MARITIME REVIEW

PUBLICATION OF THE MARITIME LEAGUE

Issue No. 21-2 MAR-APR 2021

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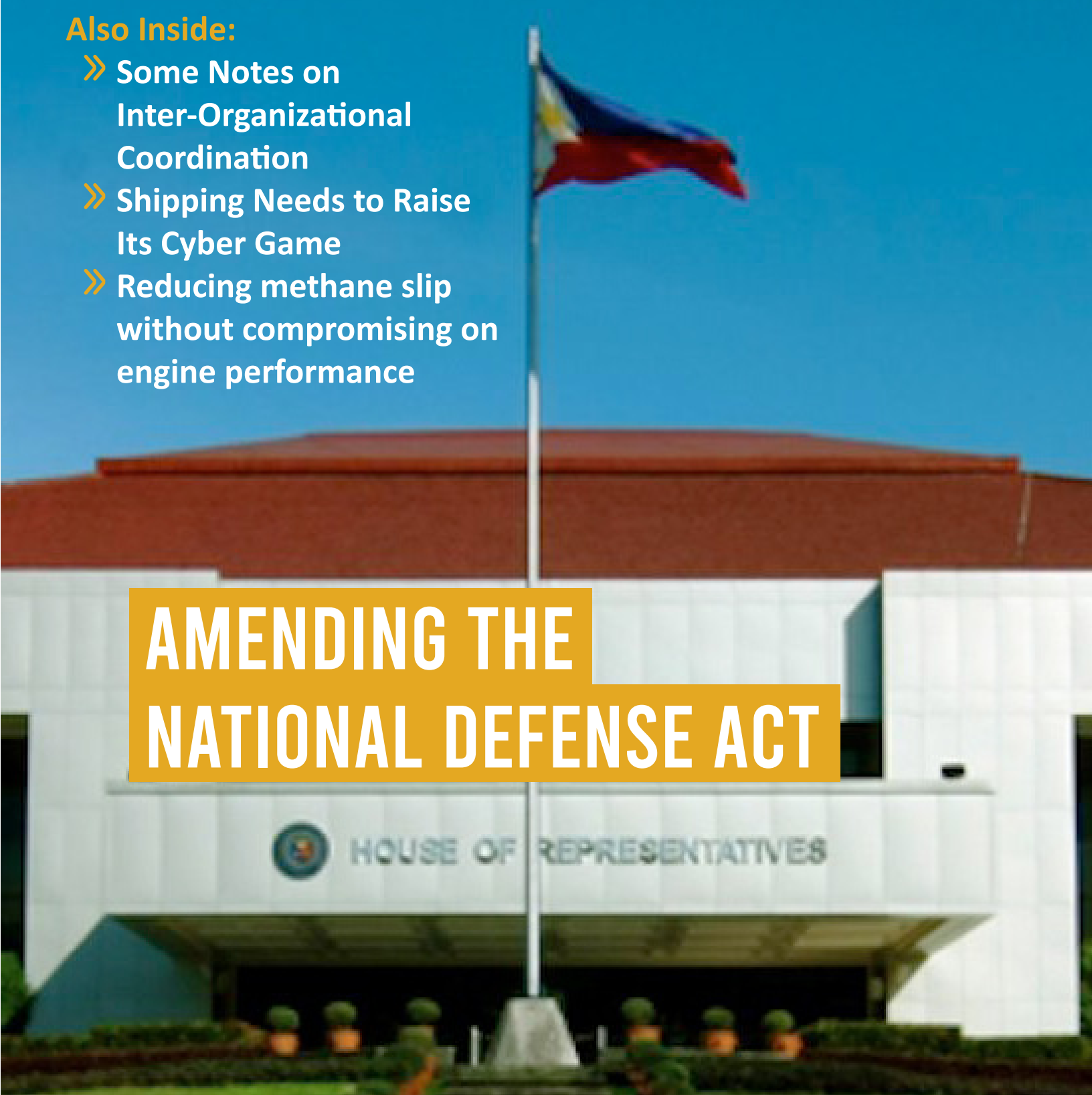
- Some Notes on Inter-Organizational Coordination
- Shipping Needs to Raise Its Cyber Game
- Reducing methane slip without compromising on engine performance



AMENDING THE NATIONAL DEFENSE ACT

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The Maritime Review is published bimonthly on behalf of the Maritime League and is supplied to members as a part of their annual membership package. The opinions expressed by the writers do not necessarily reflect those of the Maritime League

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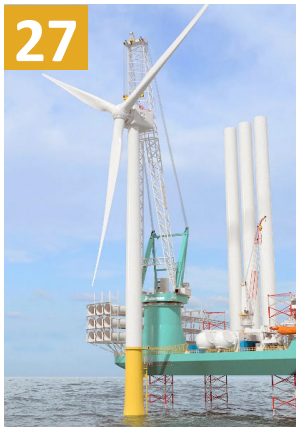


ABOUT THE COVER
"Philippine House of Representatives."

Maritime Events Calendar

MARCH 2021

12-15 7TH INTERNATIONAL LNG CONGRESS (MADRID, SPAIN)
5-7 TALLINN BOAT SHOW (ESTONIAN FAIRS CENTER, FRITA ROAD, FRITA ROAD 28, ESTONIA)
9-11 2ND WORLD HYDROGEN SUMMIT (DIGITAL EVENT)
16-18 INTERMODAL ASIA 2021 (SHANGHAI WORLD EXPO EXHIBITION AND CONFERENCE CENTRE, SHANGHAI, CHINA)
30 INTERNATIONAL MARITIME EXPO (INMEX) VIETNAM (HO CHI MINH CITY, VIETNAM)
23 MARITIME FORUM #161 (MARITIME ACADEMY OF ASIA AND THE PACIFIC (MAAP); ONLINE VIA ZOOM MEETING)

APRIL 2021

12-15 SEATRADE CRUISE GLOBAL (MIAMI, FLORIDA, USA)
17-25 SEATRADE MARITIME EVENTS: SEA ASIA-SINGAPORE (SUNTEC SINGAPORE CONVENTION & EXHIBITION CENTRE, SINGAPORE, SINGAPORE)
21-22 OFFSHORE WINDCONFERENCE 2021 BY SCOTTISH RENEWABLES (VIRTUAL EVENT)
21-22 COASTLINK CONFERENCE ANTWERP 2021 (PORT OF ANTWERP, ANTWERP, BELGIUM)
21-22 9TH AVL LARGE ENGINE TECHDAYS - DECARBONIZATION FACING GLOBAL ECONOMIC CHALLENGES (HELMUT LIST HALLE, GRAZ, AUSTRIA)
19-30 NACE CORROSION 2021 VIRTUAL CONFERENCE AND EXPO (VIRTUAL EVENT)
TBA MARITIME FORUM #162 (MARITIME INDUSTRY AUTHORITY (MARINA); ONLINE VIA ZOOM MEETING)

MAY 2021

11-12 ENVIROTECH FOR SHIPPING FORUM (HILTON ROTTERDAM HOTEL, WEENA 10, ROTTERDAM, NETHERLANDS)
18-20 BREAKBULK EUROPE 2021 (MESSE BREMEN, BREMEN, GERMANY)
18-20 EUROPORT ROMANIA (IDU HALL, MAMAIA, CONSTANTA, ROAMNIA)
24-27 MARITIME WEEK AMERICAS (PANAMA CITY, PANAMA)
TBA MARITIME FORUM #163 (PHILIPPINE NAVY (PN); ONLINE VIA ZOOM MEETING)

JUNE 2021

8-10 TOC EUROPE (ROTTERDAM, NETHERLANDS)
8-11 SEANERGY FORUM 2021 INTERNATIONAL LEADING EVENT ON OFFSHORE WIND AND MARINE RENEWABLE ENERGY (PAYS DE LA LOIRE, NANTES, SAINT-NAZAIRE, FRANCE)
15-17 SEAWORK SOUTHAMPTON 2021 - EUROPE'S LEADING COMMERCIAL MARINE AND WORKBOAT EXHIBITION (MAYFLOWER PARK, SOUTHAMPTON, UK)
16-18 SHIPPAX FERRY CONFERENCE 2021 (ONBOARD PEARL SEAWAYS, SAILING BETWEEN COPENHAGEN, DENMARK - OSLO, NORWAY - COPENHAGEN, DENMARK)
21-23 CRUISE SHIP INTERIORS EXPO AMERICA (CSI) (MIAMI, FLORIDA, USA)
21-23 MARINE MONEY WEEK (NEW YORK, USA)
21-23 SURFACE TECHNOLOGY GERMANY (MESSE STUTTGART, MESSE-PIAZZA 1, BADEN-WURTTEMBURG, STUTTGART, GERMANY)
23-25 7TH EDITION OF PHILIPPINES MARINE (PHILMARINE 2021) (SMX CONVENTION CENTER, SM MALL OF ASIA COMPLEX, PASAY CITY, METRO MANILA, PHILIPPINES)
SHIPBUILD PHILIPPINES 2021 (CO-LOCATED WITH PHILMARINE 2021)
OFFSHORE PHILIPPINES 2021 (CO-LOCATED WITH PHILMARINE 2021)
22-24 ELECTRIC & HYBRID MARINE WORLD EXPO (AMSTERDAM, NETHERLANDS)
TBA MARITIME FORUM #164 (PHILIPPINE COAST GUARD (PCG); ONLINE VIA ZOOM MEETING)

JULY 2021

6-8 BLACK SEA PORTS AND SHIPPING (THE MARMARA TAKSIM, BEYOGLU BELEDIYESI, TURKEY)

JULY 2021

TBA MARITIME FORUM #165 (NATIONAL COAST WATCH COUNCIL (NCWC); ONLINE VIA ZOOM MEETING)

AUGUST 2021

3-5 INDONESIA MARITIME AND OFFSHORE EXPO 2021 (IMOX 2021) RADISSON GOLF AND CONVENTION CENTER,BATAM, INDONESIA
16-19 OFFSHORE TECHNOLOGY CONFERENCE (HOUSTON, TEXAS, USA)
25-26 DIGITAL OCEAN CONVENTION 2021 (HANSEMESSE ROSTOCK, ROSTOCK, GERMANY)
TBA MARITIME FORUM #166 (PHILIPPINE PORTS AUTHORITY (PPA); ONLINE VIA ZOOM MEETING)

SEPTEMBER 2021

13-17 LONDON INTERNATIONAL SHIPPING WEEK 2021 (LONDON, UK)
21-23 SEA ASIA 2021 VIRTUAL CONFERENCE AND EXPO (ASIA'S ANCHOR MARITIME ANDOFFSHORE EVENT) (MARINA BAY SANDS, SINGAPORE, SINGAPORE)
TBA MARITIME FORUM #167 (NATIONAL DEFENSE COLLEGE OF (NCWC); ONLINE VIA ZOOM MEETING)

OCTOBER 2021

5-6 MARINE ENERGY TRANSITION FORUM 2021 (HAVENHUIS ANTWERPEN, ZAHA HADIDPLEIN1, ANTWERP, BELGIUM)
6-8 INDONESIA MARITIME EXPO (IME 2021) (INDONESIA EXPORT IMPORT, JAKARTA, INDONESIA
11-13 INMEX SMM INDIA EXPO AND CONFERENCE (BOMBAY EXHIBITION CENTER, MUMBAI, INDIA)
12 ANNUAL CAPITAL LINK NEW YORK MARITIME FORUM (VIRTUAL CONFERENCE)
13-14 AIS SUMMIT 2021. HYBRID OF DIGITAL AND PHYSICAL EVENT (ST ANNENUFER 5, HAMBURG, GERMANY)
13-15 CMA SHIPPING CONFERENCE AND EXHIBITION 2021 (HILTON STAMFORD CONNETICUT, 1 STAMFORD PL, STAMFORD, CONNETICUT, USA)
20-22 OIL AND GAS VIETNAM 2021 (PULLMAN VUNG TAU, VUNG TAU, VIETNAM)
21-22 GLOBAL PORTS FORUM 2021 (OCBC CENTRE, SINGAPORE, SINGAPORE)
TBA MARITIME FORUM #169 (PHILIPPINE PORTS AUTHORITY (PPA); ONLINE VIA ZOOM MEETING)

NOVEMBER 2021

2-3 ASIAN LOGISTICS AND MARITIME CONFERENCE (HONG KONG EXHIBITION CENTER, HONG KONG)
2-5 EUROPORT 2021 (ROTTERDAM AHOY CONVENTION CENTRE, AHOYWEG, ROTTERDAM, NETHERLANDS)
8-11 ABU DHABI INTERNATIONAL PETROLEUM EXHIBITION AND CONFERENCE (ADIPEC 2021) (ABU DHABI NATIONAL EXHIBITION CENTER, AL KHALEEJ AL ARABI ST, AL RAWDAH CAPITAL CENTER, ABU DHABI, UAE)
11 CHINA SHIP FINANCE SUMMIT (THE RITZ-CARLTON SHANGHAI PUDONG, SHANGHAI, CHINA)
15-18 NAVIGATION 2021 – THE EUROPEAN NAVIGATION CONFERENCE (ENC) AND THE INTERNATIONAL NAVIGATION CONFERENCE (INC) (VIRTUAL EVENT
TBA MARITIME FORUM #170 (DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES (DENR); ONLINE VIA ZOOM MEETING)

DECEMBER 2021

1-3 INTERNATIONAL WORKBOAT SHOW (MORIAL CONVENTION CENTER, NEW ORLEANS, LA, USA)
7-10 MARINETEC CHINA 2021 (SHANGHAI NEW INTERNATIONAL EXPO CENTRE, SHANGHAI, CHINA)
TBA MARITIME FORUM #170 (UNIVERSITY OF THE PHILIPPINES - INSITUTE FOR MARITIME AFFAIRS AND LAW OF THE SEA (UP-IMLOS); ONLINE VIA ZOOM MEETING)

SOME NOTES ON INTER-ORGANIZATIONAL COORDINATION

by VAdm Emilio C Marayag Jr AFP(Ret)

Early this year, a joint team of the **Bureau of Customs** (BUCUS) and the **Philippine Coast Guard** (PCG) apprehended a Chinese dredger *"MV Zhonhai 68"* for illegal and unauthorized presence in Philippine waters. Carrying a Sierra Leone flag and operated by Malaysian-registered HK Weifeng Hangyu Co. Ltd., the vessel was cleared by Cagayan Province authorities to leave the country more than a year ago but was traced in Bataan.

Upon inspection, the joint team found the automatic identification system (AIS) turned off to evade detection by electronic means. Several other Chinese cargo and dredging ships were also spotted in 2019 and 2020 by residents in the provinces of Zambales, Batangas and Cagayan. These vessels engaged in dredging and quarrying along coastal areas and tributaries, some without permits.

The recent successful maritime law enforcement operation reflects renewed efforts to detect, prevent and suppress violations of maritime laws and their concomitant rules and regulations. This is the first publicized joint accomplishment of the two agencies since their signing of the **Joint Patrol Agreement** in September 2020 to coordinate actions in enforcing their respective mandates.

The importance of inter-organizational coordination is well covered by numerous literature. In contrast to inter-agency coordination where players come only from government, inter-organizational coordination involves participation from governmental, inter-governmental, non-governmental and private organizations.

The Revised Administrative Code of 1987, sometimes referred to as the Philippine government's organizational manual as it provides the principles, structures, and rules of governance, expounds on the Constitutional principle that the prime duty of government is to serve and protect the people. The Code empowers the governmental regional offices *"to provide economical, efficient and effective service to the people in the area"* and ***"coordinate"*** with their counterparts in other departments and the local government units.

Whether interagency or inter-organizational in nature, the goal of coordination is to *"improve the effectiveness of cooperation, planning and partnership."* It is a process of organizing a complex undertaking that brings together the contributions of the member organizations to form a coherent and efficient work to solve a problem or meet an identified need. It entails creating formal structures, relationships and processes. It also facilitates unity of effort and provides common understanding. The essence of coordination is the effective integration of multiple stakeholders with diverse perspectives, authorities, responsibilities and objectives.

Inter-organizational coordination is characterized by transparency, rationality, reciprocity, cooperation, communications, cultural ethos and organizational history, investments, research, field experience, trust, institutional support, and policy implication. The collective decision by the member organizations goes through some, or any, of these processes: consensus, cooperation, collaboration, compromise, consultation and deconfliction. Necessarily, leadership is crucial and the designated leader should possess qualities that demonstrate vision, courage, integrity, humility, foresight and focus. Some areas where close coordination is required are national security, emergency management including health, critical infrastructure protection, and natural and man-made disaster preparedness and response.

