# MARITIME REVIEW

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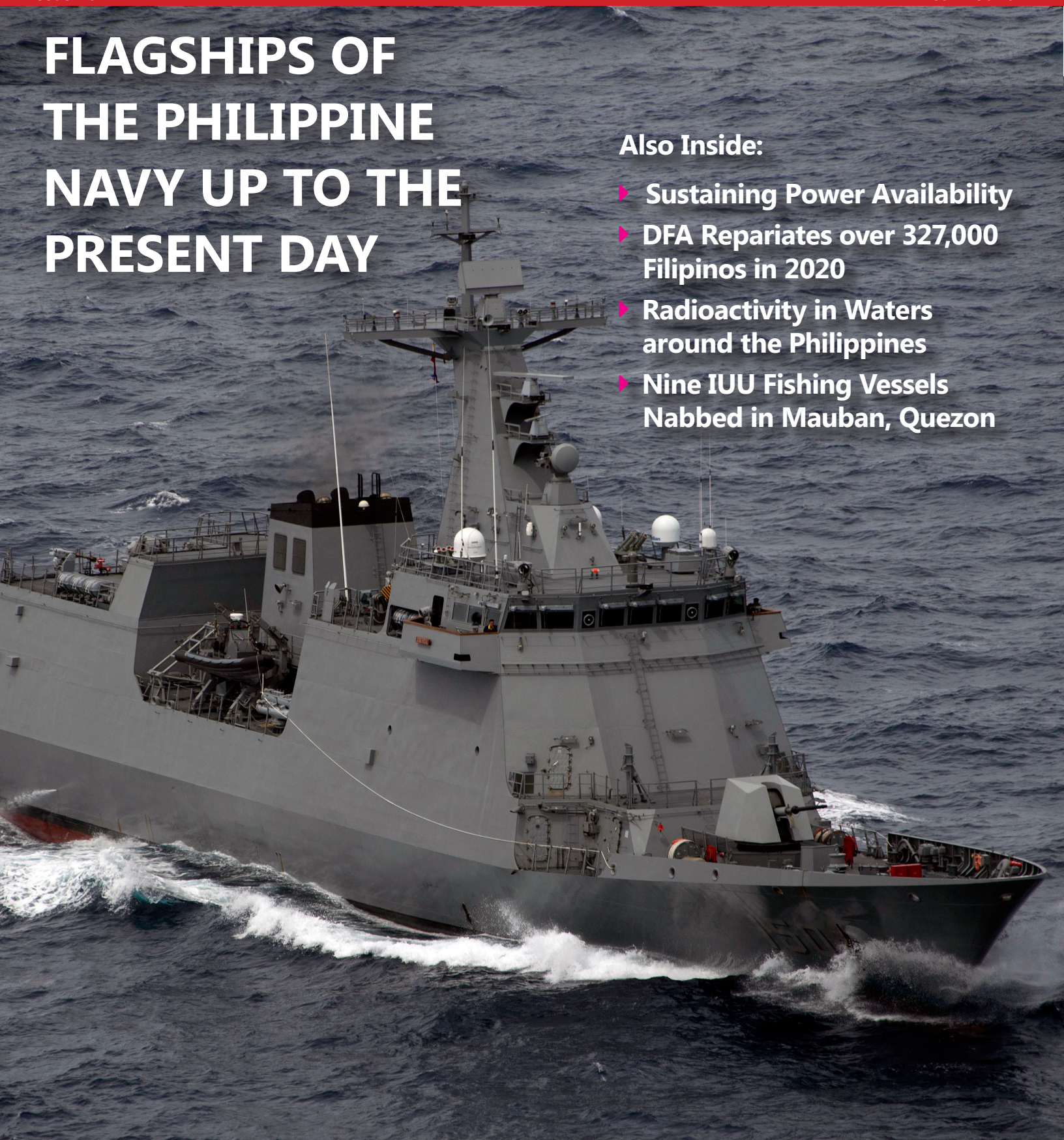
# FLAGSHIPS OF THE PHILIPPINE NAVY UP TO THE PRESENT DAY



Also Inside:

- Sustaining Power Availability
- DFA Repariates over 327,000 Filipinos in 2020
- Radioactivity in Waters around the Philippines
- Nine IUU Fishing Vessels Nabbed in Mauban, Quezon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***About the Cover:***

***BRP Jose Rizal (FF150) is the newest Philippine Navy combatant and has state-of-the-art equipment for sovereignty patrol and surface operations.Photo Courtesy of the Philippine Navy***

# MARITIME EVENTS CALENDAR

**JANUARY '21**

| | |
|---|---|
| 17 | NEWCASTLE LARGEST HOLIDAY CRUISE AND EXPO (NEWCASTLE AURSTRALIA) |
| 27-29 | MARINE ENERGY WALES CONFERENCE (DIGITAL EVENT) |
| 28 | CAPITAL LINK GERMAN MARITIME FORUM (DIGITAL EVENT) |
| 28 | WORLD OF SHIPPING PORTUGAL 2021 (DIGITAL EVENT) |
| **TBD** | **MARITIME FORUM #159 (DEPARTMENT OF FOREIGN AFFAIRS (DFA); ONLINE VIA ZOOM MEETING)** |

**FEBRUARY '21**

| | |
|---|---|
| 2-5 | SMM HAMBURG 2021 (SMM DIGITAL - THE MARITIME BUSINESS HUB) (HAMBURG, GERMANY) |
| **TBD** | **MARITIME FORUM #160 (CEBU PORTS AUTHORITY (CPA); ONLINE VIA ZOOM MEETING)** |

**MARCH '21**

| | |
|---|---|
| 1-2 | 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) |
| **TBD** | **MARITIME FORUM #161 (MARITIME ACADEMY OF ASIA AND THE PACIFIC (MAAP); ONLINE VIA ZOOM MEETING)** |

**APRIL '21**

| | |
|---|---|
| 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) |
| **TBD** | **MARITIME FORUM #162 (MARITIME INDUSTRY AUTHORITY (MARINA); ONLINE VIA ZOOM MEETING)** |

**MAY '21**

| | |
|---|---|
| 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) |
| **TBD** | **MARITIME FORUM #163 (PHILIPPINE NAVY (PN); ONLINE VIA ZOOM MEETING)** |

**JUNE '21**

| | |
|---|---|
| 8-10 | TOC EUROPE (ROTTERDAM, NETHERLANDS) |
| 8-11 | SEANERGY FORUM 2021 INTERNATIONAL LEADING EVENT ON OFFSHORE WIND AND MARINERENEWABLE 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, UNITED KINGDOM) |
| 15-17 | 7TH EDITION OF PHILIPPINES MARINE (PHILMARINE 2021) (SMX CONVENTION CENTER, SM MALL OF ASIA COMPLEX, PASAY CITY, METRO MANILA, PHILIPPINES) |
| 15-17 | SHIPBUILD PHILIPPINES 2021 (CO-LOCATED WITH PHILIPPINES MARINE 2021) |
| 15-17 | OFFSHORE PHILIPPINES 2021(CO-LOCATED WITH PHILIPPINES MARINE 2021) |
| 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) |
| 22-24 | ELECTRIC AND HYBRID MARINE WORLD EXPO (AMSTERDAM, NETHERLANDS) |
| **TBD** | **MARITIME FORUM #164 (PHILIPPINE COAST GUARD (PCG); ONLINE VIA ZOOM MEETING)** |

**JULY '21**

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

**AUGUST '21**

| | |
|---|---|
| 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) |
| **TBD** | **MARITIME FORUM #166 (PHILIPPINE PORTS AUTHORITY (PPA); ONLINE VIA ZOOM MEETING)** |

**SEPTEMBER '21**

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|---|---|
| 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) |
| **TBD** | **MARITIME FORUM #167 (NATIONAL DEFENSE COLLEGE OF (NCWC); ONLINE VIA ZOOM MEETING)** |

**OCTOBER '21**

| | |
|---|---|
| 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) |
| **TBD** | **MARITIME FORUM #169 (PHILIPPINE PORTS AUTHORITY (PPA); ONLINE VIA ZOOM MEETING)** |

**NOVEMBER '21**

| | |
|---|---|
| 3-5 | THAILAND MARINE AND OFFSHORE EXPO 2021 (TMOX 2021) (BANGKOK INTERNATIONAL TRADE AND EXHIBITION CENTRE, BANG NA, BANGKOK, THAILAND) |

# FLAGSHIPS OF THE PHILIPPINE NAVY UP TO THE PRESENT DAY

by CDR Mark R Condeno

From the past to the present, in common naval parlance, the Flagship is usually where the Admiral has its Flag. Throughout time, the Flagship is also noted for its armaments, speed, and capability.

Sometimes the Flagship is also the lead ship of a Navy's particular class of vessel specifically if it is the most well-armed or the biggest in its fleet.

As for the Philippine Navy, we trek to time to look into our Flagships from the Revolutionary period to the Present day.

## REVOLUTIONARY PERIOD

**SS BULUSAN**. The Steamship Bulusan became the First Flagship of the nascent Filipino Navy, owned by Don Eulalio Villavicencio of Batangas, the Villavicencio Family supported the revolution by donating the ship for the revolutionary cause. SS Bulusan was skippered by Merchant Marine Captain Simplicio Agoncillo Orosa, who also placed himself under General Emilio Aguinaldo's command. SS Bulusan would support the revolutionaries and would ply the route of Manila, Lemery, Batangas, Calapan, Mindoro, and the Visayas. SS Bulusan was supported by 8 captured Spanish steam launches and 5 steamships, namely: **SS BATANGAS**, **SS BALAYAN**, **SS PURISIMA CONCEPCION**, **SS TAAL** and **SS TAALENO** of the Filipino Merchant Marine donated by their owners Don Leon Apacible and Don Manuel Lopez. **SS Bulusan** would later be sunk off the coast of Masbate in 1896.

**PINNACE MAGDALO.** The Pinnace was gifted by Admiral George Dewey to General Emilio Aguinaldo and became the Flagship of the Revolutionary Navy for a few days before the arrival of the **FILIPINAS**. General Aguinaldo has informed Admiral Dewey that he has a barge being repaired at the Shipyard and he plans to arm it and utilized it to attack the Spanish positions in Intramuros. On this, Admiral Dewey informed General Aguinaldo that no attack would commence unless the bulk of the American Forces arrived. To smooth things up, Admiral Dewey gifted the **PINNACE** of the Spanish Cruiser Reina Cristina to Aguinaldo. It was christened **MAGDALO** and utilized as Transport of the Revolutionary Navy.

**FILIPINAS**. An 800-ton steamer of the Compania Tobacco De Filipinas seized by its Filipino Crew who killed the Spanish Officers. The Group was led by the Ship's Second Officer Cuban Vicente Catalan who took over as the Ship's Captain and proclaimed himself Admiral of the Filipino Navy.

Making themselves under the Command of General Emilio Aguinaldo, Vicente Catalan was commissioned as a Navy Captain in the Philippine Revolutionary Navy. The FILIPINAS was then armed with Cannons captured in Cavite and provided Naval Gunfire Support to the Revolutionaries as well as a Transport Ship of the nascent Filipino Navy.

She was later named LUZON and was active during the Second World War until it got damaged and sunk by Japanese air attack. She was then refloated by the Imperial Japanese Army and converted as a Patrol Ship/Cargo Ship and renamed HOEI MARU with Japanese Hull Number 342. She was sunk off the Yellow Sea near Jindo Island on 03-July-1945 by a Naval Mine laid by US Aircraft.

## WORLD WAR II

**CASIANA/BANAHAW.** Acquired from the United States by the Commonwealth Government in 1936, she was designated as the Presidential Yacht during the Critical days of the War in 1941. She traveled back and forth to Corregidor for personnel and transfer of supplies. Technically, she was under the Philippine Coast Guard at that time. She was sunk in Corregidor in December 1941 during a Japanese Bombing.

**Q-111 LUZON** (British Thornycroft Built 55m Torpedo Boat) was also considered as the Offshore Patrol's Flagship being the lead ship of her class. She was scuttled off Looc, Cavite, and Nasugbu, Batangas on 09-April-1942.

The following year in 1943, she was refloated by the Imperial Japanese Navy and made into a Patrol Boat, but was again sunk in 1944 by a US Navy airstrike off Manila Bay.

## POST WORLD WAR II TO PRESENT

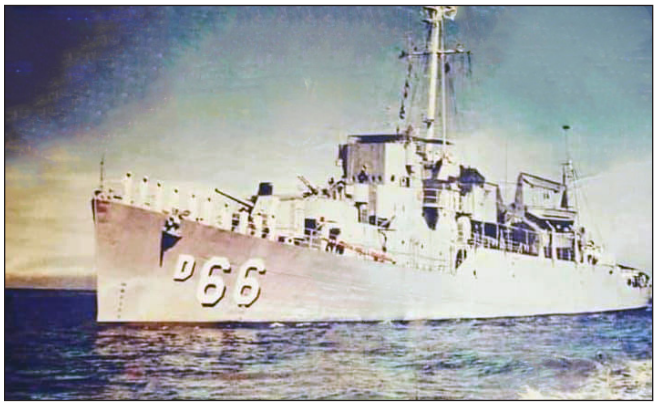
Before the arrival of the Patrol Craft Escorts (PCE) in 1948, the first ships transferred to the Philippines became our earliest naval vessels. After the war, there were 5 former US Coast Guard Bouy and Lighthouse Tenders: **USCGC ANEMONE, ORCHID, SEQUOIA, ARMISTEAD RUST**, and **TULIP** which were often used by President Osmena and President Manuel Roxas. ORCHID was the Presidential Yacht and Flagship.

**DALISAY** (President Manuel Roxas). **APO** (President Elpidio Quirino); **PAG-ASA** (President Ramon Magsaysay).

**SANTAMARIA/CORREGIDOR/INCORRUTIBLE/PAG-ASA** (President Carlos P Garcia); MOUNT SAMAT (President Ferdinand E Marcos). A notable ship with several name changes, she was the former USS Quest an Admirable Class Minesweeper transferred by the USN during the incumbency of President Roxas. This is the ship were President Elpidio Quirino held meeting with the cabinet secretaries and presidential staff during the critical days of the Korean War.

**RPS LAPU-LAPU** (President Carlos P Garcia). As Philippine Navy Flagship from 14-February-1959 until 30-December-1961. She is a Japanese built vessel as part of the war reparations act. Her First Skipper is LCDR Manuel Mandapat PN. Her designation as Flagship of the Philippine Navy was terminated on 31-December-1961 upon orders of President Diosdado Macapagal. **RPS LAPU-LAPU** would also undergo several name changes to **RPS ROXAS** during the time of President Macapagal on 09-October-1962 in honor of President Manuel Roxas. During the incumbency of President Ferdinand Marcos, she was named **RPS THE PRESIDENT**, and again as **BRP ANG PANGULO.** During the administration of President Gloria Macapagal Arroyo, she was renamed again to **BRP PAG-ASA** on 06-March-2009. By the Administration of President Benigno S Aquino III, BRP PAG-ASA was again renamed to **BRP ANG PANGULO**. The Ship is still in active service and retains her name and function.

**RPS RAJAH SOLIMAN (D-66)** was a High-Speed Attack Transport/ Buckley Class Destroyer Escort that took on the role of Flagship from 31-December-1959 until 29-June-1964 when she was sunk off Bataan during Typhoon Winnie. Her First Skipper was CDR Geronimo Cabal PN, followed by CDR Godiardo G Nonato PN.




*RPS Rajah Soliman (D-66), courtesy of Ms Jean Cabal Floro.*

**RPS DATU KALANTIAW** (PS-76). A Cannon Class Destroyer Escort replaced the Rajah Soliman as Flagship on 15-December-1967 until 21-September-1981 when PS76 was sunk off Calayan Islands.

**RPS RAJAH LAKANDULA (PF-4).** The sole Edsall Class Destroyer Escort Radar Picket took over as the Fleet's Flagship in 1981 until her decommissioning in 1988.

**BRP RAJAH HUMABON (PF-6/PS-78/PF-11/PS-11)**. Another Cannon Class Destroyer Escort acquired in 1976, Rajah Humabon took on as the Flagship with the decommissioning of BRP Rajah Lakandula (PF- 4).

