

Both **WindServe** and **Senesco** are owned by Reinauer Transportation, which has been involved in the U.S. East Coast maritime industry for nearly 100 years.

*"Choosing **WindServe** to build our **CTVs** at **Senesco** will provide locally built vessels and a local operator for the domestic offshore wind industry," said **Thomas Brostrøm**, President and CEO of **Ørsted** North America. "**WindServe Marine's** experience with **Jones Act** vessel operations and full service shipyard fabrication, coupled*

with their dedication to the future of green energy, make them a great partner as we expand operations along the East Coast."

The construction of the two **DNV GL**-classed **crew transfer vessels** is expected to support about 40 jobs.

Ørsted, the world's largest offshore wind operator, already runs the 30 MW Block Island Wind Farm, the first commercial-scale facility of its kind in the U.S. Its \$1 billion Revolution Wind project will see the installation of an additional 700 MW of turbine capacity at a site roughly 20 nm to the east of Block Island, in the state of Rhode Island.

The **Ørsted** vision is a world that runs entirely on green energy. **Ørsted** develops, constructs and operates offshore and onshore wind farms, bioenergy plants and innovative waste-to-energy solutions, and provides smart energy products to its customers. **Ørsted** is headquartered in Fredericia, Denmark and employs 5,600 people. It is the largest energy company in Denmark.

WindServe Marine is an offshore wind support services company, committed to providing excellence in all stages of the offshore wind farm lifecycle and supporting industry stakeholders in project commencement and construction, operations and maintenance, and logistics. **WindServe** is a part of the **Reinauer Group**, a privately held group of U.S. companies operating in a variety of marine business lines. ⚓

RUSSIA LAUNCHES POSEIDON-CAPABLE BELGOROD SUBMARINE

by Vicky Viray Mendoza

Russia's **Sevmash Shipyard** launched the special-purpose submarine **Belgorod (KS-139)** at Severodvinsk in a restricted ceremony held on 23-April-2019. The Kremlin hid most of **Belgorod** from public view during the launch.

Belgorod started construction in July 1992 and was initially to be part of the **Project 949AM** submarines, also known as Oscar II-class guided missile submarine. In 2012, the decision was made to convert **Belgorod** to a unique "special-mission" submarine designated as **Project 09852**. **Belgorod** will reportedly be capable of carrying up to 6 nuclear-powered and nuclear-armed Status-6 torpedoes. The 24-meter long torpedo-looking "drone" known as **Kanyon**, or more widely as **Poseidon**, can field a 100-megaton nuclear warhead while achieving a maximum speed of 185 km/h (115 mph). The system is still under development.

Belgorod will carry other special purpose mini-submarines, like those on the Kola Peninsula where Russia's **Main Directorate for Deep Sea Research**, called **GUGI**, is located. **Belgorod's** refit work added nearly 100 feet to the sub's overall length. It is now a 184-meter nuclear powered submarine, 11 meters longer than the giant 173-meter Soviet-era **Typhoon-class** ballistic missile submarines of the Cold War, and 29 meters longer than the Oscar-II class sub. It is now the world's longest submarine.

According to **Barents Observer** in March 2019 when Russia's Defense Minister

Sergey Shoigu visited **Sevmash Shipyard**, the **Belgorod** would be the first full-time carrier of the **Poseidon**, a nuclear-powered, nuclear-armed underwater drone. The **Poseidon**, a torpedo-looking drone, is powered by a small nuclear reactor, and designed as a second nuclear strike weapon. If an enemy targets Russia with nuclear weapons, it will retaliate. Launched from **Belgorod**, the drone tipped with a multi-megaton nuclear warhead, can traverse oceans in depth and silence, and is impossible to stop. **Poseidon** will be a game-changer for global nuclear deterrence when it becomes operative.

Belgorod is built on an extended hull of what was originally meant to be an **Oscar-II class** multi-purpose submarine, a sister vessel to the ill-fated **Kursk** submarine that sank in the Barents Sea during a naval exercise in August 2000. The hull of the submarine was laid down in 1992. Twenty years later, the Russian Defense Ministry decided to use the hull to construct a giant special purpose vessel in 2012. The extra space in the elongated hull has room to

carry deep-sea operations equipment, such as a small-sized nuclear reactor that can provide power for secret military installations on the Arctic Sea bed.

The "special mission" designed for the **Belgorod** is likely to be covert placement of large underwater systems, like the new multi-sensor submarine detection network named **Harmony**. The Russian network has sensors aimed at detecting enemy submarines. **Harmony** would be powered by nuclear reactors that would likely be placed on the Arctic shelf by **Belgorod**.

Belgorod is inherently linked to **Poseidon** that reportedly has an effective unlimited range, and design features that make it quite difficult to detect. **Poseidon** is meant to give Russia a second-strike deterrent capability – completely and entirely immune to U.S. missile defenses. Thus, it is called Russia's doomsday machine. In February 2019, the Russian Ministry of Defense released a video of under-

water testing of the weapon.