The United Nations (UN) is one inter-governmental organization that heavily relies on coordination to address its multifarious tasks. In 1991, the UN created the Office of

Coordination of Humanitarian Affairs (OCHA) to strengthen international response to complex emergencies and natural disasters. In the aftermath of Typhoon Haiyan (Yolanda) in Leyte-Samar provinces, OCHA was one of the leading coordinators, in tandem with the National Disaster Risk Reduction and Management Council (NDRRMC), of emergency response activities. The Office caused the release of $500 million from the UN Central Emergency Response Fund and the Strategic Response Fund, and accounted US$375 million from various donors. There were unmonitored cash transfers from other sources that OCHA estimated to surpass the recorded financial assistance. It also served as a focal point of 22 militaries and the AFP in providing relief goods for 4 million displaced individuals.

Typhoon Yolanda affected 14 million people in Eastern Visayas where over 6,000 perished. The prompt and orderly delivery of humanitarian assistance in disaster-ravaged area manifested the excellent coordinative efforts of multinational organizations and the private sector.

On the other hand, just like the OCHA, the World Health Organization (WHO) depends on coordination with the member states and other stakeholders to execute its mandate. It updated the International Health Regulations in 2005 to *"prevent, protect against, control and provide a public health response to international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade."* These regulations are adopted by the member states.

In May 2014, President Aquino issued EO 168 that created the Inter-agency Task Force for the Management of Emerging Infectious Diseases (EID) in the Philippines and directed the formulation of an EID Preparedness Manual to address government response and protocol to manage EID cases. In September 2014, the Department of Health (DOH) issued Memorandum 2014-260, "Interim Guidelines on the Preparedness and Response to MERS-CoV," a comprehensive paper that provides *"clear guidelines on public health interventions that can be instituted for the prevention and control of viral respiratory infections such as those caused by corona viruses."*

Three years later, the department formulated its Emerging and Re-Emerging Infectious Disease Program that listed the various goals and strategies like strengthening the rapid response teams, conduct of seminars and workshops, collaboration/networking with other agencies and partners, and field visits. Absent from this program are mobilization exercises at various levels of governance structure, strategic communications, and regular coordinative activities.

Inter-organizational coordination is one of the effective tools employed by the US military. Senior officers take capstone courses to prepare them for overseas assignments, like the Combined Force Maritime Component Commander Flag-level Course. The objectives of this training are to strengthen existing or develop new relationships in overseas operational areas, and to develop effective strategies for working together and enhancing stability, trade and prosperity. Subject matter expert topic presentations and subsequent discussions on command and control, multinational operations, information sharing, maritime security and humanitarian assistance and disaster relief, as well as command center tour, are geared towards attaining the course objectives.

I had attended this course in Hawaii while commanding the naval forces in Western Mindanao in 2007 to 2008, and it gave me the idea to invite the regional officials in Western Mindanao, including the provincial governors of Basilan, Tawi-Tawi, and the Zamboanga City mayor, to a quarterly inter-organizational meeting to establish a working relationship, familiarize with each other's agencies' mandate and learning areas of cooperation to better serve the people.

The maritime domain is a highly complex system. The actions of the players reflect the pursuit of one's own organizational interest, a compromise of internal norms, and adherence to rules. Thus, inter-organizational coordination players must complement the formal structures, relationships and processes with informal interactions among them to build a consensus and settle differences. This would significantly expedite inter-organizational decision making processes.

PN Disaster Response and Relief Operations

AMENDING THE NATIONAL DEFENSE ACT [NDA]: PHILIPPINE NAVY

by Karl M Garcia

In his inaugural speech as FOIC PN, VADM Giovanni Carlo J Bacordo highlighted 3 priority programs, namely: boost the capacity of the Naval Sea Systems Command; implement skills specialization for its personnel; and lastly, to modernize the mindset of every sailor and marine.[1]

In this connection, Commander Jay Tristan Tarriela PCG, in an article at the Diplomat, averred that until *"institutional problems are solved, the PN will not be able to achieve its goals. . . "* He cited the so called Philippine Navy (PN) *"unfinished business"* of having a "separate charter" with the Marines as a "separate branch of service.[2]

He believed that a change in the military structure would mitigate the domination of the AFP by the Army and make the Navy more responsive to current and future non-conventional threats. Tarriela's views would require a recodification of the National Defense Act (NDA) and subsequent Executive issuances such as the Administrative Act of 1987 etc. and the NDA bill as submitted since the 13th Congress.

In a rejoinder, Jessie Pascasio, a former Director of the Coast Watch program and a research consultant of the Navy, agreed with the recodification of the NDA without a 'mad rush to legislation' but instead more 'strategic thinking.' He adamantly disagreed with the suggestion that structural charter change would put a stop to favoring the Army, citing that maritime legislation were sponsored by SNDs that came from the Army.[3]

The common denominator of Tariela and Pascasio is the basic charter that provides the strategic trajectory that governs the Navy and the codification of its amendments leading to a revised structure. They seem to contend that PN could not achieve its goals sans charter change with the necessary strategic thinking underlying the change.

Certainly, PN awaits the new law as PRRD expressed in his SONA calling for support by asking Congress for legislation aimed "to strengthen defense related systems such as the National Defense Act." CA No 1 has been overshadowed by Administration Order of 1987 etc.

But is the proposed National Defense and Security Act (NDSA) of 2004 responsive to the concerns raised above? Let us briefly see how it came about. Interestingly, as far back as the Biak na Bato Constitution, the Navy was conceived as a unit of the Army.[4]

A Navy came about in the second phase of the Revolution towards the Phil American War. A revolutionary navy was formed from 8 steam launchers captured from the Spaniards plus 5 bigger vessels donated by rich Filipinos. In 1898 a Bureau of the Navy was under the Ministry of Foreign Relations but after the Malolos Constitution the Bureau was transferred to the Ministry of War that became the Ministry of War and Navy.

As the tension between the Filipinos and Americans heightened leading to a blockade, the Navy of 13 ships was decimated. [5]

Fast forward to the Philippine Commonwealth under US, the first law Quezon proposed in 1937 was the National Defense Act aka Commonwealth Act No 1. It is to have a Phil Army composed of a citizen army of 400, 000, but by 1938 it was only an army of less than 69,000. It was vocally criticized by Vice Governor General Hayden who believed that a small fleet of motor boats and bombers can deny hostile forces our territorial waters. Camilo Osias of the National Assembly was more colorful: "In order to have an adequate national defense it must be a "defense ashore, afloat, and aloft."[6]

The Philippine Navy appeared in the horizon in 1951 when President Quirino issued Executive Order 389 designating the Philippine Naval Patrol (PNP) that was the former Offshore Unit of the Army, as the PN. But earlier in 1950, the SND Ramon Magsaysay organized a Marine Battalion as a unit of the PNP. Internal security threats on land and an MDT with US for external threats put the PN on a supporting role to ground forces.[7]

The Administrative Code of 1987 came to pass as Executive Order 292 tasking the PN with the following mission:

The Administrative Code of 1987

ARTICLE 13 - Philippine Navy

SECTION 37. The Philippine Navy shall be composed of its headquarters, naval combat forces, service forces, the Philippine Marine Corps and such other forces as may be necessary for the conduct of naval operations. It shall be responsible for the preparation of naval forces necessary for the effective prosecution of war, except as otherwise assigned; and, in accordance with the integrated mobilization, plans, program for the expansion of the peace-time components of the navy to meet the needs of war. It shall be headed by the Flag Officer in Command, Philippine Navy (FOIC, PN) who shall hold the rank of Vice Admiral.

SECTION 38. The Philippine Navy shall:

a. Organize, train, equip and deploy naval forces for prompt and sustained;

b. Provide for naval defense; naval operations;

c. Secure the country's internal and territorial waters and its interest in the exclusive economic zone;

d. In coordination with the cognizant agencies identified herein, develop and maintain the principal and alternate base systems, maritime links to ground lines of support, programs aimed at the prompt conversion of maritime industry sectors into peculiar naval warfare formations during mobilization, and such programs aimed at propagating among private sector individuals and groups such maritime skills which can be used for naval warfare;

e. Prepare the necessary naval units for the effective execution of national defense plans and programs, and Armed Forces missions, including the expansion of a peacetime navy component to meet the needs of war;

f. Develop doctrines, concepts, systems, procedures, strategies, tactics, and techniques for operations peculiar to the Navy; and g. Organize, train, equip, regularly test-mobilize and test-deploy the

naval reserve component.

SECTION 39. The Philippine Marine Corps (PMC) shall be a type command of the Philippine Navy and shall be headed by the Commandant, Philippine Marine Corps, 19 V who shall hold the rank of Major General. The mission of the Corps is to provide combined arms maneuver forces to the unified commands and landing forces to Navy fleet forces for the conduct of amphibious operations and such other actions essential to the prosecution of naval defense. The Philippine Marine Corps functions are listed. [8]

It should be noted that before the 1987 Constitution that tasked the AFP to secure our territorial integrity, the UNCLOS came into being and as ratified by PH became part of the law of the land granting as maritime domains, requiring a Navy and Coast Guard especially after the termination of the extension of the US bases in 1991. In this connection, the PCG law was enacted followed by the Baselines Law of 2009.

Our maritime domain has been named by us as the West Philippine Sea imposing on us a patriotic pressure to take it seriously. What is in a name really? Vietnam just named her sea as East Sea and South Korea likewise. But Congressman Rufino Biazon filed 3 bills in defense of the Philippine Sea in the east. Congressman Rufino Biazon filed House Bill (HB) 5497 or the "Benham Rise Research and Development Institute Act" and HB 5498 or the *"Eastern Seaboard Strategic Defense Plan Act"* in April 2017. The two proposed measures have been pending before the House committee on government reorganization and committee on national defense and security since May last year.

HB 5497 seeks to establish a government agency that would take charge of the research, development, exploration, conservation and biodiversity concerns of the Benham Rise region. Under HB 5497, the proposed Benham Rise Research and Development Institute would be under the Department of Science and Technology.

"The said Institute shall likewise be allowed to seek and accept foreign grants to further advance its programs and operations. Accordingly, the Institute shall also have the authority to partner with foreign parties also interested in the exploration of the region," the proposed measure read.

Congressman Rufino Biazon

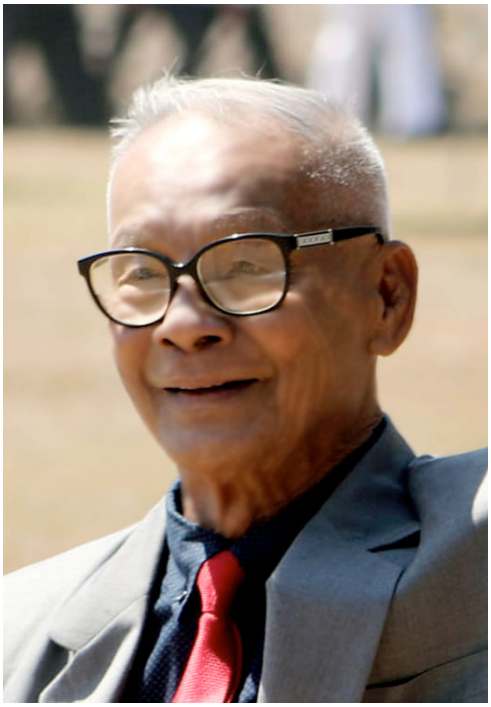
HB 5498, meanwhile, tasks the Department of National Defense and government security agencies to come up with a strategic plan to enhance defense capabilities in the country's eastern seaboard.

On July 2017, Congressman Rufino Biazon filed a third bill which seeks to declare Benham Rise a protected area under the Republic Act 7586 or the National Integrated Protected Areas System Act. Under the proposed measure, it would be the policy of the state to promote the Benham Rise or Philippine Rise region to spread awareness and concern.[9]

HB 6036 or the "Philippine Rise Natural Park Act of 2017" has been pending with the House Committee on Natural Resources since July last year.

The National Defense and Security Act was first introduced in the 13th Congress by Congressman Rufino Biazon and Senator Rodolfo Biazon, respectively.

For the 18th Congress, Congressman Rufino Biazon refiled the bill numbered HB 0550.



Senator Rodolfo Biazon

ARTICLE 13 - Philippine Navy

SECTION 38. The Philippine Navy shall:

a. Organize, train, equip and deploy naval forces for prompt and sustained;

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e. Prepare the necessary naval units for the effective execution of national defense plans and programs and Armed Forces missions, including the expansion of a peacetime navy component to meet the needs of war;

f. Develop doctrines, concepts, systems, procedures, strategies, tactics, and techniques for operations peculiar to the Navy; and g. Organize, train, equip, regularly test-mobilize and test-deploy the naval reserve component.

SECTION 39. The Philippine Marine Corps (PMC) shall be a type command of the Philippine Navy and shall be headed by the Commandant, Philippine Marine Corps, 19 V who shall hold the rank of Major General. The mission of the Corps is to provide combined arms maneuver forces to the unified commands and landing forces to Navy fleet forces for the conduct of amphibious operations and such other actions essential to the prosecution of naval defense. The Philippine Marine Corps shall have the following functions:

a. Organize, train, equip and maintain units of combined arms for amphibious operations, ground combat operations and internal security operations, and provide coastal artillery defense and early warning and surveillance of maritime corridors and choke points;

b. Develop in coordination with other services the doctrines, tactics, techniques and equipment employed by landing forces during amphibious operations;

c. Maintain deployable forces-in-readiness up to division size; type command rear service support units and the core formations of the Marine ready reserve forces;

d. Participate in national socio-economic development and assist in times of calamities and disasters;

e. Perform such other duties as may be directed by higher authorities.[10}

In the 18th Congress, Senator Panfilo Lacson also introduced a bill numbered SB 249.

Section 45. The Philippine Navy. The Philippine Navy (PN) headed by the Chief of the Philippine Navy, shall provide forces that shall be employed for the conduct of prompt and sustained naval operations in support of the AFP missions. It shall be composed of its headquarters, naval forces, service support and sustainment units and such other units as may be necessary for the conduct of naval operations.

Section 46. Functions of the Philippine Navy.

The Philippine Navy shall:

a. Develop, organize, train, equip, maintain, and sustain such naval forces or units as may be necessary for the conduct of prompt and sustained operations;

b. Prepare such forces or units as may be necessary for the effective implementation of the national defense plans and programs and armed forces missions;

c. Formulate and develop, in coordination with the other Component Services, doctrines, systems, tactics, techniques and procedures peculiar to the Navy;

d. Implement mobilization of the Navy Reserve; and

e. Perform such other functions and duties as may be provided by law or assigned by the CSAFP.[10]

Concluding Statement

My interest in National Defense and security concerns is a result of being a researcher of my father, Commodore Plaridel C Garcia, a retired Navy officer, and we spent time together as consultants to Senator Rodolfo G Biazon, the long-time chair of the National Defense and Security Committee. I became familiar with CA Act No 1 and many of the subsequent Executive issuances and laws such as the AFP Modernization Act, PCG and Baselines laws etc. In my considered opinion, I would have wished that the NDA

was passed when first introduced, but like the AFP Modernization act, certain events lead to its standstill like economic shocks, all-out wars, further internal security intensifications, even with the potential threat of China.

Now, the socio-political and the geopolitical environment also changed with the Pandemic and the continuous rise of China leading to the Indo Pacific construct, and lastly, the downturn of the economy as a result but I believe that it was a blessing in disguise that the NSDA bill was not certified urgent by all Presidents from Arroyo to Duterte.

In the first place it was mostly a recodification of CA No 1 and subsequent laws.

Second, the geo-strategic situation has been altered by the pandemic.

Third, the consequential downturn of the economy put a pressure to evaluate structures and compositions such as a citizen AFP with lesser present and future personnel costs, and conventional equipment that are very expensive may have to be replaced. Thus, the observations of Taruela and Pascasio were not in vain. The need for strategic thinking leading to PN as the premier Service and restructuring into what the economy can bear. Because this administration is about to run its course, perhaps, it is time again to sit back and think things over, but it is highly recommended for the president to consider the legislative bill as urgent.

Having stated the above, for as long as internal security threats are considered the priority, the Philippine Navy unfortunately has to fall in line. And as a consequence, external threats are not able to be addressed in a timely manner.