Among the skippers who became its flag officers were:

- Vice Admirals Eduardo Ma. Santos, Emilio Marayag Jr., and Ruben Domingo;
- Rear Admirals Eriberto Varona, Manuel de Leon, Gilmer Batestil, Edgardo Tamayo, Isabelo Gador, Jaime Bernardino, Joseph Rustom Peña, Jose Renan Suarez, Leopoldo Alano, and Giovanni Carlo Bacordo; and
- Commodores Nicanor Hernandez, Leon Oribello, Edsel Lumawag, Salvador Esguerra, Paterno Labiano, Teddy Pan, Antonio Mendoza, Virgilio Garcia, Edwin Mackay, Nichols Driz, and Adeluis Bordado.

*BRP Rajah Humabon (PF-11), by Mass Communication Specialist, 2nd Class Mark R. Alvarez, US Navy.*

PS-78 was decommissioned in 1993, but due to pressing needs, she was re-commissioned with a new machinery and hull number to PF-11 in 1995.

There were plans to re-commission the BRP ANDRES BONIFACIO (PF-7) as an Auxiliary Fleet Flagship but it did not push through.

PF-11 took on the Flagship role until the arrival of BRP Gregorio Del Pilar in 2011.

**BRP GREGORIO DEL PILAR (FF-15/PS-15).** On her arrival, most have deduced that she will take over as the Fleet Flagship from PF-11 in which she did and represented the country and the navy in various activities until her grounding.

*BRP Gregorio del Pilar (FF-15/PS15), Public Affairs Office, Philippine Navy.*

**BRP JOSE RIZAL (FF-150).** One of the Two Incheon Class Frigate derivatives that recently joined the Fleet which has represented the country at RIMPAC 2020 replaced PS-15 as the Fleet's Flagship.

*BRP Jose Rizal (FF-150), courtesy of Hyundai Heavy Industries.*

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*Sources:*


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- *The Philippine Navy 1898-1998 by Commodore Regino " Dodds" P Giagonia AFP (RES), Headquarters Philippine Navy.*
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- *Philippine Navy Turns 98 by Jose Velasco, Philippine Graphic Magazine June 3, 1996, issue.*
- *The Official Chronology of the US Navy in World War Two by Robert Cressman.*
- *On-Line Source: http://malacanang.gov.ph/home/presidential-yachts/*

*Photo: First Gen combined-cycle natural gas-fired power plant. Source: First Gen.*

# SUSTAINING POWER AVAILABILITY

by VAdm Emilio C Marayag Jr AFP(Ret)

As assistant naval staff for plans (N5) in 1999, I had an opportunity to visit the construction site of the concrete gravity structure (CGS) of the Malampaya gas-to-power project in Subic bay area. The then Captain Constancio Jardiniano, later rear admiral and former N5, personally piloted the navy helicopter that brought us there. In our earlier discussions, we both considered the location as an ideal naval operating base for large combatants under the modernization program. For some reason, higher authorities turned down the plan.

Two years later, as skipper of the Fleet flagship at that time, my vessel escorted the Singaporean tugs that towed the topside portion of the rig from 25 miles west of the mouth of Malampaya Sound up to its final destination 27 miles northwest of El Nido township. My task was to enforce the Project's exclusion zone rules until it commences operation in September 2001 and upon relief by another combatant ship.

The nearby oil rigs put up before the Malampaya project did not yield significant outputs to address the country's electric power requirements. With the new source of natural gas that would be delivered through an underwater pipeline, the government and some private companies established their power plants before Malampaya started pumping out gas into their turbines. In 2017, Malampaya supplied over 20% of the nation's electric power through 5 power plants in Batangas City with aggregate capacity of 3,200 MW: Sta. Rita, San Lorenzo, Avion, and San Gabriel all co-located in the First Gen Clean Energy Complex in Sta. Rita, and Ilijan power plant at the eastern tip of Batangas Bay.

In a few years, Malampaya's gas wells will be empty. This will create a shortage in power production that will certainly affect the country's economic activities unless new viable sources, either domestic or foreign, are found. The estimated natural gas reserves of the country in 2015 is approximately 3.48 trillion cubic feet, 50th in the world. It produces 1.08 million cubic feet making the country the 58th in the list and consumes 1.10 million cubic feet. At current national consumption rate, the domestic gas reserves will last for 25-30 more years.

Natural gas is categorized as a fossil fuel like petroleum and coal. But it is much cleaner because its carbon dioxide emission is approximately 30% and 50% lower than petroleum and coal, respectively. The reduction of carbon dioxide emission into the atmosphere is in full accord with the 2015 Paris Agreement. Hydrogen and other gases emit very small amounts of carbon dioxide, and are considered the fuels of the future but their usage is still many years away due to technological concerns. Renewable energy sources such as geothermal, hydro, biomass, solar, wind and tidal, would be inadequate to meet the power demands in the near term.

Based on the Energy Department's figures before reforms were introduced in 1998 by the government with private partnership, the power production came from: oil-fired plants (47%), imported coal-fired plants (19%), local coal-fired plants (4%), hydro power plants (10%), and geothermal plants (20%). Nearly 20 years later, new sources emerged like natural gas and renewables. From 23% in 1998, coal-fired power output more than doubled to 50% in 2017 but oil-fired plants output plunged by nearly 12-fold from 47% to 4%. Hydropower supplies remained at 10% but geothermal production rate declined by half from 20% to 11%. The Malampaya natural gas output accounted for

22% share in the total production while renewables produced 3% in the overall production. A recently operational oil and natural gas field in Alegria, Cebu is only capable of supporting a 60-MW gas plant, extracting barely 180-360 barrels of oil daily, and projected to last until 2037.

Some legislators sounded alarm over the depletion of the Malampaya reserves that could lead to rotational power outages reminiscent of the pre-Malampaya period in the late 1990s.

The government has already initiated actions to address the issue by encouraging investments in renewables and issuing a new policy governing the country's downstream natural gas industry, recognizing the eventual depletion of Malampaya reserves and the potential of natural gas to "satisfy the increasing local demand" of power for residential, commercial and industrial use.

Included in the Department of Energy's Power Development Plan, 2017-2040, are land-based gas-fired power plant projects in Port Irene, Cagayan Province and Batangas City, and floating barge gas-fired plants in Sual, Pangasinan and Batangas City. **First Gen Corporation**, one the country's pioneers in gas-fired power plants, plans to introduce a floating regasification unit to insure continuous supply of natural gas that fuels its power plants. On the other hand, **PHINMA Energy Corporation** and **Vires Energy Corporation** are focusing on floating power barges fueled by natural gas.

Due to limited production in Alegria, Cebu, and the eventual drying up of Malampaya field, the source of natural gas would come from importation and local extraction from known natural gas reserves in western Palawan, the Reed Bank. Confirmed to contain substantial quantity of natural gas in 1976 the government awarded the contract to Sterling Energy in 2002. Forum Energy in 2005 acquired the concession but retained Sterling Energy as operator. In 2011, the concessionaire started preparations to drill gas wells but on China's objection the government had to suspend all works, effectively putting the project on hold. The location of the identified extraction area in the **Reed Bank** is about 50 miles north of the Philippine naval detachment in Flat Island and 175 miles west of the Malampaya project, well within the country's 200-mile EEZ. The longer the suspension of resource extraction is, the higher our dependence on imported natural gas.

Looking at the timeline in relation to domestic and foreign events, the nation could have taken more concrete actions to preserve, protect and defend our patrimony specifically its subterranean energy resources. First of all, we had a respectable Navy when we found the location of those valuable resources in our western frontier. Second, we failed to grasp the consequences of China's modernization starting in the late 1970s to develop a highly capable seagoing force. The inward looking mindset of our leaders, civilian or uniformed, at that time may have contributed to the failure in understanding the real meaning of a maritime nation and, more so, in digesting the *"defense in-depth"* concept to secure an archipelagic state –its sovereignty, its people and its territory.

The uncertainty of resolving the Reed Bank dilemma and the eventual depletion of Malampaya reserves would necessitate closer government and private enterprise cooperation and coordination. Energy industry players may introduce new technologies and arrangements that may not be in existence in the Philippines. Consequently, the entry of these technologies would affect the current policies, rules and views of government regulatory agencies. Only by bridging the regulatory requirements and industry expectations would unhampered cleaner energy supply be assured, for as long as the convergence would not compromise the internationally accepted principles, policies and practices, and the domestic laws on energy development and utilization. ⚓

*A total of 264 repatriated Overseas Filipino Workers (OFWs) from the Kingdom of Bahrain and the United Arab Emirates are now back home as they arrived at the Ninoy Aquino International Airport (NAIA) on January 1, 2021. (Presidential Photo)*

# DFA REPATRIATES OVER 327,000 FILIPINOS IN 2020

by Philippine Information Agency

The Department of Foreign Affairs (DFA) today reported that its repatriation efforts in 2020 brought home a total of 327,511 overseas Filipinos. DFA said land-based repatriates make up 231,537 or 70.7% of the total numbers, coming from at least 90 countries around the world. The remaining 29.3% or 95,974 are seafarers from more than 150 cruise ships, oil tankers, and other bulk vessels. The breakdown of repatriates traveling or transiting through these regions are as follows: Middle East, 228,893 or 69.89%; Asia & the Pacific, 36,868 or 11.26%; Americas, 30,971 or 9.46%; Europe, 28,909 or 8.83%; and Africa, 1,870 or 0.57%.

Since Feb. 9, 2020 --the day when DFA mounted its first COVID-19 repatriation flight to Wuhan, China--the department has been relentless in bringing home overseas Filipinos despite the multitude of challenges it faced. A 10-member team from DFA and the Department of Health personally flew to Wuhan when it was still the epicenter of COVID-19 in February. The pioneer mission brought home 30 Filipinos from the Chinese city. Also in February, a three-person rapid response team flew to Japan to assist the Philippine Embassy in Tokyo in the disembarkation and repatriation of Filipinos on board the COVID-19 stricken Diamond Princess cruise ship. This marked the beginning of the pandemic's immediate impact on the cruise line industry where thousands of Filipino seafarers were working. When countries started to close their borders in March, the tourism industry was heavily hit and cruise line companies were forced to suspend their operations. From March-June 2020, DFA facilitated the daily arrival of chartered flights -- each carrying hundreds of seafarers from cruise ships docked all over Europe, North America, and the Caribbean. Many of the repatriated seafarers have only been onboard their ships for weeks when the pandemic struck. They had no choice but to come home, without certainty as to when they will be called again for work. When businesses started to close shop because of the effects of the worldwide lockdown, the repatriation of our land-based overseas Filipinos followed suit. In April, DFA chartered flights to Cambodia, Vietnam, Thailand, Malaysia, Maldives, and Italy

to bring home 1,096 distressed overseas Filipinos who lost their jobs and had no means to come home from those countries. Calls for repatriation from the Middle East came in May 2020 as the DFA sent its first sweeper flight to the Middle East, via Riyadh and Dammam, Saudi Arabia. This marked the beginning of the mass repatriation of more than 220,000 overseas Filipinos from the region. In June 2020, DFA sent a sweeper flight to Africa which stopped by Algeria, Tunisia, and Libya before heading home to the Philippines with 287 distressed overseas Filipinos on board. In August 2020, DFA was confronted with two Herculean tasks. First was the repatriation of our compatriots in Uzbekistan where the Philippines does not have an embassy, let alone an honorary consulate. Through the Philippine Embassy in Tehran and coordination with leaders of the Filipino community, DFA worked on the repatriation remotely but was nevertheless able to bring home 257 Filipinos. The second Herculean task was the need for a swift organization of a repatriation flight for the Filipino victims of the blast at Port of Beirut. DFA sent a chartered flight to Lebanon and brought home 386 repatriates, many of whom sustained injuries from the blast. Foreign Affairs Secretary Teodoro Locsin Jr. welcomed the repatriates personally upon their arrival at the Ninoy Aquino International Airport. In September, DFA also organized a goodwill mission to Lebanon. Together with the Chief of Presidential Protocol, DFA traveled to Beirut and brought 5,000 boxes of relief goods for our overseas Filipinos in Beirut. Medical supplies such as vitamins and face masks were also donated to various Lebanese hospitals and other non-government organizations. On the return flight, another 317 distressed Filipinos were repatriated.

Even as DFA entered its 8th consecutive month of repatriation efforts, October still marked several "firsts" -- the mass repatriation of more than 500 Agrostudies students from Israel, the first repatriation of 92 OFWs from Benghazi, Libya since 2017, and the first-ever repatriation by sea from Indonesia of 40 Filipino fishermen via the BRP Tubbataha. In November 2020, nine Filipino seafarers were brought home by DFA after their shipping vessel was abandoned by its owner at the Port of Djibouti. DFA, in coordination with its missions abroad, lobbied hard with the Djibouti representatives in IMO in London, the United Nations in New York, and the Djibouti Embassy in Tokyo to allow the disembarkation of the Filipino crew of MV Arybbas on humanitarian grounds. They arrived safely in Manila last November after being stranded on board their vessel for more than 14 months. December 2020 marked the highest monthly total of repatriated overseas Filipinos at 51,770 despite the cancellation of several flights as a precautionary measure to the spread of the new COVID-19 strain. Sweeper flights were also organized to bring home distressed overseas Filipinos from Syria, Lebanon, Bahrain, Kuwait, Saudi Arabia, and the UAE, in time for the holiday season.

*"While these are some of the highlights of DFA's repatriation efforts for this year, let us not forget the tireless dedication of our DFA front-liners who facilitated the return and provided airport assistance to hundreds of medical repatriates, victims of trafficking-in-persons, unaccompanied minor children, and senior citizens who were repatriated by DFA this 2020. As we start a new year, DFA remains committed to its assistance-to-nationals mandate and renews its promise to bring home every Filipino who wishes to come home,"* DFA Undersecretary for Migrant Workers' Affairs Sarah Lou Arriola said.

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*Source:https://www.philippinesnews.net/news/267434504/dfa-repatriates-over-327000-filipinos-in-2020*

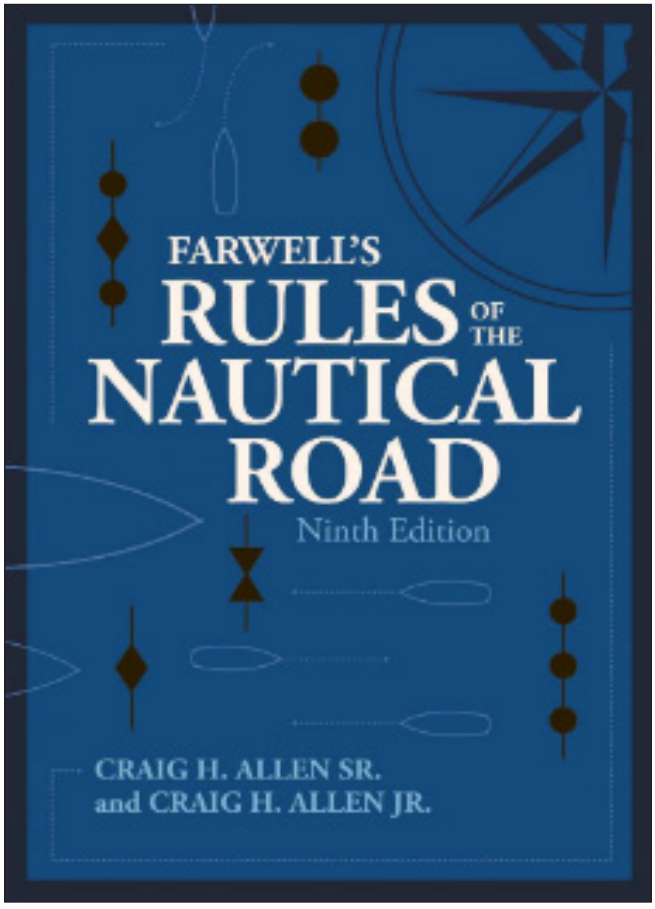
# BOOK REVIEW ON FARWELL'S RULES OF THE NAUTICAL ROAD

by Craig H Allen Sr and Craig H Allen Jr

The Preface indicates that the book was first published as The Rules of the Nautical Road by the late **Captain Raymond F. Farwell** of the U.S. Naval Reserve and professor of transportation at the University of Washington. After its first publication in 1941, many statutory and regulatory changes have been made, including the international side. These necessitated the revision of the rules in the book. But Captain Farwell observed in his 1941 edition, *"The rules will not be better obeyed until they are better understood."*

**Marine Collision Law** has for so long been a specialty of judges on the admiralty bench and of a very limited number of admiralty lawyers at the bar. It should rather be a specialty of the mariner on the bridge instead. The current book is thus designed to satisfy seamanship classes such as those at the U.S. Naval Academy and at Naval R.O.T.C., colleges, and serve as a useful handbook for the officers at sea in their professional practice of navigation.