The confirmed existence of **Poseidon** suggests that **Belgorod** could launch the nuclear-powered **Harpichord 2P-PM** mini-drone submarine from a hangar on top of the hull. The **Harpichord** could carry additional sonar and sensors to help scout ahead of **Belgorod**, and any manned midget submarine. **Harpichord** is capable of deep diving unmanned operations, and can precisely hold station over objects of interest – a feature **Belgorod** is likewise aiming for –

the ability to hover over an object in a relatively stable position underwater.

The **Sevmash Shipyard** will continue outfitting work on the **Belgorod** pier side, do mooring tests, launch the 2 reactors, and perform sea trials before its projected 2020 delivery.



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SUBMARINE COMMUNICATIONS AND SENSOR SYSTEMS

by Capt Tomas D Baino PN (Ret), Naval Architect

INTRODUCTION

This article is an attempt by the author to relate the basic concept of submarine design parameter with respect to operation and understanding how the submarine operates at the surface of the sea, below the surface of the sea, and at the bottom of the surface of the sea, in an upright position.

A submarine operation consists of horizontal movement of the surface at the sea with at least 10% positive reserve of buoyancy in order to dive easily in case of emergency. The submarine under the surface of the sea can operate in vertical and horizontal movement with neutral buoyancy and entirely dependent on the angle of dive of the submarine hydroplane and the capacity of the pressure hull to withstand the hydrostatic pressure with increasing intensity directly proportional to the depth of dive. The submarine's strength for deeper dive is limited to her design hull, a structural limitation called the Collapsed Depth.

The submarine is also constrained to transmit and receive communication signals to avoid being detected. Transmission and reception of communication signal underwater is difficult

because radio waves do not travel well through good electrical conductors like sea water. The primary defense of the submarine is solely dependent on its ability to remain concealed in the depth of the ocean.

To communicate, the solution for the submarine is to come near the surface of the sea level for the use of ordinary radio transmission. However, the submarine is vulnerable of being detected while cruising underwater near the surface of the sea.

The submarine carries a variety of sensor arrays and relies solely on passive and active SONAR to navigate and locate the target. Water is an excellent conductor of sound. Sound propagation, projection and receipt of the returning "echo" – are critical aspects in submarine underwater navigation and tracking of target.

COMMUNICATION SYSTEM

The submarine communication systems consists of the following:

- ♦ Very Low Frequency (VLF) – radio waves from 3-30 kHz can penetrate seawater at least 20 meters in depth from the

surface of the sea. A submarine in operation in extremely shallow waters utilizes this frequency. It uses a buoy to rise a few meters, just below the surface of the sea.

- ♦ Extremely Low Frequency (ELF) – Electromagnetic waves from 3-300 kHz can penetrate the sea water at depth of 100 meters or less. Communication normally is one-way transmission as much as possible.
- ♦ Standard Radio – at the surface, the submarine can use HF, VHF and UHF to transmit information by voice underwater acoustics or hydro acoustic signals.

How the SONAR works

Through sound propagation using transponder and measurement of the returning echo, it utilizes sound waves in the direction of the object to map and locate objects in the surrounding environment.

In Anti-Submarine Warfare, the active SONAR system functional diagram is shown in Fig. 1 below.

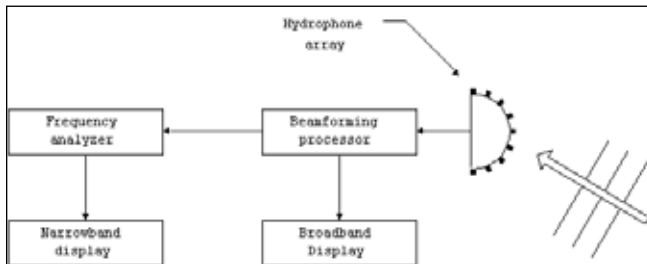


Fig. 1 Active SONAR System Diagram

The transducer array projects the sound signal and for the same purpose receives the returning echo.

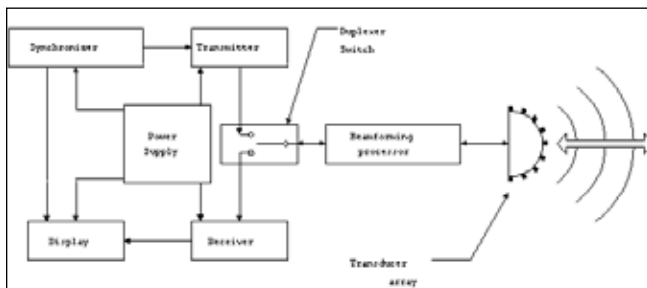


Fig. 2 Passive SONAR System Diagram

The hydrophone array picks-up and receives the returning echo projected by the transducer array or tele-printer modulation.

Underwater Modems

These transmit digital information while underwater using acoustic sound (modem and fax) frequencies of 900 kHz to 60 kHz, up to a distance of 17 miles.

Combination of Acoustic and Radio Transmission

An underwater transmitter sends a signal to the acoustic speaker pointed upward to the surface of the sea to send sound signals that can travel as pressure waves. When the sound waves hit the surface, it will cause tiny vibrations. Above the water, the radar continuously bounces a radio signal off the water surface. The radar can detect vibration, completing the signal journey from the underwater speaker to an in-air receiver. This technology is still in the infancy stage.

