# MARITIME REVIEW

A Publication of The Maritime League

Issue No. 20-5 Nov-Dec 2020


## BATTLE FOR MANILA BAY: THE INITIAL STEPS

Also Inside:




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***About the Cover:***

***This issue's cover showcases the Government's rehabilitation efforts of Manila Bay. The image highlights the planned "Beach Nourishment Area" stretching from the US Embassy toward the Manila Yacht Club. Photo courtesy of DENR.***

# MARITIME EVENTS CALENDAR

**OCTOBER '20**

| | |
|---|---|
| 5-8 | AUVIS XPONENTIAL (VIRTUAL CONFERENCE) |
| 7-9 | NAVEXPO INTERNATIONAL 2020 (PORT OF LORIENT, SOUTH BRITTANY, FRANCE) |
| 7-9 | CONTRACT MANAGEMENT FOR SHIP CONSTRUCTION, REPAIR AND DESIGN COURSE (THE ROYAL INSTITUTE OF NAVAL ARCHITECTS, LONDON, UK) |
| 10-12 | INTERNATIONAL CONFERENCE ON MARITIME TRANSPORT (DIPARTAMENTO DI INGEGNERIA CIVILE, EDILE E AMBIENTALE, ROME ITALY) |
| 13-14 | AFRICAN PORTS AND RAIL EVOLUTION (DURBAN ICC, DURBAN, SOUTH AFRICA) |
| 13-15 | SHIPPING INSIGHT (STAMFORD, CT, USA) |
| 14-16 | INTERNATIONAL SHIPPING AND COMMUNITY CONFERENCE (HILTON STAMFORD HOTEL & EXECUTIVE MEETING CENTER. STAMFORD, USA) |
| 15 | 3RD BANGLADESH INTERNATIONAL MARINE & OFFSHORE EXPO (BIMOX) 2020 (DHAKA, BANGLADESH) |
| 19-22 | GLOBAL OCEANS CONFERENCE & EXPO 2020 (VIRTUAL CONFERENCE) |
| 20-21 | ENVIROTECH FOR SHIPPING FORUM (ROTTERDAM, NETHERLANDS) |
| **21** | **MARITIME FORUM #157 (UP INSTITUTE OF MARITIME AFFAIRS AND LAW OF THE SEA (IMLOS); ONLINE VIA ZOOM MEETING)** |
| 21-23 | OIL & GAS VIETNAM (PULLMAN VUNG TAU, VUNG TAU, VIETNAM) |
| 23 | COMMERCIAL MARINE EXPO (PROVIDENCE, RI, USA) |
| 24-28 | INTERFERRY (HOBART, AUSTRALIA) |
| 26-30 | POSIDONIA (ATHENS, GREECE) |
| 26-28 | SEATRADE MARITIME MIDDLE EAST (DUBAI, UAE) |
| 27-29 | DANISH MARITIME DAYS (COPPENHAGEN, NETHERLANDS) |
| 27-29 | TOC AMERICAS (VIRTUAL CONFERENCE) |
| 28-31 | CLEAN GULF CONFERENCE & EXHIBITION (NEW ORLEANS, LA, USA) |

**NOVEMBER '20**

| | |
|---|---|
| 2-6 | OFFSHORE TECHNOLOGY CONFERENCE (OTC) ASIA 2020 (VIRTUAL CONFERENCE) |
| 9 | ABU DHABI INTERNATIONAL PETROLEUM EXHIBITION & CONFERENCE (ADIPEC) (ABU DHABI, UNITED ARAB EMIRATES) |
| 9-11 | MARITIME AIR SYSTMS & TECHNOLOGIES (MAST JAPAN DEFENSE) (TOKYO, JAPAN) |
| 9-13 | INTERNATIONAL BUSINESS HOUSE (IBH) TRADING AND SHIPPING WORKING TOGETHER TRAINING COURSE (AMSTERDAM, NETHERLANDS) |
| 11-13 | KOREA OCEAN EXPO (SONGDO CONVENSIA, INCHEON, SOUTH KOREA) |
| 17-18 | ASIAN LOGISTICS AND MARITIME CONFERENCE (HONG KONG CONVENTION AND EXHIBITION CENTRE, HONG KONG) |
| **26** | **MARITIME FORUM #158 (DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES(DENR); ONLINE VIA ZOOM MEETING)** |

**DECEMBER '20**

| | |
|---|---|
| 1-3 | OCEANOLOGY INTERNATIONAL (OI) 2020 (LONDON, UK) |
| 1-3 | PACIFIC MARINE EXPO 2020 (CENTURYLINK FIELD EVENTS CENTER, SEATTLE, WA, USA) |
| 7-9 | SEATRADE MARITIME MIDDLE EAST (DUBAI EXHIBITION CENTRE, DUBAI, UNITED ARAB EMIRATES) |
| 8-10 | UNDERSEA DEFENSE TECHNOLOGY (UDT) (ROTTERDAM, NETHERLANDS) |
| 15-16 | INTERNATIONAL GREEN SHIPPING AND TECHNOLOGY (GST) SUMMIT (METROPOLITAN HOTEL ATHENS, PALAIO FALIRO, GREECE |
| 15-17 | INTERNATIONAL WORKBOAT SHOW (ERNEST N MORIAL CONVENTION CENTER, NEW ORLEANS, USA) |
| 20-22 | SHIPPING & LOGISTICS INDIA (CHENNAI TRADE CENTRE, CHENNAI, INDIA) |

**JANUARY '21**

| | |
|---|---|
| 17 | NEWCASTLE LARGEST HOLIDAY CRUISE AND EXPO (NEWCASTLE AURSTRALIA) |
| **TBD** | **MARITIME FORUM #159 (DEPARTMENT OF FOREIGN AFFAIRS (DFA); ONLINE VIA ZOOM MEETING)** |
| 30-4 FEB | K-LOVE CRUISE (FORT LAUDERDALE, USA) |

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

**MAY '21**

| | |
|---|---|
| 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) |
| 21-23 | CRUISE SHIP INTERIORS EXPO AMERICA (CSI) (MIAMI, FLORIDA, USA) |
| 21-23 | MARINE MONEY WEEK (NEW YORK, USA) |
| 22-24 | ELECTRIC AND HYBRID MARINE WORLD EXPO (AMSTERDAM, NETHERLANDS) |
| **TBD** | **MARITIME FORUM #164 (PHILIPPINE COAST GUARD (PCG); ONLINE VIA ZOOM MEETING)** |

**JULY '21**

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

**AUGUST '21**

| | |
|---|---|
| 16-19 | OFFSHORE TECHNOLOGY CONFERENCE (RHOUSTON, TEXAS, USA) |
| **TBD** | **MARITIME FORUM #166 (PHILIPPINE PORTS AUTHORITY (PPA); ONLINE VIA ZOOM MEETING)** |

**JULY '21**

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

**OCTOBER '21**

| | |
|---|---|
| 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) |
| 20-22 | OIL AND GAS VIETNAM 2021 (PULLMAN VUNG TAU, VUNG TAU, |

# MANILA BAY - A NEW BEACH EMERGES

by Timothy Muelder

The efforts to rehabilitate Manila Bay are once again in the news.

Recently, a project to add a beach extension along Roxas Blvd. was undertaken by the Philippine national government. It is part of the Department of Environment and Natural Resources (DENR) Manila Bay Rehabilitation Program launched by DENR Secretary Roy Cimatu in January 2019. Within the same year, part of the 2020 national project was allocated for the artificial beach project. The project has received support from the Manila city government led by Mayor Isko Moreno.

This project has not been without some controversy. Environmental concerns have been raised by the use of crushed Dolomite as the beach fill medium. Some have said it may contain high levels of heavy metals that could contribute to the acidity and pollution of Manila Bay waters. Also some concerns have been voiced regarding the possibility of health hazards due to possible dust exposure. Also permitting issues over the mining, processing, and placing approximately 3,500 metric tons along the water's edge just south of the U.S. Embassy compound.

Many of the environmental concerns are somewhat over the top, and can be explained as follows:

- The most common use for dolomite is in the construction industry. It is crushed and sized for use as a road base material, an aggregate in concrete and asphalt, railroad ballast, rip-rap, or fill. Dolomite is a stable clean mineral, it does not contain heavy metals.
- Dolomite's reaction with acid also makes it useful. It is used for acid neutralization in the chemical industry. In river and stream restoration projects, dolomite is used to condition water in marine aquariums, and as a soil conditioner. The size of the crushed dolomite used for Manila Bay fill is coarse and large enough to prohibit dust formation, thus, not inhalable by those walking on the beach. It should also be noted that many water filtration systems use sand compounds, some of which contain Dolomite and Diatomaceous Earth or DE powder as the filter media with great success.

Manila Bay had already been heavily polluted long before this project was undertaken, rendering it hostile to both aquatic life and anyone around its waters, regardless of the Dolomite fill.

The environmentalists, affected local governments, and corporations that use non-degradable plastic for their products might do better in addressing the tons of litter, raw sewage, squatter villages, mangrove destruction, deforestation, and toxic runoff flowing down from the Mountain Rivers and into the bay, and commit to help reduce the pollution with a long-term clean-up strategy.

On September 19, after workers had flattened and packed the sand, officials allowed a curious public access to the beach. Thousands showed up to take selfies, and two days later President Rodrigo Duterte praised the project, saying *"people now are really enjoying the reclaimed area with the white sand."*

The Manila Bay beach rehabilitation project, once fully completed, is expected to reach from the U.S. Embassy compound to the Manila Bay Yacht Club, a 500-meter stretch of shoreline. There are many additional projects throughout the Philippines that could help to educate each and every one to follow safe environmental practices, repair the damages done, protect what we have, and keep moving forward for the next generations to enjoy too what our families enjoyed.

It will take responsibility, focus, perseverance, accountability, and acceptance by everyone to ensure a positive outcome. It's not something we should do; it's something we must do. If we don't – who will?

⚓⚓⚓

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

# BATTLE FOR MANILA BAY: THE INITIAL STEPS

by VAdm Emilio C Marayag Jr AFP(Ret)

During the 158th Maritime Forum held at **DENR** Head Office, Secretary **Roy T Cimatu** presented a comprehensive update on the rehabilitation and restoration of Manila Bay ecosystems. As Chair of the interagency **Manila Bay Task Force (MBTF)** created by Presidential AO 16, series of 2019, the Secretary also revealed some observations that affect the smooth implementation of the **Operational Plan for Manila Bay Coastal Strategy (OPMBCS)** crafted way back in December 2005.

This **OPMBCS** strategy aims to protect human welfare and the ecological, historical, cultural and economical features of the bay, mitigate environmental risks caused by human activities, develop areas of opportunities that balance economic development and environmental management, direct the formulation and implementation of policies to achieve sustainable development, and communicate to all stakeholders their rights and responsibilities and issues pertaining to Manila Bay's environmental programs.

According to Manila Bay Coordinating Office's Executive Director **Donna Mayor-Gordova**, in her MR17-6 article (November-December 2017), from 2011 to 2016, **DENR** and other agencies addressed a number of liquid and solid waste management issues on water quality and pollutants, relocated 45,204 informal settler families squatting along the easement areas in numerous tributaries leading to the bay, and partner with different agencies and stakeholders to conduct studies and monitor water quality. Gordova also reported that the number of informal settler families along the bay's river systems ballooned due to the failure of the local government units (LGUs) to control the cleared areas and the entry of new settlers.

*With these initial steps, the government has manifested a strong political will and the Filipino people have high hopes that this campaign will be pursued for the sake of future generations.*

In early 2019, the **DENR**-led **MBTF** with full support from the President through AO 16, decided to face the challenges of an environmental campaign dubbed ***"Battle for Manila Bay."*** In the MR19-2 issue (March-April 2019), the publication contended that this government drive was a test of political will and would take a longer period to attain the goal given the magnitude of the informal settler families and the financial requirements. But as a proverb advances, "a journey of a thousand miles begins with a single step," the Task Force reviewed the OPMBCS and what it had already accomplished, in order to identify priorities and deliverables going forward within resource limitations.