While the rules have evolved and will continue to do so, the principles of collision avoidance remain unchanged. The principles of collision avoidance are identified as: positive avoidance, bias for action, risk management, predictability, and communication. Maritime schools teach effective team communication as one of the pillars of bridge resource management.




The authors state that a rapid evolution in vessel navigation and collision avoidance technology in the 21st century took place. The **International Regulations for Preventing Collisions at Sea (COLREGS)** and U.S. Inland Rules as of 1-December-2019 are presented showing there are no material differences. COLREGS apply to all vessels on the high seas and in all waters connected there. The amendments to the 1980 Inland Navigational Rules Act (INRA) by Congress and U.S. Coast Guard, made INRA closely parallel to the 1972 **COLREGS**.

Despite the few differences that remain between the Inland Rules and the COLREGS, the current version of the Inland Rules represents a major advance along the path to unification and harmonization. The power delegated to the U.S. Coast Guard to amend the rules provides flexibility to meet changing conditions and prevent the U.S. rules from becoming unduly out of line with international practice. By reducing the confusion engendered by divergent regimes, Congress and the USCG have helped eliminate one of the frequently cited causes of human error.

By 2012, the number of vessels traversing the world's oceans have increased by 60%. Oceans and waterways are tighter yet must be shared. Accident data show 33% of all collisions occur in the morning between 4 and 8, consistent with accident analyses in other industries. An MIT study concluded that visibility was the single most important factor resulting in collisions. U.S. National Transportation Safety Board, Normal Cockcroft's studies, and the MIT study conclude that 72% of the collisions developed from head-on situations; while crossing and overtaking situations accounted for 9%.

Whether mariners and the maritime education and training establishment are ready for a paradigm shift that relies on dual action, automated collision avoidance, or a "smart maritime ecosystem" vision that enlarges the vessel control function of shore-side players is an open question. It is too early to tell whether it is realistic to expect that the 150-plus nations now party to the 1972 **COLREGS Convention** could reach agreement on such a fundamental change.

Several conventions developed under the IMO are of central importance, including the Convention on **Standards of Training, Certification, and Watchkeeping for Seafarers (STCW)** and the **Convention for the Safety of Life at Sea (SOLAS)**. These IMO conventions operate within the overall framework of the 1982 **United Nations Convention on the Law of the Sea (UNCLOS**).

After discussing the history of nautical rules, Collision Law is discussed. Collisions and other marine casualties resulting in significant injury, property damage, or environmental harm must be reported to the USCG, which will investigate the causes of the mishap and initiate appropriate remedial action. Response to a collision may include civil or criminal penalties, or suspension of the involved mariners' professional license.

**Rule applicability, definitions, structure, and construction.** Vessels on the high seas, territorial seas, and certain inland waters of the U.S. are subject to the 1972 COLREGS. When navigating on waters inside U.S. demarcation lines, vessels are governed by the Inland Rules. While uniformity of the COLREGS and Inland Rules has been greatly advanced, the mariner must observe the differences in requirements according to the location of the vessel. The rules of the road have application within fixed geographical limits, are mandatory, must be obeyed in a timely manner, applied alike to all vessels, understood in the light of court interpretations, and applied consistently with other applicable legal regimes.

**Rule of Good Seamanship and the General Prudential Rule.** It covers in detail the mariner's obligation to avoid collision, with prudence and forehandedness, which are achieved not just by following the nautical rules but by applying them with a high doze of good seamanship.

**Look-outs, Radar systems, and Watch-standing duties.** Look-out is a 24/7 responsibility. Per Rule 5, the look-out function includes radar, including ARPA, AIS, radiotelephone, and, for some vessels, a variety of other electro-optical detection equipment. Court decisions make it clear that a lookout must have no other duties, on which the STCW Code largely agrees with. The lookout must be constantly alert and vigilant, have had a reasonable amount of experience as a seaman, and report all sightings to the officer of the watch. The look-out function deserves the full attention of a qualified, well-rested, and dedicated seaman.

**The Safe Speed Rule.** Control over the vessel's speed is an indispensable risk management measure for the master and watch officer. Speed affects both the time available for collision avoidance and the force of impact if collision cannot be avoided. Safe speed requires judgment that is based on a careful consideration of a number of factors, some of which apply only to radar-equipped vessels. Safe speed is inextricably linked to look-out effectiveness and vessel maneuverability. When watchstander reaction time is increased, through stress or multitasking demands, speed must be decreased.

**Risk of Collision.** The risk of collision rule works hand in hand with the STCW Code provisions for watch-standing and the U.S. Navigation Safety Regulations. Mariners or courts seeking a bright line definition of "risk of collision" in the collision regulations will be disappointed as there is none. They will, upon close inspection, find the method for detecting and assessing risk of collision. Under Rule 5, the radar must be used properly. Radar use under Rule 7 also includes plotting or equivalent systematic observations.

**Action to Avoid Collision.** Rule 8 prescribes actions to avoid collision in all conditions of visibility, in all three of the approach situations for vessels in sight; Rule 19 for vessels in restricted visibility; Rules 13 and 15 for overtaking and crossing situations, respectively; and Rule 18 for the less maneuverable vessels to make a single action approach where one vessel keeps her course and speed while the other maneuvers to avoid collision. Per Rule 14, applicable to head-on encounters, both vessels are required to alter course to starboard. The collision funnel concept emphasizes taking early action since options narrow as the situation develops.

**Responsibilities in Narrow Channels and Fairways**. Rule 9 recognizes the increased risk of collision in restricted waters. The risks arise not only from the limited waterway and high traffic density, but also from the potential for hydrodynamic interaction. Rule 9, which applies in all conditions of visibility, seeks to provide lateral separation between vessels by requiring all vessels proceeding along the course of the channel to keep to the starboard side. Passage in restricted waters is a time of increased risk because close-quarters situations cannot always be avoided. Encounters along turns or bends should be avoided.

**Responsibilities in Managed Waterways**: TSS and VTS. Within the U.S., each VTS operates under a set of rules regarding vessel reporting, movement, and operation. The regulations make it clear they do not displace the applicable rules of the road. One controversial area of development is the extent to which shore-side VTS operators may exert operational control over vessels within the VTS. Presently, the VTS regulations and applicable IMO guidelines make it clear that navigation responsibility remains with the vessel, and the role of the VTS is limited. How long that will remain with the introduction of unmanned vessels, is uncertain.

**Responsibilities Based on Vessel Type, Status, or Employment.** Rules 12 and 18 apply when vessels are in sight of one another. Rule 12 governs approaches between two sailing vessels. It does not apply if one or both are also operating under power. A fog signal of one prolonged and two short blasts indicates that the vessel sounding it is encumbered, but it does not confer a give-way/stand-on relationship. The prudent mariner will consider the approaching vessel's status in deciding what risk management actions to take, while recognizing that legal privileges in Rule 18 do not begin until the vessel is visually sighted.

**The Head-on Situation**. This situation is characterized by a high speed approach, a threat of situational ambiguity and conflicting action, maximum effect of even small changes in course by either vessel in avoiding collision and maximum damage, in case of actual collision. Where neither vessel has the right of way, neither is obligated to hold course and speed.

Rather, both have a duty to avoid collision by turning to starboard to effect a safe port-to-port passing. Extreme caution is key from the moment a head-on becomes evident until collision is no longer present.

**The Overtaking Situation.** The overtaking rule requires the overtaker to keep out of way of the vessel being overtaken. The requirement prevails over any contrary provisions in Rules 4-18. Rule 14 permits the overtaking vessel to pass on either side, subject to the rule applicable in narrow channels that if the leading vessel is keeping to the right per Rule 9(a), good seamanship dictates that she be overtaken on her port side.

The Crossing Situation. Rule 15 is a single action collision avoidance rule based on the theory that one vessel is directed to stand-on, while the give-way vessel maneuvers to keep out of the stand-on vessel's way. The give-way vessel is directed to avoid crossing ahead of the stand-on vessel. This is accomplished by the give-way vessel making an early and substantial turn to starboard to pass under the stand-on vessel's stern. If necessary, she must lower speed or stop or reverse. Where collision cannot be avoided by the give-way vessel alone, Rule 17(b) requires the stand-on vessel maneuver to avoid collision.

Responsibilities in Restricted Visibility. Risk management measures are prescribed by the rules of the road, SOLAS, STCW Conventions, U.S. Navigation Safety Regulations, and standards of good seamanship. Vessels operating in under restricted visibility are required to display their lights and sound fog signals. Vessels with weak radar signatures should carry and use radar reflectors or transponders. Sound signals are to be given when visibility decreases to 2 miles or less. A visibility of 5 miles or less is cause for reevaluating safe speed and readying engines for maneuvering.

Lights and Day Shapes. The importance of proper running and riding lights is emphasized by the fact that so many of the COLREGS and Inland Rules relate to them. In collision cases, the courts lavish some of their harshest criticisms on vessels that disregard the Rules on lighting requirements.

Sound and Light Signals. Violations of the sound signal rules constitute statutory fault. Under the Pennsylvania rule, any vessel not equipped with required sound signaling equipment, or found to have omitted a required signal, or sounded a misleading signal, will avoid liability for such fault only if she can prove her violation was not a cause of the collision. U.S. Supreme Court's reason for its ruling in the Pennsylvania case is worth recalling: *"The collision and its terrible toll might have been avoided had the correct signal been given in a timely manner by the bark Mary Troop."*

**Conclusion**. Farwells Rules of the Nautical Road presents pinpoint snapshots of the rules relating to the potential risks that may spring up in every voyage, buttressed with detailed analysis, and that is an understatement. It is a thorough book. This review is but a glimpse of what you may learn in each of the 17 chapters. The book abounds with elaborations of the important rules through illustration and forewarning of risky scenarios that may take place should the rules be disregarded. The book is written in such a way that a civilian or seafarer would equally understand the concept of avoiding risks, whether on inland waters or out at sea. As such, it would be an invaluable learning material for students in maritime schools and academies who would serve in the merchant fleet and seagoing services; and an irreplaceable reference material for watch-keeping officers and crew to safely navigate their vessels. As the saying goes, *"Just prevent one accident –the next one!"* ⚓

# Maritime Forum

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

# ACTION PLAN FOR URBAN SECURITY AGAINST TERRORISM

by Police Brig. Gen. Chris R. Francisco (PNP Ret), PhD, MNSA

## Prevailing Conditions

The need to strengthen urban areas has been considered among the most vital considerations in securing the country from terrorism, crime and violence. This is to underscore the fact that urban areas are the centers of the political and economic activities wherein the legitimacy of the country's existence and the ability to perform the mandate of governance must be fully secured both from the physical and non-physical threats that endanger society.

The magnet of attraction created by the political and economic centers is difficult to ignore for migrants from the rural areas who are not transient visitors but permanently seeking jobs in urban areas. More often, these people end up as squatters with their families, living under inhuman conditions thereby adding to the congestion of the city populace and creating fertile ground for criminality. Urban centers are favorite and primary sources of illegal funds through bank robberies and kidnappings. The complexities and indifferent attitude of people in the cities are perfect haven for criminals and terrorists.

This paper is a contribution to the overall effort to come up with an action plan and implementing strategy to secure urban communities. It also provides platforms where pre-emptive solutions or approaches can be developed to decongest urban centers thus discouraging migrants from the rural areas. Strategy is proactive that must consider long range approaches to address future implications. It must include all aspects of crime prevention, economic development, and social reforms so that the growing magnitude of criminalities, violence and disorders can be reduced or minimized.

## Some Fundamental Principles, and Doctrines of Security and Urban Defense.

1. " The primary duty of Government is to serve and protect the people. The Government may call upon the people to defend the State, and in the fulfillment thereof, all citizens may be required, under conditions provided by law to render personal, military or civil service." (Sec. 4, Art. II of the 1987 Constitution).
2. Every person has the right to property where the most sacred property is life and honor. Self-defense is paramount and recognized by law.
3. "The right of the people to information on matters of public concern shall be recognized…" (Sec. 7, Art. III, Bill of Rights). Hence, the people must have access to information that endangers society that they may be prepared for self-defense and security without having to wait for police or government.
4. Economics of Communized Policing. A movement from public policing (where all law enforcement and policing duties are under the government forces) toward private or citizen policing within the bounds of law. Citizen involvement especially in the prevention aspects and pre-emptive endeavors are ideally developed. Example: Patrol 117; Citizens watch and voluntary civic duties. Education and reorientation programs for citizens must be done.
5. Trust-Confidence by the Citizens to the Police. An earned reputation and credibility of the police as legitimate protector, law enforcer and partner of the people. Do citizens fear or trust our police?
6. Policing through Communitarianism and Consent. Communitarianism is an acronym for community spiritualism; being a model citizen deeply involved in community activities to ensure a peaceful environment; to contribute to the healthy and progressive neighborhood system with public safety as its main objective. As a communitarian, you are involved in action results program (not mere thoughts and words) to make your community safe. It is an anchor to the community. If this is imbibed in the heart and mind of every citizen, then policing is not difficult. A voluntary engagement between the citizens and police. The community through this reinforcing partnership (like husband-wife relationship) is a vital source of information about criminals, illegal activities, and potential threats to society. This is to remove "a dichotomized thinking" that the local officials primarily represent civil authorities; and that the military or police are the ones responsible for handling civil disorder, insurgency and terrorism."
7. The local government leaders are the primary officials responsible for peace and order. The police are under their supervision. The police station commander is the executive officer under the mayor.

The government cannot provide soldiers or police in all parts of the country for security; hence the need to establish a nucleus of local defense force utilizing all able-bodied citizens under the supervision of the territorial force (PNP) through the general direction of the local government units (LGUs). Communitarianism is the underlying doctrine here. AFP reservists, retired military/police/fire/jail, and law enforcement personnel like the National Bureau of Investigation (NBI), to include company guards, good citizens and volunteers, must be fully organized as the secondary force component, with police and military as primary forces.

8. National Unity (words, actions, and support) against terrorism and criminality. National and local government officials are sworn persons to defend the Constitution. They are not there to play personal vested politics to glamorize (or protect) the enemies of the state nor denounce the actions of the military or police against criminals or terrorists. They are the primary source of

morale and will to fight by our military and police. (Some government officials are perceived to have an alliance with the rebels or terrorists.)

9. Glamourizing the rebels and enemies through the media is a counter-productive practice that emboldens the criminals and terrorists to justify their unlawful actions.

10. Professional jealousy and competition for credit (which are prevalent among the military and law enforcement agencies) must be stopped and rectified. The role of the territorial forces and organized home defenses through the local government must be established once the area has been cleared to avoid a vacuum for the rebels to retake or return.

11. Negotiation with an ideological enemy and terrorists is a sign of psychological weakness. "To adhere to peace but remain weak is self-treason." You cannot pamper the enemy. Fighting the terrorists and rebels is fighting a war. They are not ordinary criminals but ruthless enemies of the state without accountability or moral conscience. Truce or ceasefire only favors the enemy.

12. In an impoverished society which is a perfect breeding ground for insurgency, we cannot and must not allow dangerous ideology against a democratic way of life to prosper or develop, much more to protect such idea under the guise of freedom of thought; "a mortal combat in an open market of ideas."

This is self-defeating chivalry that a struggling country like the Philippines cannot afford to adopt. "If we are to stop a flowing water from the mountain, where shall we put the barrier --down or at the source?"

President Duterte has given a stern warning to some schools and universities for communist groups to stop their recruitment activities targeting students to join the communist movement.

- For 50 years, we have been fighting the rebels, but we have been protecting the breeder of these rebels…" This is irrationality, if not madness!

13. Let us align with our allies and be consistent with our commitment. Rebels and terrorist groups have been declared as terrorists by the superpowers, but we beg to disagree with them. Psychologically, we have manifested our defeat and perpetual humiliation. Do we not have the political will to be strong? Have we internalized the meaning of power? We cannot even agree and have one voice. We appear to be divided!