Sensors Systems

A submarine is only as good as its electronics detection system. The SONAR (Sound Navigation and Ranging) provides a system to navigate underwater, communicate or detect object underwater as well as in the surface of the sea. There are two (2) types of SONAR systems.

- ♦ Passive SONAR – underwater sensor mainly for listening to sound emissions from underwater or surface contacts. The passive SONAR can avoid being detected because it doesn't project sound signals.
- ♦ Active SONAR - underwater sensor mainly for projection of sound signals and listening to the returning "echo." Both sensors, can locate and do measurements of acoustic frequencies from a very low (infrasonic) to extremely high (ultrasonic). This type of SONAR would reveal the presence of the submarine underwater.

Towed Array SONAR System

This is the linear array of a hydrophone towed behind the submarine or ship. It is similar to the variable depth SONAR. The linear arrays are towed behind in order to isolate the system from the noise generated by the ship or submarine machines.

Towed Array is either SURTAS or SUBTAS. Whereas SURTAS is used by surface ships, SUBTAS is used by submarines.

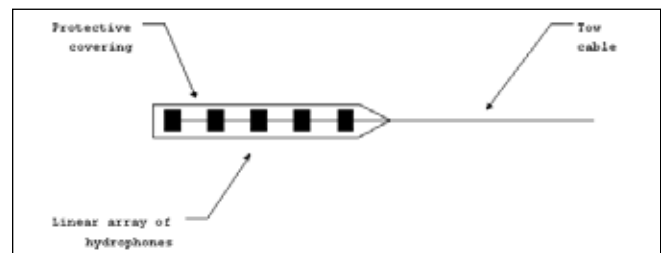


Fig. 3 Towed Array SONAR System (TASS)

SONOBUOY

This is a small self-contained SONAR System employed by an aircraft. The information pick-up by the SONOBUOY is transmitted back to the aircraft by Very High Frequency (VHF) radio link. The SONOBUOY is self-destructing after some period of time. It is used to detect a submarine underwater, and feed the information to the aircraft, which then sends the information to the submarine.

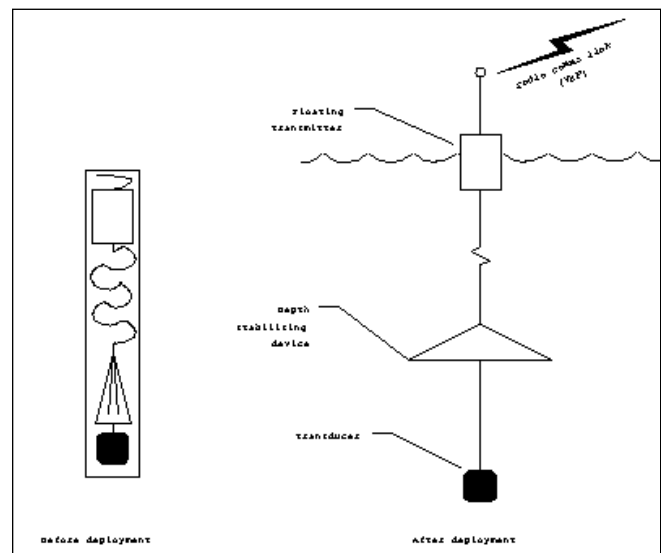


Fig. 4 SONOBUOY Deployment

Capabilities of SONOBUOY

The following are types of SONOBUOYS:

- ◆ DIFAR – direction finding acoustic receiver; a passive system with hydroplane array transmitted into back to aircraft.
- ◆ DICASS – directional Command active system which transmits pulses back to aircraft
- ◆ VLAD – vertical thin line-array hydroplane; improves directionality back to aircraft with reduced noise from the submarine.

BI-STATIC SONAR

This is a combination of active and passive sonar systems for reception and transmission sharing of information of underwater targets by Anti-Submarine Ships and Anti-Submarine Helicopters.

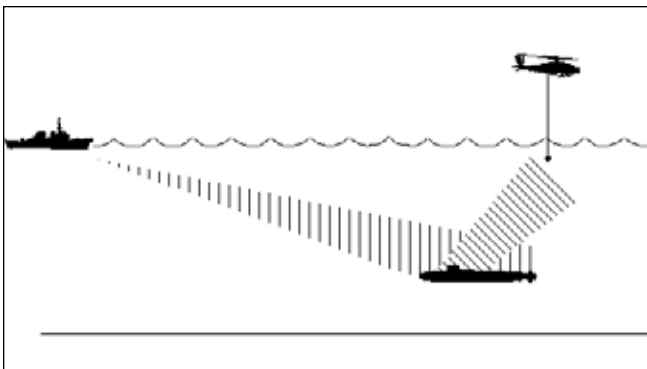


Fig. 5

NON-ACOUSTIC DETECTION

The submarine cruising underwater near the surface is vulnerable to visual detection. Periscopes and antennae or a mast can protrude at the surface of the water. The mast creates a wake called feather. It also leaves a remnant scar of a long streak of foam or bubbles at the surface of the sea.