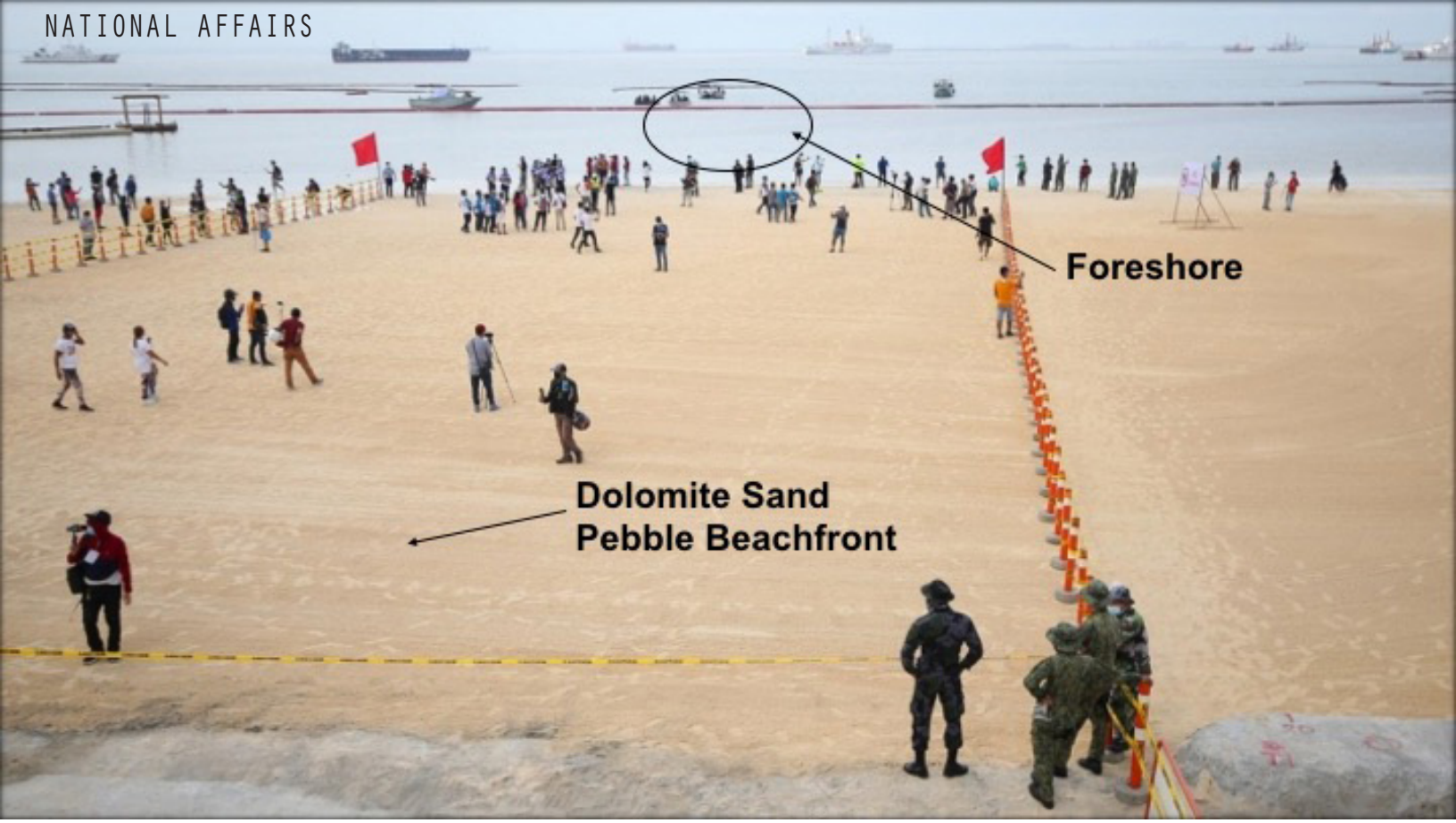
The **MBTF Task Force** listed 7 key result areas (KRA): liquid waste management (KRA1); solid waste management (KRA2); social preparation and relocation of the informal settler families (KRA3); habitat and ecosystems management (KRA4); rule of law (KRA5); strategic communications, education and mobilization (KRA6); and sustainable rehabilitation plan (KRA7). Phase 1 consists of clean-up and water quality improvement (KRA1 & 2) to be followed by Phase 2 which involves full rehabilitation and resettlement (KRA3 & 4). The final stage is Phase 3 which entails protection and sustainment (KRA5, 6 & 7).

Liquid and solid waste management begins with clean-up activities starting with garbage removal. To-date, the Task Force has removed 24,471 tons of solid waste since 2019, an average of 60 tons per day. It has also hired ***"Estero Rangers"*** to clean and monitor the clogged "esteros" that require clearing, grubbing and desilting. The agency performed partial dredging of some river systems, like Tullahan and San Juan rivers, healed and recovered several easement areas, stopped illegal reclamation, and relocated 251 informal settler families to Trece Martires and Caloocan cities. The Task Force has installed trash traps in Baseco Beach, planted mangroves in some areas in Pampanga, Bulacan, Las Piñas, and Baseco. To improve water quality, the Task Force installed sewerage interceptors, communal septic tanks, and distributed toilet bowls to informal settler families living in shanties along the tributaries pending their relocation. The Task Force continuously monitors the fecal coliforms in some bathing beaches and noted the drastic reduction in Luneta and Bacoor.

To initiate the gargantuan effort to "win" the campaign, the Task Force started with the rehabilitation of the Manila Baywalk. Waste water from various establishments and dwellings on land have been diverted to a solar-powered sewage treatment plant before being discharged to Manila Bay. Several floodwater pipes, silt curtains, and trash booms were also installed. Due to heavy siltation, the baywalk beach, which extends 60 meters from the seawall and 800 meters wide, was dredged and erosion protection geobags were installed at the edge before pouring the layers of dolomite sand pebbles. Contrary to some critics' unfounded opinion, dolomite sand, which is heavier than ordinary sand, is not carried away by the waves. The lightweight grey sand brought in by the waves settles on top of the dolomite sand, which will resurface once beach cleaners comb the sands. It also attracts fish and migratory birds, thus adding a more scenic view to the baywalk coastline.

The Task Force would have accomplished many more missions this year had it not been not for the pernicious COVID-19 pandemic. Nearly Php2 billion had been programmed to partly rehabilitate Manila Bay and many other activities which had to be postponed. Nevertheless, the President has promised to support the budget of this particular activity.

With these initial steps, the government has manifested a strong political will and the Filipino people have high hopes that this campaign will be pursued for the sake of future generations. We congratulate the Secretary Cimatu for his clarity of vision and focused commitment to pursue this noble endeavor. The **Maritime League** wishes the **DENR** and **MBTF** officials and employees *"fair winds, clear skies and following seas"* in their continuing voyage to protect Manila Bay, the environment, and the natural resources of our nation. ⚓




# WAVE DYNAMICS MAINTAIN DOLOMITE SAND PEBBLES INTACT AT MANILA BAY WATERFRONT

by Capt Tomas D Baino PN (Ret)

## INTRODUCTION

This article is primarily written to provide some clarification to the apprehensions on the dolomite sand pebbles, spread in layers at the breachfront along the seawall, would be washed away during typhoon season towards the foreshore of Roxas Boulevard of the Manila Bay Area.

Research, facts, observations, and analysis on prevailing waves characteristics were analyzed based on previous experiences of the researcher and yielded the following answers to the questions of our citizens.

## WAVE DYNAMICS, PATTERN AND FREQUENCIES


*Fig. 1 Map of Roxas Boulevard*

Facts: As shown in Fig. 1, the wave direction is constantly rushing towards the shoreline at the beach front where dolomite sand pebbles on the beach are located. Waves are constantly moving eastward to the location of the seawall of Roxas Boulevard.

The behavior of waves are surface waves that always occurs on free surface bodies of water of Manila Bay. They result from blowing winds (Beaufort scale) over an area of sea surface. Also, strong waves in the ocean travel a long distance, thousands of miles before reaching the shoreline.

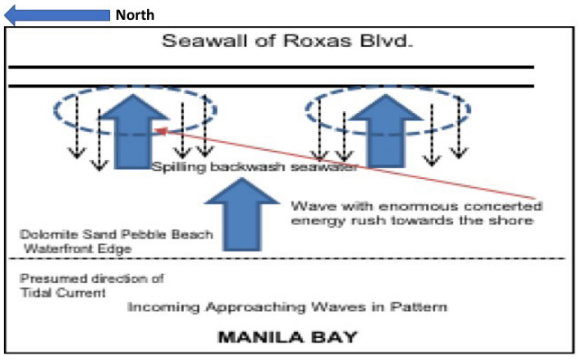



*Fig. 2 Wave Patterned Diagram Slamming and Pounding the Seawall During Rough Weather Condition*

As shown in Fig. 2 is an illustration of incoming approaching waves with enormous concentrated energy rushing in pattern towards the shoreline of the seawall during high tide and rough sea conditions, colliding, slamming and pounding against the seawall at precise time intervals in seconds called wave crossing time.

The wave energy carried by the waves dissipate to zero energy as it collides onto the seawall and has to maintain equilibrium. The energy is transformed to a spilling wave backwash sea water that converges at the seawall beach front zone and becomes surface gravity waves, a part of the horizontal movement of water often accompanying the rising and falling of tides which is called a tidal current along the coast.

*Fig. 3 Violent waves colliding the sea wall where the dolomite sand pebble beach layer is located (Roxas Blvd.)*

Shown in Fig. 3 are violent waves under sea state condition 6 colliding with the seawall where the enormous wave energy absorbed by the seawall upon impact at precise intervals every wave crossing period of 9.8 seconds and was transformed to wave spray and spilling wave water particles with negligible backwash energy.

*Fig. 4 After Effect of Typhoon. Garbage left behind by the waves at low tide. Sand patches on top of the dolomite sand pebbles layer.*

Shown in Fig. 4 is the aftermath of strong wave disturbances by Typhoons Rolly and Ulysses. Floating garbage carried by the waves were left behind by the waves at low tide and the patches of gray color sand were pushed by the wave towards the seawall, and deposited on top of the layers of dolomite pebble sand.

## THEORY OF TROCHOIDAL WAVE STRUCTURE

The Trochoidal wave is a progressive wave moving in an orbital circle form on the surface of incompressible seawater fluid of infinite depth is progressive in nature, the wave grows bigger in magnitude and accumulates wave energy as it travels large bodies of water in rolling motion.

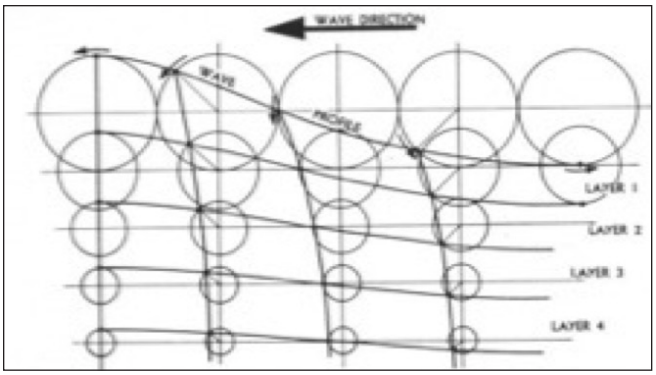



*Fig. 5 Trochoidal Wave Diagram Wavelength*

Fig. 5 is a diagram showing how the trochoidal wave moves from the origin of disturbances (fetch) at the middle of large bodies of water towards the shore. The trochoidal wave is represented in the diagram by an imaginary larger diameter orbital circle at the surface (Layer 1), which is an indication of a stronger wave energy in the zone of the wave profile because hydrostatic pressure is negligible near the surface of the wave profile.

The wave energy represented by the orbital circle in deep water becomes less in magnitude (Layer 2) to almost negligible in deeper water (Layer 4). The trochoidal wave movement in the wave direction is horizontal, triggered by the direction of blowing winds in contact with the surface of the sea.

The underlying movement beneath the wave profile has a vertical motion from smaller orbital circle (Layer 4), the energy of the wave is less because of the hydrostatic pressure which is directly proportional to the depth. The deeper the water, the greater the hydrostatic pressure. The wave energy becomes smaller from Layer 1 to Layer 4, because of the compressive effect of hydrostatic pressure from the column of water above the seabed.

## WAVE SWELL

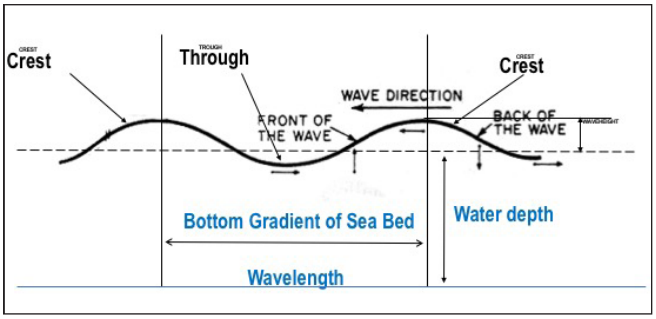



*Fig. 6 Wave Swell Diagram*

Fig. 6 is a diagram of wave swell profile typical in the trochoidal wave diagram which travels from the point of origin of disturbance. The swell is also a rolling orbital motion of waves, where the energy is measured between the distance of the wavelength crest to crest, the wave height, velocity or speed, wave direction and water depth at the swell tends to compress the dolomite sand pebbles at the seabed. Swell occurs as an after effect of disturbances from large bodies of water.

## SPECIFIC GRAVITY OF DOLOMITE

Dolomite sand pebbles specific gravity is 2.85 ± 0.01 is dimensionless. Defined as the ratio between density of mass over density of seawater is 1.025. The crushed sand particles specific gravity is 1.70, lighter than the dolomite sand pebbles and smaller in particle sieve size.

The beachfront at Roxas Boulevard where the dolomite sand pebbles were laid in layers on top of crushed sand bedding, will firmly remain intact by specific gravity and by interlocking with the individual grain size pebbles of dolomite. It has the tendency to move towards the seawall due to the energy persistently exerted by the waves towards the shore. However, such energy of the waves is negligible and smaller at the bottom of the waterfront and maintains the balance between energy of waves versus the hydrostatic pressure and specific gravity of the dolomite sand pebbles. In this situation, only the crushed sand particles equivalent to the size of silt were moved to the top of the dolomite sand pebbles layer indicated by gray sand patches in Fig. 4 as the after effect of the Typhoon Rolly and Ulysses.

## PROBABILITY OF SEA STATE CONDITION 6

Shown in Fig. 7, are the coastal shores of the Philippine Archipelago. Sea Area 40 are large bodies of water adjacent to Manila Bay. Tables 1 and 2 are the probability of occurrence and definition of sea state condition of a fully arisen sea. The sea state condition has a radius of disturbance from 130-180 nautical miles at the sea surface, and can affect the adjacent bodies of water of Manila Bay.