## Major Operational Factors and Environmental Realities

- Cities and urban areas are the centers of the government economic and political activities. The rule of law must prevail to maintain civil order, and governance to sustain. They are the major targets of terrorism.

**Terrorism is to create a climate of destabilization and collapse to humiliate the government and characterize it as inutile or incapable to protect the citizens. When urban centers collapse, the entire country will collapse. The government cannot project strength or power if it is crippled or weak from within the center of power – the urban center. "Terrorism is the systematic use of terror especially as a means of coercion. An act of violence or threat thereof intended or calculated to provoke a state of terror in the general public; a particular group of persons with a political agenda:**

- The United Nations through the superpowers have listed the following causes and insights of global terrorism:
  - Enmity, hatred, frustrations that create and inspire terrorists to commit even to offer their lives. Religious beliefs and indifference.
  - Poverty is the root cause; imbalance of wealth brought about by ignorance and fanaticism, envy and jealousy. There is hope in universal misery. Poverty abets terrorism and conversely terrorism breeds poverty.
  - Misery, frustration, grievance, despair that cause some people to sacrifice human lives including their own in an attempt to effect radical change.
  - Conventional responses designed to address previous kinds of conflict are irrelevant, and will not work.
  - No borders/moral, ethical or legal boundaries. No respect for any station in life. No sector of society is spared. Society is the whole target. Time is boundless; and is enshrined in the heart and soul of terrorists/practitioners, i.e., promising reward after death.
  - Satanism in a different form in the 21st century (vis-à-vis, Nazism, and Communism).
  - The United States of America (USA) demands for preemptive attack as a solution, i.e., to destroy the monster before it takes its victim.
  - Popularity and orientation, common in the breeding society of Islam.

**The Anti-Terrorism Law of 2020 authored by Senator Panfilo Lacson is a powerful weapon against terrorism, has finally rectified the old and ineffective Human Security Act of 2007 that had been giving more comfort, protection and advantage to the terrorists.**

- Urban centers are dependent on the food, resource supply, and products (to include industrial) from the countryside. If the countryside is open and controlled by the rebels and insurgents, the urban centers are strangled; the factories and businesses are being pushed toward the urban centers, hence migrant workers flock to the cities and add to congestion and squatting.
- The countryside must be protected and safeguarded by the territorial forces supported by the military and the people. The PNP (regional and provincial) mobile forces must be the office of primary responsibility (OPR) to continuously patrol the countryside to clear the area from the control of insurgents. When industrial peace and security are established through extended perimeter defense, then factories and businesses can prosper. This will result in "magnetizing and frontiering toward the countryside;" hence decongesting the urban centers. The PNP Special Action Force (the SWAT-oriented force) shall be the strike force in the urban areas.
- The territorial forces (PNP/BJMP/BFP) must be augmented by the citizen volunteer forces organized and composed of the AFP reservists, personnel, company guards barangay officials, volunteer citizens (especially with licensed firearms) under the control and management of the local PNP through the mayors. In this regard, liberalization of firearms licensing and renewal must be encouraged. Areas of responsibilities and other obligations or duties must be specified. A scenario or

mobilization must be conducted on a periodic basis to outline the defense and offensive campaign. Household members and school children must be indoctrinated and educated.

- Mandatory coordination and exchange of (intelligence) information or sharing of ideas and tactics must be developed by removing compartmentalization and unfounded confidentialities.
- The intelligence community must take a primary role, and improve the intelligence gathering and utilization. Former President Gloria Macapagal-Arroyo has expressed concern on this intelligence failure. Nevertheless, we must have the enduring vigilance, to safeguard our plans and intentions. The terrorists and rebels will not attack at the time and place of our choosing. They are cunning and highly motivated fanatics.
- Interlinkages of alarm systems between and among business establishments and vital government installations (like banks) connected with the central operation center of the police and military must be established. One approach is the use of geographical base files or street block labelling displayed on the electronic screen at the operation center to monitor reported criminal activities, and calamities to facilitate quicker and accurate response. Street names and directional signage must be improved.
- A 24-hour duty system for judges/prosecutors be maintained for purposes of issuing warrants, filing of cases within the allowed detention period of suspects especially during weekends and holidays.
- There is an observed minimal background on military or police among the local officials. Few are graduates of the defense college or military schools. They have inadequate background/knowledge on counter-insurgency or crisis management. The national security council and defense college can sponsor a seminar-workshop on national security seminar-workshop among local officials.
- Upgrading the armaments of the local police beyond the traditional police firearms to match the firepower of the rebels and terrorists. LGUs as juridical persons can procure firearms for issue to the local police. Explore donor agencies.
- Additional training on para-military duties together with the citizens volunteer group must be undertaken. This can be done during weekends and holidays. Our local PNP especially in the isolated towns must be reoriented toward military duties and discipline. Complacency and wrong attitude that they are only good for receiving complaints must be rectified. "Civilian in character" has been misinterpreted. Local PNP must at least safeguard their immediate perimeter, and intensify barangay intelligence networking.
- The mayors and governors league must conduct the efforts for an integrated strategy on pooling of resources, and expertise through a unified planning and implementing task force. This includes big companies and multi-national corporates in the area. The more we rely externally for security, the more insecure we become. Self-reliance within our own capabilities and resources must be explored to the maximum.

**Democratic Ideals in a Developing Country**

Our country adheres to the democratic way of life following the ideal system of developed countries where poverty is not a major problem. Poverty which a primary cause of terrorism is a continuing problem of the government against the back-drop of uncontrolled population 35 years ago; we were 58 million people that had increased to over 109 million in 2020. Food supplies from the country side are decreasing, affected by frequent calamities; hence, affecting seriously the food requirements in urban centers.

The nation's security & survival is confronted by several forces of destabilization caused by growing criminality and illegal drugs that destroy society. But the more serious threat is terrorism attributed to the different terrorist groups especially in the southern part of the country carried by the Muslim rebels and criminal elements. The secessionist movement has been a great problem of the government that is threatening to split the republic. This is being aggravated by the popular desire of some politicians advocating federalism that will make this country impoverished and cater to the desires of the insurgents, rebels, and greedy politicians.

Certainly, chaotic situations will prevail amidst overlapping levels of government. Shall we aggravate the more confused confusion? In a developing country, the primary national security (NS) forces are combined military and police. The problem is more of internal where the military is the leading agency with partnership with the police. The 1987 Constitution provided for the creation of national police that is civilian in character; hence, removing the former Philippine Constabulary (PC) from the AFP. This was a product of emotional sentiments of the victims of Martial Law where the PC was the primary implementer of Martial Law. Unknowingly, this was a home run victory of the communist and insurgents. It has emasculated the government operational effectiveness against insurgency especially the secessionist problem in Mindanao.

The rigid and independent set up of the PNP as separate from the AFP was not only a dissipation and reduction of limited power but a wastage of resources and operational capability. In South America (Chile, Argentina, Brazil), the police while a separate agency is associated with the military at all times. Accordingly, it would take at least a hundred years for them to be separated from the military when the country attains a status of a 'highly developed' country. They have cited the parallel condition of the Philippines, and that the abolition of the PC was a big blunder; aggravated by a non-consistent provision, i.e., "renouncing war as an instrument of national policy."

A former defense secretary was arguing with our policy makers, that the enemy was inside our garage and yet we were debating to fight back due the inconsistent provision on renouncing war as an instrument of national policy. Only in our country has this kind of provision which is designed to weaken us and remain subservient. An expert in national security from the US has fully emphasized this and said it would be much better if we removed this provision. And yet we went to fight in Korea and Vietnam Wars in violation of this provision!

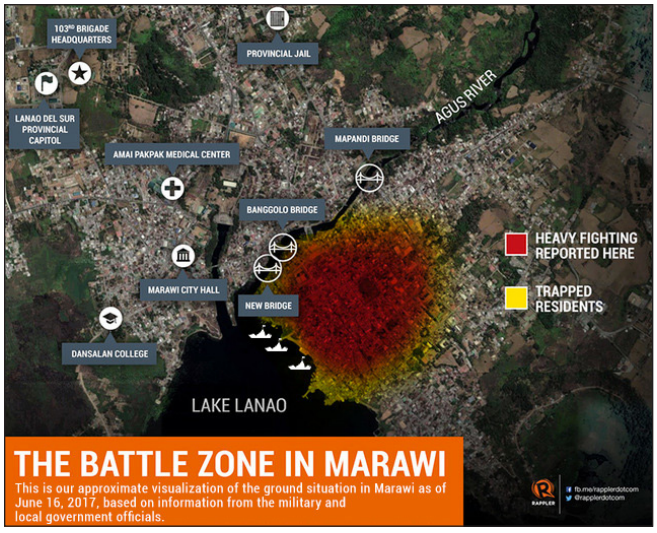
**RECOMMENDATION**

Mandatory Coordination and Joint Action in all Operational Tasks by the Military and Police.

Refusing to learn from the blunders of the past is a stub-born, vain and arrogant behavior dictated by the greed for power and monopoly of credit-recognition. The unfortunate

blunder of the sensational 'Oplan Exodus' that resulted to the slaughter of 44 PNP Special Action Force (SAF) by the MILF on 25-January-2015 at Mamasapano, Maguindanao was considered "the biggest loss of government elite force in history." It was purely a PNP operation without the participation of the AFP. This was repeated in a mis-encounter on 29-June-2020 where four military intelligence operatives were gunned down by the PNP troops in Sulu. Two of them were Major Marvin A. Indammog (PMA Class 2006) and Captain Irwin B. Managuelod (PMA Class 2009). As per the report, the military intelligence operatives did not coordinate with the PNP troops and instead sped up when confronted by the PNP. Many serious blunders had happened in the past but we have refused to learn from the mistakes. No amount of words and medals or compensation to the victims and their families can compensate. Like a 'ningas cogon grass' burned easily and forgotten, many similar blunders in the past have been committed by both the military and police due to a rigid professional jealousy and stiff competition for credit.

The required coordination between the military and police cannot be achieved by a mere operational standard operating procedure (SOP). A need for a higher authority directing the Chief of Staff of AFP and the PNP Chief must be created under the direction of the President who is the commander-in-chief of all armed forces of the Philippines. A Presidential Executive Order (PEO) directing the CSAFP and PNP Chief for mandatory and joint operational action in all national security problems in order to attain a maximum effectiveness and optimal utilization of manpower, intelligence and available resources is the immediate solution. This is urgent and can be done immediately. The AFP and PNP have both legal and doctrine development offices that must attend to this mandatory requirement.




*Urban warfare. Photo credit: Rappler.com*

## Dynamics of Terrorism

The dynamics of terrorism has been properly identified through the basic definitions both of local and international concerns. The causes and insights are explained. This paper has advanced some pointers to address terrorism toward protecting urban communities in society and country as a whole.

*A building in urban Marawi City is set ablaze by airstrikes carried out by Philippine Air Force and Philippine Navy's Naval Air Group. Photo by Mark Jhomel.*

*Smoke billows are seen as government troops continue their assault against insurgents from the Maute group (The Straits Times). Photo credit: Reuters.*

The fundamentals of public order in society underscore that a civilized society is characterized by the existence of law and order. Without the rule of law, chaos is imminent and disorder prevails. Indeed, no government can long exist as a viable entity amidst lawlessness and chaos, which are conducive to the creation of anarchy.

Our motto: *"Fight terrorism and win!"*

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*About the author: P/BGen. Crisogono "Chris" Rebaño Francisco PNP (Ret). A professional for more than five decades in military & defense, civil government, civilian sector, academe, real estate; and an educator. A consistent scholar and honor graduate, he holds a PhD in Criminology, Master of Science in Operations Research & Systems Analysis, Masters in National Security, and an MBA. He authored books and publications on defense/national security, policing education, operations research, and literary fields in poetry and technical writing. He is a 4th degree Knight of Rizal. In 1976, he graduated from the United States Naval Postgraduate School in Monterey, California. He graduated from the Philippine Military Academy, Class of 1968. He was born in Kalibo, Aklan.*


# SHIPS RISK DETENTION OVER CYBERSECURITY

by IMO

Ships that fail to comply with cybersecurity code of the International Maritime Organisation (IMO) may face detention from 1-January-2021. This comes as the IMO identified the management of cybersecurity as a key aspect of safety as technology becomes essential in ship operations.

The group has identified cybersecurity as a major risk to be addressed in safety management systems. The handling of the risks is to be verified in audits from 1-January-2021 onwards.

Heike Deggim, Director of IMO's Maritime Safety, said at the Safety@Sea webinar that "there is a strong need to balance the benefits of new technologies with safety and security concerns, in particular, cyber-security. Many people tend to have a very outdated view of what modern shipping looks like. Modern ships are technologically advanced workplaces and IMO plays an important part in shaping the development."

Recent reports have revealed that cyber-attacks are on the rise in shipping. Deggim said cyber technologies have become essential to the operation and management of numerous systems critical to the safety and security of shipping and protection of the marine environment, including bridge systems, cargo handling and management systems, propulsion and machinery management systems, power control systems, administrative, and crew welfare systems.

Deggim also said one of the most critical developments in smart shipping and rapidly gaining importance is cybersecurity, recognizing the use of electronic technologies is continually increasing in many areas of shipping.

With the process of digitalization accelerated by the COVID-19 pandemic, cyber-attacks have become more common not just in shipping, but globally in 2020, and indeed the IMO itself was hit by a cyber security incident.

Deggim detailed how cyber risks will have to be addressed in a vessel's safety management system from the annual verification of its Document of Compliance from 1-January-2021.

*"Considering the human element aspect is vital in this regard, while systems can be protected and recovered by implementing different IT technologies, it is important humans understand the risks associated with the use and operation of critical systems," she said at the webinar.*

*"Thus, implementing good cyber discipline within an organization is critical in good cyber risk management as much in shipping as anywhere else,"* Deggim said.

Also, the United Nations report on a review of maritime transports 2020 stated that many issues may be identified onboard ships that make them more vulnerable to cyber-attacks, including unsecured networks and software, lack of seafarer training and insufficient protection of data.

The report, however, stated that shipping companies would need to consider these issues and include cyber risk into their safety management systems, so they know how to deal with and approach a cyber incident.

*"As this will require some time, all work should be completed ahead of the first inspection by International Safety Management auditors after 1-January-2021.*

*Owners who fail to comply may risk having their ships detained by control authorities that will aim to enforce the requirement in a uniform and equitable manner.*

*At the same time, implementing cybersecurity is important to protect shipping assets and technology from mounting cyber threats, in particular given that cyber risks are expected to grow, with greater reliance on virtual interaction as a result of the ongoing COVID-19 crisis,"* the UN report stated.

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*Source: http://news.bestnaira.com/posts/view/ships-risk-detention-over-cybersecurity*

# DIGITALIZING THE MARITIME SECTOR SET TO BOOST COMPETITIVENESS AND RESILIENCE OF GLOBAL TRADE

by World Bank Group

Joint report by the **World Bank** and **IAPH** to assist ports and maritime transport community accelerate digitalization and minimize ship-shore human interaction and COVID-19 risks

**WASHINGTON**, January 21, 2021—A new report was launched by the World Bank and the **International Association of Ports and Harbors (IAPH)** shows that better digital collaboration between private and public entities across the maritime supply chain will result in significant efficiency gains, safer and more resilient supply chains, and lower emissions.

Maritime transport carries over 90% of global merchandise trade, totaling some 11 billion tons of cargo per year. Digitalizing the sector would bring wide-ranging economic benefits and contribute to a stronger, more sustainable recovery.


**Accelerating Digitalization**: Critical Actions to Strengthen the Resilience of the Maritime Supply Chain describes how collaborative use of digital technology can help streamline all aspects of maritime transport, from cross-border processes and documentation to communications between ship and shore, with a special focus on ports.

The COVID-19 crisis has evidenced a key benefit of digitizing waterborne and landside operations: meeting the urgent needs to minimize human interaction and enhance the resilience of supply chains against future crises.

*"In many of our client countries, inefficiencies in the maritime sector result in delays and higher logistics costs, with an adverse impact on the entire economy. Digitization gives us a unique chance to address this issue,"* noted Makhtar Diop, World Bank Vice President for Infrastructure. *"Beyond immediate benefits to the maritime sector, digitalization will help countries participate more fully in the global economy, and will lead to better development outcomes."*

**IAPH** Managing Director of Policy and Strategy, Dr Patrick Verhoeven, added: "the report's short and medium term measures to accelerate digitalization have the proven potential to improve supply chain resilience and efficiency whilst addressing potential risks related to cybersecurity. However, necessary policy reform is also vital. Digitalization is not just a matter of technology but, more importantly, of change management, data collaboration, and political commitment."