RADAR

The periscope mast exposed above surface of water can be detected by specially designed radar. The periscope generally is very hard to detect by ordinary radar. The ISAR (Inverse Synthetic-Aperture Radar) has been very effective in detection and tracking of submarine periscope.

INFRARED DETECTION

The heat from a submarine emitted by the propulsion system is also vulnerable to infra-red detection and becomes its heat signature specially when snorkeling and re-charging battery.

MAGNETIC ANOMALLY DETECTION (MAD)

This measures the change of earth magnetic field due to the presence of large magnetic ferrous materials found in the submarine, which can be detected in extremely shallow water. It can provide information on the exact location of the submarine.

CYLINDRICAL TRANSDUCER ARRAY

This is a reduced beam with projection in vertical direction. It is mounted on the hull array and only receives sound with downward direction.

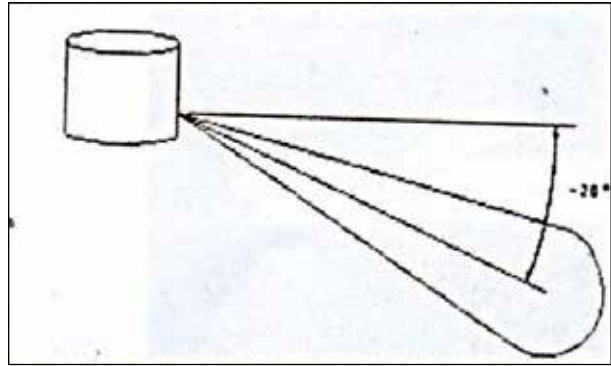


Fig. 6. Cylindrical Transducer Array

FLANK ARRAY SONAR

This provides efficient beams forming a scan, which rejects its own ship noise, port and starboard beam. It has an increased detection and classification performance at high speed maneuver. It has excellent bearing resolution/discrimination.



Fig. 7. Passive Flank Array Sonar

RECOMMENDATION

The shipbuilder or ship designer venturing into submarine design can adopt this article as a preliminary source of information on some of the basic communication and sensors to outfit a diesel electric submarine.



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About the Researcher:



CAPT TOMAS D BAINO PN (Ret) completed his post-graduate studies in Submarine Design at the Department of Naval Architecture, University College of London, United Kingdom of Great Britain, under the sponsorship grant of the UK Ministry of Defense. Capt Baino is an associate editor of the Maritime Review, providing series of articles on Naval Ship Design and presently serving as Naval Architect Consultant with the Department of Transportation and the Philippine Coast Guard Project Management Office in ship acquisition program.



THE PORT MANAGEMENT OFFICE OF ZAMBOANGA DEL NORTE (PMO-ZDN)

by Vicky Viray Mendoza

The City of **Dipolog** is the capital of **Zamboanga del Norte**, which is the largest province of the Zamboanga Peninsula region by land area, covering 7,301 sq. km. located in northwestern Mindanao. The City of **Dapitan** is the place where the Spaniards exiled Jose Rizal, our national hero, for his revolutionary ways, making **Dapitan** a shrine-city.

Since 1993, the **Port of Dapitan** has been in the limelight as it continues to play an important role in connecting the network of roads and **RORO** ports to form a highway known as the **Strong Republic Nautical Highway (SRNH)** along the Western Seaboard. The port is the jump off point to/from Luzon and Visayas. Since the initial launching of the **SRNH** in 2003, a significant increase in **RORO** traffic in both cargo and passengers has taken place in the **Port of Dapitan**.

PMO-Zamboanga del Norte (PMO-ZDN) is now the official name as a result of the approval of **Philippine Ports Authority (PPA)** Rationalization Plan by virtue of Governance Commission for government-owned and controlled corporations (**GOCCs**)

Memorandum Circular No. 10-2014 dated 25-March-2015.

PMO-ZDN used to be called **TMO-Dapitan**.

PMO-ZDN is located in Barangay San Vicente, Dapitan City. It is 14 kms away from Dipolog City, and 7 kms away from the Dapitan City proper in Zamboanga del Norte, which is to the north of Zamboanga del Sur, Zamboanga Sibugay, and Zamboanga City, and flanked to the north by the Sulu Sea.

PMO-ZDN has a total port area of 22,614 sqm, of which 14,078 sqm is operational area, and 186 sqm is commercial area. It has 3 **RORO** ramps, 2 **R.C.** piers, and 2 wharves. There are at least 9 domestic shipping lines that make shipcalls to PMO-ZDN. There are 2 lighthouses, in Tag-ulo Point and Barangay San Vicente. As part of its cargo stacking area and container yard, the port has a total reclaimed area of 10,402 sqm, operational area of 7,667 sqm, and back-up area of 5,000 sqm.