Endnotes

1. *https://cnnphilippines.com/news/2020/2/3/giovanni-bacordo-philippine-navy-chief.html*
2. *https://thediplomat.com/2020/09/whythe-philippines-needs-to-revise-its-national-defense-act/*
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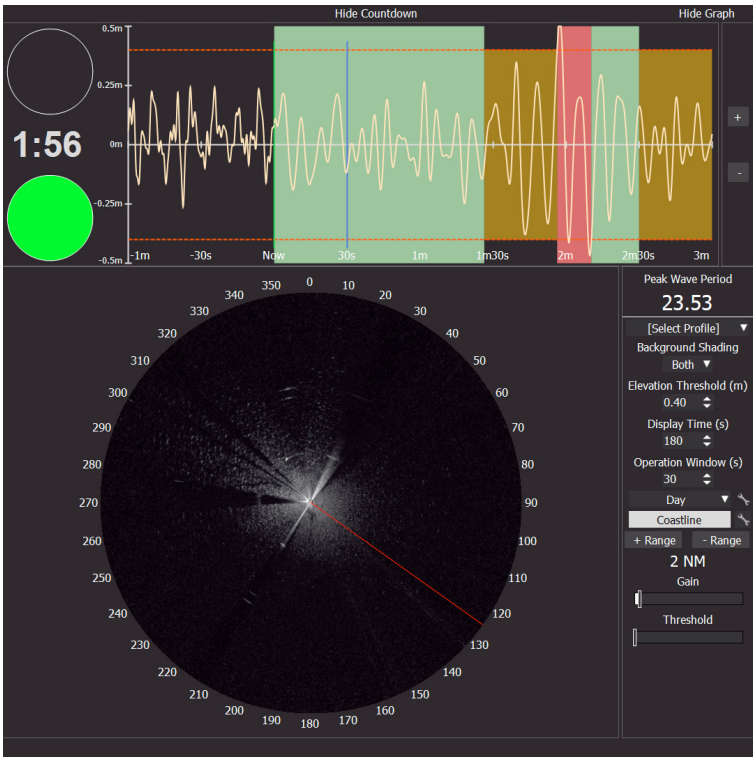

Wave Prediction Becomes A Reality

by Rutter

Sigma **S6 WaveSignal**, launched this week by **Rutter** Inc., is the latest addition to the sigma S6 line of advanced radar processing systems. **WaveSignal** uses x-band radar and predictive analytics to determine when quiet periods in wave action will occur. This information will improve mariner safety while conducting on-deck operations, carrying out cargo or personnel transfers, and a host of other offshore activities.

High definition visual representations of approaching wave fields, combined with a timer to the next light change, keep operators well-informed when assessing risk and identifying safe operational windows. **WaveSignal** forecasts quiet periods in wave activity, when it is safer to conduct on-deck operations. This includes predicting if, and when, a larger wave will impact the vessel.

The operator can input specific wave height thresholds, as determined by the nature of the work and acceptable conditions. When these thresholds are exceeded, a red signal light is activated – or conversely, quiet periods are identified with a green signal light, indicating it is safe to proceed. Like a traditional traffic light signal, a red or green light is displayed on the bridge system, and on an on-deck signal panel, indicating when it's safe to begin and continue operations, or necessary to suspend operations.

The origins of the technology within **WaveSignal** began in 2008 at **OceanWaveS** GmbH in Lüneburg, Germany, later acquired by **Rutter.** The research, which was spearheaded at the **OceanWaveS** office through collaboration with several governmental and educational research groups, quickly demonstrated the real-world application for this technology. Since then, Rutter R&D teams in Germany and Canada have worked to develop and commercialize **WaveSignal.**

"It has been very exciting, and challenging, bringing this breakthrough product to market. Because only now, some twelve years after the idea first germinated, has computing power and high-definition imaging been up to the task of dealing with the complexities of real-time wave prediction," says Blair Wheaton, **Rutter** CEO.

"Our fabulous R&D team has come up with a simple, elegant, highly intuitive interface and user experience that belies the complexity of the underlying technology." says **Rutter** President, Fraser Edison, *"This technology will provide a new layer of safety for mariners. In concert with the range of products under the sigma S6 banner, we are confident that* ***WaveSignal*** *will quickly become an essential tool in the technology kit of mariners and oil & gas production professionals around the world."*

"We gratefully acknowledge the participation of the Provincial Department of Industry, Energy and Technology as well as National Research Council (NRC) in helping us bring this innovation to market."

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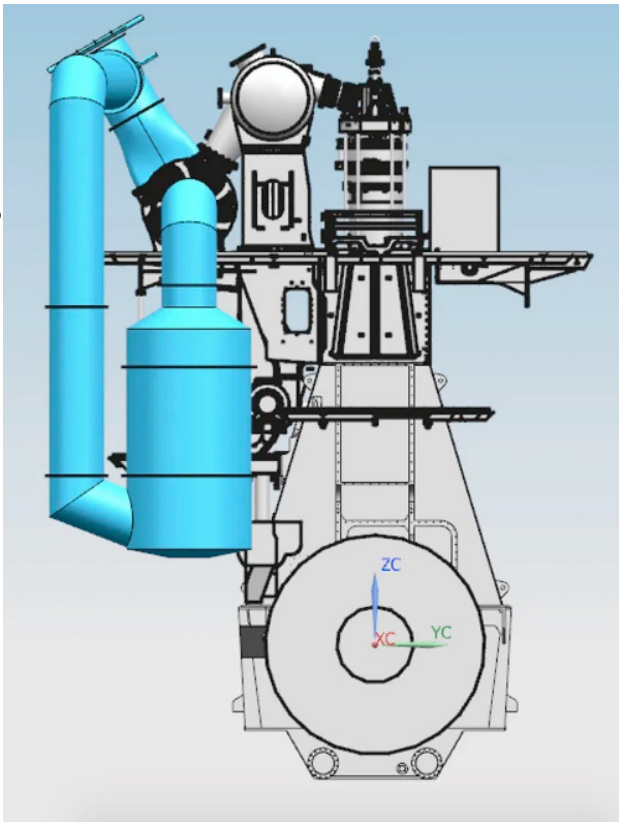
Source: *https://rutter.ca/wave-prediction-becomes-a-reality/#:~:text=sigma%20S6%20WaveSignal%2C%20launched%20this,in%20wave%20action%20will%20occur*

Reducing methane slip without compromising on engine performance

by Vessel Performance Optimization



iCER at driving end. Photo Credit: VPO

*Swiss engine technology company **WinGD** is helping shipping companies to optimize engine combustion and reduce methane slip with a new intelligent dual fuel engine technology.*

Intelligent Control by Exhaust Recycling **(iCER)** is a new technology that has been brought to the market by engine specialists **WinGD**. The technology, which is integrated into the company's new X-DF 2.0 engine design, recirculates methane to reduce the amount that is left in the exhaust system and ultimately escapes into the atmosphere.

During a webinar hosted by **VPO Global** at the end of last year, Dominik Schneiter, VP R&D, and Volkmar Galke, global director sales with **WinGD** explained how the technology reduces methane slip from engines by up to 50% without affecting performance.

What is methane slip and why reduce it? Methane is a strong greenhouse gas (GHG) that is emitted from engines burning liquefied natural gas (LNG). **LNG** as a marine fuel has grown in popularity in recent years thanks to some of the huge advantages it offers, including the reduction of sulphur oxides (SOx), nitrogen oxides (NOx), particulate matter (PM) and carbon dioxide (CO2). Its growing availability means that it is a relatively easy fuel for shipping companies to obtain. As environmental requirements set out by the International Maritime Organization **(IMO)** tighten, **LNG** offers a viable solution to guarantee compliance.

Despite its benefits, **LNG** is still a fossil fuel. **WinGD** believes that rather than being a solution for shipping's decarbonization, LNG can be thought of as a transformation fuel while the path for alternative fuels continues to be paved. Synthetic LNG **(SLNG)** and bio gas, if available, could be used today to reduce GHG drastically with X-DF engines.

Figure 1. WinGD sees LNG as transformation fuel while other methods to decarbonize shipping continue their development. Photo Credit: WinGD.

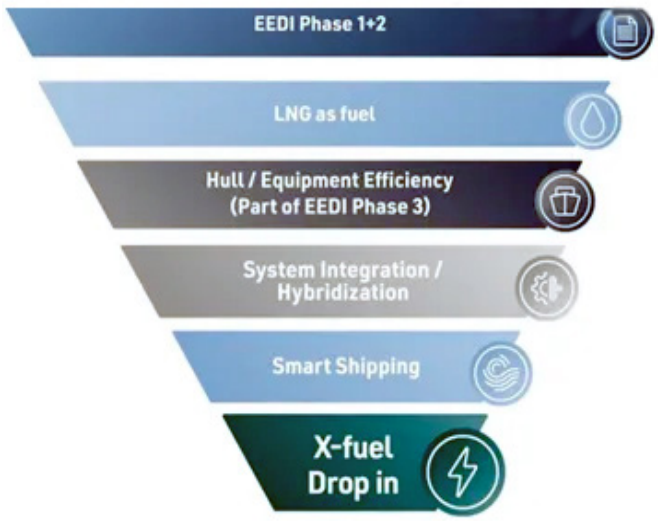
WinGD's answer to methane slip. WinGD's goal is to provide engine technology that can both improve the environmental credentials of marine fuels available today and cope with new fuels that are expected to enter the market in the future.

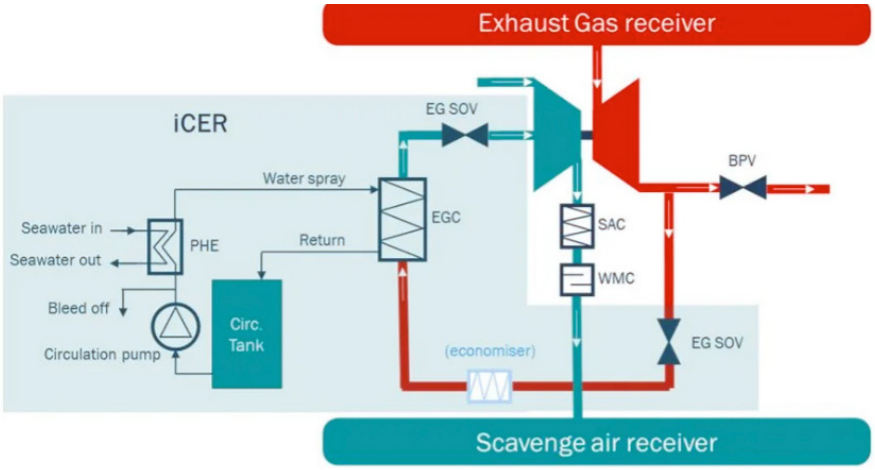
The company's latest engine design, the two-stroke dual fuel X-DF 2.0 has already proven its capability to optimize fuel performance with the help of the innovative technology known as Intelligent Control by Exhaust Recycling (**iCER**).

*"**iCER** technology can reduce methane slip by up to 50%,"* Mr Schneiter explained to listeners tuning in to VPO's webinar. The **iCER** system works by cooling and recirculating up to 50% of the exhaust gas through a low-pressure path during operation in gas mode. This makes complete use of the turbocharger capacity when compared with a high-pressure path. A system adjacent to the engine circulates part of the exhaust gas (up to 50%) after the turbine, through an exhaust gas cooler (EGC) to the compressor inlet. The exhaust gas and the fresh air are mixed before entering the compressor wheel of the turbocharger (see figure 2).

In the event of **iCER** technology failure, the system can simply be bypassed. The **iCER** technology will be available for all X-DF engines as part of the new X-DF 2.0 design upgrade.

As well as reducing methane slip, the intelligent technology





Abbreviation explanation:

BPV	Back Pressure Valve	EGC	Exhaust Gas Cooler
SOV	Shut Off Valve	SAC	Scavenge Air Cooler
EG	Exhaust Gas	WMC	Water Mist Catcher
PHE	Plate Heat Exchanger		

Figure 2. The iCER system recirculates part of the exhaust gas through a low-pressure path during operation in gas mode. Image courtesy of WinGD.

allows the user better control over combustion speed to improve overall engine efficiency. *"By adjusting the recirculation rate of inert gas and controlling parameters like fuel admission and ignition timing, we can increase compression ratios for greater efficiency,"* explained Mr Galke.

The new X-DF 2.0 engine design with **iCER** technology is capable of reducing fuel consumption in diesel mode by up to 5 g/kWh and energy by 4% in gas mode. NOx emissions up to **IMO** Tier III standards are reduced, and the release of Black Carbon, which is not currently regulated by IMO but could be in the future, is cut. According to **WinGD**, these additional benefits mean that the engine is prepared for the next level of **IMO** regulations.

WinGD's X-DF engines offer the greatest flexibility for future fuel through the combination of both the Diesel & Otto cycle in one engine, giving the shipowner the freedom to select either cycle for the greatest efficiency in utilizing any new fuel to come.

Current orders. *"We have already seen a big interest in the customer side with many systems being rolled out today,"* Mr Schneiter confirmed. To date, there have been nearly 400 orders of the X-DF engine, 100 already in operation, and more than 980,000 operating hours covering 5 variable segments. According to Mr Schneiter and Mr Galke, the lengthy operational hours prove the reliability and soundness of low-pressure technology.

To improve the engine further, **WinGD** is continuously collecting and using onboard data to ensure the most recent feedback is used to develop the engine further. *"With all this data available, we no longer have to assume, we have hard facts to help us address the energy management challenges."*

Preparing for the future. One question Mr Galke said he often hears companies ask is, *"If there's no regulation now, then why should I invest?"* With increasing pressure on the shipping industry to decarbonize and achieve ambitious climate change goals, tighter regulations can be expected. Moreover, shipping companies seen to be 'going green' are more likely to benefit from incentives and other discounts.

WinGD's answer is to ensure that any investment made now is also an investment for the future. It wants to provide its clients with adaptability and flexibility so that as new fuels become available and tighter regulations enter, owners and operators already have the technology to cope with whatever change the market brings.

Ammonia is expected to grow as an alternative fuel between 2040 and 2045, according to classification society DNV GL.

"The system to use ammonia, for example, is there. It doesn't need a fundamental change in approach so ammonia could be used by an LNG engine. However, volumes of ammonia need to be increased to make up the same quantity of LNG. The engine compatibility won't be a challenge, we can handle that. The bigger challenge is on the fuel handling and availability side," Mr Schneiter confirmed.

"As a technology provider we put the market requirements into a product. We get a clear demand from shipping companies and owners to move into a greener energy direction," Mr Schneiter added.

The company also introduced the 'fuel sharing' concept – a combustion cycle that mixes **LNG** and diesel to further optimize engine performance.

Source:
https://vpoglobal.com/2021/01/29/reducing-methane-slip-without-compromising-on-engine-performance/

SETTING SAIL FOR MORE EFFICIENT AND GREENER TRADE BY SEA

by WSP

Increasing Relevance of Reefers. Shipping lines continue to recognize the importance of trades involving fruit, frozen meats and other foodstuffs and are maximizing the reefer potential of vessels deployed on key shipping routes, such as the West Coast of South America (WCSA) or New Zealand.

It is now relatively common-place for container vessels to offer more than one third of capacity for reefer goods in some locations. Of the global operators, Mediterranean Shipping Co (MSC) and CMA-CGM have, for example, led the way in terms of increasing the number of reefer plugs offered, especially with vessels built since 2005. Additionally, specialist local operators such as Dole, have long recognized the added value of shipping by reefer containers instead of cargo moving loose and in bulk on reefer ships.

As part of a recent Maritime Advisory Project for a leading global terminal operating company, WSP assessed that volumes of banana exports in conventional vessels in one of the key exporting countries in the WCSA market had reduced by 50% over the past decade. Moving forward, it is projected that by 2040, all banana exports will be shipped via reefer containers and no use of general cargo reefer ships will remain. This is just one example, which applies to many different commodities that need reefer containers. However, it clearly confirms the future trends that are being catered for by both shipping lines, and port and terminal operators, who are offering market intelligence and research, which then leads to technical disciplines across maritime activities.

Yet the trend for greater capacity for reefer containers on ships is directly linked to key developments involving the vessels themselves, especially since the introduction of IMO 2020 by the IMO and future requirements for new fuel alternatives to keep pace with the drive for more environmentally friendly options. These new developments fully support the UN's Sustainable Goals 13 (climate action) and 14 (life below water).

Transitioning Towards Green Seas. An assessment of the current ship order book offers some interesting trends. It is estimated that around 3.5% of the existing global fleet is using "alternative" fuels, but if the confirmed ships under construction are included the figure is increasing to 25-30% of the future fleet.

Of all the "green" shipping fuels available, liquefied natural gas (LNG) is the most popular option, followed by liquefied petroleum gas (LPG). Several other options are being developed, for example, 13 ships being built will use ethane-sourced power, 11 vessels should use methanol and an additional seven units will be fully powered by biofuel. As such, it is no surprise to see a growing interest in studying the potential for the supply of ammonia bunkering at the Port of Singapore to support (changing) future vessel requirements.