Although the **International Maritime Organization (IMO**) has made it mandatory for all its member countries to exchange key data electronically (the FAL convention), a recent **IAPH** survey reveals that only a third of over 100 responding ports comply with that requirement. The main barriers to digitalize cited by the ports were the legal framework in their countries or regions and persuading the multiple private-public stakeholders to collaborate, not the technology.

The report analyzes numerous technologies applied already by some from the world's leading port and maritime communities, including big data, the internet of things (IoT), fifth-generation technology (5G), blockchain solutions, wearable devices, unmanned aircraft systems, and other smart technology-based methods to improve performance and economic competitiveness.

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*SOURCE: https://www.worldbank.org/en/news/press-release/2021/01/21/digitalizing-the-maritime-sector-set-to-boost-the-competitiveness-and-resilience-of-global-trade*

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# 77% OF SHIPPING BUSINESSES USED CHARTER FLIGHTS FOR CREW CHANGES

by SAFETY4SEA

Over 90% of shipping businesses are re-thinking how crew changes are managed as a result of the COVID-19 pandemic, according to new research carried out by travel management company, ATPI Marine & Energy.

Representatives from over 30 different shipping businesses around the world took part in the research, the results of which were unveiled this week and show the impact of the global pandemic on crew changes in shipping.

**Key findings**

- Almost half of research respondents (45%) state that crew changes have become at least twice as time-consuming and stressful compared to pre-COVID times.
- Meanwhile, 15% of shipping professionals highlight the increased stress and time reaching a four-fold increase.
- Over three quarters (77%) of the shipping business representatives surveyed had made use of specially commissioned repatriation charter flights to enable crew changes to happen in 2020. Crew charter flights were a very rare occurrence before the Covid-19 pandemic, which saw international borders closed and flights curtailed.
- When it comes to planning for the rest of 2021, over a third were considering charter flights –either independently or through industry association collaborations– as part of how they will ensure crew changes can happen.

*Filipino seaman throwing the ball of the heaving line ashore, Photo by Maxine Felder*

*"This research, conducted among participants at CrewConnect at the end of 2020, highlights just some of the extreme challenges facing those who work in the shipping industry,"* **Jochem Hemink**, Head of sales shipping Europe & Asia, ATPI Marine & Energy, said.

*"Significant repatriation efforts at a previously unthinkable scale are now part of the day to day fabric of our industry when it comes to ensuring crew can safely join vessels and return home again. For shipping businesses this means changing how crew rotations are planned and tackled, ever increasing costs, and developing new areas of expertise,"* Hemink added.

Meanwhile, the survey unveiled how the cost of crew changes is a major challenge for the industry. Almost three-quarters of respondents (73%) have seen crew changes get more expensive since March 2020. A quarter (27%) estimate crew changes will cost 10-20% more in 2021 than the previous year, and almost a third (32%) are planning for cost increases to be around 20-40%.

In addition, a 55% of shipping organizations are working to move crew changes to what are regarded as 'easy' ports with fewer Covid-19 restrictions in place, better protocols to allow seafarers to travel, and sufficient connecting flight capacity.

*"Almost two-thirds of the shipping businesses we talked to are seeing a spiraling mix of increased costs and less time in which to deliver crew changes. Almost two-thirds (64%) are having to submit additional reporting on the costs of crewing and travel as businesses look to find efficiencies,"* Hemink concluded.

Since the beginning of the pandemic, travel restrictions have forced hundreds of thousands of seafarers to overrun their contracts, rising concerns over ship safety, crew fatigue and access to healthcare. Meanwhile, the crew change issue is now becoming more complicated with much of the world locking down again in light of the new COVID-19 variants.

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*Source: https://safety4sea.com/77-of-shipping-businesses-used-charter-flights-for-crew-changes-survey-reveals/*

# SHIP REPAIR AND RETROFIT GOES DIGITAL

by Digital Ship

Vessel maintenance specialist, Newport Shipping, has unveiled a first of kind, innovative online portal that has been specifically designed to ease the complexities of ship repair and retrofit works.

Digitalization is making its mark in the shipping sector, with many bespoke online tools now being utilized daily to operate and manage the world's merchant vessel fleet. Arguably however, the ship repair and retrofit sector has lagged behind in adapting to the digital age, with most of the work around these vital activities still being conducted via complex spreadsheets, layers of brokers and reams of paperwork.

**Newport Maritime Services (NMS)** is a new way of managing ship repair and retrofit projects via a bespoke, online platform. The NMS platform enables shipowners and fleet operators to obtain instant quotes for routine maintenance works, have real-time visibility of shipyard availability and get priority access to dry dock slots, all at the click of a mouse.

NMS' Managing Director, **Ege Akcasoy**, outlined how the NMS platform bridges the gap between shipowners and shipyards: *"Digitalization is on the agenda of all companies operating in the shipping industry, but the sector also remains true to its traditional roots. We wanted to introduce an online tool that works in harmony with the people that make the ship repair sector what it is today, enabling greater transparency and thereby validating the trust and personal relationships that this industry is built on."*

Subscribers to the **NMS** platform will have access to instant quotations for a wide range of routine maintenance and repair works, as well as the ability to book slots at a shipyard of their choice with a real-time view on the yard's current availability. The platform will also provide access to a full set of bespoke solutions in repair, retrofit and conversions with a low carbon focus from an exhaustive list of trusted Newport Shipping supplier partners. This is a potential game-changer for those responsible for the management of multiple vessels, empowering them with a level of transparency and control that more traditional methods cannot give, and also significantly de-risking the whole process.

The team behind the NMS platform has poured over 60 years of organizational experience into refining the design, layout, functionality and operational aspects of the system and is confident that it will benefit users in a number of ways.

*"NMS is a fully-automated booking and management platform for high-quality dry docking, retrofit and conversion projects. It combines priority access, on-demand quotes, price stability and live yard availability in a streamlined way that ultimately saves shipowners time and money. In addition to this, the visibility that the platform allows through each stage of the process helps to reduce risk and futureproof ship repair operations,"* said NMS Mr Akcasoy.

The introduction of this new digital tool also stands to support the industry with its **Environmental, Social and Governance (ESG)** mandate. Audit trails, data points, real-time information and the transparency that comes with further digitalization all serve to help the ship repair and conversion sector clearly communicate what it is doing and how it is doing it.

Through implementation of the right processes and digital tools to communicate information in the right way, NMS believes that the sector can attract interest from a broader set of investors and tentatively look forward to a more prosperous and sustainable future.

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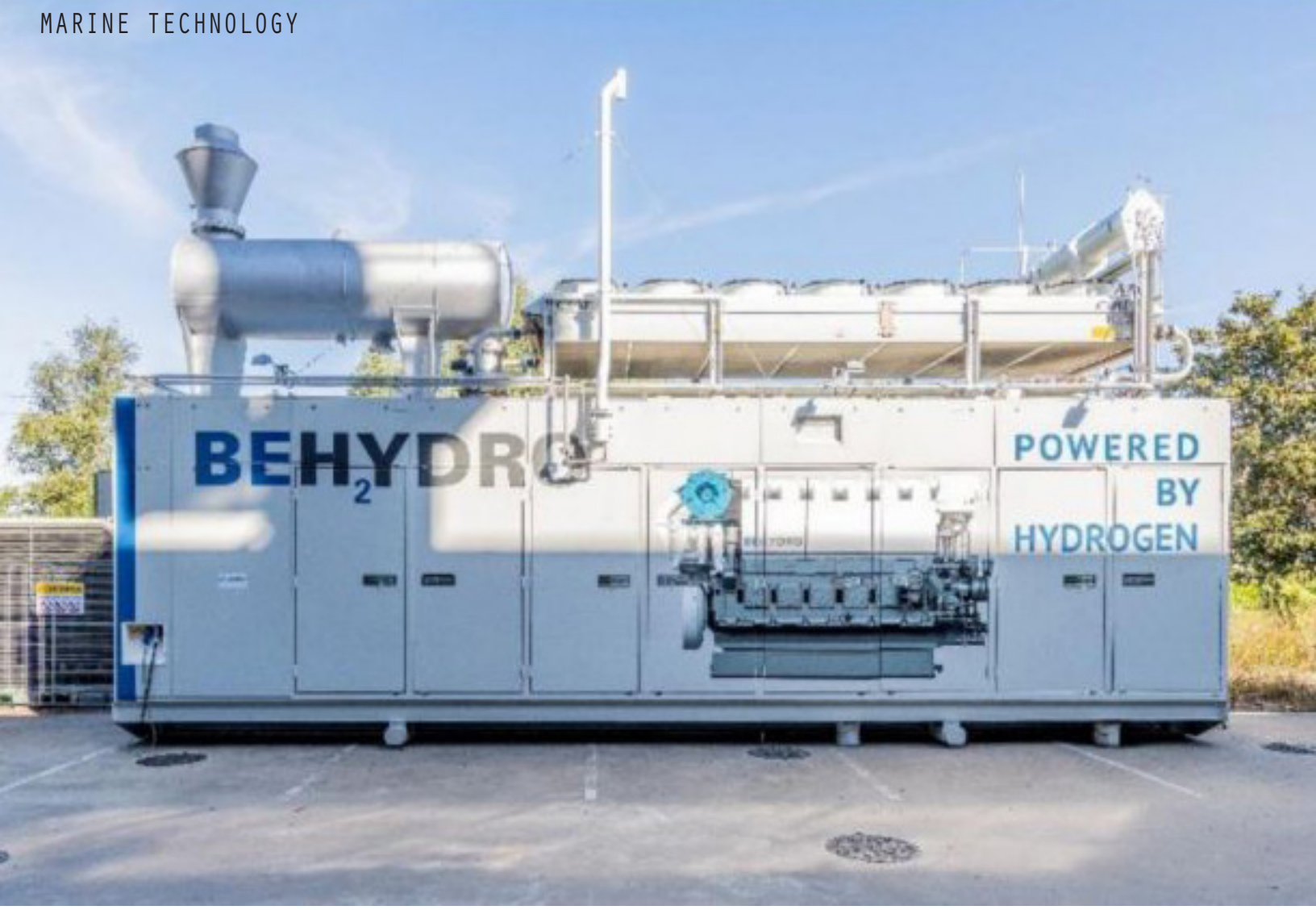
*Source: https://thedigitalship.com/component/k2/item/7051-ship-repair-and-retrofit-goes-digital*




# DUAL-FUEL ENGINE CUTS EMISSIONS BY 85%

by Vessel Performance Optimisation

A new engine capable of reducing CO2 emissions by up to 85% by injecting and burning hydrogen has been launched by **BeHydro**, a joint venture between engine producer **ABC** and shipping firm **CMB**.

Over the past three years BeHydro has developed, produced and extensively tested a dual-fuel (diesel-hydrogen) engine with a capacity of 1 MW. Based on this technology, larger engines of up to 10 MW can also be produced.

With dual-fuel technology, the engine can continue to supply power, even if no renewable energy or hydrogen is available.

**Tim Berckmoes**, CEO of **ABC**, said*: "BeHydro has already received its first order for 2 x 2 MW dual-fuel engines that will be installed on board the HydroTug. This vessel is the very first hydrogen tugboat in the world, and will be deployed by the Port of Antwerp."*

In a first phase, 100 hydrogen-powered engines can be produced per year. BeHydro is developing a mono-fuel hydrogen engine that will be ready by the second quarter of 2021

Alexander Saverys, CEO of CMB explained how BeHydro engines can be used: "BeHydro reinforces the recently announced EU vision on hydrogen and proves that the energy transition for large-scale applications is possible today. These include main engines for coastal shipping, inland shipping and tugboats, auxiliary engines for deep-sea vessels, but also trains and electricity generators for hospitals and data centers. In theory, any large diesel engine can be replaced by a BeHydro engine. The hydrogen future starts today!"

A 1MW BeHydro hydrogen powered motor can:

- supply green electricity to 3,000 families in Belgium;
- reduce CO2 emissions by 3,500 tons per year (or the equivalent of 300 hectares of forest);
- be used to convert 13,600 diesel locomotives in Europe to hydrogen; and
- produce as much energy as 1 wind turbine of 3 MW or 36,000 solar panels.

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*SOURCE: https://vpoglobal.com/2020/09/18/dual-fuel-engine-shows-potential-to-cut-emissions-by-85-per-cent/*

# GLOBAL FLOATING WIND ENERGY MARKET TO RECORD A 2000-FOLD INCREASE BY 2050

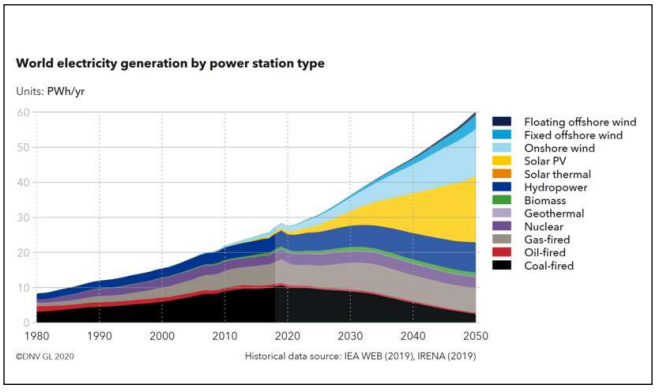
by Smart Energy International

A new report forecasts that with the right drivers in place, the installed capacity of floating wind energy will grow from the existing 100 MW to 250 GW in 2050 – a 2000-fold increase.

The study from risk management and quality assurance company **DNV GL** states that because floating wind energy is unrestrained by ocean depth, *"it will be an especially attractive option to bring wind power in reach of much more of the world's population, including the megacities of Asia Pacific."*

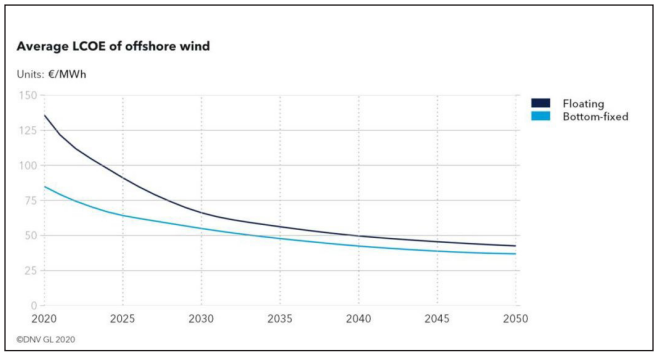
Floating wind could contribute 2% of the world's power supply by 2050 says **DNV** GL**,** but to get to that stage demands more comprehensive industry standards and risk management to enable the technology to scale.

According to the report, the cost of floating wind energy will fall approximately 70% by 2050 to a global average of €40 per MWh and offer new opportunities to players in the offshore wind, oil & gas and maritime industries as they shift their portfolios to become less dependent on fossil fuels.




Although the average cost is not expected to become less than that for bottom-fixed wind, the price difference will narrow as both fall. Key to these savings will be the introduction of larger turbines, larger wind farms, significant technology developments and the creation of a highly cost-competitive supply chain.

The report highlights how learnings from established offshore industries will be vital for floating wind and, in particular, standardization and risk management will be essential to build stakeholder confidence.




*Remi Eriksen, President, DNV GL Group*

*"We know floating wind is technically feasible – the challenge now is to move rapidly to commercial deployments,"* said **DNV GL** group president, **Remi Eriksen**.

*"There is a wealth of expertise to call on. The know-how from bottom-fixed offshore wind, the competences of shipyards and of oil and gas contractors all broadly align with the technical, logistical and operational challenges of floating wind."*

Magnus Ebbesen, Floating Wind Lead at DNV GL, added: *"There is a lot of room for innovation and optimization, but also for brand new solutions. That brings some risk, but risks that can be managed and minimized."*

*"With an evolving technology, flexibility and forward thinking are imperative. Get it right, and floating wind presents a very attractive opportunity with healthy returns – for investors and the planet."*

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*Download the report from https://protect-eu.mimecast.com/s/7KVtCyP4MIJ8XOlSQ7qPG.*

*Source: https://www.smart-energy.com/news/global-floating-wind-energy-market-to-record-a-2000-fold-increase-by-2050/*

# INTERORIENT SHIPMANAGEMENT INVESTS IN ε-ORB SOFTWARE FLEET-WIDE

by Prevention at Sea

Interorient Shipmanagement has decided to transition from traditional paper **Oil Record Books (ORB)** to using paperless, electronic **ORBs** through **ε-ORB**, which is a **MARPOL** electronic oil record book, and a Prevention at Sea software application.