PMO-ZDN has 2 Terminal Management Offices (TMO): TMO Sindangan and TMO Liloy. (1) TMO SINDANGAN is located in Calatunan, Sindangan. It has 1 **RORO** ramp and 2 **R.C.** piers with



FROM TOP TO BOTTOM:
Zamboanga del Norte Map; Sindangan Seaport; Lamao Seaport; PMO-ZDN Administration Building

SOURCE OF MATERIALS:
Information and images were provided by PMO-MOZ; port statistics were obtained from PPA website: ppa.com.ph

a draft of up to 6 meters, and a paved reclaimed area for open storage of 5,250 sqm. (2) TMO LILOY is located in Lamao, Lilooy. It has 1 RORO ramp with a draft of 10 meters; 2 R.C. piers, one with a draft of 6 meters and the other between 6 to 15 meters; and a back-up area yard of 3,550 sqm. There are 2 public ports: Galas and Nabilid; and 3 private ports: Southern Island Oil Mills; Mindanao Estates Timber; and Dipolog Coconut Oil Mill.

Engr. Arcidi S. Jumaani is the Port Manager of **PMO-ZDN**. He completed his Bachelor of Science in Civil engineering at the Western Mindanao State University, Zamboanga City in 1988. He passed the Junior Geodetic Engineers Board Exam and the Civil Engineering Licensure Examination in April and November 1988, respectively. He completed his Masteral Degree in 1999 at Medina College, and completed all the academic subjects for a Doctor in Sustainable Development Studies, except Dissertation, at **Mindanao State University-Iligan Institute of Technology (MSU-IIT)**. He joined the **PPA** in 1992 as Field Engineer assigned at Facilities, Construction and Maintenance Department, **PPA** Head Office. He was later appointed Supervising Engineer of **PPA**, at PMO-Ozamiz in 1995, and promoted to Principal Engineer in 2002. He was then assigned to PMP-Iligan in 2012 as Acting Division Manager, Engineering Services Division, and promoted to Division Manager in 2015. He was designated Officer-in-Charge of PMO-Iligan in 2016, Acting Port Manager shortly thereafter, and was assigned to PMO-Mindoro where he became a full-pledged Port Manager in June 2018. He was later assigned to **PMO Zamboanga del Norte** in January 2019, and currently serves as Port Manager of **PMO-ZDN**.

Growth in Operations. Based on main operational data sourced from PPA covering 2016 to 2018, statistics show that PMO-ZDN has achieved the following compound average growth rates: (a) Shipcalls, 9.8%; (b) Passenger Traffic, 10.2%; (c) Container Traffic in TEU, 4.7%; (d) RORO Traffic, 17.4%; and Cargo Throughput in MT, 7.4%. RORO Traffic showed the highest compound average growth rate (CAGR).

PMO-ZDN	2016	2017	2018	CAGR
Shipcalls	3,886	4,393	4,688	9.8%
Passenger Traffic	961,803	1,016,484	1,168,049	10.2%
Container Traffic (TEU)	14,002	15,353	15,360	4.7%
RoRo Traffic	72,598	86,579	99,991	17.4%
Cargo Throughput	989,728	1,034,969	1,142,683	7.4%
Domestic Shipcalls	3,853	4,353	4,651	9.9%
Domestic Container Traffic	14,002	15,353	15,360	4.7%
Domestic Cargo Throughput	782,560	804,342	870,205	5.5%
Foreign Cargo Throughput	207,169	230,628	272,478	14.7%
Imports Cargo Throughput	8,400	22,498	45,196	132.0%
Exports Cargo Throughput	198,769	208,130	227,283	6.9%

Compound Average Growth Rate*

Shipcalls were predominantly domestic, as with **Container Traffic**. But there was much higher growth in **Foreign Cargo Throughput** (14.7%) than **Domestic Cargo Throughput** (5.5%). **Imports** comprised 10.7% of total **Foreign Cargo Throughput** (MT) while **Exports** comprised 89.3% on average during the period 2016-2018. However, the main driver of growth in Foreign Cargo was from **Imports** cargo that grew 132%, compared with **Exports** cargo that grew 6.9%. ⚓



The Charles W. Morgan is the last of an American whaling fleet that once numbered more than 2,700 vessels. Ships like the Morgan often used routes defined by the trade winds to navigate the oceans. Photo Credit: NOAA.

THE TRADE WINDS EL NIÑO AND LA NIÑA

by Vicky Viray Mendoza

The Earth has five major wind zones: (1) **polar easterlies**, (2) **westerlies**, (3) **horse latitudes**, (4) **trade winds**, and (5) **doldrums**.

According to the **National Oceanic and Atmospheric Association (NOAA)**: “Early commerce to the Americas relied on the trade winds — the prevailing easterly winds that circle the Earth near the equator. Known to sailors around the world, the trade winds and ocean currents helped early sailing ships from European and African ports make their journeys to the Americas. Likewise, the **Trade Winds** also drove sailing vessels from the Americas toward Asia. Even now, commercial ships use **Trade Winds** and currents the winds produce to hasten oceanic voyages.

Between about **30°N and 30°S** of the equator, in a region called the **horse latitudes**, Earth’s rotation causes air to slant toward the equator in a southwesterly direction in the northern hemisphere, and in a northwesterly direction in the southern hemisphere. This is called the **Coriolis Effect**, as mentioned earlier which in combination with an area of high pressure, causes the prevailing **Trade winds** to move from **east to west** on both sides of the equator across this **60° belt**.”