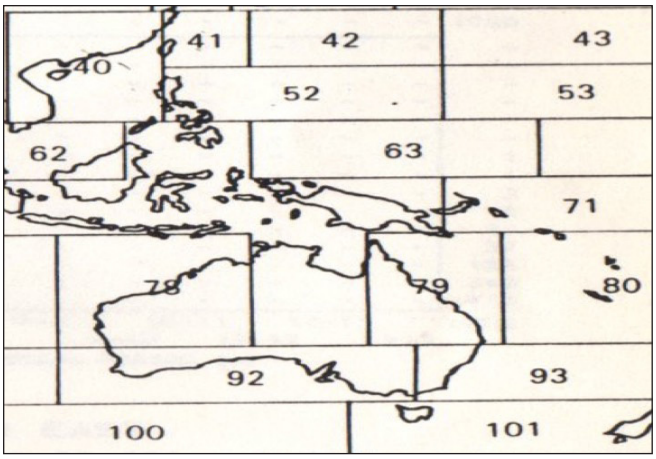



*Fig. 7 Philippine Areas of Responsibility*

The prevailing sea state condition 6 is presented in Table 1. The wave energy estimated is approximately 6000 lbs. per square foot. The wave energy of this magnitude when travelling at instantaneous speed of 30 knots, would indicate 18 million lbs. per minute per square foot of frontal wave area at the surface of the wave profile which is always moving towards at great distance to the shoreline.

| Sea-General | | Wind | | | | Sea | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sea State | Description | Beaufort Wind Force | Description | Range (knots) | Wind Velocity (knots) | Wave Height: Average | Wave Height: Significant | Wave Height: Average of One Tenth Highest | Significant Range Periods (sec) | Periods of maximum Energy of Spectra $T_{max}=T_c$ | Average Period $T_z$ | Average Wave-length $L_w$ (ft unless otherwise indicated) | Minimum Fetch (nautical miles) | Minimum Duration (hr unless otherwise indicated) |
| 0 | Sea like a mirror | 0 | Calm | 1 | 0 | 0 | 0 | 0 | - | - | - | - | - | - |
| | Ripples with appearance of scales are formed, but without foam crests | 1 | Light airs | 1-3 | 2 | 0-04 | 0-01<br>0-01 | 0-09 | 1-2 | 0-75 | 0-5 | 10 in | 5 | 18 min |
| 1 | Small wavelets; short but pronounced crests have a glossy appearance, but do not break. | 2 | Light breeze | 4-6 | 5 | 0-3 | 0-5 | 0-6 | 0-4-2-8 | 1-9 | 1-3 | 6-7 ft | 8 | 39 min |
| | Large wavelets; crests begin to break. Foam of glossy appearance, perhaps scattered with horses. | 3 | Gentle breeze | 7-10 | 8-5 | 0-8 | 1-3 | 1-6 | 0-8-5-0 | 3-2 | 2-3 | 20 | 9-8 | 1-7 |
| | | | | | 10 | 1-1 | 1-8 | 2-3 | 1-0-6-0 | 3-2 | 2-7 | 27 | 10 | 2-4 |
| 2 | Small waves, becoming larger; fairly frequent white horses | 4 | Moderate breeze | | 12 | 1-6 | 2-6 | 3-3 | 1-0-7-0 | 4-5 | 3-2 | 40 | 18 | 3-8 |
| | | | | | 13-5 | 2-1 | 3-3 | 4-2 | 1-4-7-6 | 5-1 | 3-6 | 52 | 24 | 4-8 |
| 3 | | | | 11-16 | 14 | 2-3 | 3-6 | 4-6 | 1-5-7-8 | 5-3 | 3-8 | 59 | 28 | 5-2 |
| | | | | | 16 | 2-9 | 4-7 | 6-0 | 2-0-8-8 | 6-0 | 4-3 | 71 | 40 | 6-6 |
| 4 | Moderate waves, taking a more Pronounced long form: Many white horses are formed (chance of some spray) | 5 | Fresh breeze | 17-21 | 18 | 3-7 | 5-9 | 7-5 | 2-5-10-0 | 6-8 | 4-8 | 90 | 55 | 8-3 |
| | | | | | 19 | 4-1 | 6-6 | 8-4 | 2-8-10-6 | 7-2 | 5-1 | 99 | 65 | 9-2 |
| | | | | | 20 | 4-6 | 7-3 | 9-3 | 3-0-11-1 | 7-5 | 5-4 | 111 | 75 | 10 |
| 5 | Large waves begin to form; white crests are more extensive everywhere (probably some spray) | 6 | Strong breeze | 22-27 | 22 | 5-5 | 8-8 | 11-2 | 3-4-12-2 | 8-3 | 5-9 | 134 | 100 | 12 |
| | | | | | 24 | 6-6 | 10-5 | 13-3 | 3-7-13-5 | 9-0 | 6-4 | 160 | 130 | 14 |
| 6 | | | | | 24-5 | 6-8 | 10-9 | 13-8 | 3-8-13-6 | 9-2 | 6-6 | 164 | 140 | 15 |
| | | | | | 26 | 7- | 12-3 | 15-6 | 4-0-14-5 | 9-8 | 7-0 | 188 | 180 | 17 |
| 7 | Sea heaps up, and white foam from breaking waves begin to be blown in streaks along the direction of the wind (Spindrift begins to be seen) | 7 | Moderate gale | 28-33 | 28 | 8-9 | 14-3 | 18-2 | 4-5-15-5 | 10-6 | 7-5 | 212 | 230 | 20 |
| | | | | | 30 | 10-3 | 16-4 | 20-8 | 4-7-16-7 | 11-3 | 8-0 | 250 | 280 | 23 |
| | | | | | 30-5 | 10-6 | 16-9 | 21-5 | 4-8-17-0 | 11-5 | 8-2 | 258 | 290 | 24 |
| | | | | | 32 | 11-6 | 18-6 | 23-6 | 5-0-17-5 | 12-1 | 8-6 | 285 | 340 | 27 |
| | Moderate high waves of greater length; edges of crests break into spindrift. The foam is blown in well-marked streaks along the direction of the wind. Spray affects visibility. | 8 | Fresh gale | 34-40 | 34 | 13-1 | 21-0 | 26-7 | 5-5-18-5 | 12-8 | 9-1 | 322 | 420 | 30 |
| | | | | | 36 | 14-8 | 23-6 | 30-0 | 5-8-19-7 | 13-6 | 9-6 | 363 | 500 | 34 |
| | | | | | 37 | 15-6 | 24-9 | 31-6 | 6-20-5 | 13-9 | 9-9 | 376 | 530 | 37 |
| | | | | | 38 | 16-4 | 26-3 | 33-4 | 6-2-20-8 | 14-3 | 10-2 | 392 | 600 | 38 |
| | | | | | 40 | 18-2 | 29-1 | 37-0 | 6-5-21-7 | 15-1 | 10-7 | 444 | 710 | 42 |
| 8 | High waves. Dense streaks of foam along the direction of the wind. Sea begins to roll. Visibility affected. Very high waves with long | 9 | Strong gale | 41-37 | 42 | 20-1 | 32-1 | 40-8 | 7-23 | 15-8 | 11-3 | 492 | 830 | 47 |
| | | | | | 44 | 22-0 | 35-2 | 44-7 | 7-24-2 | 16-6 | 11-8 | 534 | 960 | 52 |
| | | | | | 46 | 24-1 | 38-5 | 48-9 | 7-25 | 17-3 | 12-3 | 590 | 1110 | 57 |
| 9 | over-hanging crests. The resulting foam is in great patches and is blown in dense white streaks along the direction of the wind. On the whole, the surface of the sea takes on a white appearance. The rolling of the seas becomes heavy and shock like. Visibility is affected. | 10 | Whole gale | 48-55 | 40 | 26-2 | 41-9 | 53-2 | 7-5-26 | 18-1 | 12-9 | 650 | 1250 | 63 |
| | | | | | 50 | 28-4 | 45-5 | 57-8 | 7-5-27 | 18-8 | 13-4 | 700 | 1420 | 69 |
| | | | | | 51-5 | 30-2 | 48-3 | 61-3 | 8-28-2 | 19-4 | 13-8 | 736 | 1560 | 73 |
| | | | | | 52 | 30-8 | 49-2 | 6-25 | 8-28-5 | 19-6 | 13-9 | 750 | 1610 | 75 |
| | | | | | 54 | 33-2 | 53-1 | 67-4 | 8-29-5 | 20-4 | 14-5 | 810 | 1800 | 81 |
| | Exceptionally high waves. Sea completely covered with long white patches of foam lying in direction of wind. Everywhere edges of wave crests are blown into froth. Visibility affected | 11 | Storm | 56-63 | 56 | 35-7 | 57-1 | 72-5 | 8-5-31 | 21-1 | 15 | 910 | 2100 | 88 |
| | | | | | 59-5 | 40-3 | 64-4 | 81-8 | 10-32 | 22-4 | 15-9 | 985 | 2500 | 101 |
| | Air filled with foam and spray. Sea white with driving spray. Visibility very seriously affected | 12 | Hurricane | 64-71 | >64 | >46-6 | 74.5 | 94-6 | 10-35 | 24-1 | 17-2 | - | - | - |

*Table 2. Definitions of Sea State Conditions of Fully Arisen Sea*

### The Philippine Sea Condition; Sea Area 40, 41 and 52

| Sea Areas | Proportion of time when wave heights exceed 4 meters in height | Per 1,000 Wave Observations |
|---|---|---|
| 40 | 10.60% | 106 times to happen |
| 41 | 11.10% | 111 times to happen |
| 52 | 6.70% | 67 times to happen |
| 62 | 3.20% | 32 times to happen |
| 63 | 2.00% | 20 times to happen |

*Table 1. Philippine Sea Condition, Sea Area 40, Sea Area 41 and Sea Area 52*

### CONCLUSION

I conclude that the prevailing forces of nature through the wave energy constantly moving in precise intervals towards the direction of the shoreline of Roxas Blvd., the hydrostatic pressure from the columns of seawater, and the granular interlocking sizes of dolomite sand pebbles with high specific gravity, will all keep said dolomite sand pebbles intact at the dolomite beach-front of Roxas Blvd., along Manila Bay.

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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.*

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# DA-BFAR LAUNCHES INTEGRATED FISH AND VEGETABLE FARMING FOR URBAN DWELLERS

by DA-BFAR News

As part of the Farmers' and Fisherfolk's Month celebration, Agriculture Secretary **William Dar** unveiled the project **Urban Aquaponics** during the launching of the Plant, Plant, Plant Program in Quezon City.

**Aquaponics**, an innovative technology that combines concepts of aquaculture and hydroponics to allow fishes and vegetables to grow together in an integrated system, is one of the government's newest project to ensure sustained food production in urban communities as the nation eases into the "new normal" in the midst of **CoVID-19** pandemic.

*"We want an agriculture that is modern; we want an agriculture that is technology-based; we want to eradicate subsistence agriculture; we want an agriculture that is inclusive and market-oriented,"* DA Secretary **William Dar** said.

Sets of two newly-constructed solar energy and electricity hybrid-powered models of Urban Aquaponics in small and large sizes that can fit on confined spaces in the metropolis are currently housed at the **Department of Agriculture (DA)** compound and the Philippine Coconut Authority compound in the said city. These are only two of the five Urban Aquaponics models that the department, through the **Bureau of Fisheries and Aquatic Resources (BFAR)**, will make available for interested individuals and communities in the coming months.

Under DA's *"Plant, Plant, Plant Program"* and BFAR's Food Resiliency and Recovery Program for **CoVID-19**, 15 small-scale and 10 large-scale fiberglass units, and 50 large-scale canvas units of Urban Aquaponics will be distributed as immediate assistance to urban communities within Metro Manila. The distribution will follow an institutional arrangement through a memorandum of agreement (MOA) among the agency and the organized groups identified as recipients of the project.

The project will cover the start-up inputs for culture of fish and vegetables as well as include a training component for fast and efficient transfer of technology.

Aside from ensuring household and community food security, urban aquaponics is seen to offer its stakeholders an excellent livelihood opportunity. For instance, the small model only takes up a square meter of space but can already yield 50-75 units of catfish and 54 pieces of lettuce amounting to at least P4,080 per cropping.

The large model, with a width three times the size of the small model, can produce 120-300 units of catfish and 344 units of lettuce for a total of P112,572 in gross sales. The cost of production for these models is only P36,000 and P120,000, respectively.

Procurement of more units of these models is already underway and for distribution to serve as livelihood for more recipients. These models are also being replicated around the country through the agency's regional field offices. The project is in line with one of the 8 paradigms –Modernization of the department's *"New Thinking"* approach for agriculture. ⚓

# THE RP-U.S. VISITING FORCES AGREEMENT – "LET GO OR NOT?"

by BGen. Manuel P Oxales AFP (Ret)

Early this year on February 11, the President announced the termination of the **Visiting Forces Agreement (VFA)** in response to the suspension by the U.S. of visas of certain Philippine officials in the Department of Justice and an incumbent senator. The suspension would have taken effect 180 days later. On June 11, in a reversal of position, the government, citing developments in the South China Sea, and a world-wide health crisis, (quarantine rules took effect March 15) the President suspended the termination of the VFA for six months, extendable for another six months.

On July 27, the President in his SONA said that China has actual possession of Philippine islands territories and sea areas in the West Philippine Sea (WPS), a subject of dispute by the two countries. He referred to the islands and islets in the Spratly Group located about 130 miles west of Palawan and the Scarborough Shoal, 120 miles east of Zambales which are parts of Philippine territories and the sea areas within their exclusive economic zones, EEZ.

*ASEAN states, the Philippines included and Taiwan have been in dispute with China who has continuously asserted sovereign rights over SCS despite the ruling in 2016 of the Hague Permanent Arbitral Tribunal that China's so-called nine-dash line has absolutely no legal and historical basis.*

On August 5, the President viewing with alarm the increasing tensions between China and U.S. as they issued strong statements over their disputes in the SCS accompanied by major movements of naval and air forces, directed the Philippine Navy not to join a scheduled bilateral exercise with the U.S. Navy in the West Philippine Sea.

These actions of the government have far reaching implications on the external defenses of the Philippines (RP). In particular, the termination of the **VFA** will make ineffective and inoperative the 1951 **Mutual Defense Treaty** (**MDT**) and 2014 **Enhanced Defense Cooperation Agreement** (**EDCA**) which has replaced the 1947 **Military Bases Agreement (MBA)** and terminated by the Senate in 1992.