In addition, some new ships on order may also be oriented towards energy-saving technologies (ESTs). These will include things such as rigid sails, kites, exhaust gas economizers, bow enhancements, to name but a few.

While some of these examples do not appear on container vessels, they still point to growing momentum for these items, with different types of ESTs contributing to supporting shorter-term IMO requirements.

The trend towards greater use of alternative fuels is due to a combination of increased environmental pressures and the introduction of stricter emission regulations, most notably IMO 2020, the US rejoining the Paris Climate Accord and China's carbo net zero target by 2060. IMO continues to drive the process, with a reduction of CO2 emissions by at least 40% across international shipping by 2040 and a 70% drop by 2050.

In the competitive context, for those regions that make extensive use of reefer containers, future access to export markets may depend on the ability to convert reefer vessel shipments into containers. In the WCSA trades, for example, access to reefer containers and to reefer plugs in ports and on ships is essential for shipping lines to maintain or increase their market share for this type of cargo, with approximately 1/3 of capacity for the relatively common reefer traffic on vessels in this region. For this reason, any shipping industry development, including the increased use of reefers in the above example, is one of several growing areas of support that the WSP Maritime Advisory team continues to offer to its clients in the ports and shipping industry.

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Source: *https://www.wsp.com/en-US/insights/setting-sail-for-more-efficient-and-greener-trade-by-sea*

STRETCHING GREEN POSSIBILITIES FOR SHIPPING FUELS

by Gulf News

Wider use of LNG will speed up transition, but it can't end there. In this decade, we'll see more accelerated change in shipping fuels than we've seen in the last century. *What does this heightened diversity mean for shipowners?*

They must be nimbler than ever – a shift that requires work. It means "greening" supply chains, bolstering energy efficiency, nurturing more partnerships, streamlining costs, and becoming adept at green finance (frequent change can be expensive to start with). All will help shipowners' fuel portfolios adapt to the inevitable need for a greener status quo as the g-push for a lower carbon world intensifies – and maritime fuels are often caught in an unflattering spotlight.

Need to get it done. Overhauls can be stressful for any industry, but there's good news. We know that the supply chain for bunker fuels, including shipowners, can react quickly. We're nearly one year into the International Maritime Organization's ruling to cut the sulphur limit on bunker fuels from 3.5% to 0.5%.

Removing these three percentage points marked one of the bunker fuel industry's biggest overhauls in decades. The ruling was designed as part of the IMO's initial greenhouse gas (GHG) strategy to cut carbon intensity of international shipping by 40% by 2030, compared to 2008. And it wasn't cheap.

Compliance bills were cited at an additional $25 billion to $30 billion in fuel costs for container liners alone in 2020-2023, said **Boston Consulting Group** (BCG) in late 2019. This was especially tricky for shipowners, an industry emerging from bankruptcies and closures, to absorb.

Smooth switch. Yet the switch has been relatively seamless – a point which buoys many stakeholders' optimism in the face of even greater change.

LNG ahoy. Appetite for liquified natural gas (LNG) bunkering is undoubtedly rising, helped by the robust supply of this "greenest fossil fuel." In early 2019, there were just six LNG bunkering vessels around the world. This has doubled, and with a further 27 on order and/or undergoing commissioning, according to SEA-LNG.

Of these 27, the majority are due to come into service by 2023. Plus, the bunkering infrastructure is also rapidly developing. LNG can now be delivered to vessels in some 96 ports with a further 55 ports in the process of facilitating LNG bunkering investments and operations. And shipbroker SSY said in November that around 10% of the total tanker orders made so far this year were for LNG dual-fuelled vessels.

But rising demand doesn't mean LNG is a one-stop shop win for all shipowners. It's still a fossil fuel in an increasingly green world, putting it at a high risk of falling victim to environmental restrictions. The stakeholders who've caught on early are proactively examining how to decarbonize LNG, which would vastly elongate its longevity and thus commercial viability.

Silver bullet? Can the most abundant element in the universe transform the maritime fuel industry up to 2050? Yes, but there's a vast amount of groundwork that must first be achieved.

Hydrogen's potential is not new; it's had a few false starts in the last half century. But the current revival – illustrated by news headlines describing hydrogen as "the" not "a" fuel of the future – seems to have greater credibility than ever in the political and business circles embracing sustainability.

Still needed are roadmaps detailing policy and technological developments, an array of pilot projects to pinpoint risk-reward ratios, reliable supply-demand dynamics and scalability.

But clearly, potential abounds. Nearly all of the voyages made by container ships along the China-US corridor –one of the busiest shipping lanes in the world– in 2015 could have been powered by Hydrogen, detailed the International Council on Clean Transportation (ICCT) this year.

And even this array – LSFO, LNG, and Hydrogen – are just a part of the greener marine fuels bucket in the 21st century. There's still plenty of work to explore other clean alternative fuels, such as ammonia and methanol.

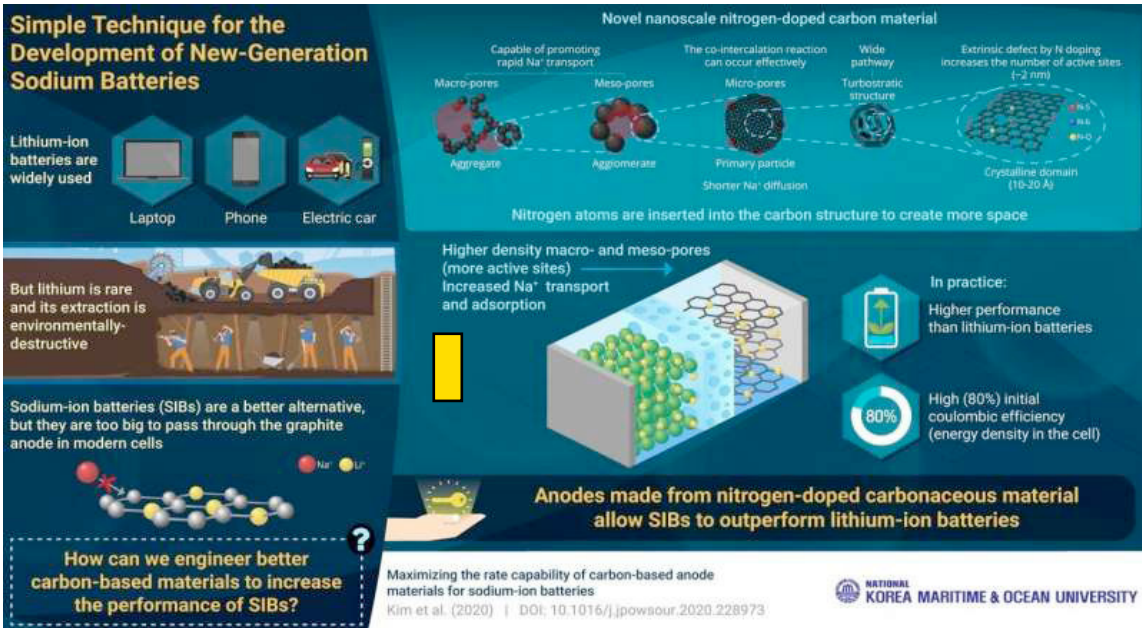
Proactivity will be pivotal to help shipowners calm the roaring seas of change, for one thing is certain: the status quo they sailed in the last century will be unrecognizable in the next decades to come.

Photo Credit: Lars Leibig, Gulf News

Source:
https://gulfnews.com/business/energy/stretching-green-possibilities-for-shipping-fuels-1.1610016296210

REVOLUTIONIZING RECHARGEABLE SODIUM-ION BATTERIES WITH 'DOPED' CARBON ANODES

by National Korea Maritime and Ocean University



Researchers in Korea have developed a 'heteroatom-doped' (modified) carbon-based anode that helps sodium-ion batteries to surpass the performance of lithium-ion batteries. Photo Credit: Korea Maritime and Ocean University.

As the world becomes aware of the imminent environmental crisis, scientists have begun a search for sustainable energy sources. Rechargeable batteries like lithium-ion batteries are seeing a popularity surge, concurrent with production of 'greener' technologies such as electric propulsion ships (which are being developed to meet the environmental regulations by the **International Maritime Organization**) and other electric vehicles. But, lithium is rare and difficult to distribute, putting its sustainability in doubt while also risking sharp increases in cost.

Researchers have thus turned to sodium-ion batteries (SIBs), which are electrochemically similar to lithium-ion batteries and offer advantages like higher abundance of sodium and cheaper production. However, currently, the standard anode material in SIBs is graphite, which is thermodynamically unstable with sodium ions and leads to lower reversible capacity (a measure of its storage) and poor performance.

To this end, researchers at **Korea Maritime and Ocean University**, Korea, set out to find a suitable non-graphite anode material for SIBs. Dr. Jun Kang, the lead scientist, says, *"Because SIBs have low performance—only 1/10th the capacity of a lithium-ion battery—it is crucial to find an efficient anode that retains graphite's low cost and stability."*

Now, in their latest study published in the Journal of Power Sources, the scientists reported the following strategies to overcome the limitations of carbon-based anode materials for SIBs: (1) employing a hierarchical porous structure capable of promoting rapid Na+ (sodium) transport from the bulk zone of the electrolyte to the interface of the active material; (2) retaining large specific surface areas where Na+ migrates to the interface, which can be easily accessed in the active material; (3) retaining surface defects and pore structures that enable co-intercalation from the surface to the interior; (4) retaining nanostructures in Na+ inserted into the active material from defects and pores that can have short diffusion paths; and (5) increasing the number of active sites due to extrinsic defects that result from these elements through hetero-element doping. These strategies led to the electrochemical performance of the battery being significantly improved, even surpassing that of current lithium-ion batteries!

In two of their previous studies, they successfully tested this method using phosphorus and sulfur, which were featured on the cover pages of *Carbon* and the *ACS Applied Materials & Interfaces*, respectively.

Dr. Kang is optimistic about the various potential applications of their technology, such as in electric propulsion ships and other vehicles, drones, and even high-performance CPUs. *"These five factors afford good capacity retention, reversible capacity, ultrahigh cycling stability, high initial coulombic efficiency (80%), and remarkable rate capability. This means they can be used for a long time even with intense battery use,"* he explains.

Considering the advantages of sodium over lithium, these findings certainly have important implications for the engineering of sustainable, inexpensive, high-performance batteries and can take us a step closer to the realization of an energy-efficient future.

Reference:

- *Dae-Yeong Kim et al, Maximizing the rate capability of carbon-based anode materials for sodium-ion batteries, Journal of Power Sources (2020). DOI: 10.1016/j.jpowsour.2020.228973. National Korea Maritime and Ocean University.*
- *Source:https://techxplore.com/news/2021-01 revolutionizing-rechargeable-sodium-ion-batteries-doped.html*

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NEW ABB EMISSION MONITORING SOLUTION HELPS MARITIME INDUSTRY ACHIEVE DECARBONIZATION

by Select Science

The launch of ABB's CEMcaptain will help shipping comply with the sulphur emission regulations that were enforced in 2020.

In January 2020, the low SOx and NOx emission limits in the International Maritime Organization regulations became effective worldwide. CEMcaptain is a powerful emissions monitoring system from ABB designed to help the maritime industry meet these new regulations and become more sustainable.

Its measurement and digital capabilities increase on-board safety, provide process optimization and substantially reduce ownership costs. By consistently achieving 98 percent and more uptime, the new system not only requires less maintenance effort but also saves time otherwise spent on handling non-compliance issues.

Designed with busy mariners and a regularly changing crew in mind, CEMcaptain is a multi-component analyzer system that continuously provides real-time data offering reliable measurement of emissions with the highest stability. Operating in even the harshest of conditions it integrates analyzer modules and sample handling components in a standalone cabinet, making installation easy.

Equipped with ABB's renowned Uras26 non-dispersive IR gas analyzer, CEMcaptain simultaneously and continuously measures sulphur dioxide (SO2) and carbon dioxide (CO2) in line with regulation requirements. Each analyzer has two separate gas paths to allow for continuous CO2/SO2 measurement of separate streams, with up to four different components per analyzer module.

"Our solutions are driving the evolution of sustainable shipping, paving the way to a zero-emission marine industry. ABB has more than 60,000 Continuous Emissions Monitoring Systems (CEMS) installed in over 100 countries that help monitor our environment," said Stephen Gibbons, ABB's Head of Product Management in Continuous Gas Analyzers. "We draw on 60 years of experience in emissions monitoring to provide this support in concrete terms. CEMcaptain has been combined with innovations in on-site and remote digital services. The result is a solution that provides the industry with a digital toolbox that increases regulatory compliance and operational efficiency."

Fast fault reporting, diagnosis and repair are achieved via the on-site and remote digital services which help operators get closer to 100% availability for their gas analysis instrumentation. Dynamic QR codes are integrated into the ABB CEMcaptain system display panel. All relevant diagnostic information can be collected from the analyzer via a scanned code and transferred to ABB support.

This means that maritime instrumentation technicians can send real-time information to an ABB service expert to get immediate guidance on appropriate maintenance. ABB Ability™ Remote Assistance with secured connectivity direct to ABB support is also offered for real-time solutions to problems. These features reduce the costly training of changing crews as well as the number of experts required on board. They also increase on-board safety by reducing crew exposure to emissions.

Source:
https://www.selectscience.net/product-news/new-abb-emission-monitoring-solution-helps-the-maritime-industry-achieve-decarbonization-targets/?artID=53707

According to new data released by the **NGO Shipbreaking Platform**, 630 ocean-going commercial ships and offshore units were sold to the scrap yards in 2020. Of these vessels, 446 large tankers, bulkers, floating platforms, cargo- and passenger ships were broken down on three beaches in South Asia, amounting to near 90% of the gross tonnage dismantled globally.

Ships are considered hazardous waste under international environmental law as they contain many toxic materials and substances within their structures, and onboard as residues. These toxics include, amongst others, cadmium, lead batteries, asbestos, mercury, ozone depleting substances, PAHs, and residue oils, which all need to be managed in a safe and environmentally sound manner. Their export from developed to developing countries is banned by UNEP's Basel Convention.

On the beaches of Alang in India, Chattogram in Bangladesh, and Gadani in Pakistan, where near 90% of the global world tonnage was scrapped last year, the negative consequences of shipbreaking are real and felt by many. Workers – often exploited migrants, some of them children – are exposed to immense risks. They are killed or seriously injured by fires and falling steel plates, and sickened by exposure to toxic fumes and substances. Coastal biomes, and the local communities depending on them, are devastated by toxic spills and air pollution due to the lack of infrastructure to contain, properly manage and dispose of the many hazardous materials embedded in the ships.

"It is a scandal that laws and standards aimed at protecting people and the environment are ignored when scrapping the near totality of the global fleet. Governments, the clients, financiers and insurers of shipping, as well as the employees of shipping, need to take a much stronger stance against this exploitation of vulnerable communities and fragile ecosystems," says Ingvild Jenssen, Executive Director and Founder of **NGO Shipbreaking Platform.**

Last year, at least 10 workers lost their lives when breaking apart vessels in Bangladesh. At least another 14 were severely injured. Despite repeated attempts to obtain official statistics, no information on accidents at the Indian and Pakistani yards has been made available. The sector suffers from a serious lack of transparency, and it is expected that many accidents go unreported. Many more workers suffer from cancers and other occupational diseases. The detention of BBC reporters and confiscation of footage from France 2 journalists by local officers from the Gujarat Maritime Board (GMB), which controls the port in **Alang**, reveals how the industry seeks to thwart public scrutiny of the deplorable conditions at the yards.

DUMPERS 2020 – Worst practices

Greece tops the list of country dumper in 2020. Greek owners sold 48 ships for scrapping in total, most of which were beached in Bangladesh and Pakistan.

"Whilst some EU Member States are increasingly cracking down on environmental crime, almost a quarter of the tonnage broken in South Asia was owned by European shipping companies. Greece in particular has systematically closed its eyes to the deplorable end-of-life track record of its shipping industry," says Jenssen of **NGO Shipbreaking Platform.**

The "worst corporate dumper" prize goes to **South Korean** company **Polaris Shipping.** Under pressure following serious incidents on the Stellar Daisy, which sank in the Atlantic with the loss of 22 lives in 2017, and on the Stellar Banner, which was scuttled off the coast of Brazil in June, Polaris Shipping scrapped 11 of its carriers in 2020. All units were beached in Bangladesh and Pakistan. Four major accidents, causing the death of one worker, occurred during the dismantling of Polaris' vessels in Chattogram.