As the wind blows to about **5°N and 5°S** of the equator, both air and ocean currents come to a halt in a band of hot dry air. This **10° belt** around Earth’s midsection is called the **Inter-Tropical Convergence Zone (ITCZ)**, more commonly known as the **doldrums**. Intense solar heat in the **doldrums**

warms and moistens the **Trade Winds**, thrusting air upwards into the atmosphere like a hot air balloon. As air rises, it cools, causing persistent bands of showers and storms in the tropics and rainforests. Rising air masses move toward the poles, and then sink back toward Earth's surface near the horse latitudes, which are known for calm winds and little precipitation. The sinking air triggers the **Trade Winds**, completing the cycle."

Trade Winds blow in the tropics between **30°N and 30°S** of the equator. Hence, they pick up moisture and bring heavy rainfall on the eastern sides of the tropical islands. **Trade Winds** are any of the constant **easterly** winds that dominate most of the tropics and subtropics throughout the world, making **Trade Winds** also referred to as **Tropical Easterlies**. The **Trade Winds** generally flow from **east to west**. In the northern hemisphere, Trade Winds cool and descend near **30°N**. The descending air blows from the northeast to southwest, and back toward the equator. In the southern hemisphere, Trade Winds blow from the southeast to the northwest, and descend near **30°S**. This is the **Coriolis Effect**.

In normal **non-El Niño** conditions, **Trade Winds** blow in a westerly direction along the equator. These winds pile up warm surface water in the western Pacific, so the sea surface is as much as 18 inches higher in the western Pacific than the eastern Pacific.

Trade Winds, El Niño, and La Niña. Over the Pacific Ocean, the chain of winds known as the **Walker Circulation** exists in a wind-sea interaction. A large warm body of water heats the air in the western Pacific. The air expands, rises, and carries moist air, which produces large amounts of rainfall near the **Philippines**. The risen air moves eastwards and sinks near the Americas. The air completes the cycle by moving westward to replace the rising air near the Philippines. This final segment of the **Walker Circulation** is the **Trade Wind**, which periodically decreases during the **El Niño** season, and increases during **La Niña** season. **El Niño** happens in warmer surface waters in the eastern equatorial Pacific, while **La Niña** happens in colder surface oceans.

This fluctuation occurs every 2-8 years, called the **El Niño Southern Oscillation (ENSO)**. **El Niño** is caused by the warming of sea surface temperature in the Pacific, and can affect air and sea currents. This results in reduced rainfall that can lead to dry spells, severe droughts or stronger typhoons. **La Niña** is caused by a build-up of cooler waters in the tropical Pacific between the Tropics of Cancer and Capricorn. Stronger **Trade Winds** and ocean currents bring this cold water to the surface, called an **upwelling**. This can result in either intense storms or drought. The Pacific northwest gets much wetter; the Pacific northeast gets very cold.

PAGASA says **El Niño** is expected to last in the Philippines until June 2019, suggesting a slight delay of the onset of rainy season, threatening water supply reliability for Metro Manila. "Our climate is now getting hotter and dryer due to the ongoing **El Niño**," Flaviana D. Hilario, PAGASA deputy administrator. "The air temperatures are now increasing as we approach the dry season, and impacts of **El Niño** are expected to be severe. ⚓

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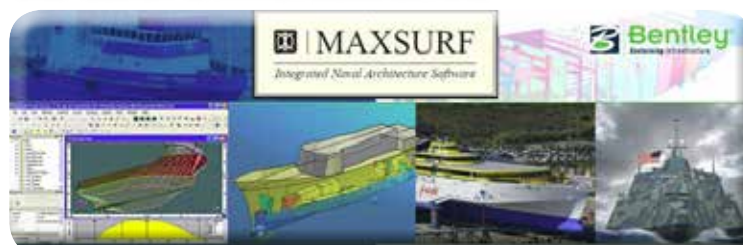
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BULUSAN LAKE

by Josephine M Viray

Bulusan Lake surrounds the foothills of Mount Bulusan Volcano, located in the municipality of Bulusan, Sorsogon province, Bicol Region. Mount Bulusan, which has erupted at least 15 times since 1885, is considered the 4th most active volcano in the Philippines after Mayon, Taal, and Kanlaon; and is the highest peak in Sorsogon.

On 23-October-2016, Rappler reported that a phreatic eruption of the volcano –exhibited by explosions of water, steam, rock, and ash– produced an ash column 2.5 kilometers high. On 24-August-2018, Wysily S. Ala for the Philippine Information

Agency stated that the popular site had later been closed following Mount Bulusan’s steam-driven phreatic eruption on 5-June-2017. In its bulletin, PHILVOLCS said that since then, Mount Bulusan’s upper slope has deflated and the occurrence of volcanic earthquakes has declined, signs that it would be safe again to carry out human activities in the park’s tourist area. With the reopening of the park, visitors to the tourist site would be able to marvel at the mountain’s peak, which stands at 1,559 meters above sea level with a base area of about 400 square kilometers. Only a 4 km radius permanent danger zone is marked

from the summit, and other buffer zones 4km–10km also from the summit, because sudden phreatic expulsions might take place, but it is safe outside that perimeter.