This over-simplified scenario illustrates the incongruous situation. A house owner (Philippines) wants the fire station (US) within the vicinity. In the event his house catches fire, he wants the firemen (US military) to put out the fire but not to enter his yard or house. (Under the 1951 **MDT** which is still in effect, US is obligated to defend RP against external attacks).

The RP-US 1951 **Mutual Defense Treaty** was signed by the governments of the Philippines and U.S. one year after the Korean War (1950-53) broke out. The **VFA** was entered into in 1998 by RP and US, ratified by the Senate, in 1999, set the rules on the entry and stay of US military and civilian personnel in the country undergoing bilateral exercises with Philippine military on matters of visas, taxes, criminal cases, etc. With the 1947 MBA terminated by the Senate in 1992 and alarmed by China's aggressive expansions, intrusions and occupations of Philippine territories and sea areas in WPS over which it has sovereignty, the government of President Benigno Aquino Jr. (2010-2016) signed with U.S. the 2014 **EDCA** which allowed U.S. to place its military forces on six agreed bases or locations, on Philippine territory on 'rotational basis.'

The government of President Aquino wanted a more visible and concrete manifestation of U.S. resolve and determination to defend

the Philippines against external attack. The U.S. government felt that without **EDCA** it could not effectively perform its obligations to RP under the 1951 MDT. With VFA in place, the 1951 MDT and 2014 **EDCA** have become more effective and implementable.

The importance of **VFA** to the external defense and economy of the country was cited by Department of Foreign Affairs Secretary Locsin in his testimony before the Senate in February. He said the **VFA** ensures the operationability of the 1951 **MDT** and the 2014 **EDCA**; enables the continuance of combined exercises by U.S. military forces and our armed forces; provides continuity of U.S. military assistance which for year 2016-2019 amounted to $544 million and for 2020-21 amounted to $200 million; addresses non-traditional threats such as drug and human trafficking, cyber-attacks, terrorism and other internal threats, and provides assistance in air surveillance and during natural calamities. Close relationship with U.S. has economic and trade benefits: economic and development assistance was 38% grant, U.S. is 3rd largest trading partner, 3rd source of tourism, and 5th source of investment.

The permanent termination of the **VFA** will severely weaken the external defenses of the country. U.S. will not be allowed to conduct exercises with AFP, station on and operate military forces from Philippine territory. Thus the Philippines will not have a very strong and credible deterrence and protection against external attack.

As an archipelago, with a very long coastline, about 37,000 kms. and porous borders, the country is vulnerable to intrusions, invasions and other hostile acts from outside. Its ill-equipped air force and navy cannot possibly do a continuing maritime surveillance of the WPS and the Pacific coastline. It has to depend on the space vehicles of an ally. Photos have shown that Pagasa, an island municipality, the Kalayaan islands, Palawan and islets in the Spratly Group, the Scarborough Shoal west of Zambales, and their sea areas have been continuously intruded into, with Filipino fishermen denied entry and the Philippine navy harassed and intimated by Chinese warships and vessels superior in number and weaponry.

A Philippine territory, Mischief Reef in the Spratlys, was occupied since 1995 by Chinese troops (Note: The 1947 **MBA** was terminated by Senate in 1992), who have put up a runway, structures and harbors on reclaimed sea areas of military use. In 2012, a Philippine Navy vessel and Chinese militia vessels had a month long stand-off by the seas of Scarborough Shoal where Filipino fishermen were denied entry. In his testimony before the Senate Defense Secretary Delfin Lorenzana categorically said, *"Our Navy cannot prevent intrusion or block the entry of Chinese ships."*

The termination of the **VFA** and its consequent effects on two other defense treaties will have other very serious implications: It will engender anxiety and fear among the people, foreign investors and nationals, lessen bargaining power for recovery and protection of disputed islands and sea areas in the WPS, embolden insurgents and separatist elements, reduce prestige and credence in the **ASEAN**. (Revival of the Sabah claim makes this implication highly relevant.)

To strengthen its defenses against external attack and various levels of hostile actions, the Philippines has to increase its defense budget to carry out the P300 billion **AFP Modernization Program** (**AFPMP**) or the acquisition of very expensive military assets staggered for a number of years. For the Second Horizon (2018-2022) program the **Defense Department (DND)** will spend P125 billion on aircraft, naval vessels, weapons and communication systems. Its budget for 2020 is P192.3 billion of which P25 billion is allotted to **GHQ** as its outlay for the AFPMP. With the onset of a pandemic, **DND** realigned P19.1 billion of its budget to support the government provide monetary, health, and various assistances. This P19.3 billion fund came from the P9.4billion allotted for the AFPMP and P9.7billion capital outlay.

Thus, the outlay for **AFPPM** for the year 2020 had a big short fall. The cost of upgrading and strengthening external defense capabilities is highly prohibitive. Take the case of air defense as illustrated by the offer by U.S. to Taiwan of 90 F-16C/D fighter interceptor aircraft with latest electronic and weapon systems spares at a cost of $62billion or an average of $68.8 million each. In pesos, that is P3.44 billion each (P50 to US$1). Hence, for a purchase of 24 aircraft for a PAF squadron will cost P82.6 billion.

Other than aircraft, an air defense system will require surveillance facilities or radar, improved runways and additional hangars. Incidentally, two years ago, U.S. offered F-16s to the Philippine government but no specific number or price was given. RP politely declined the offer and said it would prefer attack helicopters. The Navy acquired from South Korea two frigates (one to arrive February 2021) at a total cost of P16 billion plus P2 billion for weapons and munitions or a total of P18 billion. It plans to buy four more frigates, two corvettes at a total cost of P18 billion and other vessels for maritime defense. It has also plans to build new or improve harbors and shipyards. The Army is evaluating land based offensive and defensive missiles -- a complete system may cost in the hundred million dollars. With an yearly outlay of P25 billion as indicated for the Second Horizon (2018-22) of the AFPMP, it would take a decade or more to erect the building blocks of a 'minimum credible defense' capability.

The budget for defense is 6% of annual appropriation of the national government and is way below compared to other ASEAN states: Vietnam 8.3 %, Singapore 16.5%, and Myanrmar 13.3%. An increase in defense budget, however, will cut into that for education, health, infrastructure, etc. It would be unwise to increase defense expenditures in a country facing a pandemic that has resulted in a business closures, big and small, massive unemployment, a big decline in remittances from abroad and in government revenues, and an economy facing a recession.

The President, just like leaders of relatively weak ASEAN states, protecting their primordial interests: the survival and safety of the state and the welfare and progress of their people will, understandably, do not want to get involved in the open and acrimonious rivalry of US and China for dominance and control of the **SCS**. They would rather pursue separately their respective disputes with China and maintain cordial and harmonious relationships with her leaders. The President amid the pandemic, given and offered assistance by China disallowed the Philippine Navy from participating in a bilateral exercise with the US Navy in the **WPS** scheduled in August.

When elephants quarrel mice and frogs stay away, or they could be hurt or crushed as the earth and roots of the trees shake and move.

Not so few nationalist government officials, private citizens and critics have publicly favored the termination of the VFA which, they say, would make permanent the stay of U.S. military forces in the country, infringe on sovereignty, disregard local laws on criminal cases and diminish national prestige. The national mood on this issue, however, has been reflected by the poll of the Social Weather Station, where 82% agreed that the *"country should form alliances with other democratic countries that are ready to defend its territorial rights in the West Philippine Sea."*

One very serious statement critics have repeatedly pointed

out is the perceived ambiguity in the 1951 **MDT**. The clause referred to here states, "Each Party recognizes that an armed attack on either Parties in the Pacific would be dangerous to its own peace and security and would meet the common danger in accordance to its constitutional processes." They aver that the WPS is not located in the Pacific and unlike the NATO treaty (for US and her allies in Europe) U.S. response in the event of an attack is not an 'automatic' or self-effecting. They stressed that Philippine claims over islands and sea areas in the WPS were initiated in the 1970's or decades after the 1951 MDT was entered into. Hence, U.S. will not go to war with China to defend RP over small islands, reefs, and sea areas in the WPS.

These fears and doubts have been dispelled by U.S. Secretary of State Mike Pompeo in his visit to the country in March 2019. He said it is the "US position that SCS is in the Pacific' and that an "armed attack on Philippine armed forces, public vessels and aircraft will trigger Art IV of the 1951 MDT." In July this year, Secretary Pompeo in a land mark and bold statement, a significant shift in U.S. foreign policy in the SCS said, "Beijing claims to offshore resources across most of SCS are completely unlawful as its bullying to control them." (During the term of President Obama 2009-17 U.S. was neutral on the SCS disputes of China and ASEAN states and Taiwan).

Citing the 2016 Hague Arbitral Tribunal ruling that favored the Philippines, he rejected China's claim based on nine dash line as *"unlawful under the UN Convention on the Law of the Seas (UNCLOS)."* He warned, *"US will not allow China to make SCS its maritime empire."* His statement effectively supported **ASEAN** states and Taiwan in their disputes with China. Another U.S. official, Defense Secretary Mark Esper, said *"US will sail, fly and operate wherever international law allows and will defend the right of her partners and allies to do the same."*

The most definitive and unambiguous statement of support to the Philippine was that of U.S. Assistant Secretary on East Asia and Pacific Affairs David Stillwell, who said, "In Scarborough, specifically we have made clear our opposition to any efforts by the Peoples Republic of China (PRA) to block entry of fishermen, and any move by Beijing to physically occupy, conduct reclamation at or militarize Scarborough." The very significant shift in U.S. foreign policy on the SCS issue was notably preceded and followed by major naval movements by U.S. carrier strike forces with her allies, Japan and Australia, in the sea lanes of SCS, a demonstration of US superior might, firmness and determination.

The underlying basis of the foreign policy announcements by U.S. top officials is the Asia Reassurance Initiative Act (ARIA) passed by the US Congress in 2018 that set forth U.S. long term strategy, policy and vision in the Indo-Pacific region (which stretches from India, Australia, the Pacific Ocean and the West Coast). It is funded $1.5 billion annually for five years from 2018-23 to "ensure America's presence" in the region. Of interest to the Philippines on its territorial disputes in the WPS with China is the statement in the Act, *"to encourage the ASEAN to develop a common approach to affirm the 2016 Arbitral Tribunal Ruling"* which favored the Philippines. It mentioned a diplomatic strategy, *"to strengthen relations with partners"…that encompasses "the peaceful resolution of disputes" backed up by "strong military presence."*

In summary, the permanent termination of the VFA will make the 1951 MDT and 2014 EDCA ineffective and inoperative. The Philippine will not have a credible deterrence and protection from external attacks and continue to be vulnerable to increased intrusions, harassment and intimidation by Chinese ships in the WPS. Considering its limited defense budget, it would take a decade or more for the armed forces to acquire very costly military assets and upgrade to a 'credible minimum level' its external defense capabilities. Top U.S. officials issued very significant statements that effectively supported the Philippines' claim on islands and sea areas in WPS, and that it would honor its obligations under the 1951 **MDT**.

In conclusion, with **VFA** in place, explicitly assured protection from external attack and effectively supported by U.S. in its dispute with China, the Philippines can now forthrightly and vigorously assert, hold on and pursue its claim over islands and sea areas in the WPS presently occupied by Chinese troops, warships and other vessels. In line with its independent foreign policy of promoting primordial interests –the survival, safety and welfare of its people– the Philippines should continue to engage in harmonious, cordial and fruitful relations with China and have more dialogues with her on their disputes in the WPS. Likewise it should continue productive discussions with other ASEAN states and Taiwan on their overlapping claims in the Spratly Group of Islands and arrive at a 'modus vivende.'

A very assertive statement on the issue was made on August 25 by Defense Secretary **Delfin Lorenzana**. In response to China's protest of 'illegal provocations in the **WPS** by Philippines sending air and naval patrols in the Spratlys and in the WPS said, *"It is they (China) who are doing provocations by illegally occupying some features within our **EEZ**. Hence they have no right to claim they are enforcing their laws."* He added, *"their so-called historical rights over an area enclosed by the nine-dash don't exist except in their imagination."*

President Rodrigo Duterte in a virtual speech before the UN Assembly on September 22, said, "The Award (Hague Arbitral of 2016) is now part of international law beyond compromise, beyond the reach of passing governments to dilute, diminish or abandon. We firmly reject attempts to undermine it."

On November 11, Pres. Duterte directed the suspension of the VFA for another six months "to enable the parties to arrive at an enhanced, mutually beneficial, agreeable and more effective and lasting arrangement on how to move forward in our mutual defense." On November 12, during a virtual ASEAN Summit, he said the 2016 Hague Arbitral Ruling "is part of international law and its significance cannot be diminished nor ignored by any country however big and powerful."

The Philippine leans on a wall under a roof made of thick steel-reinforced concrete slabs that can stand heavy rains and strong winds. ***"Naka sandal ka na sa matibay na pader!"***

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***About the author:***

*Brig Gen Manuel P Oxales AFP (Ret) was with GHQ AFP Staff for Plans and International Relations, and a Wing Commander in Southern Mindanao. A Golden Aviators Awardee, he had several articles on external defense, security and advocacy issues published in magazines for professionals. He wrote three books: Advocacy in Retirement, which was officially designated reference of the National Defense College of the Philippines, Public Safety College and the AFP Educational, Training and Doctrine Command (AFPETDC), and the Offices of Senators Gregorio Honasan and Antonio Trillanes III; Advocacy Through the Year, a reference of the AFPETDC; and Two Stories of the February 1986 Revolution, which was made into a two-hour telemovie in 1987 starred by top movie actors. He has an MBA from U.P. and an MNSA from the National Defense College (Distinguished Graduate). He completed the National Security Management program at the US Industrial College. He was a lecturer at the Graduate School of Business of U.P., Ateneo de Manila University, and NDCP. You may reach him at: maningoxales@yahoo.com.*

# NAVY CHIEF AFFIRMS COOPERATION WITH PHILIPPINE COAST GUARD AND NCWC

by PN News

**NAVAL STATION JOSE ANDRADA,** Manila, September 29 - Philippine Navy (PN) Fag Officer in Command, Vice Admiral Giovanni Carlo Bacordo visited the headquarters of the Philippine Coast Guard (PCG) at South Harbor, Manila as a gesture of affirming stronger inter-agency cooperation.