The decision to implement electronic recording on the entire Interorient fleet was taken to support the broader goal of more effective ship operations and to achieve the many benefits that come from the retention of electronic records, such as a reduction in the administrative burden associated with manual paperwork and reporting.

Switching to using the **ε-ORB**, developed by Prevention at Sea, in total replacement of traditional paper ORBs across the fleet also reinforces the transparency, credibility and traceability of vessel reporting since it prevents the falsification of log entries and the automated calculations prevent vague entries and mistakes. It also guards against potential and practical **ORB** inconsistencies. Adoption of the **ε-ORB** by Interorient was driven by the fact that the system provides a plethora of vital options and useful functionalities such as the daily recording of tank soundings and total peace of mind knowing that vessels maintain accurate information.

Captain **Maurice Baker**, Managing Director of **Interorient**, says, *"Errors occurring when maintaining a traditional oil record book can bear significant issues for a vessel. For us, the immediate benefits of the **ε-ORB** were obvious, and this software supports our move to yielding the benefits of greater digitalization across our fleet. Working with Prevention at Sea in the roll out of the ε-ORB has been a simple, cost-effective process and we would highly recommend the ε-ORB platform."*

Mr Petros Achtypis, founder and **CEO** of Prevention at Sea, comments, *"The comprehensive fleet agreement between Interorient Shipmanagement and Prevention at Sea comprises the roll out of the ε-ORB across their entire managed fleet. We are extremely proud that Interorient Shipmanagement have adopted our innovative software, demonstrating the trust between our two companies. Their use of **ε-ORB** will bring many benefits associated with simplifying and standardizing current inefficient and time-consuming workflows for traditional ORB reporting."*

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*Source:*

- https://preventionatsea.com/
- https://www.hellenicshippingnews.com/

# HYDROGEN – ENERGY OF THE FUTURE

by SHELL Research

**SUMMARY**. Hydrogen is one element receiving significant attention. As an energy source, hydrogen has long been considered a possible sustainable energy in the future. But it cannot be viewed in isolation, since it is both in competition and interdependent with other energies, and the technologies that use them. The question is whether hydrogen can be an important energy carrier of the future. Shell has been involved in hydrogen production as well as in hydrogen research, development and application for decades, with a dedicated business unit, Shell Hydrogen. In cooperation with the German research institute and think-tank Wuppertal Institute, Shell has conducted a study on hydrogen as a future energy carrier. The Shell Hydrogen Study looks at the current state of hydrogen supply pathways and application technologies and explores the potential and prospects for hydrogen as an energy source for the transportation sector. Currently, however, the aviation and maritime sectors have the lowest technology readiness levels in applying hydrogen energy.

**THE ELEMENT HYDROGEN.** Hydrogen was the first element created after the Big Bang. It is the most common substance in the universe and the richest energy source for stars like the sun. Hydrogen (H) is the first element in the periodic table of chemistry and is also the smallest, lightest atom. Pure hydrogen occurs on Earth only in molecular form (H2). Hydrogen on Earth is usually found in compounds, most notably as water molecules (H2O). First discovered in the 18th century, hydrogen was originally known as "inflammable air." In the 19th century, hydrogen was featuring in contemporary visions of the future, especially in relation to the energy industry and locomotion. In the 1960s and 1970s, space travel and the increasing scarcity of resources further intensified the aura of excitement surrounding hydrogen. Since the 1990s the interest in hydrogen has been boosted by the growing urgency to find sustainable energy sources. More recently, the focus has been on hydrogen's role in an increasingly electricity-based energy economy. Owing to its special physical properties, hydrogen is an almost permanent gas, since it only liquefies at very low temperatures (below –253°C). It has a low density, so it is usually stored under pressure. Liquefaction increases its density by a factor of 800. The most characteristic property of hydrogen is its flammability. It also has the highest gravimetric energy density (how much energy it contains in comparison to its mass) of all energy sources in use today. Due to its chemical properties, hydrogen has to be handled with care.

**SUPPLY PATHWAYS**. Since hydrogen usually exists on Earth as part of a compound, it has to be synthesized in specific processes in order to be used as a material or energy source. This can be achieved by different technical methods, and various primary energy sources both fossil and renewable fuels, in solid, liquid or gaseous form, and can be used in these technical production processes. The most important primary energy source for hydrogen production currently is natural gas at 70%, followed by oil, coal and electricity (as a secondary energy resource). Steam reforming (from natural gas) is the most commonly used method for hydrogen production. Other production methods include partial oxidation, auto-thermal reforming and gasification, which generally use fossil primary energy sources. Some unused residual hydrogen is available for energy use as a by-product of industrial production processes.

To date, only small amounts of hydrogen have been generated from renewable energies, although that amount is set to increase in the future. Electrolysis currently accounts for around 5% of global hydrogen production, but most of this is still based on conventional electricity sources. Electrolysis from surplus renewable power is seen as offering huge potential for the future. Alkaline electrolysis has been used in the industry for more than a century. Alternative electrolysis methods offering improved performance parameters (regarding conversion efficiency, flexibility and cost) are currently in development. Hydrogen production from biomass, while technically feasible, is still insignificant on a global scale, and while thermochemical methods such as biomass gasification and biogas reforming are already in use, biochemical processes are still in their infancy. Biomass has to be checked against sustainability, since it is a limited resource.

As the main hydrogen supply pathways, steam reforming of natural gas and biogas and electrolysis have been analyzed and compared in terms of energy input, Greenhouse Gas (GHG) emissions and production costs: Electrolysis based on conventional electricity (grid mix) requires high primary energy input. By contrast, natural gas and biogas reforming and electrolysis based on renewable electricity require little primary energy. Moreover, electrolysis of renewable electricity uses only minimal amounts of fossil resources. H2 originating from electrolysis with electricity from renewables produces the lowest GHG emissions, whereas H2 obtained from gas reforming – natural gas or biogas is better than hydrogen from grid-based electrolysis.

Of all the production methods considered, centralized hydrogen production is more cost-effective than production in smaller, decentralized plants. Centralized natural gas reforming is most cost-effective of all, with production costs of 1 to 2 EUR per kg of hydrogen. Electrolysis is significantly more expensive, and its commercial viability largely depends on electricity prices. The costs of biomass-based hydrogen production are between natural gas reforming and electrolysis. In the future, decentralized natural gas reforming, centralized electrolysis and centralized biomass routes are expected to offer the greatest cost-saving potential.

**STORAGE & TRANSPORTATION.** The specific physical and chemical properties of hydrogen lead to higher logistics costs in storage and transportation than other energy carriers. Hydrogen has a very low volumetric energy density, thus it has to be compressed for storage and transportation. Most important is the hydrogen storage as compressed gas. For end users, high-pressure storage tanks of varying design (350, 700 bar) are available.

A higher density for storage can be achieved by liquefaction,

although this involves cooling the hydrogen to –253°C. The higher the storage density, the greater the amount of energy needed for cooling and compression, which is why more efficient storage methods are being explored. Unlike electricity, hydrogen can be successfully stored in large amounts for extended periods. Low-pressure underground storage facilities such as caverns can be filled with hydrogen from surplus renewable electricity and used as buffer stores for the electricity sector. As yet, there are very few underground hydrogen storage facilities in use. Novel storage media are materials-based hydrogen storage technologies.

At present, hydrogen is generally transported by lorry in pressurized gas tanks, and in some cases also in cryogenic liquid tanks. However, a lorry trailer can only carry so much gaseous hydrogen or liquid hydrogen. Regional hydrogen pipelines are available in some locations, the longest being in the USA and Western Europe. In the long-term, the natural gas supply infrastructure (pipelines and underground storage facilities) could also be used for the storage and transportation of hydrogen. In terms of transport costs, liquid hydrogen is suitable for long-distance transport; compressed gaseous hydrogen is suitable for shorter distances in smaller amounts; while pipelines are advantageous for large volumes.

NAUTICAL APPLICATIONS AT A GLANCE

| | |
|---|---|
| **Market maturity** | Use of fuel cells for on-board power generation being trialled. Concepts for small ship/boat propulsion systems; propulsion systems for commercial maritime shipping unlikely. |
| **Requirements** | Low emissions combined with low prices for drive-trains and fuels. |
| **Advantages** | Higher efficiency, lower emissions. |
| **Disadvantages** | Expensive propulsion technology and fuel. |
| **Alternatives** | Diesel engine with heavy fuel oil, marine diesel, (commercial) diesel fuel; gas turbine with LNG/CNG. |

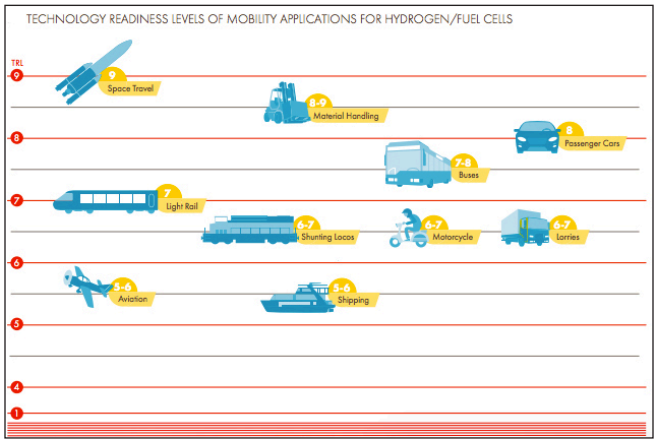
**MARITIME APPLICATION.** Hydrogen is a highly versatile basic chemical with two main areas of use: material applications and energy applications. The most important material applications in industry are ammonia synthesis, primarily used for the production of nitrogenous fertilizers, and methanol synthesis. Also, hydrogen is a by-product of crude oil refining in refineries, in particular catalytic reforming of naphthas, on the other hand it is used for the processing and refining oil products in refineries in hydrotreating and hydrocracking. Energy applications involve converting the energy in hydrogen into heat, power or electricity.

In the shipping industry, diesel engines are used almost exclusively today. Ocean-going vessels use either heavy fuel oil or marine diesel as fuel, while inland waterway vessels within the EU use commercial diesel fuel. To date the only relevant alternative drive option for the shipping industry is the use of liquefied natural gas (**LNG**) or compressed natural gas (**CNG**) to fuel ships. As in aviation, fuel cells are currently being tested as energy providers for the on-board power supply. The functional capability of fuel cell modules has been tested successfully under maritime conditions (e4ships 2016). Fuel cells work more efficiently than comparable diesel-generator sets, in the partial load range in particular and through the possibility of combined heat and power generation. Air pollutants and noise emissions in ports can be reduced. In many cases the fuel cells are operated not with hydrogen but with other fuels, including methanol, natural gas or diesel fuel. These offer the advantages of greater availability, lower price and easier storage. They are converted into hydrogen with the aid of internal or external reformers.

The use of hydrogen-powered fuel cells for ship propulsion, by contrast, is still at an early design or trial phase – with applications in smaller passenger ships, ferries or recreational craft. The low- and high-temperature fuel cell (**PEMFC**) and the solid oxide fuel cell (**SOFC**) are seen as the most promising fuel cell types for nautical applications (**EMSA 2017**). As yet, however, no fuel cells have been scaled for and used on large merchant vessels.

In comparison to the efficient, slow-running diesel engine, which runs on heavy fuel oil, the power train and fuel are far too expensive. International technical standards need to be developed to use gaseous fuels such as hydrogen (Würsig/Marquardt 2016).

Submarines are a niche application of fuel cells. For instance, electrolysers have been used in submarines for some time now to produce oxygen for breathing air. Submarines operating with fuel cells have been developed in the USA and Germany. The submarines developed in Germany use PEM fuel cells and metal hydride hydrogen stores. In terms of submarine applications, fuel cells are characterized by low noise emissions, low operating temperatures and air-independent operation. However, the market for submarines is quite small, and even in the future it will not grow beyond a niche size.




**MOBILITY APPLICATIONS**. Hydrogen can be used as an energy source for mobility applications. Initially, it was also tested in internal combustion engines, but in the transport sector hydrogen is now used almost exclusively in fuel cells. Space travel provided the historical and technical impetus for the development of hydrogen and fuel cell technology. In principle, hydrogen fuel cell systems are suitable for virtually all means of transport, but their technological maturity varies according to the means of transport and the way in which it is used. The technological maturity of a product can be determined in terms of Technology Readiness Levels (**TRL**), a system developed by the US space authority NASA. The TRL scale has levels 1-9. Sufficient technological maturity, which means at least proven functionality in the field of use at TRL 8, is a crucial prerequisite for a market launch in the respective mobility application area. At TRL 5-6, there are no plans as yet for commercial aircraft or merchant ships, but fuel cells can be used as an efficient energy source for auxiliary power units (APUs).

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*This article describes the promise of Hydrogen, and summarizes the maritime application of hydrogen. To read its application to other transport sectors, download the full report:*
*https://hydrogeneurope.eu/sites/default/files/shell-h2-study-new.pdf*

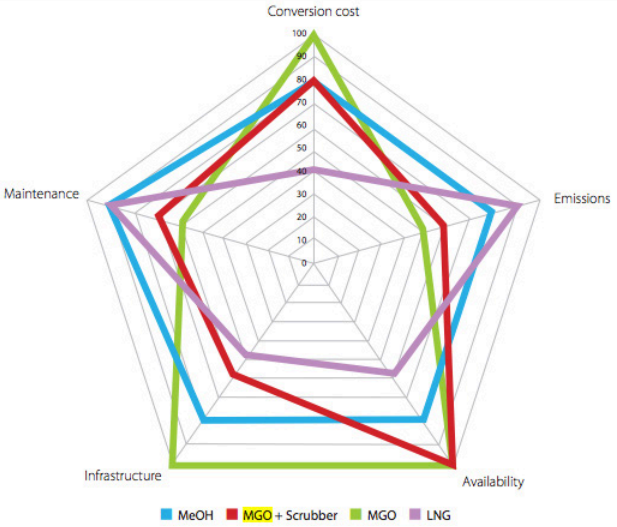
# METHANOL AS MARINE FUEL

by Vicky Viray Mendoza

Very large fuel tankers run on heavy fuel oil (HFO) mainly because of its low price but HFO emits a substantial amount of greenhouse gas (GHG). Cleaner ways of reducing emissions include shifting to alternative fuels like LNG, biogas, methanol, wind, hybrid-electric, fully electric, fuel cells, or by lowering speed.

The Paris Agreement and agreements within the IMO mandate that carbon dioxide (CO2) emissions from shipping must be reduced by 50% by 2050. The global shipping sector emits substantial CO2, Nitrogen Oxide (NOx), Sulphur Oxide (SOx), and particulate matter into the air.

AirClim of Sweden reports that through chemical reactions in the air, SOx and NOx are converted into very small airborne particles of sulphate and nitrate aerosols. These tiny airborne particles are linked to premature human deaths. The particles can get into the lungs and are small enough to pass through tissues and enter the blood. They can then trigger inflammations which eventually cause heart and lung failures. Ship emissions also have carcinogenic particles.




| | MeOH | MGO + Scrubber | MGO | LNG |
|---|---|---|---|---|
| Conversion cost | 80 | 80 | 100 | 40 |
| Emissions* | 80 | 60 | 50 | 90 |
| Availability | 80 | 100 | 100 | 60 |
| Infrastructure | 80 | 60 | 100 | 50 |
| Maintenance | 90 | 70 | 60 | 90 |

*Emissions are considered from a well to propeller perspective.

The International Organization for Standardization is in the process of developing a methanol marine fuel grade specification, and moving towards inclusion of low-flashpoint fuels into IMO's IGF Code. The basic mandate of the IGF Code is to provide guidance for the arrangement, installation, control and monitoring of machinery, equipment, and systems using low flashpoint fuels, such as liquefied natural gas (LNG) and methanol, to minimize the risks to the ship, its crew, and the environment.