On 22 June, during an illegal night shift at Jumuna Ship Breakers yard, Abdul Halim was hit by an iron piece in the stomach on the ship Stellar Knight. On 1 July, Rohul fell and broke five ribs while dismantling the Stellar Iris at KSB Steels yard. The same day, Mozaffor fell from the Stellar Journey at RA Shipbreaking yard. Finally, on 25 December, Md Ibrahim was killed when hit by a large iron piece while breaking the Stellar Hermes at Kabir Steel's Khawja yard. Shipping media Splash reports middleman scrap-dealer GMS is linked to several of Polaris' recent demolition sales.

Another South Korean company, **Sinokor**, is runner-up for worst corporate practice. Sinokor sold four vessels for scrapping in Bangladesh last year. On 24 March, two brothers, Sumon Das and Nironjon Das, died due to toxic gas inhalation while working in the engine room of the tanker West Energy at Kabir Steel's Khawja shipbreaking yard. Shumon and Nironjon left five children behind. In the same accident, two other workers, Kawser and Habib, were also exposed to the toxic gas and fell sick.

Brazilian state-owned company **Petrobras** comes third for worst corporate practice. Three years have passed since civil society organizations and trade unions urged the Brazilian government to stop the dumping of toxic ships on South Asian beaches. Yet, oil giant Petrobras dumped nine of its old tankers in South Asia last year alone. The units were auctioned off to

630 Ships Sent for Demolition During 2020

by NGO Shipbreaking Platform

unscrupulous scrap-dealers, also known as cash buyers.

"To avoid such deplorable practices in the future and ensure the enforcement of international legislation on hazardous waste exports, Brazilian authorities need to introduce stricter requirements for the public auctions of Petrobras' end-of-life vessels," says Nicola Mulinaris, Communication and Policy Officer at the **NGO Shipbreaking Platform.**

Berge Bulk, Costamare, Eurobulk, Evergreen, K-Line, Maersk, Swire & Sons, and **Teekay** are other well-known shipping companies that dumped their toxic ships on South Asian beaches in 2020.

In October, a worker lost his life during the scrapping of two Transocean's rigs at **Isiksan**, a Turkish ship recycling yard included in the EU list of approved ship recycling facilities. The accident is a strong reminder of the challenges related to both containment and safety when dismantling offshore units. More than half of the oil and gas units scrapped last year ended up on the beaches of South Asia, including units owned by **Noble Corporation, Tidewater and Valaris,** as well as top dumper Petrobras. The mercury-laden FSO tanker JNAT was, on the other hand, banned from entering Bangladesh and India after NGOs called upon authorities to halt the import.

Environmental and labor laws that regulate ship recycling exist, but they are ignored and easily circumvented by ship owners, often with the aid of cash buyers. These pay the highest price for end-of-life vessels and typically re-name, re-register and re-flag the vessels on their last voyage to the beaching yards. Almost half of the ships sold to South Asia in 2020 changed flag to one of the black-listed flags **Comoros, Palau and St Kitts & Nevis** just weeks before hitting the beach. At least 14 of these flag changes enabled ship owners to circumvent the EU Ship Recycling Regulation.

"Whist European shipping companies own 40% of the world fleet, only 5% of end-of-life ships were registered under an EU/EFTA flag in 2020. Flags known for their poor implementation of maritime law have always been particularly popular at end-of-life. Ship owners hiding behind anonymous post box companies set up by cash buyers and backed by blacklisted flag registries is a reality that begs for the introduction and enforcement of measures that effectively hold the real beneficial owners of the vessels responsible," says Jenssen.

In a landmark ruling last year, a Norwegian court sentenced ship owner Georg Eide to six months unconditional imprisonment for having assisted cash buyer Wirana in an attempt to export the Tide Carrier to Pakistan for scrapping. Several other cases of illicit traffic are under investigation: unravelling the murky practices of shipbreaking, they highlight the importance of conducting due diligence when choosing business partners.

Due to the pandemic, the cruise shipping sector has been forced to downsize, with many ship owners, such as **Carnival Corporation and Pullmantur,** taking steps to reduce operating expenses, including the retirement of relatively young vessels. Carnival Corporation receives the 2020 award for best ship recycling practice. Leading by example, the American cruise shipping giant sets a standard the remaining of the cruise and shipping sector can follow.

*"**Carnival Corporation** is honored to receive this award. Our highest responsibility and top priorities are to be in compliance everywhere we operate in the world, to protect the environment and the health, safety and well-being of our guests, the people in the communities we visit and our shipboard and shoreside employees. This commitment holds true for every stage of the life and retirement cycle for each of our ships,"* says Carnival Corporation's spokesperson.

Clean and safe solutions are already available. Less than a million Light Displacement Tons (LDT) were recorded recycled in EU-approved facilities in 2020, which represent a minor fraction of what these yards are able to handle.

*"We applaud companies, such as **Carnival Corporation**, that have a responsible policy for the recycling of their vessels 'off the beach'. Now, we call upon policy makers to adopt effective measures, such as a return-scheme for ships, that will incentivize more owners to recycle their assets in a sustainable manner," concludes Mulinaris.*

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Source:
https://shipbreakingplatform.org/platform-publishes-list-2020/

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ENVIRONMENTAL FACTORS ENHANCE DIESEL ELECTRIC SUBMARINE DOMINANCE IN THE LITTORAL ZONE BATTLESPACE

by Capt Tomas D Baino PN (Ret)

INTRODUCTION

This article attempts to describe the difference between the two (2) submarine battlespaces in the littoral zone and open ocean for diesel electric submarines and nuclear attack submarines, and the inherent environmental factors in an arena of underwater warfare for type submarine that can be exploited to one's own advantage by cognizant naval commanders. This research work by the author is based on various reading materials particularly from the US Naval Post Graduate School in Monterey, California, lecture notes during my student days in Post Graduate Study in Submarine Design, Department of Naval Architecture, University College of London, United Kingdom of Great Britain in 1991 and also from various reading materials in defense review magazines.

LITTORAL ZONE SUBMARINE OPERATIONS

Submarine operation in littoral zone operation is a contested environment similar to the Archipelagic coastal waters of the Philippine seaward portion and is predominantly considered as confined and shallow waters (with depths less than 200 meters), narrow straits, jagged and rugged coastlines, tidal areas as well as extensive seabed flats, underwater hills and mountains, shoals, and river estuaries. Furthermore, it also includes the landward coastal inland human activities in which submarine sensors pick-up signals that could significantly affect target information reception and be regarded as a very specific operational environmental risk associated with heavy maritime traffic and prevailing variable climate conditions that affect sound projection of sensors in the conduct of military operations.

In summary, it is a cramped, congested and contested operational environment which is extremely complex, thus, the challenging littoral zone underwater battle zone arena of conflict affects freedom of movement with various threats and risk. However, such a broad range of limitations provide some opportunities for submarine cognizant commanders to swing these opportunities to their own tactical advantage.

OPEN OCEAN SUBMARINE OPERATIONS

Deepwater is ideal for submarine operation because it is the opposite of littoral waters in that submarine operation has no limitation in terms of space, time and environmental factors, and offers a wide spectrum of underwater battlespace for submarines with a high level of maneuverability, speed and acoustic sound propagation that is almost perfect to enable cognizance of an incoming deliberate attack.

TWO TYPICAL TYPES OF SUBMARINES IN WORLD NAVIES

The common types of submarines in the inventories of various Navies of the World are the Diesel Electric Submarine and the Nuclear Attack Submarine.

a) Diesel Electric Submarines (SSN) - A small to medium size conventional submarine between 150 to 1,640 tons displacement propelled by diesel electric propulsion unit.

Dolphin Class Submarine

Displacement:	1,640 tons surfaced and 1,900 tons dived
Dimension:	Length 57.3m (188 ft) Diameter 6.8m (22 ft. 4 inches) Draught 6.2m (20 ft. 4 inches)
Performance:	Speed 11 knots snorting and 20 knots dived, range 14,825 km (9,120 miles) at 8 knots surfaced 780 km (485 miles) at 8 knots dived
Diving depth:	350m or 1,150 ft operating depth
Torpedo Tubes:	6x533mm (21 inches) and 4x650mm (25.6 inches) tubes all bow mounted
Electronics:	Elta Surface Search Radar, CSV 90 active/ passive hull mounted SONAR, PRS-3 passive imaging SONAR, ISUS 90-1 torpedo fire control system and Tinmax x 4 CH(V) 2 ESM
Target:	Hostile surface ship and submarine of high military value
Complement:	30

b) Nuclear Attack Submarine

Displacement:	7,800 tons dived
Propulsions:	1 x General Electric S9G Reactor supplying steam to 2x steam turbine delivering 29,825 kw (40,000 shaft horse power) to one shaft to a pump jet propulsor
Performance:	Speed 34 knots dived and endurance unlimited
Armament:	4 x 12 inch (533 mm) tubes for 26MK 48 ADCAP Mod 6 wire guided torpedoes and/ or Harpoon Anti-Ship Missiles or MK 67 Mobile and/or MK 60 CAPTOR Mines, and 12 Vertical launch system, tubes for 12 Tomahawk land attack missiles with nuclear warhead.
Electronics:	1 x BP S-16 Navigation Radar, 1x CCSM combat data system, 1x WLX-1 Acoustic Countermeasure System, 14 External, 1 Internal Countermeasure launch, an advance SONAR Suite including an active/passive array, 2x passive wide-aperture flank array active keel and fin arrays, TB-16, and TB-19 towed array.
Target:	Carries weapons of mass destruction for deterrence and to neutralize other surface vessels and submarines of high military value.
Crew:	134

ASSESSMENT

A very small or medium-size diesel electric submarine is a very quiet submarine and capable to hide with natural underwater concealment, blended with natural underwater terrain. Said submarine can

operate underwater using only batteries to supply power to the entire submarine's ship system which emits negligible sound, undetectable by surface ship sensors.

Said submarine is very difficult to detect because SONAR sound propagation of anti-submarine surface ship is being significantly affected by environmental factors, hence, sensor reception of the returning echo to the sensor receivers make it difficult to conclude a deliberate anti-submarine attack.

A huge nuclear attack submarine can also operate in littoral zone during peace time situations, but said type submarine is risky to dive deeper to evade anti-submarine surface ship attack in times of conflict because of its large volume of hull structures. It should not take unacceptable risks of grounding and colliding with undersea terrain.

Nuclear submarines can be easily detected in littoral zones because of its huge body volume of displacement that creates disturbances in the surrounding underwater environment. Aside from this, it is quite noisy and constantly emits acoustic noise from her pumps continuously operating to supply seawater to her cooling system for her nuclear reactor in order to prevent meltdown.

CONCLUSION

The most feared adversary of naval commanders is the submarine as it is not visible at the surface of the sea in areas of conflict.

Stealth is an important attribute of a submarine. However, when the presence of a hostile submarine is detected, her invincibility is lost and the effective use of her weapons system is denied. So, instead of being the hunter she now becomes the hunted.

A poor Navy that possess an inventory of a diesel electric submarine can provide a force multiplier to her fleet in the areas of conflict in contested waters, and can provide fighting capabilities for gaining sea control in the arena of a contested environment.

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SOUTH KOREAN SHIPBUILDERS EXPECT TO DOMINATE GLOBAL MARKET ON BACK OF LNG CARRIERS

by Arirang News

South Korea retained its status as the world-leading shipbuilding industry last year despite many COVID-19 challenges.

Experts forecast the new year will treat domestic shipbuilders better as they will benefit from the introduction of eco-friendly policies.

South Korea's Daewoo Shipbuilding and Marine Engineering has developed a technology that helps determine the safety of liquefied natural gas carriers in its shipyards.

This saves time and helps cut operating costs as the shipbuilder previously had to take new LNG vessels to one of two specific shipyards to carry out special tests.

Thanks to technological developments, South Korea took more than 40% of the global orders and maintained its position as the world's top shipbuilder last year.

Industry experts say the domestic shipyards' performance is likely to catch a massive tail wind in 2021, with the anticipated introduction of new environmental regulations as well as rising global demand for eco-friendly vessels.

The European Union hinted at new measures for carbon emissions targeting ships entering its ports.

To accommodate these changes and bolster its shipbuilding capabilities, South Korea has vowed to support the development of new technologies.

"The oceans and trade ministries will invest over 870 million dollars from 2022 to 2031 in innovative eco-friendly shipbuilding technologies projects. We also plan to give national certificates to eco-friendly vessels and materials to help commercialize new technologies and turn them into global standards."

Building LNG carriers requires technical precision and the ability to meet high production standards.

The right technology is also needed so that the gas can be kept at 163 degrees Celsius while being stored. With this technology in place, Korean companies are able to stay ahead of their rivals.

"Without the right technology, it's hard to adapt to the market. We can say there's a lot for the domestic shipyard to benefit from the changing trend."

Experts believe the number of global ship orders will jump 24% from last year and many indicators predict a rosy outlook for South Korean shipbuilders.

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Source:
http://www.arirang.com/News/News_View.asp?nSeq=271706

Philippine Seafarers of CF Sharp. Photo Credit: Business Mirror, Oct. 2020.

PHILIPPINES SUPPORT OF NEPTUNE DECLARATION HIGHLIGHTS VITAL ROLE OF SEAFARERS

by SAFETY4SEA

Numerous manning agencies based in Manila support the Neptune Declaration, to ensure the wellbeing of seafarers affected by the crew change crisis during the COVID-19 pandemic.

According to local media, the Neptune Declaration was signed by over 450 maritime industry and human rights leaders, including Döhle Seafront Crewing (Manila), Philippine Transmarine Carriers (PTC), and OSM Maritime, representing the Philippines.

Commenting on the declaration, Döhle Seafront President lawyer, Mrs. Iris Baguilat highlighted that during this enduring time, every action counts, ''especially if it works for the wellness of seafarers and keeping the industry running.''

She also added that while shipping ''roughs out'' pandemic to keep its businesses afloat, it is now necessary to break the barriers down and ''walk together in unity and cooperation.''

In addition, Gerardo Borromeo, vice chairman and chief executive officer of PTC, also made a comment, saying that the industry now has a unique opportunity to make a difference, coming together to resolve the humanitarian concerns of seafarers.

In fact, at the peak of the crew change crisis in the autumn of 2020, the UN International Maritime Organization estimated that around 400.000 seafarers were on their ships beyond the expiry of their contract, while another 400.000 seafarers were unable to get to work.

The Neptune Declaration was announced in late January in light of a peak in the crew change crisis, which has left hundreds of thousands of seafarers stranded onboard due to travel restrictions. Sharing responsibility based on their roles across the entire maritime value chain, the signatories seek to ensure that the crew change crisis is resolved as soon as possible by defining four main actions to keep global supply chains functioning:

1. Recognize seafarers as key workers and give them priority access to Covid-19 vaccines;
2. Establish and implement gold standard health protocols based on existing best practice;
3. Increase collaboration between ship operators and charterers to facilitate crew changes;
4. Ensure air connectivity between key maritime hubs for seafarers.

Recently more organizations have expressed their support towards the Neptune Declaration. More specifically, the Liberian Registry announced it has become the first ship registry to sign the Declaration. ECSA has also expressed its full support on the Neptune Declaration, with BIMCO adding that now the industry can overcome the challenges by working closely.

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Source: *https://safety4sea.com/philippines-support-of-neptune-declaration-highlights-the-vital-role-of-seafarers/?utm_source=noonreport&utm_medium=email&utm_campaign=safety*

PROPELLING THE MARITIME INDUSTRY INTO A DECARBONIZED FUTURE by Wärtsilä

With increasing demands on owners and operators to improve efficiency while also preparing for decarbonization targets, the maritime industry is facing multiple challenges. While the development of alternative fuels is a critical element in the decarbonization journey, the need to increase efficiency and reduce energy consumption is also a key part of this equation. Propulsion solutions are central to this efficiency gain as the journey towards zero-carbon vessels continues.