VAdm Bacordo met with PCG Commandant and fellow member of PMA "Hinirang Class of 1987, Admiral George Ursabia Jr, along with the members of his staff. They discussed successful collaborations and plans especially in the conduct of maritime law enforcement country-wide. Admiral Ursabia underscored the significance of this visit as an avenue "to have a good working relationship, to promote a better working relationship for we work in a common environment, and that is the maritime environment."

*"Even though we (the PCG) are a separate outfit, we still want to converge with our former mother, the Philippine Navy,"* added Adm Ursabia in citing another important purpose of this visit. PCG was a major unit of the PN from 1967 until its transfer to the then Department of Transportation and Communications in 1998.

For his part, Navy Chief VAdm Bacordo pointed out that the country needs *"a strong maritime sector because we are an archipelagic country and this collaboration now with the Coast Guard and the Navy is going into that direction."*

The PCG visit came a day after the courtesy call on the Navy Chief by the newly assumed director of the **National Coast Watch Center (NCWC), PCG** Commodore **Roy Echeverria**.

The visiting PCG official of NCWC was given fitting honors upon his arrival at the **PN** headquarters and was received by the **FOIC**, **PN** along with the members of his staff.

The Navy Chief expressed full support to the NCWC that is mandated to coordinate and implement the whole of government efforts in protecting the Philippine national interests against security threats, enforcement of national sovereignty and sovereign rights, and fulfillment of the international responsibilities and obligations throughout the maritime jurisdiction of the country. VAdm Bacordo considered the **NCWC** visit as an "opportunity to come up with stronger inter-agency coordination and collaboration between **NCWC** and our **maritime research information center (MRIC)** and **maritime situational awareness centers (MSAC)** in providing them maritime information to support awareness in our maritime domain."

Commo Echeverria took over the helm of **NCWC** last 01-September-2020. He was the former Commander of the Coast Guard District Southeastern Mindanao prior to his assumption to PCG Commandant..

The said calls further established a robust linkage among the three agencies – **PN**, **PCG**, and **NCWC** - as they strengthen ties towards enhancing maritime governance while they share the responsibility of monitoring and defending the country's maritime domain.

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*SOURCE: https://navy.mil.ph/*


*Photo Credit: Philstar, 2020*

# PCG HOLDS SAILING DEMONSTRATION OF BRP GABRIELA SILANG IN MANILA BAY

by PCG News

The **Philippine Coast Guard** (PCG) held a sailing demonstration of the **BRP Gabriela Silang** (OPV-8301) at the vicinity waters 25 nautical miles off Port of Manila on 15-September-2020.

PCG Commandant, **Admiral George V Ursabia Jr** personally welcomed Philippine National Defense (DND) **Secretary Delfin N Lorenzana** and Philippine Navy (PN) Flag-Officer-In-Command, **Vice Admiral Giovanni Carlo J Bacordo** who witnessed the activity.

**OCEA** Country Director, **Mr. Jacques Briand**, requested PCG's assistance in the conduct of a sailing demonstration to showcase the capabilities of the BRP **Gabriela Silang** (OPV-8301) to **Secretary Lorenzana** and **Vice Admiral Bacordo** who are planning on the further modernization of the Armed Forces of the Philippines..

The **BRP Gabriela Silang** (OPV-8301) is the largest and most advanced aluminum hull offshore patrol vessel in the world constructed by the **OCEA** — the leading aluminum shipbuilding company in France.

This 84-meter vessel is designed to meet the demanding mandates of the PCG on maritime law enforcement, maritime search and rescue, maritime security, maritime safety, and marine environmental protection.


It is capable of transporting approximately 500 people at one time and performs beyond its contractual specification of 20 knots of speed. It has a range of 8,000 nautical miles at 15 knots and an endurance of up to five weeks of non-stop operations. Above all, it has an excellent seakeeping ability and maneuverability, on top of the great comfort it offers for people onboard.

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*SOURCE: https://www.coastguard.gov.ph/index.php/11-news/3751-pcg-holds-sailing-demonstration-of-brp-gabriela-silang-opv-8301-in-manila-bay*

# PHILIPPINE MARITIME SAFETY INFORMATION NOW AVAILABLE ONLINE

by Cdr Carter S Luma-ang, NAMRIA (MNSA)

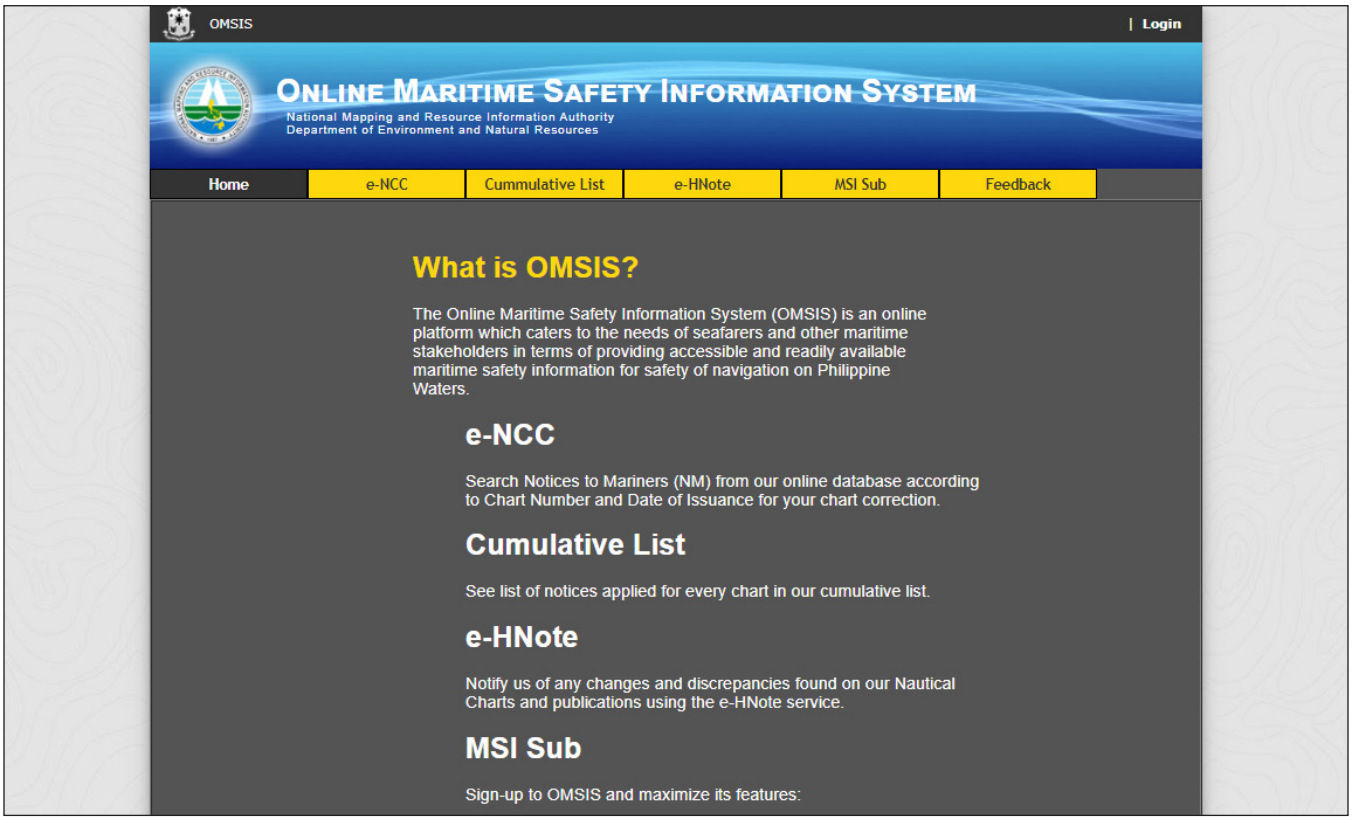


*Figure 1. NAMRIA Online Maritime Safety Information System*

The importance of nautical chart cannot be overemphasized. It is more important to a mariner than a map is to a driver. While the driver can see the road and the obstructions, a mariner cannot directly see the dangers underwater or around him. A chart is important for planning the route but equally important is its updateness to ensure the vessel's safety. The International Convention for the Safety of Life at Sea (SOLAS) requires that "nautical charts and nautical publications, such as sailing directions, lists of lights, notices to mariners, tide tables and all other nautical publications necessary for the intended voyage, shall be adequate and up to date" (Regulation 27). It is the duty of a navigator that he keeps his chart updated. Otherwise, safety is compromised.

A lot of activities happen in the oceans and seas that can affect the safety of vessels. Even in coastal installations, anything can happen in an instant such as decommissioning of aids to navigation or construction of new piers that might affect safety of life at sea. These activities and changes are published thru Navigational Warnings and Notices to Mariners. These are issued by the Hydrography Branch of the National Mapping and Resource Information Authority (NAMRIA). The Hydrography Branch is the national hydrographic office of the Government of the Philippines. It has the mandate of providing charts covering the Philippine waters and issuing Navigational Warning and Notices to Mariners.

The Notice to Mariners provide Chart Correcting Notices, which provide corrections to 162 NAMRIA issued nautical charts. Chart Correcting Notices are valid until a new chart edition is issued or if a chart is decommissioned or retired. As of 2019, NAMRIA has maintained 4,317 chart correcting notices issued from 1972 to 2019.

## Chart Correcting Notices and the Mariner's Dilemma

A mariner has to keep track of the Notices to Mariners to identify which information may affect his charts and diligently apply them as soon as possible. The whole process can be tedious, time-consuming, and highly prone to human error. If not monitored adequately, corrections may pile up, and eventually lead to erroneous application of corrections. It is not unusual that mariners neglect to correct their chart and will do so only when vessel inspections for compliance with the SOLAS V approach. When this happens, a mariner has to avail all past Notices to Mariners, browse through them one by one, and look for the concerned charts. Britannia Steam Ship Insurance Association Limited (2017) reported that many mariners still do not correct their paper charts despite being familiar with its importance. In some cases, the corrections are identified but not applied. NAMRIA likewise observes private mariners rarely reporting navigationally significant information.

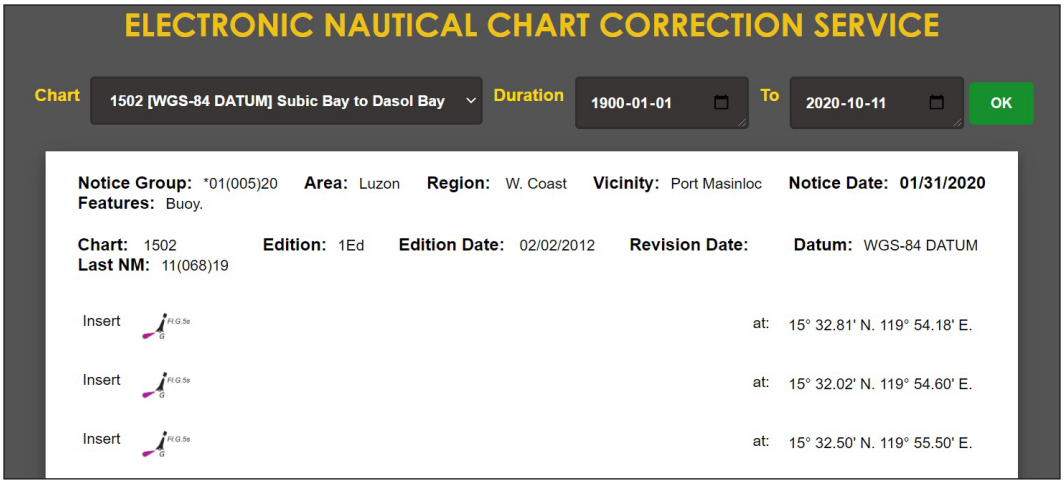


*Figure 2. Electronic Nautical Chart Correction*

## Leveraging technology

Taking advantage of the development in technology, NAMRIA has launched the Online Maritime Safety Information System (OMSIS). The OMSIS is designed to (a) strengthen the mariner's access to chart-correcting notices, (b) strengthen the collection of navigationally significant information, and (c) strengthen user subscription to Notice to Mariners.

The OMSIS is a free 24/7 service and is accessible at www.namria.gov.ph/omsis (Figure 1). It leverages the use of the internet to help mariners in correcting their NAMRIA nautical charts as they wait for the updated nautical chart at the same time encouraging them to share information observed. Currently, at the initial stage, the OMSIS is a step towards supporting the call for adherence to the S-100 data model of the International Hydrographic Office.

The OMSIS has an easy to use interface to search chart correction notices per chart number or date of publication (Figure 2). It contains all the information that can be found in the printed Notices to Mariners. A searchable cumulative list of charts (Figure 3) correcting notices is also available for a summarized listing of notices. Mariners who sign-up to OMSIS may subscribe to specific charts to be automatically notified when a chart correction for the chart is being issued. The website also allows mariners and those working in the maritime industry to report information actually cited through the Electronic Hydrographic Notes, either as a general report thru Form 10 (Figure 4) or as a port information report thru Form 11.