**Methanol (CH3OH)** is four parts hydrogen, one part oxygen, and one part carbon. It is mainly produced from natural gas by reforming the gas with steam, and then converting and distilling the resulting synthesized gas mixture to create pure methanol. It can also be made from coal, biomass or waste materials, or from CO2 in the atmosphere along with renewable hydrogen.

**Chris Chatterton**, Chief Operating Officer, Methanol Institute said: *"Methanol is increasingly seen as one of the candidate fuels to be used in the decarbonization of shipping. It is already in use as marine fuel on tankers, bulkers, ferries and harbor craft. Its lower pollution and greenhouse gas emissions profile offers owners the opportunity to move towards IMO2030 compliance, whilst also gaining valuable knowledge towards IMO2050 ambitions."*

Douglas Raitt, Regional Advisory Services Manager, Lloyd's Register, commented: *"The maritime industry is sizing up many decarbonization options in its journey from low carbon to net zero. Methanol is among these and it offers a pathway that will enable owners to progressively lower their emissions' profile while using conventional engine systems and technology to achieve net zero."*

Methanol, in contrast to petroleum-based fuels such as bunker oil and LNG, has only one type of molecule: CH3OH. Thus, when burned, methanol produces virtually no SOx or particulate matter, and emits very low levels of NOx. It has lower GHG emissions than conventional fuel and could help ship owners meet IMO2050.

To produce methanol using simple chemistry, water is split into hydrogen and oxygen with the aid of electricity from wind or hydro power. Hydrogen is then combined with CO2, from the paper industry, to form methanol. This electrofuel is called e-methanol, where e- stands for the electricity used in the production.

*"Methanol is an excellent fuel, especially for ships. It's a liquid at room temperature, which makes handling much easier than LNG. It is water-soluble, which means that any leaks are quickly diluted and broken down in natural processes. Its use results in very low emissions of NOx. Moreover, e-methanol is produced from renewable raw materials using green energy,"* said Thomas Stenhede, Senior Technical Advisor for Liquid Wind, and founder.

When asked which ship fuels to look into for research, **Selma Brynolf**, scientist at the Department of Mechanics and Maritime Sciences, **Chalmers University of Technology**, said, *"Recently, I've been concentrating on electrofuels, i.e., fuels that are made from hydrogen produced through the electrolysis of water and combined with CO2 or nitrogen. If we add CO2 to hydrogen, we can produce e.g., methane, methanol or diesel, and if we add nitrogen we can produce ammonia. Previously, we looked at LNG, methanol and biofuels where we studied production costs and conducted life cycle analyses. Next we'll start taking a closer look at ammonia, pure hydrogen and electric drive."*

As to the advantages of methanol as a fuel, Brynolf said,

"One advantage is that methanol is liquid at room temperature and normal pressures, unlike hydrogen and LNG. Methanol is a small molecule, and it takes relatively little energy to produce compared to diesel. Also, methanol has a lower risk of climate impact."

As to the disadvantages of methanol as a fuel, Brynolf said, "Methanol contains less energy per unit mass than e.g. diesel, and this requires larger tanks. It is of course a toxic substance even when in contact with the skin, and must be handled appropriately, so special safety procedures are necessary when using methanol as a fuel. It shares a problem with all electrofuels – it's expensive to produce. Electricity is necessary for the production of hydrogen gas and the actual methanol, and the equipment itself requires major investment, at least for the time being. It also calls for large quantities of CO2. Renewable sources of CO2 are of course preferable from a climate standpoint, but their availability is limited. Another alternative is to capture CO2 from the air, but that technology is expensive and not yet fully developed."

Thomas Stenhede of Liquid Wind said, "Methanol is toxic, like any other fuel, and it will require different safety procedures. Methanol burns with an invisible flame. This is because it forms no particulates, which is fabulous in terms of the environment, but can be dangerous if you cannot locate the fire in an incident. So this will require training and new procedures."

Another disadvantage is the energy content, which is only about half that of today's ship fuels like HFO and MGO. "However, this is not a direct disadvantage on ships as they have plenty of space for fuel tanks and must anyway take on ballast. What's more, the tanks can be made in any shape to fit the interior, unlike LNG tanks, which must be cylindrical," said Stenhede.

The initial price of e-methanol will be about twice that of today's low cost fossil fuels. However, Liquid Wind believes e-methanol will achieve parity with fossil fuels by 2030, Stenhede said. He believes methanol will increasingly be attractive as more stringent emission standards are imposed on the shipping sector.

Methanol's emissions are negligible, and therefore definitely more environmentally friendly than Heavy Fuel Oil (HFO) or diesel. It is a clear, colorless liquid that quickly dissolves in water and biodegrades quickly. Thus, the negative environmental effect of a large methanol spill would be much lower than that of an equivalent oil spill.

Large quantities of methanol is available in most ports. A supply chain system can be developed, as methanol is one of the world's most transported chemicals. And as a liquid fuel, methanol is the easier fuel in storing onboard ships as well as in distributing, compared with gas or electricity.

Methanol is now one of the top five chemical commodities shipped worldwide. Methanol requires only minor changes to the existing port terminal infrastructure and is already available for bunkering at over 88 of the world's top 100 ports.

Methanol is well-suited for ships because it is a more efficient fuel yet less complicated to produce. There are ship engines that have used methanol. So far, large two-stroke engines for methanol are commercially available, but now a range of four-stroke engines are being developed to be powered by methanol.

Methanex reports that In 2016, Waterfront Shipping Company Ltd., Mitsui O.S.K. Lines Ltd., Marinvest/Skagerack Invest, and Westfal-Larsen Management welcomed the world's first 7 new innovative, clean-burning, fuel-efficient ocean-going vessels to the sea. These seven 50,000 dead weight ton (DWT) vessels are built with the first-of-its kind MAN B&W ME-LGI 2-stroke dual fuel engine that can run on methanol, fuel oil, marine diesel oil, or gas oil. In 2018, Waterfront Shipping, Marinvest/Skagerack Invest, IINO Kaiun Kaisha, Ltd., Mitsui & Co., Ltd., and NYK Group announced their investment in another four dual-fuel vessels powered by the new second generation MAN dual fuel engines. These vessels were delivered in 2019, and have the ability to achieve Tier III NOx standards without after-treatment.

For methanol to become the dominant marine fuel of the future, the shipping industry will need to convert ship engines in a simple and cost-efficient way to run on methanol. New engines must preferably be developed and will need to do ship trials at sea. Nevertheless, the cost to convert vessels to run on methanol would be significantly less than what other alternative fuel conversions will cost, without the need for expensive exhaust gas after-treatment. Moreover, as a liquid fuel, only minor modifications are needed for existing storage and bunkering infrastructure to handle methanol. The cost of methanol also has to significantly drop to compete with LNG and MGO.

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- *About Methanol, METHANEX, https://www.methanex.com/about-methanol/how-methanol-made#:~:text=About%20Methanol,-Overview&text=Methanol%20%E2%80%93%20CH3OH%20%E2%80%93%20is,mixture%20to%20create%20pure%20methanol.*

# NEW POLL: MAJORITY OF AMERICANS WOULD CHANGE WHERE THEY SHOP TO SUPPORT CLEANER SHIP

by Pacific Environment

A new poll conducted for **Pacific Environment by Yale University**, **George Mason University**, and **Climate Nexus** finds that nearly three-quarters (74%) of American voters would be more likely to shop at companies that use cleaner ways to ship their goods. The poll finds that 70% of American voters would continue to shop at these brands even if using clean ships raised the price of their goods.

*"People care about the harm ships do to our communities, oceans, and climate, and will bring their business to the retailers that are doing something about it,"* said Madeline Rose, climate campaign director at Pacific Environment. *"This poll, which we believe is the first of its kind, shows that consumers are eager to put their dollars behind first-mover brands that can deliver zero-emission shipping."*

These findings also demonstrate a strong American preference to shop at companies taking action to address the outsized impacts from maritime shipping, which transports around 80% of all global freight by volume. About three-quarters of voters feel more favorably toward a company that imported their products using the cleanest fuel available (75%), was the first to ship their products on a zero-emissions ship (73%), or reduced shipping-related emissions by just a third (72%). More than eight in 10 (84%) agree that the shipping industry should be doing more to reduce the impacts of shipping goods around the world.

*Photo Credit: Ian Taylor via Unsplash*

*"Americans are putting corporations' feet to the fire when it comes to tackling climate change and polluting practices. These findings show that companies that fail to reduce their shipping emissions could lose customers to competitors making good on climate commitments that include the human health and environmental impacts of shipping,"* said **Madeline Rose**.

The findings come amidst mounting public pressure for companies to take action on climate change. According to the numbers, the pressure — which is coming from investors, workers, and the public — is working. The United Nations announced during Climate Week in September 2020 that commitments from businesses to reach zero-emissions have doubled in less than a year, and research finds that corporate climate goals are becoming more ambitious. A survey of global experts found that two-thirds of experts across 66 countries say companies must become carbon neutral by 2030 or sooner in order to remain competitive, and a survey of Chief Financial Officers found most report increasing pressure from a broad range of stakeholders to act on climate change.

*"In the face of climate emergency, every company on the planet should be racing to achieve zero emissions this decade. Zeroing out emissions from shipping must be part of that race,"* said Rose.

At almost one billion tons of climate emissions per year, the shipping industry emits roughly the same as all the coal plants in the U.S. combined. The sector could account for 17–18% of all global emissions by 2050 if corrective policies are not put in place. The **International Maritime Organization**, the United Nations agency that regulates shipping, has set a goal of cutting shipping emissions at least 50% below 2008 levels by 2050, but recently bowed to industry pressure to weaken the rules governing pollution from the shipping industry.

**Climate Nexus Polling**, in partnership with the **Yale Program on Climate Change Communication** and the **George Mason University Center for Climate Change Communication**, conducted a representative survey 13-October-2020 of 1,936 registered voters in the United States. The margin of error for this survey is +/- 2.3% at the 95% confidence level. The poll was sponsored by Pacific Environment and funded by C**limateWorks Foundation.**

Pacific Environment is a global environmental organization dedicated to protecting communities and wildlife of the Pacific Rim. They have consultative status at the United Nations' International Maritime Organization, which sets international shipping law. Toplines for the poll are available here.

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*Source: https://cleantechnica.com/2020/12/05/new-poll-majority-of-americans-would-change-where-they-shop-to-support-cleaner-ships/*

# RETROFIT HIGHLIGHTS USE OF LPG AS A MARINE FUEL

by Wärtsilä

The world's first LPG-fuelled vessel has set sail. Powered with Wärtsilä's customized and reliable Fuel Supply System, the vessel represents a major breakthrough in the search for new ways to reduce marine emissions. **BW LPG**, the world's largest owner and operator of very large liquified petroleum gas (LPG) carriers, is approaching a major milestone in the retrofit of a number of its very large gas carrier (**VLGC**) to run on **LPG** instead of **Heavy Fuel Oil** (**HFO**).

About 20 months ago, **BW LPG** signed a contract with Wärtsilä to install LPG Fuel Supply Systems (**LFSS**) on four of its vessels. As part of the contract, Wärtsilä was also asked to manage the integration of the new system into the vessels. This meant making necessary ship design modifications, integrating the LFSS control system with the ships' integrated automation system (**IAS**), and acting as a coordinator between and among the yard, the engine manufacturer, and the owner. Now, after the successful completion of full-scale testing and installation of the systems, the first **BW** vessel has successfully completed sea and gas trials and is on a historic transpacific voyage from China to Enterprise Port in Houston, Texas, on full LPG propulsion.

**Better for efficiency and environment**. **Serge Schwalenstocker**, Project Manager, **BW LPG**, says the decision to make the switch from running vessels on **HFO** to **LPG** made sense from the economic, operational, and especially environmental perspective. *"Compared with HFO, LPG emits up to 97% less sulphur (SOx), 20% less nitrogen oxide (NOx), 90% less particulate matter (PM) and 20% fewer carbon emissions," Schwalenstocker says. "Based on current fuel price levels where LPG is cheaper compared to compliant fuel alternatives, we are using cleaner and cheaper fuel to power our vessel.,"* he adds.

Kaj Portin, General Manager, Research & Technology Programs at Wärtsilä, says LPG has other benefits. *"LPG is affordable and easy to handle; it can be stored in pressurized tanks, is easily accessible across all terminals in the world, and is more environmentally friendly than other fossil fuels. If you look at an engine running on LPG, it will have quite low CO2 emissions as it has short molecules, mostly propane and butane. It also has no methane slip and is great for controlling GHG emissions. Only LNG, Methane and Ethane will be as good with CO2 slip,"* Portin says.

**Meeting challenges.** In February 2020, Wärtsilä completed full-scale testing of its **LFSS** with a full sized 2-stroke marine engine fuelled by **LPG**. The performance of the system exceeded expectations, and **BW LPG** exercised its option to extend the project and increased the total number of ships for retrofitting to twelve. *"Retrofitting 12 of our vessels with pioneering LPG propulsion technology is a significant upfront commitment, but the returns are positive in both financial and environmental terms,"* says Schwalenstocker. *"It is the result of our company's focus to invest resources and expertise to pioneer technology that can be used to push our industry towards decarbonization without the need for dedicated newbuilding orders."*

Developing the pioneering technology required to retrofit the vessels was not easy. **Wärtsilä** needed to install two LPG tanks of 900 m3 volume each to replace the **HFO**. The LPG from these new tanks also had to be pressurized and conditioned to make it ready to send to the engine. Once sent and used as fuel, the engine returns liquid. The returning liquid too, needs to be conditioned and handled in varying volumes. **Wärtsilä** had to ensure that this process was carried out smoothly while integrating and interfacing with the existing systems on the vessel.

**Peter Zürcher**, Project Manager, **Wärtsilä**, outlines the complexity of the task. *"These are massive tanks. What we are doing is supplying storage volumes and doing process systems. So, we have to set up interfaces 'to the engine' to meet their requirement for pressure, temperature and flow. Simultaneously, we also have to ensure the reverse flow 'from the engine' is managed in a similar manner. This complicated system has to work seamlessly when the ship leaves the yard,"* **Zürcher** says.

**A New Horizon**. **BW LPG** expects the next vessels, to be completed within Q3 2021. All these vessels will be fitted with Wärtsilä's new deck tanks and LFSS on the main deck. In the engine room, the engine supplier will convert the main conventional fuel engine to an LPG dual-fuel engine. This process is expected to take about two months for each vessel, including testing. *"This is a new system, and this is the first time it will happen on board a vessel. It is not a tried and tested well-defined system. It has to be developed and invented,"* says **Kjell Ove** Ulstein, Director, Sales and Marketing, at **Wärtsilä**. *"As system integrators and technology providers, we have to ensure that our solution meets the multiple objectives of our customer, exceeds their expectations of efficiency, and is relevant in the long term."*

Sustainability at the Forefront. The challenge is that much of what will happen in the long term will be driven by sustainability. Emissions norms are getting tighter, and the marine industry has a long way to go in reducing its environmental footprint. The **International Maritime Organization (IMO)** has mandated that the shipping industry bring down CO2 emissions by 50% by 2050. Will adopting LPG, a fossil fuel, help meet those goals?

Mathias Jansson, General Manager Fuel Gas Supply Systems at Wärtsilä, says it is a good interim step. "For those using HFO, LPG is a first step towards more sustainability and fuel-flexibility in the longer term," Jansson says. Wärtsilä is not alone in its pioneering work on the use of LPG as a marine fuel. There is broad interest in the fuel. The classification agency DNV GL is reported to have developed new class rules and a class notation for the use of gas-fuelled LPG ships. According to reports, a joint study by **DNV GL** and **MAN** found *"LPG is at least as attractive an energy source as LNG, with shorter payback periods, lower investment costs and lower sensitivity to fuel price scenarios."*

So far, **LPG** as a marine fuel has only been tried on LPG carriers. But experts believe that with costs declining and the availability and accessibility of LPG rising, it is only a matter of time before many more vessels adopt it.

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*Source: https://www.wartsila.com/insights/article/retrofit-highlights-use-of-lpg-as-a-marine-fuel*

# RADIOACTIVITY IN WATERS AROUND THE PHILIPPINES

by Timothy Muelder

Recently a friend asked me if I had heard any news regarding elevated levels of radioactivity in the waters surrounding the Philippine Islands. I admit I had not, but would check into it.