Binaday, Amarga, Barrameda, and Bonagua, mentioned in “Amphibians and Reptiles in the vicinity of Bulusan Lake, Bulusan Volcano Natural Park, Sorsogon, Philippines,” *Philippine Journal of Science* (September, 2017) that a preliminary inventory of amphibians and reptiles was done in the vicinity of Bulusan Lake. In the study, 26 species were documented. The documentation of species cited 8 frogs, 10 lizards, and 8 snakes. The survey features the first record of the Blunthead Slug-eating Snake (*Aplopeltura Boa*) from Luzon Island; as well as the Philippine Pit Viper (*Trimeresurus Flavomaculatus*). A new species of a white-iris Northern Temple Pit Viper (*Tropidolaemus Subannulatus*) was also recorded.

Michael B. Jaucian reports in the *Philippine Daily Inquirer* on 11-February-2018 that aside from being known as a “Volcano Town,” Bulusan is a popular destination for nature lovers, especially trekkers. Different species of trees surround the 16.43 hectare Bulusan Lake, the main attraction inside the 3,672 hectare Bulusan Volcano Natural Park.

Two endemic plant species, *Preneprrium bulusantum* (a fern) and *Schefflera bulusanicum* (an evergreen tree), are present in the area, including wild orchids and giant ferns.

Bulusan Lake, the main attraction inside Bulusan Volcano Natural Park, is a developed tourist site with a trail around its 2- kilometer circumference, and boating facilities on its 33-meter deep waters. Bulusan Lake’s ambiance of scenic tranquility brought about by its deep emerald green waters, surrounded by wondrously lush flora and fauna from its surrounding rainforest makes the lake a worthwhile tourist destination.

Kayaking is a popular sport among tourists who visit Bulusan Lake. Waterfalls and springs can be found in the lush rainforest surrounding Bulusan Lake. Hiking and crossing the hanging bridge are commonly done in this vicinity. There are 21 species of freshwater fish, of which 15 are endemic to Bulusan Lake, and 6 are introduced from outside the lake. The Dusky Sleeper (*Eleotris Fusca*), Jungle Perch (*Kuhlia Rupestris*), and Spotfin River Goby (*Awaous Occelaris*) are examples of endemic fish. Tilapia stands out only because of its huge stock. Most marine life in Bulusan Lake grow to enormous proportions because of the lake’s rich and well-preserved natural resources.

Bulusan Lake is now part of the Bulusan Volcano Natural Park, of which rainforests surround Bulusan Volcano. This forest land was proclaimed a National Park by virtue of Proclamation No. 811 on 7-June-1935, and then under the NIPAS ACT, was reclassified by DENR as a Natural Park on 27-November-2000.



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- ♦ Jaucian, Michael B. *Philippine Daily Inquirer*, 11-February-2018 issue.
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MARITIME FORUM

The League organized the Maritime Breakfast Forum (MBF) series in 1995 as a venue for developing plans and programs to discuss and resolve issues in the maritime industry. The MBF is attended by stakeholders in the maritime sector and resource persons in the government and private agencies involved in maritime concerns. The MBF is regularly held, without fail, every month except December, hosted by different agencies and organizations in the maritime industry. Policies and projects presented during the forum are published in the *Maritime Review* for information and dissemination to the general public.



Silla purse seiner "Shilla Explorer," 2338 GT, 79.90 meters. Photo Credit: Silla Co. Ltd.

FRIEND OF THE SEA CERTIFIES SOUTH KOREAN SILLA SKIPJACK AND YELLOWFIN

by Vicky Viray Mendoza

Purse seiner vessels of a South Korean company, **Silla Co. Ltd.**, is found compliant with **Friend of the Sea's** sustainability criteria, following third party certification audit. Six **Silla purse seiner** vessels catching mainly **Skipjack and Yellowfin Tuna** in the Western Central Pacific have been approved according to international certification sustainability requirements.

The certified Tuna does not come from overfished stock. It is fished by means of selective fishing gears, and following sustainable fishery policies. The **Friend of the Sea** Audit also verifies appropriate waste and energy management, Dolphin-Safe and FAD practices, as well as social accountability.

Silla was founded in 1967 and is headquartered in Seoul, South Korea. Since 1990, Silla has focused on Tuna fishing

via **purse seiners** to supply tuna canneries worldwide. In the past, **Silla** had engaged in trade of textile exports as their starting business. Since 1972, **Silla's** field of business has shifted to deep-sea fishery, steel industry, and restaurant operations, but Silla's current main business is in deep-sea fishery. Deep-sea fishery began in the North Pacific with trawler fishing and later expanded to **longline seiner** fishing in 1988. Since 1990, it has been catching Tuna for canning purposes using purse seiner vessels.