The OMSIS is being designed to support other modules such as navigational warnings, corrections to Coast Pilot, and corrections to List of Lights. On top of this, NAMRIA will start promulgating the following publications - Annual Summary List of Notices to Mariners and Cumulative List of Notices to Mariners to further ease the burden of the mariner in gathering updated information. The OMSIS is still at its beta stage and any feedback about the system may be emailed to the Maritime Affairs Division, Hydrography Branch, NAMRIA at maritime.affairs@namria.gov.ph.

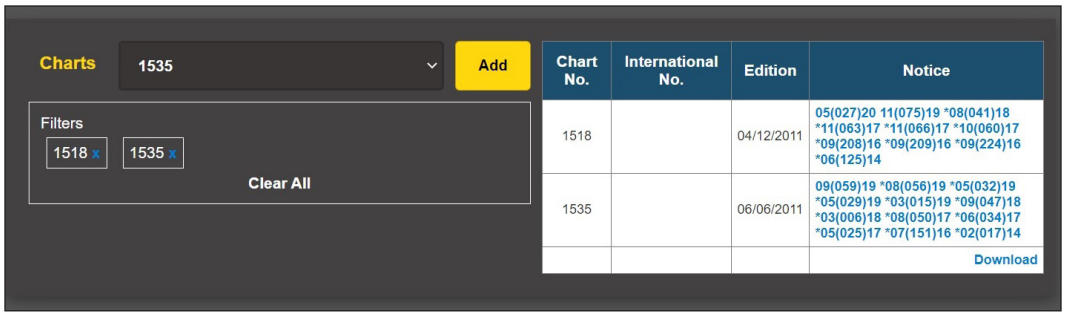


*Figure 3. Cumulative List of Notices*

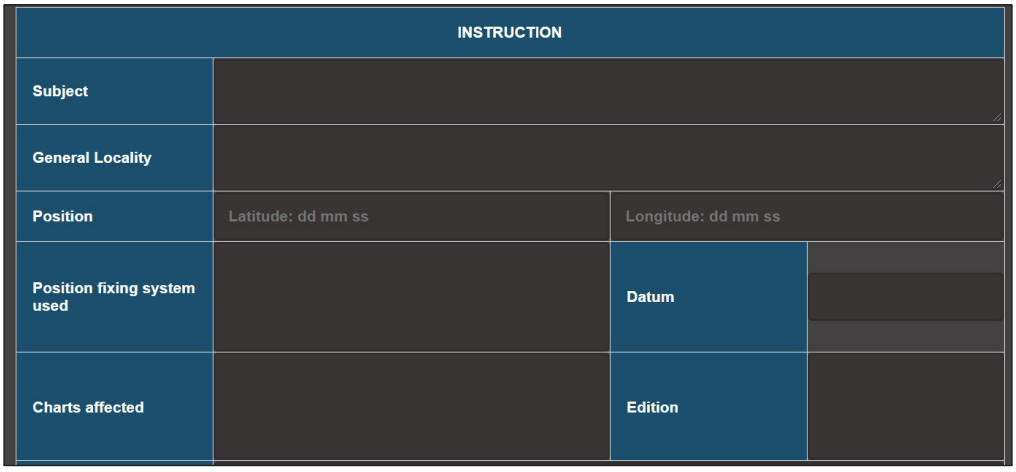


*Figure 4. Electronic Hydrographic Note*

The OMSIS is a product of the capstone project of Lt Commander Lorena Jasmin D Lerio who graduated with honors from the Master of Development Program of the Development Academy of the Philippines last 25-September-2020.

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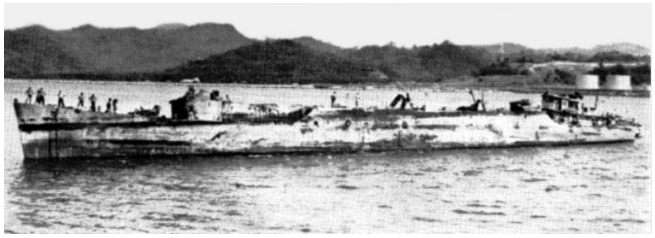
SOLANDA

# THE SINKING AND RAISING OF RPS RAJAH SOLIMAN (D-66) 29-JUNE-1964

by CDR Mark R Condeno

On 29-June-1964, the Philippine Navy lost its Flagship and First Destroyer Escort during the fury of Typhoon Winnie. The loss of a Flagship is a major loss to any Naval Force. Fortunately during this incident, none of the Officers and Crew were lost. Despite the harshness of Mother Nature, the ship's entire complement braved the typhoon to save the ship until the very end. For us to know what transpired on that fateful day, here is part II of her story.



*The Battered Hulk of the Philippine Navy Destroyer Escort RPS Rajah Soliman (D-66). Photo Courtesy of the US Navy All Hands Magazine January 1965 issue.*

**ESSENCE OF THE OPERATION: TESTED TECHNIQUES.** The raising of Rajah Soliman's wreck is noteworthy as the facility where it was at was a vital industrial berth. Thus, removing the wreck was of the essence, while the United States Navy saw it as an important salvage exercise to further hone its capabilities for the exercise objective of keeping Vietnam's Rivers navigable with the impending Vietnam War in the horizon. The SALVEX also brought out the importance of the Lift Craft type of vessel in this kind of operations. The parbuckle was last used almost 20 years ago and during the Salvage operations with Rajah Soliman, it has again proven that the technique is still up to standard with adequate technological and personnel support.

**DISPOSAL AND SCRAPPING.** After the successful operation, D-66 was towed to the Ship Repair Facility at Subic Bay Naval Base on 1300H 18-February- 1965. Another survey was made of the ship and it was decided that she was beyond economical repair. She was sold to the Mitsubishi International Corporation for scrapping on 31-January-1966.

**COMPOSITION AND FATE OF THE US NAVY SHIPS DURING THE SALVAGE OPERATIONS FOR RPS RAJAH SOLIMAN.** United States Naval Units involved were the Salvage Ships USS Bolster (ARS-38), USS Grasp (ARS-24) Harbor Tug USS Takelma (ATF-113) and Floating Crane YD-127, along with two Royal Navy Lift Crafts from Singapore, LC-25 and LC-28.

**USS Bolster (ARS-38)** a Bolster Class Rescue and Diving Ship was commissioned into service on 01-October-1945 and as of the present, undergoing scrapping. During the SALVEX, her Skipper was CDR Francis L Looney USN.

**USS Grasp (ARS-24)** was a Diver Class Rescue and Salvage Ship commissioned on 22-August-1944 that conducted patrol missions during the closing days of the World War II. She again saw action during the Project Jennifer Operation. During the SALVEX, she was skippered by LCDR Peveril Blundell USN.

**USS Takelma (ATF-113)** is an Abnaki Class Tug commissioned on 03-August-1944 in US Naval Service and still currently in active service with the Navy of Argentina as ARA Sub-Official Castillo (A-6). During the Rajah Soliman SALVEX, her Commanding Officer was LT Ray William Jr USN.

**USS YD-127** is a 100-Ton capable Floating Crane. Currently, no records or details exist online. (Based on the Harbor Mine Clearance Operations handbooks, it notes that YD-120 was utilized during the operation, but again one of the illustrations notes the Yard Crane is YD-127 though no online records of YD-127 is available; YD-120 is currently in service at the Apra Harbor, Guam.

- British Royal Navy (HM Singapore Naval Base): WW2 VINTAGE 750-TON LIFT CRAFT
- Lift Craft 25
- Lift Craft 28 - no records or details exist for these two vessels

Other US NAVAL OFFICERS involved in the SALVEX:

- REAR ADMIRAL JOSEPH W WILLIAMS JR USN COMMANDER TF 73-LOGISTIC SUPPORT FORCE, U.S. 7TH FLEET FLAGSHIP USS AJAX (AR-6)
- COMMANDER EUGENE B MITCHELL USN – PAC Fleet Salvage Officer
- LCDR J.HUNTLY BOYD USN Fleet Salvage Officer CO Service Group 3
- COMMANDER WILARD FRANKLYN SEARLE USN – Supervisor of Salvage
- CHIEF WARRANT OFFICER W.D. THOMAS USN SRF-SUBIC BAY
- COMANVPHIL Explosive Ordnance Division, Naval Magazine, Subic Bay, Philippines

## POSTSCRIPT

What is lacking in this article are the details of the SALVEX operation and personnel involved as conducted by the Philippine Navy while they initially righted the ship earlier on. The author would highly appreciate any information on this particular matter.

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*SOURCES*


- *Exchange of Communication via email with the SON OF CAPTAIN NONATO, Sir Jhun Nonato, from 15-June to 27-June 2018. Upon request of this author, he kindly provided photographs of CAPTAIN NONATO as well as other details of his Family and career.*
- *His memoirs http://my-memoirs.yolasite.com/rps-rajah-soliman-capsizes-off-bataan.php and http://my-memoirs.yolasite.com/blog/rps-rajah-soliman-de-66-conflicting-dates-on-sinking were vital in completing the D-66 story.*
- *The author would like to acknowledge the assistance of Sir Jhun Nonato in the completion of this article.*


*The complete list of sources will be published in the online version of the Maritime Review magazine.*


# 400,000 SEAFARERS STUCK AT SEA AS CREW CHANGE CRISIS DEEPENS

by IMO

Some 400,000 seafarers from across the globe are now stranded on ships, continuing to work but unable to be relieved, in a deepening crew change crisis which threatens trade and maritime safety.

During a high-level event on the margins of the **United Nations General Assembly** (24 September), Captain Hedi Marzougui, who was in command of a vessel between December 2019 and May 2020, appealed to Governments to act to allow seafarers to come home.

*"Not knowing when or if we will be returning home brings a severe mental toll on my crew and myself,"* Captain **Marzougui** said. *"I would encourage each and every one of you to think of how you would feel, if you had to work every day, for 12 hours, with no weekends, without seeing your loved ones, and trapped at sea. Now add that you have to do that with no idea of when you will be repatriated."*

The **COVID-19** pandemic restrictions on travel and transit have severely impacted on seafarers. Despite multiple pleas to Governments to designate them as essential key workers and to facilitate their travel, the number of seafarers whose contracts have been extended by several months has continued to increase. Some seafarers have now been at sea for 17 months without a break, well beyond the 11-month limit set out in the **Maritime Labour Convention** (MLC). Besides the 400,000 seafarers stuck at sea, another 400,000 are unable to join ships.

This threatens the fundamentals of ship safety standards which the **International Maritime Organization** (IMO) has worked to develop over six decades, **IMO** Secretary-General **Kitack Lim** told the online event, which brought together leaders from major global businesses, the maritime industry, government, the UN and unions.

Captain **Hedi Marzougui** joined **UN** chiefs in appealing to Governments to act to allow stranded seafarers to come home.

*"Overly fatigued and mentally exhausted seafarers are being asked to continue to operate ships,"* Mr. Lim said. "*On more than 60,000 cargo ships which continue to deliver vital goods, foods and medicines, ship safety is hanging in the balance, just as seafarers' lives are being made impossible. The safety of navigation is in peril."*

IMO Secretary-General Lim restated his plea to Governments: *"Action is needed – and is needed now. We all depend on seafarers. They should not be the collateral victims in this pandemic. Seafarers deliver for us – and now we need to deliver for them."*

In a statement read out at the event, to mark **World Maritime Day 2020**, UN Secretary-General António Guterres reiterated his concern for seafarers stranded at sea. He renewed his appeal to Governments *"to address their plight by formally designating seafarers and other marine personnel as 'key workers', ensuring safe crew changes and implementing the protocols developed by UN agencies, as well as the International* ***Chamber of Shipping and the International Transport Workers' Federation****, allowing stranded seafarers to be repatriated and others to join ships."*

In a letter issued to the **UN Secretary General**, the **CEOs of 30 Consumer Goods Forum** companies, including **Unilever** and **Danone**, have called on governments to designate seafarers as "key workers" and raised strong human rights concerns, stating: *"the situation has also inadvertently created a modern form of forced labour."*

**Unilever**'s Chief Supply Chain Officer Marc Engel said COVID safe crew changes were needed without delay. *"When the ships stop, so does everything else. We are now close to an entirely avoidable breaking point which could ripple out through the*

*economy. Even a temporary interruption could push companies and countries over the edge,"* he said. Ms. Henriette Hallberg Thygesen, VP and CEO, Fleet and Strategic Brands at **A.P. Moller-Maersk** echoed the call for words to be followed by action.

Sanda Ojiambo, CEO and Executive Director of the **UN Global Compact**, the world's largest corporate sustainability initiative, encouraged businesses to call on governments to end the labour abuses that seafarers are suffering, noting that the **Ten Principles of the UN Global Compact** represent pillars of responsible business which *"are connected to the humanitarian, economic and safety crisis unfolding on our seas."*

*Captain Hedi Marzougui joined UN chiefs in appealing to Governments to act to allow stranded seafarers to come home*

Both Guy Platten, Secretary-General of the **International Chamber of Shipping** and Stephen Cotton, General Secretary of the **International Transport Workers' Federation** called on governments to intervene to end the crew change crisis, warning the numbers of seafarers impacted would only continue to increase without coordinated action by governments.

**ILO** Director General Guy Ryder called on governments to implement urgent and pragmatic solutions that fully respect seafarers' rights. *"Seafarers are exhausted and simply cannot continue working onboard indefinitely,"* Mr. Ryder said.

Transport and maritime ministers from **Canada, France, Kenya, Panama, and** the **Philippines** also addressed the virtual event. They urged other Governments to join them in designating seafarers as essential workers, implementing measures for safe crew change and facilitating COVID-safe transit for seafarers.

The meeting was convened by the **UN Global Compact**, the **International Maritime Organization**, and the **International Labour Organization**, in collaboration with the **International Chamber of Shipping** and the **International Transport Workers' Federation**.