According to **Philippine Nuclear Research Institute (PNRI)** radioactive material was indeed found in existing coral and waters in the **West Philippine Sea (WPS)**.

PNRI Director Carlo Arcilla said in a news conference that traces of iodine-129 (a radioactive material) was found in corals in the sea. In a follow-up interview, he said the radiation "is not dangerous but traceable."

The question is what is it and why is it there? Possibly, nuclear activities happening in the area or in neighboring countries? "Based on data received from the Global Environmental Monitoring System, there's an increase in background radiation in the South China Sea in connection with a radiation incident," said Russia's Rospotrebnadzor Agency. It added that the radiation levels did not *"currently threaten the Russian population"* and that it *"has increased its radiation monitoring in the adjacent border areas"* (***The Moscow Times***).

Iodine-129 is a long-lived radio isotope which occurs naturally, but also is of special interest for monitoring and effects of man-made nuclear fission decay products because it serves as both tracer and potential radiological contaminant.

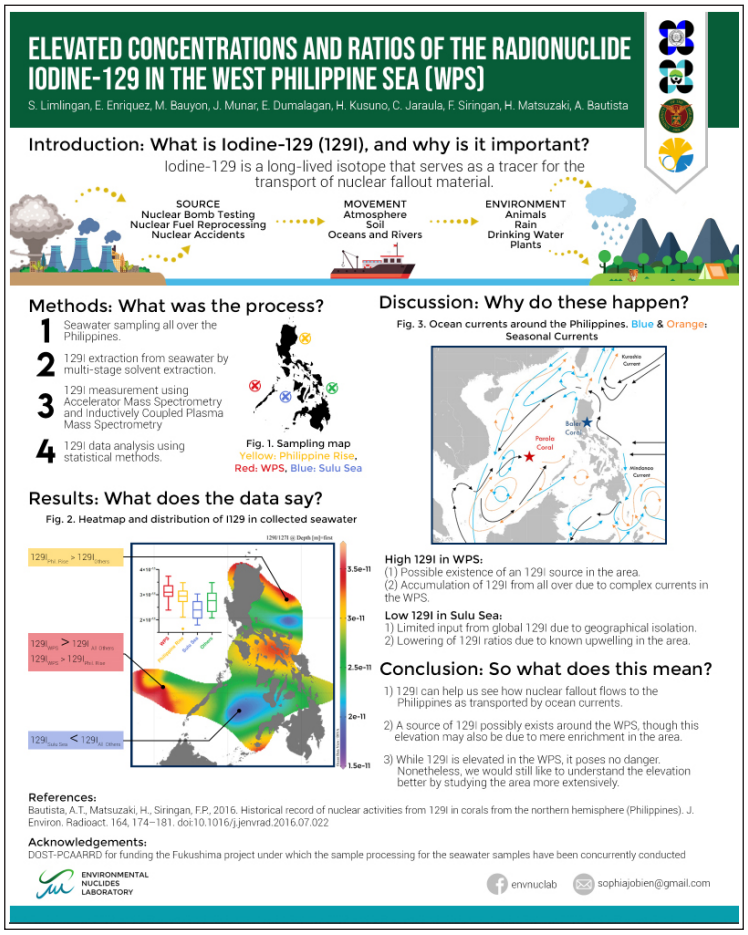
The United States Environmental Protection Agency (EPA) website states that most iodine-129 in the environment come from nuclear weapons testing.

Atmospheric testing in the 1950s and '60s had released radioactive iodine to the atmosphere, the EPA stated.

PNRI Director Arcilla said the initial findings were documented by PNRI scientist Dr. Angel Bautista III as part of his 2016 dissertation at the University of Tokyo on the effects of nuclear activities on the environment, including the possible effect of Japan's Fukushima nuclear power-plant accident in 2011. The study found the radiation was not from Fukushima so it may have come from new undetermined activities. Arcilla said they might have come from nuclear-powered vessels.

Arcilla stated the iodine-129 levels in the West Philippine Sea (WPS) in 2020 were higher than surrounding areas although further tests need to be completed to determine its source.

Studies will continue and the Philippines has plans to construct 10 environment monitoring stations for placement facing the WPS. Other ASEAN countries also have plans, as some of them also face the WPS.




Dr. Bautista, in a phone interview, said that based on the history of the corals, they were found to have already had a high level of iodine-129 deposits "from the 1950s to the present."

"So that means the corals had iodine-129 even before the Fukushima accident occurred in 2011," Dr. Bautista said.

However, Dr. Bautista said that it is yet to be determined if the contamination in the sea water was caused by natural concentration or other sources.

Bautista said he is continuing the studies on the coral and sea water contamination.

According to Arcilla, at the meeting of the ASEAN Network of Regulatory Bodies on Atomic Energy (ASEANTOM) in Vietnam in November 2020, the countries were "very concerned" when he reported about the findings.

Any findings will be shared among ASEAN countries as an obligation under ASEANTOM.

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

# WAVE SYSTEM AT WORK ON DOLOMITE SAND PEBBLES BEACHFRONT ALONG MANILA BAY

by Capt Tomas D Baino PN (Ret)

## INTRODUCTION

This article is a part II of my previous publication, "Wave Dynamics Retain Dolomite Sand Pebbles Intact at the Beachfront along Manila Bay," in the Maritime Review's Nov–Dec 2020 issue.

In addition to that previous article, this topic presents the real time wave system along Roxas Blvd., Manila Bay, explaining my analogy by illustration and definition, the physical behavior of the wave system prevailing in Manila Bay Area.

The aim of this reading material is to contribute a high level of confidence by presenting theory and facts on what is happening on the beachfront. You can expect the dolomite sand pebbles not to be eroded by underwater turbulence of the bottom of the seabed of Roxas Blvd for a long period of time, for generations to come, if not forever.

**Analogy of Wave Systems.** Presented in Fig. 1 is the wave system along Roxas Blvd; its cycles and probability of occurrence of 106 times per 1000 observations in the Philippine Sea Areas of Responsibilities (World Meteorological Observation Statistics).

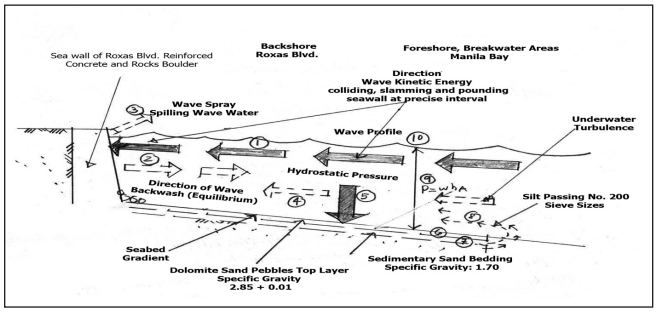


*Fig. 1 – The Wave System along Roxas Blvd.*

| Legend | Description |
|---|---|
| 1 | Direction of Wave Kinetic Energy slamming, colliding and pounding the seawall of Roxas Blvd., at precise intervals of 14.8 seconds, 4.86 times/minutes, 243.28 times per hour or 5,837.83 times/24 hours. |
| 2 | Wave energy absorbed by the seawall at the point of impact of the seawall from the wave, energy, dissipates which turns into back wash waves in equilibrium, at the seawall convergence zone. |
| 3 | Wave spray/spilling water waves are thrown to the atmosphere upon impact on the seawall. |
| 4 | Underwater turbulence with the trochoidal wave at the surface is maximum while underwater turbulence is negligible due to the effect of the constant compressive force of the hydrostatic pressure. |
| 5 | The seawater hydrostatic pressure constantly exerts towards the seabed, and the magnitude of force is directly proportional to seawater density and depth per square unit that press the dolomite sand pebbles to the seabed. |
| 6 | A layer of Dolomite sand pebble has specific gravity of 2.85 ± 0.01 with granular interlocking particle sizes. |
| 7 | A layer of sand bedding with specific gravity of 1.70 with silt and smaller particles of sand passing sieve size #200 equivalent to silt. |
| 8 | Silt and smaller sand particles are washed away towards the seawall by underwater turbulence deposited on top of dolomite sand pebbles at the edge of the beachfront before the wave convergence zone. |
| 9 | Pressure of seawater is zero at the wave surface profile and maximum in deeper water. Water is incompressible. |
| 10 | Wave profile energy is maximum at the surface of the sea triggered by the wind in contact/friction with the sea surface and normally moves in the wind's direction. |

## SANDBARS AT MANILA YACHT BASIN AND BASECO BEACH

The sandbars at Baseco Beach and Manila Yacht remain intact. They are not being eroded by strong wind and tidal currents despite being exposed constantly to unseen forces of nature. The sandbars remain deposited on said area.

*Fig. 2 – Baseco Beach*

*Fig. 3 – Manila Yacht Basin Sandbars*

Sands deposited by tidal currents and waves along the beachfront of Baseco Waterfront and Manila Yacht Basin have remained intact and undisturbed by wave and current despite the fact that these beaches have no beach protection from underwater turbulence, current and backwash waves, and predominant forces of nature which is the kinetic energy of the waves constantly pushing the sandbars inland during high tide and rough sea conditions. Yet they have never eroded. In theory, the forces of nature create islands that initially start as shoals, sandbars, etc.

*Fig. 4 – Wave Convergence Along Sea wall of Roxas Blvd.*

Shown in Fig. 4, is the wave convergence along the seawall of Roxas Blvd., Manila Bay Area. This observation is at real time in constant occurrence, during which the wave surface kinetic energy dissipates upon colliding and slamming the seawall, then backwash waves and spilling water wave spray are thrown up in the atmosphere. The backwash waves and spilling water that accumulate along the seawall or at the wave convergence zone create differences in seawater elevation and in turn said mass of seawater will just flow back seaward, called gravity waves, and will be carried during high and low tide. Said movement of water neither affects nor erodes resilient properties of the dolomite sand pebbles pushing at the opposite direction towards the foreshore or the deeper part of Manila Bay.

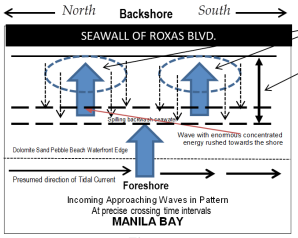


*Fig. 2*
*Wave Intervals Diagram Slamming and Pounding the Seawall During High Tide and Rough Sea Condition*

***Concentrated kinetic energy of the waves with precise time interval slamming and pounding the seawall and dissipate to spilling wave and back wash maintain the equilibrium of sea surface at the wave convergence zone.***

## CONCLUSION

Nature protects the dolomite sand pebbles beachfront from underwater turbulence. The constant real time direction of waves rushing towards the seawall is in total harmony and favorable to the said beachfront project.

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*ABOUT THE RESEARCHER*

- *CAPT BAINO retired from the Philippine Navy in 2004. A registered Civil Engineer and Naval Architect in the Professional Regulation Commission (PRC) in the Philippines.*
- *His early years in the Philippine Navy was with the Philippine Navy Seabees Mobile Construction Battalion and Waterfront Dredge Unit involved in the early phases of the reclamation of Cultural Center and Folk Arts Theater area in the early years of 73 and gain some training experience with the US Navy Seabees Amphibious Construction Battalion in support to Marine Landing Operation during series of SEATO Naval Exercise and MAULEX (Marine Amphibious Unit Landing Exercise) in the Philippines.*
- *Sent by the NAVY to complete the Advance Engineer Officer Course in Military Engineering at the United States Army Engineer School, Fort Leonard Wood, Missouri in 1991 and completed a training course in Underwater Archeology in Asia Institute of Technology (AIT) in Bangkok, Thailand in 1980 under the sponsorship of DOST/SPAFA (Special Project in Fine Arts) in salvage, collection and preservation heritage marine wrecks.*
- *He participated in Cross-Training Exercises with the US Navy 7th Fleet Mobile Diving and Salvage Unit (MODSU) in Ship Salvage Exercise during the Cooperation Afloat Readiness Training (CARAT 2001-2003). CAPT BAINO was awarded Outstanding Achievement Medal as Ship Salvage Director of the Naval Sea System Command by PGMA during the 2002 Navy Day Celebration in Sangley Point Cavite City, for the successful refloating and salvage of PF-7 BRP Andres Bonifacio and 3 other sunken vessels at the Capt. Yutadco Pier, Naval Shipyard, Fort San Felipe, Cavite City.*
- *He worked for 2 years as Operations Manager with the International Operations and Maintenance Company (IOMC), Land Oil Group of Companies in Port and Harbor Facility Operation and Maintenance contract with the Saudi Ports Authority, Saudi Arabia from 1981 to 1983.*
- *Presently, he is Associate Editor for Technical Matters in the Maritime Review Magazine and the Maritime Forum in the Philippines.*

# NINE IUU FISHING VESSELS NABBED IN MAUBAN, QUEZON

by DA-BFAR

Nine (9) commercial fishing vessels using Danish Seine, locally known as buli-buli or hulbo-bulbot, were apprehended by fisheries law enforcers of the Department of Agriculture - Bureau of Fisheries and Aquatic Resources (DA-BFAR) and other agencies in the river of Barangay Tapucan in Mauban, Quezon before the year 2020 capped off.

In the morning of 31-December-2020, the commercial fishing vessels were spotted docking in the berthing area of the Tupacan River by the combined team of BFAR 4A – Fisheries Protection Law Enforcement Group (**FPLEG**), 1st Quezon Provincial Mobile Force Company (**1QPMFC**) of Philippine National Police Maritime Group, Naval Intelligence and Security Group (**NISU-32**) of the Philippine Navy, and Alpha Company of 59 Infantry Battalion of the Philippine Army during their conduct of illegal fishing operation in the said municipality.

The inter-agency law enforcement operation is part of DA-BFAR's intensified campaign to eliminate i**llegal, unreported, and unregulated fishing (IUUF)**, including hulbot-hulbot, which has led to heightened and more effective maritime patrol operations even during holidays.

*"We could not stress enough how proper enforcement of the fisheries laws is beneficial to the overall performance of the Philippine fishery sector. Billions are lost to Illegal, Unreported and Unregulated fishing and if we truly commit to reduce unsustainable and destructive fishing practices as what the government through the **DA-BFAR** is doing now, our fisherfolk will truly benefit from this effort,"* **DA-BFAR** National Director **Commodore Eduardo Gongona** said.

Upon investigation, the vessels were identified as FBca Ening-1, FBca Vanessa II, FBca Vanessa-I, FBca Leanel-M, FBca Ening, FBca Reana Lieh, FBca Lady Vanessa M. Uno, MBca Audrey-B, and FBca Vanessa-7. Of the nine, two fishing vessels (FBca Vanessa-I and FBCA Vannesa-7) have previous record of apprehension.

In coordination with the local governments of Perez and Alabat, the vessels were brought to Alabat, Quezon for impoundment, documentation, and filing of proper charges in court.

The owners of the commercial fishing vessels were already sent notices of violations of Sections 86 (**Unauthorized Fishing**), 89 (**Unregulated Fishing**), 97 (**Use of Destructive Fishing Gears**), and 108 (**Failure to Comply with Minimum Safety Standards**) of Republic Act 10654 or the Amended Philippine Fisheries Code. They may also face charges for violation of FAO 246-1, which penalizes fishing boats by mere possession of hulbot-hulbot including its paraphernalia.

Hulbot-hulbot is considered a destructive fishing gear built with nets connected to sinkers or tom weights. The use and mere possession of hulbot-hulbot including its paraphernalia is prohibited by the government under the amended Fisheries Administrative Order (**FAO**) 246-1.

In 2020, DA-BFAR filed a total of 793 IUUF-related cases; 684 cases of which were resolved.

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*Reference: BFAR 4A and the BFAR Information and Fisherfolk Coordination Unit. Source: https://www.bfar.da.gov.ph/BFARnews*

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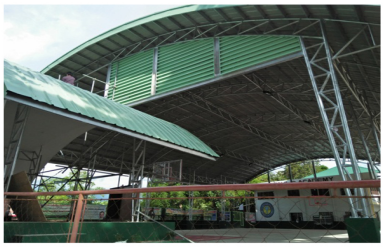



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Geographic destiny has given the Filipino the innate talent to be an excellent seafarer. To enhance this natural skill, the Maritime Academy of Asia and the Pacific (MAAP) was established on January 14, 1998. The Academy stands on a 103-hectare property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

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

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

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

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