Bernd Bertram, Vice President – Propulsion, **Wärtsilä** shares his thoughts. *"The past decade has been one of great change in the maritime industry as it looks to navigate the conflicting megatrends of globalization and decarbonization," observes Bertram. "Ensuring vessel compliance with **IMO** targets requires investment but now, with the Poseidon Principles initiative, such investments are not only about meeting targets, they are about ensuring profitability, asset financing and access to local incentives. It is now a business imperative to have the lowest possible Annual Efficiency Ratio (AER) and the highest possible fuel efficiency, and we have the technology – and the people – to help achieve this."*

A holistic approach to decarbonization deadlines. *"It's a given that operators need to make efficiency improvements, both to cut costs and to reduce emissions, and the best results are achieved with an integrated efficiency package," points out Bertram. "Together, our propulsion technologies are capable of delivering the efficiency needed to meet current and upcoming regulations, and we also help owners to build a case to gain access to local funding streams. Improving fuel and propulsion efficiency is also the most effective way to reduce a vessel's operating costs."*

Different vessels and trading areas require different solutions. **Wärtsilä** carefully ensures solutions are customer-tailored. *"We always carry out a detailed study to give customers the opportunity to compare different solutions and find the right one for their vessel and its area of operation," shares Bertram. "Adding value is at the very heart of what we do, and customers often come to us with a specific challenge or objective and ask us to help them solve it. For example, Wijnne Barends needed a very specific propulsion solution for Baltic conditions, and needed to reduce fuel costs, so we worked with them to develop the right solution to fit their needs. Our propulsion efficiency packages allow us to integrate and optimize our energy-saving technologies for the customer's specific vessel and application, giving highly attractive efficiency improvements from just one supplier, with optimized vessel layouts, reduced design costs and lead times, better assurance of full-scale performance, and full integration with onboard systems and software."*

Bernd Bertram, Vice President – Propulsion, Wärtsilä

People, passion and performance. Wärtsilä's propulsion business consists of three business lines: thrusters and propulsion controls; propellers and transmission; and waterjets – with a technology function that underpins them all. Each business line offers market-leading technology and solutions and working together to deliver the best results. The company is widely recognized as having the widest capability and portfolio of any original equipment manufacturer (OEM) in the industry, but Bertram is quick to reiterate that it's not just the advanced technologies that make the difference. *"We have about 550 engaged and talented colleagues in our propulsion business, all working together to shape the industry, drive decarbonization and provide the best solutions for our customers. Our Technology teams use their expertise to develop, validate and design not only new products but also to enhance our existing offering by combining technologies in different ways to create added benefits for our customers. Having an inspiring and exciting workplace is important so we can attract and retain the best and most knowledgeable professionals in the business,"* he explains.

The industry's best solutions all in one place. As awareness about the work required to meet the requirements for 2030 and beyond grows, Wärtsilä has been proactive in considering what its role can be beyond its current OEM portfolio. *"We realized early on that a holistic offering can be best delivered by working with others to help lower our customers' emissions,"* explains Bertram. *"By adding innovative new solutions and capabilities and integrating them into our propulsion offering, we're ensuring that our customers can enjoy the benefits of a total solution. Products like Kuribayashi Steamship Co.'s Gate Rudder, Anemoi Marine Technology's Rotor Sails, and Silverstream Technologies' Air Lubrication System help us to achieve significant emission reductions. Partnerships and collaboration are very important to Wärtsilä – we see these innovations as part of our holistic solution to the challenge of decarbonization and a way to offer a totally comprehensive value proposition to our customers."*

Looking to the future, Bertram is convinced that efficient propulsion will continue to be key. *"Vessels will always need propulsion, but in the future that could be achieved in a combination of ways: wind sails, batteries, fuel cells or smaller engines, for example. In all probability the prices for bio-based or synthetic fuels will be more expensive than fuel is now, so even when your vessel can operate on these future fuels you will still always do well to make it run as efficiently as possible. In this way, increasing propulsion efficiency is only going to become more important as we continue towards a zero-carbon future for the industry."*

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Source:
https://www.wartsila.com/insights/article/propelling-the-maritime-industry-into-a-decarbonised-future

Equipped with Kongsberg Maritime systems, OIM Wind's new vessel will, on completion, be capable of sustainably transporting and installing multiple sets of next-generation wind turbines.

OIM WIND TO INSTALL KONGBERG WIND TURBINE INSTALLATION UNIT

by Vessel Performance Optimization

Norway-based company **OIM Wind** will install a next-generation Wind Turbine Installation Unit (WTIU) by **Kongsberg Maritime** (KM) that will reduce energy consumption by up to 30 per cent. The installation is destined to be among the largest of its type.

A Letter of Intent was signed between Chinese shipbuilder Yantai CIMC Raffles Offshore and KM to deliver the BT-220IU Wind Turbine Installation Unit.

The vessel will be suitable for transporting and installing multiple sets of next- and future-generation wind turbines, and their foundations. The agreement provides the option for another vessel of identical design.

The new vessel, which is expected to be delivered by the end of 2022, will feature a KM Integrated Solution for Wind Turbine Installation Units. This proven solution combines KM's motion control, propulsion and dynamic positioning functionalities to maintain operability in all conditions.

Monitoring and controlling of the KM components will be handled by a K-Chief 700 marine automation system, and the company's scope of delivery is rounded out with a comprehensive Digital Solution with a new planning, advisory, monitoring and reporting tool to improve the safety and operation of the vessel.

Included in the delivery are Bergen LNG (liquified natural gas) engines, together with an LNG Fuel Gas Supply System. KM's new state of the art PM azimuth thrusters will secure optimized performance both for transit, maneuvering and dynamic positioning. The scope of supply also includes an array of appropriate deck machinery.

The electrical system will make use of KM's Energy Storage Solution, a green, load-smoothing initiative which will optimize power production and enable the vessel to operate for limited periods on battery power alone. By allowing these stretches of zero-emission running, the solution will reduce the need for installed power and minimize maintenance costs, and can reduce energy consumption by up to 30%.

With the highly efficient power plant running on LNG the vessel will be the most environmentally friendly WTIU built to date.

OIM founder, president and chief executive Oddgeir Indrestrand, said: *"**OIM** has been working closely with **Kongsberg Maritime** for many years, and we are very happy to include their advanced range of future-proof equipment and solutions into our units."*

"It's a source of real pride for us to be such an integral part of the specification for this new wind turbine installation unit," says Brynjulv Standal, vice president sales-offshore, **Kongsberg Maritime.** *"The environmentally friendly principles which shape its design, construction and operation mirror our own ambitions to engender sustainability in offshore wind projects, and of course in all maritime sectors. Our technologies are a key element in achieving these green goals."*

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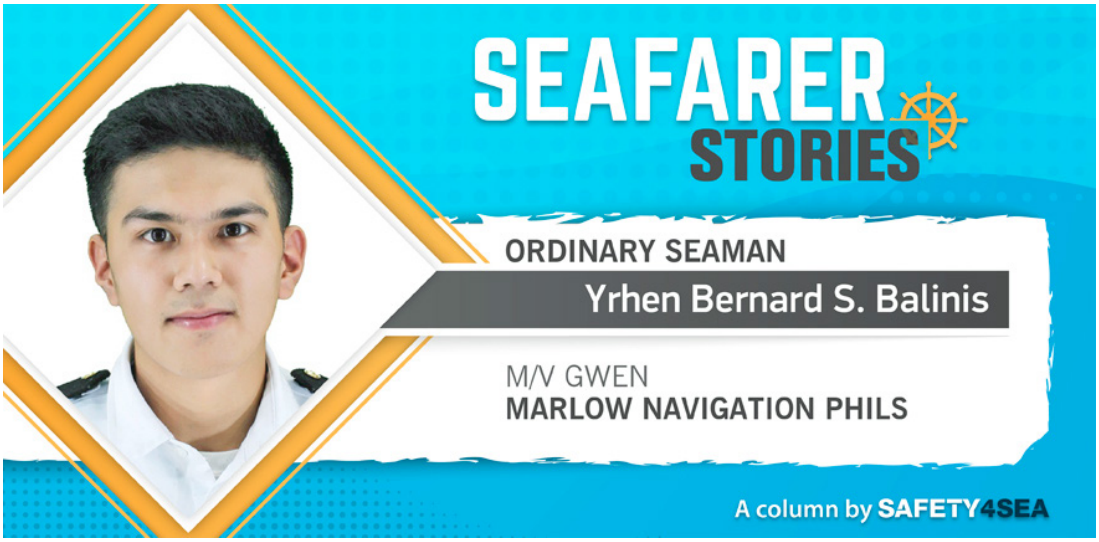
Source: *https://vpoglobal.com/2021/01/25/oim-wind-to-install-kongberg-wind-turbine-installation-unit/*



Our 'Seafarer Stories' new column hosts seafarers' views who present briefly the key challenges of life and work onboard, providing a picture of what a career at sea actually means. In this context, we are happy to host an interview with **Yrhen Bernard S. Balinis**, an ordinary seaman from Philippines, who inspire us with his story. Yrhen shares his life-changer experience and explains why working at sea is a 'continuous learning progress.'

SAFETY4SEA: What do you love the most in your career at sea?

Yrhen Bernard Balinis: There are no two days which are ever the same in this profession. The uncertainty of what tomorrow will bring; the thrill of surprises waiting on a brand new day— those are the things that draw me back to the oceans.

Growing up, people would always say to me "This kid will go places!", and never in my imagination did I think of taking that literally. My passions have always centered in exploration and freedom. Before becoming a sailor, I was an active campus journalist bagging awards for my college, Mariners' Legazpi. Now that I look back, I have come to the understanding that there are more similarities of becoming a journalist, and being a seafarer than what I originally knew. That these two are not of opposite poles and you can be one without sacrificing the other. Both of them offer the thrill for the adventure of going places, and the longing for freedom— all of which define the entirety of me.

I'm a seafarer by profession but a writer by heart. And we can all agree that creative juices flow richer with the melodious sound of waves, the calming starry moonlit night while a soft breeze slowly caresses the pages of your notebook as you glide your pen to what will be a part of your memoir. The seas indeed have a therapeutic effect (not until it rocks-and-rolls the entire vessel— but even then, it can also be a source of inspiration).

And of course, as mainstream as it sounds, I also love immersing myself on another culture. For what better way is there than living with them for nine months on a floating community?

S4S: What have you learned in your career at sea?

Y.B.B.: I learned so much— be it technical or practical know-hows. But above all, I learned more about myself and that I am capable of the things I once thought I couldn't. It made me realize that although I can do things alone, work will be much easier when shared, and rushing things will either diminish its quality or compromise your safety. There are other insights which I shared in my article with Royal Institute of Navigation (Navigation News, Sept/Oct 2020) and The Nautical Institute (Seaways, Oct 2020) written by a young navigator for a young navigator. If I will have to summarize my thoughts, it is that: Seafaring will shake your very core, question your long-held beliefs, seed doubt to your principles and alter your concept of living.

S4S: How would you describe your daily life at sea?

Y.B.B.: Continuous learning progress. In my contracts, I am always the all-around runner. My previous officers and captain put my job description best. They called me "the sanitation officer," "the junior third mate," "alternate to the alternate security officer," and "the little captain." I have no escape with the deck works since that is a part of being a holistic seafarer. The cleanliness of the lobby, ship's office, and other common areas is also under my care earning me the title "sanitation officer." I am also one of the "rust warriors" keeping the vessel in shipshape condition. However, my eyes are fixed on the goal of becoming an officer hopefully by next contract. I am treading the waters with the officer works believing that one should prepare for the next higher rank.

S4S: What is the biggest challenge to face onboard?

Y.B.B.: Loneliness may be the unanimous answer for seafarers. The contributing factors being: we are away from family, the absence of social cohesion, no culture of supportiveness, and a lack of sense of purpose. When you are a young starry-eyed dreamer, you may have envisioned of creating an impact that will echo long after you're gone. A nagging feeling of lack of sense of purpose will therefore eat you alive when you feel that you are wasting away nine months on an isolated metal prison. Experience taught me that when it arises, you have to step back and reassess: am I happy with what I'm doing? Will my current actions create the reality I imagined? Are my skills and capabilities aligned here? Am I willing to strengthen my strengths and weaken my weaknesses? If you answered no to any of the above, then it's time you re-evaluate your decisions in life.

S4S: Any piece of advice to fellow crew members onboard?

Y.B.B.: Unless your name is Atlas, the world does not rest on your shoulders. You do not own all the problems of the world, nor should you own them. Loosen up, you look so tensed. Relax. Shake off that negative energy. Smile. the world looks brighter when you do. Turn that frown upside down believing that your time will soon come. Count the days but never forget to make the days count. I know that you are doing your best even in these challenging times in a pandemic— your family is proud of you, your children (and siblings) look up on you, and your country applauds your heroic deeds keeping the economy afloat. Above all, know that you are never alone.

S4S: What inspires you every day onboard?

Y.B.B.: The idea that I am doing something that will alleviate my family's standards of living; that I may be able to give back to them and provide them the life they so-deserve; these are what wake me up in the morning. My family has always been my source

Seafarer Stories: Yrhen Bernard Balinis, Ordinary Seaman, Filipino

of inspiration. We, Filipinos are known for being extremely family-oriented, I am of no exception. Until such time that I have my own family, all of my efforts are directed for their benefit. The fulfillment of my family's dream is my dream.

S4S: What has been the most extraordinary thing that you have experienced onboard?

Y.B.B.: "People believe in you, and your unbelief to yourself is an insult to those who trust you. You are too busy doubting yourself when others are amazed by your potential."

That is my key takeaway to what I recently experienced. I am aware of my relatively newness to the industry and thus by far this is my most extraordinary experience:

Before 2020 ended, The Royal Institute of Navigation launched their first W.G.P. Lamb Awards in recognition of "a major contribution to the development of a more navigable world by a younger person."

I, imbued with the nothing-is-wrong-in-trying attitude, submitted my nomination form. I was my own proposer but was then faced with a dilemma! Who will be my seconder? I searched and reached out for my connections through social media. But since I am onboard and cannot personally present myself and my credentials, they declined. And when I was about to give up, as if by divine intervention, I remembered that I am in fact onboard, and who else is the most credible person that can attest my suitability for the award? My Captain! However, hesitation then again crept down to my spine. What if he does not sign? What if he thinks that I am not up to that level yet? Doubt started to seethe in my core.

My mind is overthinking! Should I abort mission? But I have not come this far only to come this far! Shaking off the negativities, I decided to have second and chief officers endorse me to captain to strengthen my application.

With some insane amount of courage (and a bit of luck), I presented my recent accomplishments along with the nomination form to Captain. And guess what happened… he signed! My eyes were welling up with tears! I was in the brink of abandoning my application for the award only to find out that my officers also believe that I have created a strong argument for my credentials.

The RIN Awards Committee will still deliberate early 2021 on who will be the recipient of the first W.G.P. Lamb awards, but for me, I felt like I've won. That experience is a life-changer; it taught me to stop doubting myself and start trusting. That we are capable more than we think and sometimes it takes someone else to see those potentials.

S4S: What should change to make life better onboard?

Y.B.B: Colors should only be discriminated in rainbows never on skin. Your race, gender, age, religious belief and political inclination have nothing to do with how well you should be treated and respected. In a floating community detached from the rest of the world, the one thing that should be developed is a culture of support and learning.

Fostering an environment where communication flows freely; where people can speak their minds without fear; where mentoring is present— it is the utopia of seafaring, and a perfect ground for safety culture to flourish. As how The Nautical Institute emphasizes the value of mentoring, officers and engineers too must see the benefit of training the young bloods. For who else will soon relieve them and take the helm?

As I learned, mentoring does not always have to be hierarchical— it does not have to be from top to bottom. One can also learn from their subordinates. Let the cadets speak, they can also offer valuable insights. Listen to what they have to say. They are fresh from colleges and therefore theoretical knowledge is still ever-present. Also, in an age of automation and digitization, their tech know-hows may be put into good use. Who knows, the input that they are holding is the critical information you are missing.

The main factors for a successful mentor-mentee relationship as I observed are: language, willingness and enthusiasm. Language needs not to be English; it can be anything so long as both the mentor and the mentee can understand each other. I have had Russian, Ukrainian and Filipino officer-mentors; they all made me who I am today. This brings me to my next point.

Mentoring will only be successful if both parties are open to learning. Willingness and enthusiasm is therefore vital. Imagine delivering a speech to an audience who are yawning and disinterest is written all over their faces, would you feel continuing the presentation? Certainly not!

One can never underestimate the value of mentoring, especially in the eyes of a newcomer in the field. As somebody who has been taught, it gave me a sense of responsibility and accountability. Even just by doing the mundane tasks of maintaining the fire hoses, ventilation flaps, helping with the ENC updates, stationery and demonstrating during drills; those are huge confidence boosters. That somehow, somebody views me more than my rank, that I have potential. I just have to turn that potential energy to kinetic- into action. Teach the cadets and show them that you care and they will look up to you. Share your experience; look after them during mooring operations, it makes them feel belonged.

The way that an officer will become in the future is largely reflective of how they were treated in their formative years as a cadet. As they say *"it takes a village to raise a child"* but I say *"it takes a vessel to raise an officer."*

S4S: What piece of advice would you give to someone thinking a career at sea?