A recording of the event can be viewed at: https://bit.ly/3mIKRCV

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***Source:*** *https://www.hellenicshippingnews.com/400000-seafarers-stuck-at-sea-as-crew-change-crisis-deepens/*
*Photo credit: seafarers on twitter*


# REV OCEAN & WMU JOIN FORCES DEVELOPING A "FLOATING UNIVERSITY" OCEAN CONCEPT

by World Maritime University

In a virtual ceremony on 8 September, **REV Ocean** and the **World Maritime University (WMU)** signed an exciting new partnership agreement to join forces and find solutions to critical ocean issues. The agreement focuses on tackling marine debris, illegal, unreported and unregulated fishing (IUU), and climate change through innovative education initiatives that will also support priority areas identified in the **United Nations Sustainable Development Goal 14** that is focused on the ocean.

Specifically, REV Ocean and **WMU** will develop the concept of a ***'floating university'*** to provide new ocean science learning opportunities in developing coastal and small island States globally. The collaboration will enable young and unestablished scientists from all over the world to become stewards of our ocean and undertake important science in areas such as marine debris, IUU fishing and climate change.

Dr Cleopatra Doumbia-Henry, President of WMU, welcomed the agreement saying, *"**WMU** is pleased to enter into this important agreement with **REV Ocean** that promotes ocean literacy and education. The ocean is the lifeblood of humanity and through key partnerships such as this, we are working to protect it and support the achievement of UN SDG 14."*

Nina Jensen, CEO of REV Ocean said, *"This partnership agreement is the start of a long-term commitment of **REV Ocean** to education and ocean literacy. We are looking forward to working with WMU over the coming years to provide unique experiences to students from all over the world to learn on board the **REV Ocean** vessel and access our state-of-the-art equipment."*

In light of the agreement, Dr Cleopatra Doumbia-Henry, President of **WMU** commented, *"**WMU** is pleased to enter into this important agreement with **REV Ocean** that promotes ocean literacy and education. The ocean is the lifeblood of humanity and through key partnerships such as this, we are working to protect it and support the achievement of UN."*

The **World Maritime University (WMU)** in Malmö, Sweden is established within the framework of the International Maritime Organization, a specialized agency of the United Nations. The mission of **WMU** is to be the world center of excellence in post-graduate maritime and oceans education, professional training and research, while building global capacity and promoting sustainable development. **WMU**'s vision is to inspire leadership and innovation for a sustainable maritime and oceans future. WMU is an organization by and for the international maritime community and is committed to the United Nations 2030 Sustainable Development Agenda.

**REV Ocean** is a not-for-profit company founded in June 2017 by Norwegian businessman Kjell Inge Rokke with one overarching purpose, creating solutions for a healthier ocean. Established in Fornebu, Norway, **REV Ocean** works to improve knowledge of the ocean, make that knowledge more available and turn the knowledge into real solutions.

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*SOURCE: https://www.wmu.se/news/wmu-and-rev-ocean-partner-to-find-solutions-to-critical-ocean-issues*

# SHELL SETS COURSE FOR NET-ZERO EMISSIONS SHIPPING

by SHELL

Today, in a new report, Decarbonizing Shipping: Setting Shell's Course, **Shell** highlights the important role that hydrogen and fuel cells could play in achieving a decarbonized shipping sector. Calling for the **International Maritime Organization** (**IMO**) to adopt a clear trajectory to net-zero emissions by 2050, Shell outlines how it is contributing to accelerating the change needed in the industry to achieve this goal.

*"The shipping industry needs to develop the new technologies, fuels and infrastructure required for a net-zero emissions sector at a pace never previously seen,"* said Grahaeme Henderson, Global Head of **Shell Shipping & Maritime**. *"This will require the determination of all of those at the forefront of this transition. We have listened to our customers and partners in the sector and we have set ourselves an ambitious course. I hope that by doing so, openly and transparently, others will be encouraged to join us and help create a net-zero emissions future for shipping."*

This publication builds on the optimism and momentum of the interviewees in the Decarbonizing Shipping: All Hands on Deck report published in July 2020 by **Shell and Deloitte**.

In its new report, Shell considers the potential role of different future fuels. Continuing to build the industry's understanding of possible future technologies through research and development will be critical. **Shell**'s analysis points to hydrogen with fuel cells as the zero-emissions technology which has the greatest potential to help the shipping sector achieve net-zero emissions by 2050. **Shell** will seek to advance its research in this area, as hydrogen is projected to benefit from build-out across other industry and transport sectors, making it potentially more cost competitive than alternative zero-emissions fuels.

Meanwhile, the shipping sector cannot simply wait for its zero-emissions fuel to emerge and must also look to bring down and peak emissions as quickly as possible. A zero-emissions fuel is not likely to be available on a commercial scale globally until the 2030s. It is essential that the industry takes action to reduce emissions now with solutions available today. Efficiency gains are vital in all pathways. Solutions such as wind assist, air lubrication, advanced engine lubricants and digital optimization technologies must all be deployed to close the gap to net-zero emissions as much as possible.

**Liquefied natural gas** (**LNG**) can also help lower greenhouse gas emissions today. Compared to heavy fuel oil, from extraction to combustion **LNG** reduces greenhouse gas emissions by up to 21% for 2-stroke slow speed engines, and up to 15% for 4-stroke medium speed engines. It can also be used with fuel cells to aid the development of this key technology. In this way, **LNG** can play a critical role in helping the industry to lower its emissions today and develop technology for the zero-emissions fuels of the future, while continuing to address methane slippage.

This report sets out how **Shell** is accelerating progress in its own operations and across the industry.

**Shell** has set a course guided by its belief that collaboration is essential, and by the **IMO** principles that shipping's emissions must be phased out as soon as possible and the sector's emissions must peak as quickly as possible. A selection of key actions **Shell** will undertake are to:

- call for the **IMO** to adopt a clear trajectory to a net-zero emissions shipping sector by 2050;
- develop the experience and standards for use of hydrogen in a marine environment and enable commercial deployment of hydrogen across sectors;
- establish a consortium to develop and trial fuel cells on a commercial deep-sea vessel;
- develop a set of performance standards for application on future new-build vessels for all ship types with the aim to deliver up to 25% emissions savings;
- implement a program of emissions data collection across **Shell**'s internationally traded time and voyage charters with the intent to publish annual carbon intensity data;
- double **Shell**'s existing **LNG** bunkering infrastructure on key international trade routes by the mid-2020s;
- further build the commercial case for our unique industry offering of carbon neutral lubricants through development of our nature-based solutions portfolio; and
- collaborate deliberately and decisively with those at the leading edge of the transition in the sector in order to accelerate decarbonization. This will include, for example, working within the **Getting to Zero** coalition, and developing an industry-based coalition covering the entire value chain for US and Canadian cabotage shipping operations.

**Shell** is setting its course to help accelerate the shipping sector's decarbonization pathway. There is no single technology which will achieve this, and it will be a multi-decade journey. Consequently, **Shell**'s response will evolve over time.

But today, this report seeks to stimulate the opportunities and partnerships needed within the industry so **Shell** can be most effective in working with its customers and partners on a net-zero emissions future.

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*Download the report at shell.com/DecarbonisingShipping*
*Source: https://www.shell.com/business-customers/trading-and-supply/trading/news-and-media-releases/shell-sets-course-for-net-zero-emissions-shipping.html*

# MARKET EXPANSION AND DIVERSIFICATION OVER THE PAST DECADE: WHAT'S NEXT FOR LNG?

by Lloyd's Register

Using **Liquefied Natural Gas (LNG)** as a marine fuel is a sensible strategy amid tightening regulations, new economic realities and the development of the new zero carbon fuels of the future, says Panos Mitrou, Head of Gas, **Lloyd's Register (LR)**.

Panos Mitrou, LR's Global Gas Segment Manager, has been dealing with **LNG** as fuel for the past eight years.

Over this period, he has seen the use of **LNG** expand and diversify from just a few **LNG** carriers using boil off gas for convenience to far wider adoption across a range of shipping sectors. In recent months, the **LNG** as fuel question is part of the decision making process in approximately 50% of new projects.

Today, despite the sceptics, he is more passionate than ever about the future for **LNG** as a fuel. There are plenty of naysayers who discount **LNG** because, as a hydrocarbon, it still has a footprint. Combustion usually involves some methane slip, and unburnt methane can be 30 times, 85 times for those who prefer to overweigh short term impact, more potent as a **greenhouse gas (GHG)** than carbon. Therefore, they claim, LNG used as a marine fuel generates only modest **GHG** savings. Mitrou is not remotely fazed by these arguments, which he addresses patiently. He then lists some of the reasons why adopting LNG at this time makes eminently good sense.

## Maturity and tightening regulations

**LNG** as fuel is already a mature technology capable of meeting stricter carbon reduction regulations likely in phases 3 and 4 of the **IMO's Energy Efficiency Design Index (EEDI).**

Embryonic marine fuels such as ammonia and hydrogen may offer significant potential in the longer term, Mitrou concedes, but **LNG** can deliver a concrete 15% and more reduction of GHG today. In the mid term, it could embrace primarily sustainable biogas and to a lesser extent, synthetic methane. Its nature as a hydrogen carrier and its cryogenic technology may constitute some of the foundations for the fuels of the future.

There are many gaps in safety or terminal handling regulations relating to these new fuels, Mitrou points out, let alone any class rules. We are working in expediting this process but, as LNG has taught us, this takes time.

The **LR** expert moves on to some of the other reasons underpinning **LNG** fuel development. As well as being a mature technology, LNG offers significant practical and economic benefits. Anybody ordering an LNG fuelled ship today can be assured that there will be suitable global bunkering infrastructure in place at key locations by the time the vessel is delivered, he predicts. And shipowners will be able to rely on an abundant future supply of gas, less susceptible to geopolitics and volatile price swings than oil, and much cheaper than other sulphur compliant fuel options.

## Wide emission benefits

In its early stages, **LNG** was pioneered by the leading cruise line companies due to the pressure to reduce SOx, NOx; and particulates were being generated, Mitrou explains. At that time, the emission of GHGs was not on the table. Cruise lines, Mitrou points out, were therefore focused on local pollution aspects, and these progressive companies consequently installed the engines that were most suitable for cruise ship operation. They were usually four-stroke, low pressure units with relatively poor methane slip performance and therefore only modest GHG reduction properties. But Mitrou says that this move was not deliberate – cruise lines had other priorities, namely local pollution levels.

He highlights that technology advances on methane slip in most combustion technologies – particularly in low pressure, Otto cycle engines – have had significant reductions already, and advocates that more is to come through proper engineering assessment and analysis. He also points to high pressure, two-stroke diesel cycle engines and the combined cycle gas turbine, not yet used in a marine context, which could generate virtually no methane emissions. As well as advances in combustion technology, Mitrou predicts that methane performance will be improved further by exhaust gas after treatment technologies. Engine designers and manufacturers are engaged in intensive research and development projects on these issues, he says.

## Carbon pricing around the corner

Mitrou turns to the political backdrop. He expects that the EU will implement some form of carbon pricing before the middle of this decade, a move that is likely to involve charterers in the carbon reducing process. A pricing scheme has significant implications both for ship operators and their customers and will, of course, widen the price gap between sulphur compliant fuel oils and LNG. This could even stimulate retrofit demand, Mitrou believes, which so far is limited by expense and complexity. But carbon pricing would change the cost benefit analysis overnight, transforming the payback profile. Apart from low LNG bunker prices, vessels would have another significant cost advantage and could, of course, continue to trade without penalty in proliferating emission control area.

Finally, Mitrou concludes with a plea to all parties in the marine fuel debate. He believes that the future lies in a widening energy mix in which LNG has an important part to play. If hydrogen is to be developed over the medium term, for example, then the cryogenic expertise developed in developing LNG as a fuel will be essential. And the companies with experience and a track record in operating LNG fuelled vessels are likely to be amongst the first to adopt liquid hydrogen as fuel.

It's not an either/or, he insists. Marine fuels will comprise a greater mix and their evolution requires everyone's collaboration.

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*Source: https://www.lr.org/en/insights/articles/whats-next-for-lng/*


# EXXONMOBIL COMPLETES SUCCESSFUL TRIAL OF ITS MARINE BIOFUEL OIL

by ExxonMobil

**ExxonMobil** has completed a successful sea trial of the company's first marine biofuel oil with shipping company Stena Bulk, bunkered in the port of Rotterdam. The marine biofuel oil is a 0.50% sulphur residual-based fuel **(VLSFO)** processed with a second-generation waste-based FAME component (ISCC certified) —and will be available later this year— initially in Rotterdam before a wider launch across the ExxonMobil port network.

The trial demonstrated that the marine biofuel oil, which can provide a CO2 emission reduction of up to 40% compared with conventional marine fuel can be used in a relevant marine application without modification and can help operators take a significant step towards meeting their carbon emissions reduction targets. This also supports the International Maritime Organization's ambition to reduce total annual **GHG emissions** from international shipping by 2050.

The Marine industry recognizes the greenhouse gas reduction benefits of biofuel oil, and the fuel meets requirements for global sulphur cap compliance and has undergone critical and extensive testing. The sea trial undertaken with leading shipping tanker operator Stena Bulk was designed and completed as part of ExxonMobil's assessment and trial protocol to demonstrate that there were no adverse equipment effects when operating with higher levels of bio components.

*"With new marine fuels coming to market recently, the need for quality fuels that are both reliable and ISO compliant has never been greater,"* said **Cowan Lee**, marine fuels marketing manager at ExxonMobil.

*"ExxonMobil's new marine biofuel oil meets that growing need as it has been extensively tested, is sulphur compliant and can make a significant contribution in helping operators reduce their CO2 emissions."*

*"As operators face increasingly stringent regulations and significant pressure from customers to demonstrate their commitment to reducing GHG emissions, this is an important next step in providing the lower-emissions fuels that operators want and need,"* Lee added.