Purse seiner fishing gear wraps around a school of tuna and constricts the bottom of its gigantic net, which is about 2.5km in length, and 300m in height. Vessels that operate via purse seine fishing are called **purse seiners**. **Silla's purse seiner** fleet is composed of the most recently built vessels with the most

up-to-date equipment and a helicopter to aid in detecting fish schools. **Silla** has 6 **purse seiners** that are considered '**super class**.' The reason why there is a difference in prices of canned Tuna in the market is due to different fish species, and the species are classified and marked on the cans. **Longline seiner fishing**. **Silla** operates **long-line seiner** vessels that catch mainly **Yellowfin** and **Big Eye Tuna** in the South Pacific Ocean

Silla's vessels are equipped with automated fishing implements, fish farming implements, and up-to-date freezing equipment. **Silla** strengthens its position as a front runner in the Tuna **longline seiner** field through constant investment in fishing equipment, and skillful labor through continuous education and R&D. Tuna for sashimi is frozen rapidly under -60°C from the moment of catch due to client preference for fresh taste and nutrition. The quality value of **Silla** fish is gained through recognition from buyers as an export item to Japan. It has also contributed to the country by obtaining foreign currency.

Silla Co. Ltd primarily engages in the deep-sea fishery business in South Korea. The company catches **Yellowfin** and **Big Eye Tuna** using a fleet of **purse and longline seiner ships** in the South Pacific Ocean. It is also involved in the sale of stainless steel and carbon alloy steel products, including wire rods, wires, coils, and steel bars; processing of seafood; and operating **Darangwon**, a Japanese Style restaurant.

Silla had a public offering of stocks in 1976 and won the '**Best Enterprise Award**' from **Korea Management Association**. In addition, the company was awarded '**Gold Industrial Medal**' and garnered exports of over \$50 million. **Silla** has invested in both domestic and foreign fishery, and seafood processing. It is a mid-sized company holding 13 affiliated companies.

Silla is the originating company of the **Silla Group**, and has walked alongside South Korea's economic development through its participation in the trade and deep-sea fishery industries, preserving its proud 50-year lineage. **Silla** currently operates 17 tuna **purse seiners**, 11 tuna **longline seiners**, and 1 Pollock trawler-boat in its capacity as a global fishery company.

Silla's goals are: building high-speed informationalization; cultivating competitive power; and managing human and intellectual resources efficiently.

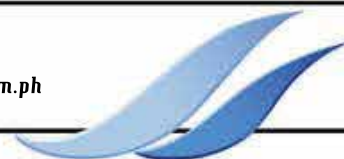
"We are extremely proud of having obtained the **Friend of the Sea certification**" comments **Silla's** top management, "This is in line with **Silla's** continuous engagement in marine conservation and social accountability."

Silla carries out various social contribution activities to ensure that the company gives back to society. As part as the **Silla Cultural Scholarship Foundation**, it has helped about 3,000 students to achieve their dreams over the past 40 years and other social contribution activities to help the underprivileged. ⚓



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MAAP Profile

Geographic destiny has given the Filipino the innate talent to be an excellent seafarer. To enhance this natural skill, the Maritime Academy of Asia and the Pacific (MAAP) was established on January 14, 1998. The Academy stands on a 103-hectare property in Kamaya Point, Mariveles, Bataan.

The Associated Marine Officers' and Seamen's Union of the Philippines (AMOSUP) founded by the late Capt. Gregorio S Oca, capitalized and developed the Academy. The new AMOSUP President, Dr. Conrado F. Oca, heads the Academy's board of governors. The board is comprised of representatives from the private sector, the International Transport Workers Federation, the Filipino Association of Maritime Employers, the International Transport Workers Federation, the All Japan Seamen's Union, the International Mariners Management Association of Japan, the Norwegian Seafarers' Union, the International Maritime Employers' Committee, the Danish Shipowners' Association, the Norwegian Shipowners' Association, and the Japanese Shipowners' Association.

MAAP conducts shipboard training aboard T/S Kapitán Felix Oca, a 5020 DWT dedicated training ship capable of accommodating 180 midshipmen and 9 instructors in 30 air-conditioned cabins and six berths.

MAAP students are all scholars who are entitled to free tuition, board and lodging. They receive a comprehensive, up-to-date and well-rounded education that fully complies with the requirements of STCW 95 and the Commission on Higher Education (CHED). To ensure the highest standards of quality, MAAP adheres to a Quality Standards System that has been certified to comply with ISO 9001 version 2008, the Det Norske Veritas (DNV) Rules for Maritime Academies, and the Productivity and Standard Board (PSB) of Singapore.

The Academy offers three main programs: the Bachelor of Science in Marine Transportation (BSMT), Bachelor of Science in Marine Engineering (BSMarE) and the Bachelor of Science in Marine Transportation and Engineering (BSMTE). The curricula for the three courses were designed with the help of the United States Merchant Marine Academy at Kings Point, New York. Courses are four-year courses with sea phases scheduled in the third year. The BSMT curriculum requires a total of 192 units: 152 at MAAP, 40 practicum/shipboard units on board T/S Kapitán Felix Oca and/or a shipping company sponsorship. The BSMarE curriculum requires a total of 193 units: 153 at MAAP, 40 practicum/shipboard units on board T/S Kapitán Felix Oca and/or a shipping company sponsorship.



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