Y.B.B: DONT meaning: Dedicate your great works for the greater good and the Greatest God; Onwards, upwards, inwards— find that spark that will make your journey enjoyable; Need help? Ask. People are born helpful. They are always willing to help; There's more! Read my articles with Royal Institute of Navigation and Nautical Institute for some of the things I wish somebody told me before I started sailing.

Sea you in the great big ocean! Onwards we sail to a stronger maritime industry!

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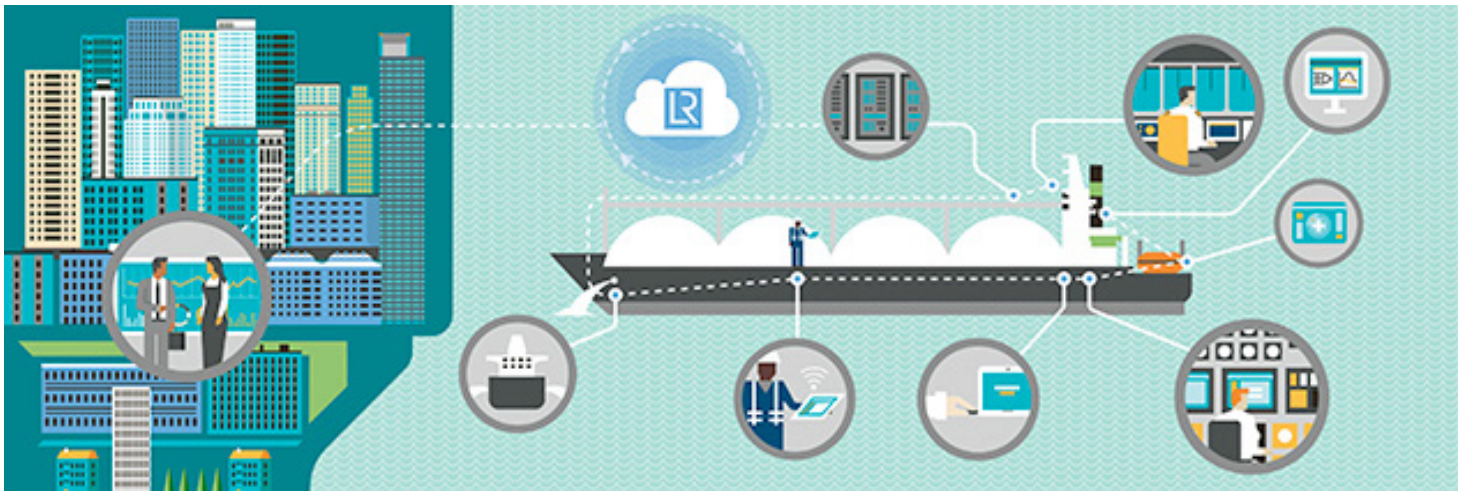
Source: *https://safety4sea.com/cm-seafarer-stories-yrhen-bernard-balinis-ordinary-seaman/?utm_source=noonreport&utm_medium=email&utm_campaign=lookout*

SHIPPING NEEDS TO RAISE ITS CYBER GAME

by Lloyd's Register



The shipping industry is lagging behind other industrial sectors in the all-important field of cyber security. Ben Densham, Chief Technology Officer of **Nettitude**, the cyber security services provider of Lloyd's Register, warns of a rising incidence in attacks, with ransomware and targeted cyber assaults both becoming more common.

"As the pace of shipping's digital transformation accelerates, the threat surface is expanding all the time," he warned. "and the onset of the pandemic has coincided with a marked increase in malicious attacks. The combination of circumstances provides more opportunities for hackers and, as a result, all parties in maritime must exercise utmost vigilance."

As well as being directly impacted and disrupted by events such as ransomware, Densham noted that hackers who find their way into digital systems are targeting increasingly complex supply chains through sophisticated methods. He drew attention to the recent high-profile cyber-attack on SolarWinds, a US federal software contractor, widely thought to have been state-sponsored.

Hackers were able to plant malicious code in software which then lay dormant for a number of weeks before being triggered to attack government departments, federal agencies, many Fortune 500 companies and even the mighty Microsoft itself.

On taking over as US President on January 20, Joe Biden ordered an immediate investigation into the SolarWinds incident, the full extent of which is still not clear.

So far, shipping is not thought to have been affected by the SolarWinds attack but Densham pointed out that growing sophistication across the hacking community needs to be met with the utmost security diligence.

He and his colleagues, who also provide cyber security services in other key sectors including financial services, defense, government and healthcare, are concerned that attention to cyber safety in shipping and ports is simply not keeping pace.

Densham highlighted similar sectors including logistics and offshore. Both of these industries are on the leading edge of digital development, he said, and there are a lot of lessons around cyber security that can be learnt from these sectors.

In contrast, many shipping companies view digital defense as merely a compliance issue, rather than a constant and dynamic threat that needs to be managed.

Whilst the **IMO**'s cyber initiatives are helpful, Densham explained why, on their own, they are not sufficient to meet the rapidly developing threat environment.

*"The **IMO** guidelines set the overall future direction for the industry. But cyber security needs to be dealt with at pace and with agility. We're talking here about highly motivated and mentally agile hackers set on causing cyber disruption," he said. "It is a fast-moving scene which can change by the minute. We see this every day – just ask one of our financial services clients – and the backdrop is very different now, compared with 12 months ago."*

When it comes to autonomous vessels, *"marine and offshore autonomous development is advancing," Densham stated. "But there are both lessons to be learnt from other sectors such as autonomous vehicles and cyber security needs to be seen intrinsically and not as an afterthought or bolt on to a development program."*

Densham revealed that one of **Nettitude**'s most sought-after services from clients are requests from companies seeking to test whether or not their cyber defense systems are sufficiently robust. This usually involves Nettitude specialists taking on the role of the threat actor, seeking to identify gaps in security systems or other weaknesses.

Some shipping companies, he said, already have teams of in-house Offensive Penetration Testers, sometimes known as "hackers", employed specifically for this purpose – thereby demonstrating the type of proactive approach that is necessary. However, for many, it is merely a compliance issue and another box to tick, he said.

Densham singled out cruise lines and navies as leaders in the maritime cyber security field.

"Cruise liners are effectively floating cities," he commented. *"They need to be secure across many digital arenas, including personal data, health, finance, retail, inventory management, always-on internet services, ship operation, and so on."*

Cruise lines' dynamic approach sets a good example, Densham said. *"Being ready for an attack is key, not merely protected by yesterday's systems."*

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***Source:** https://www.lr.org/en/insights/articles/shipping-needs-to-raise-its-cyber-game/*

DA-BFAR Lifts Three-Month Galunggong Closed Season in Palawan

by DA-BFAR

The Department of Agriculture's Bureau of Fisheries and Aquatic Resources (DA-BFAR) assures of stable supply of fisheries products as the three-month closed fishing season starts on 1-Nov-2020 until 30-Jan-2021. BFAR said the move would allow fish species to reproduce and for the fry and juveniles to mature and restore their valuable fish stocks. Photo Credit: Philippine News Agency (PNA).

The Department of Agriculture's Bureau of Fisheries and Aquatic Resources (DA-BFAR) lifted the three-month closed fishing season on round scad or galunggong in northeastern Palawan on 31-January-2021. This marks the 6th year since it was first implemented in 2015.

The province of Palawan is a major supplier of galunggong in Metro Manila with an average of 95% of galunggong catch landed in Navotas Port coming from Palawan in 2020. With the opening of the galunggong-rich northeastern Palawan, the supply of galunggong in the wet markets of Metro Manila is set to increase.

As a result, DA-BFAR is expecting the price of galunggong and other fish commodities to stabilize in the capital region in the coming weeks.

Since 2015, the implementation of closed fishing season in Palawan has continually yielded significant positive results in the production of galunggong in the area.

Based on the Region IVB National Stock Assessment Program, the catch estimates of the species caught by purse seine increased from 402.13 MT in 2016 to 653.66 MT in 2019. Those caught by ringnet increased from 170.97 MT in 2016 to 285.32 MT in 2019.

DA-BFAR National Director Eduardo B. Gongona said that this consistent and gradual increase in catch of galunggong in the area is a welcome development in the Bureau's bid to take care of our country's fishery resources.

"This simply reinforces our firm decision to continue the implementation of the annual closed fishing season in the country's major fishing grounds, which includes the galunggong-rich Palawan and integrate it in our holistic measures to fisheries management as part of the 'One DA' approach, which is anchored on the whole of government approach by President Rodrigo Duterte's administration," Director Gongona said.

Fisheries management and conservation measures such as closed fishing seasons, including the one in Palawan are advocated by Agriculture Secretary William Dar who calls for ensuring the sustainability of the country's fisheries resources. He also backs strengthening of science-based policies and full implementation of fishery laws.

During the span of the three-month closed fishing season, the DA-BFAR's law enforcement group stationed in Region IV-B has continuously conducted monitoring and patrol operations in the area. According to their report, only two fishing vessels were caught violating the order.

A joint initiative of the government, the fisheries sector, and other stakeholders through JAO-1, s. 2015, the closed fishing season was initiated to protect and replenish the population of the Decapterus species, also known as galunggong, during its peak spawning season and regulate the use of purse seine, ringnet and bagnet in catching the galunggong within the conservation area northeast of Palawan, from November to January every year.

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***Reference**: DA-BFAR Region IV-B*
Philippine Fisheries Development Authority

Gov't Agencies Join Hands in Restoration of Cagayan River after Typhoon Ulysses

by DOTr

The promise of President Rodrigo Duterte to normalize the lives of Cagayan residents and those in nearby provinces after the onslaught of Typhoon Ulysses was further realized as government agencies pooled resources to restore the Cagayan River.

Department of Transportation **(DOTr)** Secretary Arthur Tugade joined Department of Environment and Natural Resources **(DENR)** Secretary Roy Cimatu, Department of Public Works and Highways (DPWH) Secretary Mark Villar, and Department of Labor and Employment **(DOLE)** Secretary Silvestre Bello III in launching the Cagayan River Restoration project in Lal-lo, Cagayan on Tuesday, 2 February 2021. The river restoration work is an effort of the 'Build Back Better' (BBB) Task Force which is composed of officials from the **DENR, DPWH, DOLE,** and **DOTr.**

Assisting the task force is the Armed Forces of the Philippines (AFP) and the local government units of Cagayan Region. The restoration work involves the dredging of the Cagayan River, as a solution to the flooding woes in the Cagayan Valley area, as well as the planting of bamboo, which will not only help stabilize the riverbanks but will also create livelihood for residents, who were displaced by flooding.

Secretary Tugade said the rehabilitation initiative fulfills the promise of President Duterte to the people of Cagayan during his visit in November. *"That's why we are here – to bring fruition to the President's mandate by the four agencies (Kaya nga 'ho nandirito kami ngayon upang pasinayaan at bigyang katotohanan ang mandato ng Pangulo sa aming apat) - to help rebuild Cagayan, to help bring back hope and restore the beauty and glorious past of Cagayan,"* Secretary Tugade said.

The Transportation Chief added that aside from the dredging of the Cagayan River, the planting of bamboo will help the residents earn a living over the next few years. *"We need to dredge the river and plant bamboo trees on the riverbanks, which will result in more jobs as we aim to fulfill our President's promise (Kaya nga ba't i-dredge [ang ilog], kaya nga ba't magtanim ka ng kawayan, kaya nga ba't magbigay ka ng kabuhayan, 'pagkat gusto naming bigyang-katuparan ang pangako ng ating mahal na Pangulo).,"* Secretary Tugade added.

During the event, Secretaries Tugade and Bello also announced the granting of a P30 million livelihood assistance for Overseas Filipino Workers (OFWs) in the region who were affected by Typhoon Ulysses.

In January, the two Secretaries distributed fiberglass motorized bancas to 100 fishermen in Claveria, Cagayan and "Negosyo Karts" franchises to 100 ambulant vendor-beneficiaries in Ilagan, Isabela.

Secretary Villar meanwhile assured residents that the government is working as a whole to solve the issue of flooding in the Cagayan region. Focus of the restoration work is the dredging of some 7 million cubic meters of sand from 19 sandbars on the river that cover 235 hectares. He said dredging of the Cagayan River is only a short-term solution, with the long-term solution involving the construction of diversion channels. Secretary Villar has assured that the diversion channels, as well as other infrastructure projects in Cagayan will be finished before President Rodrigo Duterte ends his term. *"Rest assured DPWH will give our full support to the infrastructure programs in Cagayan (Asahan n'yo po na full support ang DPWH sa ating mga infrastructure programs sa Cagayan),"* Vice Chairman of BBB Task Force and DPWH Secretary Villar, stressed.

For his part, DENR Secretary Cimatu, who serves as Chairman of the 'Build Back Better' Task Force, highlighted that the government is giving priority to the dredging of the Cagayan River. *"Today we are here on a mission, to reduce the perennial flooding in the region of Cagayan Valley. Our government is taking the matter seriously. The equipment and assets of the government are now ready to start the mission,"* the DENR Secretary said. Dredging equipment from the DPWH have been positioned in the priority areas of Lal-lo, Casicallan Norte and Gattaran, Secretary Cimatu said.

Source:
https://www.denr.gov.ph/images/DENR_NEWS_ALERTS_2021/DENR_News_Alerts_05_February_2021_Friday.pdf (pp.21- 22)

Photo Credit: SAFETY4SEA

SHIPPING INDUSTRY TAKES NEW STEP TO PROTECT MARINE ENVIRONMENTS

by BIMCO

Cleaning a ship's submerged parts from barnacles and other growths, while the ship is in the water, can transfer invasive species to local marine environments unless it is properly cleaned and the debris is captured. To combat this problem, and to provide clarity and quality assurance to shipowners, ports and government authorities, **BIMCO** and the **International Chamber of Shipping (ICS)** have published the first industry standard on in-water cleaning of ships.

"This standard will help protect the environment in the port. It will also help every organization that is part of this process by raising the minimum standard of cleaning several notches higher to ensure that the end result is both a clean ship, and safe working practice," says David Loosley, **BIMCO** secretary general.

The standard and the accompanying approval procedure is now available on the **BIMCO** and **ICS** websites.

The organisms growing on the ship increases its drag through the water and can reduce fuel efficiency of the ship by as much as 35%, leading to higher fuel bills and higher CO2 emissions. It is important to remove the growths every couple of years.

A number of countries and regions have put biofouling management high on the agenda, with regional and national regulation on the drawing board or already in place. This includes the USA, Australia, the Baltic Sea region, New Zealand, Hawaii and California.

John Stawpert, Manager (Environment and Trade) at the **International Chamber of Shipping** added: *"This new industry standard establishes a benchmark for safe and environmentally sound underwater hull cleaning, an issue that is of increasing concern to the international community. We hope that this first step by industry bodies will allow cleaning companies to demonstrate that their products protect the marine environment, and that shipowners can be confident that their ships are cleaned to a safe and effective level around the world. With these industry standards port authorities can also have confidence that underwater hull cleaning can be completed with minimal risk to the environment by independently approved cleaning companies working to proven high standards."*

According to the industry standard, at least 90% of the macro fouling must be captured by the cleaning company, and effluent water coming back into the sea will have removed organisms and materials down to a microscopic size (0.000001 meters).

Rigorous testing. For **BIMCO** and the partners involved, the next step is to implement the standard on a small scale and several shipping companies have already signed up to participate.

"It is one of the typical, long term, unglamorous, behind the scenes efforts that the industry undertakes, which will hopefully have a wide-reaching positive impact on the marine environment and the industry," Loosley says.

The industry will now work to implement the standards with a number of stakeholders, including of paint manufacturers, in-water cleaning companies, shipowners, ports, and classification societies. These stakeholders will have to update their procedures, which will lead to successful cleanings, and ultimately – **BIMCO** and **ICS** hopes – to a general wide-spread acceptance of the standard and associated certification and in more ports allowing in-water cleaning.

The standard details planning, the documentation and assessment part of the operation, and the actual cleaning, the management of the effluent – the water involved in the cleaning – including the capture of particles, before releasing into the sea.

The standard also includes:

- Criteria for the cleanliness of water pumped back to sea;
- Methods to help shipowners act before the biofouling growth and coverage become severe;
- An approval procedure for cleaning companies;
- Minimum reporting requirements; and
- Minimum requirements for an inspection, service and cleaning reports.

The standard was developed by a coalition of companies and organizations including: Akzo Nobel, BIMCO, C-Leanship, CMA Ships, DG Diving Group, Fleet Cleaner, Hapag-Lloyd, Hempel, HullWiper, International Association of Classification Societies, International Chamber of Shipping, Minerva Shipping, Portland Port (UK), Port of Rotterdam, and PPG Coatings.

BIMCO is the world's largest international shipping association, with around 1,900 members in more than 120 countries, representing 59% of the world's tonnage. Our global membership includes shipowners, operators, managers, brokers and agents. **BIMCO** is a not-for-profit organization.

International Chamber of Shipping represents the world's national shipowner associations, and over 80% of the world merchant fleet.

***Source**: https://www.bimco.org/news/priority-news/20210402-shipping-industry-takes-new-step-to-protect-marine-environments*

IS NUCLEAR POWER THE FUTURE OF SHIPPING?

by SAFETY4SEA

In 2019, everyone in shipping was waiting for 2020 and the introduction of the 2020 sulphur cap. 2020 came and in spite concerns that shipping would not be able to comply with the regulation, the majority of ships actually complies. New, green fuels, like LNG and hydrogen have sure helped, as well as scrubbers.

However, the need for further decarbonization is getting bigger and bigger, and the answer may be lying on a rather controversial solution: nuclear power.

Without a doubt many people have linked nuclear power with negative situations: Hiroshima and Nagasaki, Fukushima, Chernobyl, are three of the most prominent nuclear accidents that shocked humanity.

However, the truth about nuclear power is somewhere in between. Of course with the wrong handling nuclear power can prove to be devastating. But, if used correctly and with safety, it can provide immense benefits for global decarbonization.

So, can nuclear power apply to shipping? And if yes, how is it possible?

Nuclear power in shipping. By using nuclear power – and taking as a fact that no accidents take place – ships will not emitting any emissions, as it there are no SOx, NOx, CO2 or particulates. In fact, nuclear power is millions of times more power-dense than fossil fuels, as well as popular alternative fuels, like methanol, ammonia and hydrogen.

Without a doubt, nuclear power can ensure shipping reaching IMO's 2050 greenhouse gas (GHG) reduction ambition. In fact, the carbon savings from nuclear powered ships is best demonstrated by comparing similar sized ships. We currently have a great deal of experience with both conventionally fueled ships and nuclear powered ships.

The United States Navy alone has over a hundred nuclear reactors that power 86 submarines and aircraft carriers, producing electricity, heat and propulsion.

Besides fuel savings, nuclear powered ships go about 50% faster than oil-fueled ships of the same size. For the shipping industry, the increased number of runs per year, and the increased profits, appear to more than offset the increased operational costs of nuclear, according to an analysis by researchers at Penn State.

In addition, currently nuclear power is not included in the Energy Efficiency Design Index (EEDI), meaning there are absolutely no barriers for using it.

Considering the above it comes as no surprise that, the IMO is considering small nuclear reactors, similar to those that have made Nuclear Navy successful. Just like the Navy, the big shipping fleets have very large ships that require a hug amount of fossil fuel.

Challenges to nuclear energy adoption. The environmental benefits of nuclear power are undisputable, however it is not widespread for various reasons.

One of them – perhaps the most important – is how the public sees nuclear power, as it is not accepted yet.

Nevertheless, the barriers do not stop to public perception, and they are practical as well. Namely, the **International Atomic Energy Agency** (IAEA) has stated that the main problem nuclear power has is radioactive waste disposal and accidental release of radioactivity. Such accidents can be really catastrophical for everyone involved.

More specifically as **IAEA** explains, nuclear reactions can produce enormous energy, which with wrong handling will definitely lead to disaster. What is more, nuclear waste is able to cause severe contamination of the water, destroying marine life, and as a consequence human life as well.

What is more, the movement of the sea, and especially rough sea, can also cause problems. This is because the protection of a nuclear power unit in sea is much more difficult than in land.

Another important factor to consider is the personnel or passengers on board. Being too close to a nuclear reactor is extremely dangerous. This is the reason why, researchers suggest following certain recommendations published by the International **Commission on Radiological Protection** (ICRP), regarding the maximum permissible radiation doses.

More specifically, if a reactor exists on a ship, all crew are automatically considered radiation workers, and they must not be exposed to more than 5 rems per year.

The amount of radiation is much less for passengers, as they must not be exposed to more than half a rem per year. However, taking into consideration that passenger accommodation would be away from the reactor, it would be impossible to be exposed to half a rem on one trip that lasts no more than four months.

Regulation wise, there is existing **IMO** legislation for nuclear-powered ships. Chapter VIII of the International Convention for the Safety of Life at Sea 1974 gives basic requirements for nuclear-powered ships that are particularly concerned with radiation hazards.

This set of rules refers to a detailed and comprehensive Code of Safety for nuclear merchant ships, which the **IMO** Assembly adopted in 1981. It would have to be updated to reflect new technologies, but it should overall cover them.

Examples of nuclear power in ships. In an attempt to promote nuclear power in shipping, Bill Gates launched an initiative that offers the possibility to adapt nuclear technology to future commercial maritime propulsion.

In fact, a special team tries to combine thermal storage technology with a 345MW liquid sodium cooled reactor.

However, this is only the most recent attempt of adapting nuclear power to shipping. Namely, during the last decade, several companies have developed small-scale nuclear reactors

USS Enterprise (CVAN-65) was the world's first nuclear aircraft carrier. Decommissioned in 2013, it served for 51 years, longer than any other aircraft carrier. Photo Courtesy of the U.S. Naval History and Heritage Command.

with output comparable to large commercial ships. For example, **Toshiba** has created an installation of 10MW output, while another company, **Hyperion** focused on software development, project planning, installation, and systems integration teams.

However, the key to the uptake of nuclear energy may be "Thermal Storage Technology." Namely, there is evidence indicating that it can provide a massive life expectancy. But how does this technology works?

Well, onboard heat-of-fusion technology produces steam, offering ships a few hundred miles of operational range. The heat-of-fusion vessel could be a power generator to be towed by a large ship to which it provides electrical power in order to activate ship-mounted electric motors that drive propellers. The towed vessel could also include a small nuclear generator.

In addition, a stationary nuclear power station will be able to provide recharge energy to a large-scale stationary thermal storage installation. However, there is the potential to alter the technology and include thermal recharging from mobile nuclear reactors installed in a towed vessel. This will lead to onboard stored battery electric power, that would provide short-distance low-speed sailing to large ships.

So, if nuclear energy was to work onboard a ship it would have to the Gates-inspired 345MW reactor, which will be working on nuclear fuel rods, along with radiation-free fusion thermal power.

This solution would enable vessels to operate short-sea shipping service, between ports where thermal energy storage is also available. For this reason, ferries will be especially benefitted.

Moreover, the majority of short-sea shipping operations involving thermal energy storage would use a large tug pushing and navigating a large barge. As for trans-oceanic shipping, the use of a nuclear reactor would be restricted to routes where navies could provide security from pirates.

Finally, security would be a major factor to consider, as any danger would prevent sailing nuclear powered commercial vessels via dangerous areas, such as the southern region of the Red Sea, and Gulf of Guinea.

For this reason, any future nuclear-powered trans-Pacific commercial shipping would likely involve transshipment operations at the Philippines, Taiwan or Chinese ports located east of Hong Kong.

Finally, for big ships that require more than 80MW of main engine power and carries a 345MW nuclear reactor, it would need a convoy of up to 5 ships in order to be supplied with propulsive electrical power.

Reference:

1/ Thomas B. Dade & Warren F. Witzig (1974), Container Ships: Oil Fueled versus Nuclear Powered, Nuclear Technology, 22:2, 196-223, DOI: 10.13182/NT74-A31403.

Source: https://safety4sea.com/cm-is-nuclear-power-the-future-of-shipping/?utm_source=noonreport&utm_medium=email&utm_campaign=green

ENEMY BENEATH THE WAVES: ANTI-SUBMARINE WARFARE OPERATIONS IN THE PHILIPPINE NAVY DURING THE 50'S

by CDR Mark R Condeno

INTRODUCTION

Submarine Warfare and Anti-Submarine Warfare is no stranger to the world's Second largest archipelago as its waters were witness to the various naval battles of the last Pacific War between Submarines of the United States Navy against that of Imperial Japan and/or the other way around with the former during the Battle of Palawan Passage in October 1944 with US Submarines sinking three Japanese Heavy Cruisers: the Atago, Maya and Takao; and the I-58 sinking the Heavy Cruiser USS Indianapolis in July 1945 in the Philippine Sea.

In this brief narration, I have compiled known anti-submarine warfare (ASW) operations involving the Philippine Navy during the early years of the Cold War. A capability that we had once and is currently being revived with the commissioning of the BRP Conrado Yap (PS-39), and the arrival of the Augusta Westland AW-159 Wildcat Helicopters, and in the near future, the addition of a long range Maritime Patrol Aircraft will complete the Country's ASW Trident.

OPENING SALVO IN LAMON BAY

In November 1952, at the height of the HUK Campaign, relentless reports reached the authorities on the sightings of unknown submarines in the area of Polilio Island specifically in Lamon Bay, Quezon Province.

On 12-November-1952, the ships of the 1st Patrol Craft Escort (PCE) Division under LTSG Dioscoro Papa PN aboard RPS PANGASINAN (PS-31) along with RPS SAMAR (PS-33) commanded by LTSG Domingo Villamater PN and RPS CEBU (PS-28) under LTSG Alfredo Peralta PN set sail from the Province of La Union and positioned themselves at their designated patrol areas: PS-31 at Casiguran Bay, PS-28 at San Miguel Bay, and PS-33 at Lamon Bay.

RPS Samar (PS-D33). Photo Credit: U.S. Navsource.org

On 13-November-1952, RPS Samar (PS-33) detected on its radar two converging vessels. In order to intercept, RPS SAMAR positioned herself in the middle of the rendezvous point but lost contact with the submerged craft (a 100-footer Submarine) at the range of 2,000 yards.

Within a few minutes, PS-33's sonar suite was able to regain contact and orders were made to drop depth charges, though no explosions were heard. Sonar contact was again made the following day at around 0530H 14-November-1952, where the intruder conducted evasive maneuvers and headed for deeper waters. Depth charges were again dropped with the last one around 0610H which resulted in an explosion.

RPS Samar's (PS-33) ASW-TRR was examined and assessed by Officer's and Personnel of the United States Navy at Subic Bay and at the Joint United States Military Advisory Group (JUSMAG), and it was determined in the pattern that the depth charge was dropped at beam aspect and could have damaged the submarine.

This episode marked the first ASW operation conducted by the Philippine Navy in its history. No Submarine sightings were reported after this incident until 1955.

During this point in time, apart from the ASW capabilities of our Patrol Craft Escorts, 16 Submarine Chasers formed part of the Philippine Navy.

As the Cold War was taking shape in Southeast Asia along with rising insurgencies, the Philippine Navy's mission was geared towards Anti-Submarine and Mine Warfare. Hence, the acquisition of two Patrol Craft Sweepers and Coastal Minesweepers during the Administration of President Ramon Magsaysay, himself a Navy Reserve Officer with the rank of Lieutenant Commander.

ABOVE THE WAVES

On 06-September-1955, a report reached the Philippine Constabulary (PC) unit in the Province of Batanes regarding the sighting of 3 unidentified submarines plying our Northern Waters from residents of Paganagan, Itbayat Island two miles off their coast.

The report prompted the Armed Forces of the Philippine General Headquarters (AFP-GHQ) and Headquarters Philippine Navy (HPN) to deploy two Anti-Submarine Patrol Craft Escorts from Poro Point, La Union to investigate the area.

An immediate sweep was made by the two warships on the said area and as of 2400H that same day. No sonar returns were reported by RPS Negros Occidental (PS29) under LCDR Federico Martir PN, and RPS Leyte (PS30) skippered by LCDR Dioscoro Papa PN.

Further coordination was made by CDR Ramon A Alcaraz PN Service Squadron Commander to the Batanes PC unit for the veracity of the report and to the United States Navy at Sangley Point, Cavite City if there were American Submarines in the aforementioned area. The US Sangley Point Command informed CDR Alcaraz and HPN that there are no American Submarines in our Northern Waters.

ROUND TWO: SUB SUNK

Four years after the Lamon Bay incident, RPS Samar's (PS-33) record of success would continue as she would hold the record of finally sinking an unidentified submarine, with LTSG Burgos Baluyot PN as her skipper.

Their destination: Lubang Island Mindoro, where LT Baluyot ordered a sonar sweep of the waters off Calamian, Palawan.

As a geographical backgrounder, Calamian Islands in

Northern Palawan comprises Coron, Culion and Busuanga. None however, were detected on those waters.

She then proceeded to the Municipality of Araceli, Palawan and dispatched a landing party to coordinate with the municipality officials on the veracity of reports concerning submarine sightings in the area in which the town officials and coastal residents informed them in the negative.

After departing Araceli, they sailed towards Dumaran Island, on a Southerly course. The Skipper again ordered a sonar sweep and finally made contact. Immediately, battle stations were sounded, with every crew on alert from bow to stern.

Again as in previous encounters, LT Baluyot made the standard operating procedure of hailing the submarine in case it is an allied one (though at that period, most of the allied navies in the area informs the Philippine Government through their respective embassies and the United States Navy at Sangley Point and Subic Bay that their ships are transiting Philippine waters.

Without any response from the unidentified submerged contact via Gertrude, LT Baluyot ordered "Drop Depth Charges." It was the midnight of 22-June-1956 after the drop, but contact was lost again.

ASW is a test of nerve and skill. RPS Samar (PS-33) decided not to leave the area and further stalked its quarry. Most of the officers and crew deduced that the submarine must have gone deep and was waiting for them to depart.

At 0518H 23-June-1956, sonar contact was again regained from the previous area were the contact was encountered, but was lost within a span of five minutes.

Despite losing contact, PS-33 continuously dropped depth charges in a pattern. The sonar contact was regained at around 0530H and three more depth charges were released. After the subsequent explosions, PS-33 departed the area and later returned to a site of floating objects and oil slick. The nationality of the submarine was never determined.

The then Defense Secretary Ramon Del Fierro Magsaysay, who later became President, lauded the Skippers of these warships for a job well done in preventing the re-supply of weaponry and ammunition to the HUK rebels.

RPS/BRP CEBU (PS-28). Photo Credit: Maximontero -Own work, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=20154637

FATE OF THE PROTAGONIST

These former US Patrol Craft Escorts (PCEs) were later designated as Corvettes and known as the Miguel Malvar Class in Philippine Naval Service.

RPS/BRP Cebu (PS-28) was commissioned in the Philippine Navy on July 1948 and served until 30-September-2019. She was decommissioned on 01-October-2019 after 71 years of service.

RPS Negros Occidental (PS-29) was commissioned in July 1948 and served for 62 years until 09-December-2010.

RPS Leyte (PS-30) was also commissioned on July 1948, PS-30 served for 3 decades until it was lost to grounding off Wallace Air Station in 1978. She was the Escort of the Presidential Yatch RPS Ang Pangulo.

RPS/BRP Pangasinan (PS-31) joined the Philippine Navy also on July 1948 and was decommissioned recently on 01-March-2021 after 73 years of service.

RPS Samar (PS-33) was one of the earliest PCEs of the Philippines with entry into service dating back to 24-May-1948 and serving the Navy and Country for 12 years until decommissioning in 1960.

RPS Samar was the Best ASW SHIP for three months during training exercises with the United States Navy at Subic Bay in Combat Training and Readiness in ASW in 1952.

The ships above were turned over by the United States Navy when they were still barely new with at most only 2 years in service and all were built around 1943-1944.

ASSESSMENT and CONCLUSION

This feat made the Philippine Navy achieve the four vital parts of ASW in littoral waters that of Sea Control operation, Battlespace Dominance, Chokepoint Operations, and Area Denial.

Most Submarine transit areas at that time were from the South China Sea passing through the Calamianes, Sulu Sea to Mindanao Sea, Philippine Sea through Luzon Strait. South China Sea to Southern Palawan and Celebes to Sulu Sea.

Reported Submarine sightings all over the Philippines from 1957-1958 were in Bongao, Tawi-Tawi, Sibutu Bay, Northern and Southern Palawan, Sarangani Bay, Lamon Bay, Tonkil and Dirigue Bay in Ilocos Sur.

These unidentified submarines and infiltrators must have adeptly studied the Submarine Campaign of the Second World War as these aforementioned places were the landing points of delivering supplies or disembarking allied intelligence bureau agents during the war by allied submarines.

The biggest question whose Submarines were sighted by the civilian populace and those engaged by our warships, to go into test depth in a submariners parlance, only two countries in Asia at that period possessed submarines... the rest, as we say, is history.

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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 Norweigan Shipowners' Association, and the Japanese Shipowners' Association.

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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 Kapitan 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 Kapitan Felix Oca and/or a shipping company sponsorship.

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