The **Stena Bulk** sea trial was carried out while the vessel was in commercial operation. The trial included evaluation of on-board storage, handling, and treatment and the fuel was consumed in engines and other machinery on-board.

*"We believe biofuels have an important role to play in accelerating the reduction of greenhouse gas emissions in shipping",* said **Erik Hånell**, president and CEO **Stena Bulk**. *"The development of ExxonMobil's biofuel is an important step towards a broader commercial use of low-carbon fuels and we were happy to be part of the sea trial, which proved to be very successful. The fuel performed very well and fitted seamlessly into our technical and commercial operation without the need for engine modifications or additional procedures, while contributing to a significant reduction of CO2 emissions."*

**John Larese**, Marine Fuels Technical Advisor at **ExxonMobil** added, *"As a residual fuel, it can be dropped-in without the need for expensive modification and can help provide ship operators immediate CO2 savings compared to full hydrocarbon fuel. This successful trial also involved close collaboration with the OEMs, the vessel's classification society and flag state."*

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*SOURCE: http://www.biomassmagazine.com/articles/17365/exxonmobil-completes-successful-trial-of-its-marine-biofuel-oil*

# FUEL CHOICE - THE ESSENTIAL DECISION IN SHIPPING'S DECARBONIZATION

by Vessel Performance Optimization

DNV GL – Maritime has released the 4th edition of its Maritime Forecast to 2050. The purpose of Maritime Forecast to 2050 is to enhance the ability of shipping stakeholders, especially shipowners, to navigate the technological, regulatory and market uncertainties in the industry, and set shipping on a pathway to decarbonization. It is based on a library of 30 scenarios which project future fleet composition, energy use, fuel mix, and CO2 emissions to 2050. There are 16 different fuel types and 10 fuel technology systems modelled in the report.

*"The grand challenge of our time is finding a pathway towards decarbonization,"* said **Knut Ørbeck-Nilssen**, CEO, DNV GL – Maritime. *"Reducing GHG emissions is rapidly becoming the defining decision-making factor for the future of the shipping industry. The pressure to act decisively is mounting. Perfect is the enemy of good, and so we mustn't wait for an ideal solution to arrive and risk making no progress at all. Using a wide range of scenarios involving different fuel types and technologies, and varying degrees of regulatory pressure, our new report helps to map a way forward, offering shipowners clear insights on how to meet the challenges and opportunities ahead."*

The Maritime Forecast identifies the choice of fuel as the essential factor in decarbonizing shipping. The industry is at the beginning of a transition phase, with many potential options emerging alongside conventional fuels. This increasingly diverse fuel environment means that engine and fuel choice now represent potential risks that could lead to a stranded asset. Factoring in the impacts of availability, prices and policy, on different fuels, makes the choice even more complex.

To capture this complexity and help make this picture clearer, the Maritime Forecast offers a wide range of scenarios, outlining the potential risks of a particular fuel choice. To make the ramifications concrete, alongside the pathways, the Maritime Forecast includes detailed analysis of a Panamax bulk carrier newbuilding. By stress testing technology decisions under the various pathways and scenarios, the Forecast presents potential performance and the carbon robustness of the various design choices.

The 30 scenarios result in widely different outcomes for the fuel mix in the fleet. In the scenarios with no decarbonization ambitions, **very low sulphur fuel oil (VLSFO)**, **Marine Gas Oil (MGO)** and **LNG** dominate. In 2050, while under the decarbonization pathways, a variety of carbon-neutral fuels will hold between 60%-100% market share.

Under the decarbonization scenarios it is hard to identify clear winners among the many different fuel options. Fossil LNG gains a significant share until regulations tighten in 2030 or 2040. **Bio-MGO**, **e-MGO, bio-LNG** and **e-LNG** emerge as drop-in fuels for existing ships. By 2050, E-ammonia, blue ammonia and bio-methanol frequently end up with a strong share of the market and are the most promising carbon-neutral fuels in the long run (as electric or eco-friendly fuels).

A surprising result from the model is the relative limited uptake of Hydrogen as a ship fuel, as a result of both the estimated price of the fuel and the investment costs for the engine and fuel systems. Hydrogen, however, plays an integral role as a building block in the production of several carbon-neutral fuels such as e-ammonia, blue ammonia and e-methanol, all of which gain significant uptake under the decarbonization pathways. It may also find niche applications in some vessel types, such as ferries and cruise vessels, as well as in specific regions where investments have been made into local production and distribution.

The Maritime Forecast to 2050 is part of a suite of **Energy Transition Outlook (ETO)** reports produced by **DNV GL**. The **ETO** has designed, expanded and refined a model of the world's energy system encompassing demand and supply of energy globally, and the use and exchange of energy between and within ten world regions. Download Maritime Forecast to 2050 here.

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*Source: https://vpoglobal.com/2020/09/25/fuel-choice-the-essential-decision-in-shippings-decarbonisation/*

# MARLINK AND QUADRILLE EXTEND THEIR PARTNERSHIP TO OFFER A NEWS CHANNEL FOR SEAFARERS

by Marlink


*Marlink has extended its partnership with software and service provider Quadrille to provide a dedicated news and information channel to Marlink maritime customers.*

News channels in multiple languages to support the mental health of the crew are now available via **Marlink's Xchange.**

**Marlink**, the world's leading provider of end-to-end managed smart network solutions has extended its partnership with software and service provider Quadrille to provide a dedicated news and information channel to Marlink maritime customers.

**Marlink** and **Quadrille** are thus expanding their existing partnership, which was established more than four years ago with the aim of providing seafarers with a range of video and news content. Under the Marlink brand name **XChange Media**, the companies already offer comprehensive and highly trusted, high-quality news to the crew on board.

The multi-language news service can be subscribed to through **Marlink's XChange** platform at a very competitive price. Marlink is currently offering the XChange Media service at a special introductory price so shipping companies can try the service and experience the benefits before subscribing. Marlink has integrated **Quadrille's** broadcast technology into its own smart hybrid network to enable **XChange Media** subscribers to receive daily updated news, no matter where their vessels are currently located.

**Marlink** has extended its partnership with software and service provider **Quadrille** to provide a dedicated news and information channel to Marlink maritime customers.

*"Like many critical service providers to the maritime industry, we are acutely aware of the need for the latest news and information, from trustworthy and credible sources in these times, especially during a global pandemic which forces thousands of seafarers to remain onboard,"* said **Tore Morten Olsen**, President, Maritime, **Marlink**. *"Having a reliable feed of information available in multiple languages is a positive benefit for owners and crew alike, at a time when seafarers may be onboard ship for extended periods."*

*"Quadrille makes broadcasting possible to customers in many remote locations and regions and we are pleased to have concluded an extended agreement with Marlink especially at this time when connectivity and connections are so important,"* said Xavier Battas, CEO Quadrille. "Having put in place the technology to deliver content for the maritime industry, we believe the service will quickly prove its value to seafarers and become a regular part of their lives onboard the ship."

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*Source: https://marlink.com/marlink-and-quadrille-extend-their-partnership-to-offer-a-news-channel-for-seafarers/*

# LNG RETROFITS: THE TIME IS NOW

by Vessel Performance Optimization (VPO)

LNG as fuel has long been considered the industry's last, best hope to meet the **IMO's** ambitious targets to reduce **greenhouse gas (GHG)** emissions by 2030. So why aren't we seeing more LNG retrofits on existing tonnage? In April 2018, MEPC 72 adopted resolution MEPC.304(72) on the Initial IMO Strategy on reduction of GHG emissions from ships. The IMO has called for the industry to reduce its average carbon intensity by up to 40% by 2030 and by 70% in 2050, compared to 2008.

**Owner skepticism.** The **IMO's** bold vision was applauded by politicians, the press, climate change activists and many industry stakeholders but unless the industry transitions to low carbon fuels, meeting these targets will be impossible. But because the IMO did not specify how these targets might be met, the resolution left owners with more questions than answers. What alternative fuels make sense? Is there adequate bunkering infrastructure? And more to the point, who pays? For years, natural gas has been regarded as the "marine fuel of the future." After all, LNG is readily available, affordable and since it has negligible **NOx**, **Particulate Matter (PM)** and zero **SOx** emissions, it will help owners comply with the IMO's vision. But the introduction of other alternative fuels solutions, such as hydrogen, ammonia, biofuels, and battery hybrid systems caused many owners to hesitate and ask: ***"Why invest in LNG retrofits if natural gas will be replaced by fuels with lower GHG impacts?"***

Slipping up. Others point to recent studies highlighting the impacts of methane slip, an issue specific to gas-fueled engine systems. Methane slip can occur during the gas exchange phase of the cycle when unused fuel can get trapped in the combustion chamber and top piston area, allowing some unburned methane gas to escape at the exhaust into the atmosphere. Methane slip not only results in less efficiency (thus higher fuel costs), it may add to the GHG impacts, as Methane is a major contributor to global warming. In a February press conference in London, DNV GL's maritime chief executive officer, Knut Ørbeck-Nilssen, acknowledged that low carbon biodiesel, hydrogen, ammonia and synthetic fuels are promising, but they would take time to develop. *"The pathway to carbon neutral fuels starts with gas,"* he stated. *"It is important to act now and not to wait for the 'perfect' fuel."*

As for emissions, Mr Ørbeck-Nilssen pointed out that Methane leakage had been drastically reduced in modern engines, and further improvements could be expected. Citing data provided from engine manufacturer Wärtsilä, over the last decade, gas engines have outperformed engines running **Marine Gas Oil (MGO)** in terms of **GHG** emissions.

Engine technologies. Cato Esperø, Wärtsilä's head of marine sales (Norway) confirmed that the company's engineers have continuously improved the emissions performance of its dual fuel engines (notably the 46DF, 50DF, 31DF), which allow ships to operate using a broad range of fuels, including heavy fuel oil, **MGO**, light fuel oil, bio fuel and **LNG**. The company has also introduced the 31SG, an engine optimized to run on gas alone, and provides customers with the Wärtsilä Methane Number Calculator, a tool to help shipowners and operators calculate methane values in the fuel gas. *"Wärtsilä is a pioneer in the development of sustainable engine systems, including battery hybrid solutions and is working with other key industry stakeholders to achieve zero-emissions shipping,"* he said. *"Until we succeed, we believe LNG retrofits represent the best, most viable option."* Mr Esperø acknowledged that LNG retrofits are expensive, but is quick to point out that owners willing to make the investment now will be in a better position to migrate to other alternative fuels as they become available. "It is important that owners secure fuel flexibility to fit their operational profile, in the short, medium and long term," he said. "For most owners, a dual fuel/LNG setup reduces business risk and provides flexibility with regards to availability of new fuels during the transition."

The cost of sustainability. In a world still in the grip of the pandemic, one can forgive owners for being slow to book retrofits at their favorite yards. After all, LNG conversions are expensive, time consuming and in some shipping segments, LNG tanks can reduce valuable cargo space. Nevertheless, Lianghui Xia managing director of Newport Shipping UK, a global service provider for ship repair and retrofit, argues that further delays will all but ensure the industry will fail to meet IMO targets. *"The time to act is now,"* he said. *"Natural gas may not be perfect, but let us not make perfect the enemy of good."* Xia acknowledges that more promising fuels are on the horizon, but for the next 5-10 years, **LNG** as fuel represents the only credible and achievable mid-term solution in cutting emissions. Yet so far, only a small fraction of the world fleet runs on natural gas. "Newport Shipping recognizes that the number one challenge for owners is cost, so in addition to providing turnkey solutions that includes equipment procurement, full-scope design work, on-site project execution, we offer a 5-7-year payment plan without fixed vessel mortgage collateral."

Collective action required. But that may not be enough. Indeed, **Xia** notes that if the world is serious about cutting maritime emissions, it will require more than efficient engines, skilled yards and short-term financing options. *"Right now, many owners willing to make the change simply don't have the capital to invest in conversions,"* he said. *"To reach IMO targets will take a collective effort."* Xia believes that governments could offer tax incentive schemes to reward owners and charterers could help subsidize conversions to achieve lower emissions throughout the value chain. Ports could work with logistics providers to improve bunkering access, and energy companies, which would benefit from greater demand, could help by lowering the production and delivery costs of natural gas. *"If climate change is a shared challenge, then so is the solution,"* he explained. *"Owners should not be forced to bear the costs alone."*

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*SOURCE: https://vpoglobal.com/2020/09/09/lng-retrofits-the-time-is-now/*

# TECO & AVL TO BOOST SHIPPING'S DECARBONIZATION WITH MARINE HYDROGEN FUEL CELL

by Vessel Performance Optimization (VPO)

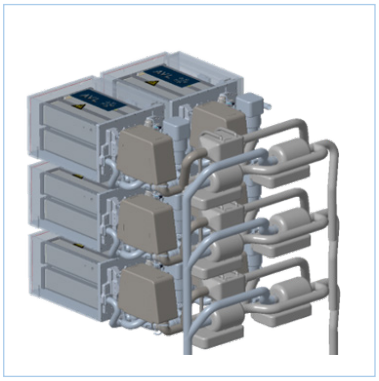
Marine engineering and equipment development company **TECO 2030** and engineering firm **AVL** List have announced plans to develop a hydrogen fuel cell system specifically designed for heavy-duty marine applications.

The companies have been working to develop the **TECO** Marine Fuel Cell, with the aim to market the first proton-exchange membrane fuel cell system specifically designed for marine applications. The three-year ambitious project has already received a letter of intent.

The news to develop the fuel cell follows the work **TECO** 2030 and **AVL** have been doing to develop the **TECO** Future Funnel, a next generation scrubber that reduces emissions from combustion engines. The ultimate goal for this scrubber is zero emissions.

*"There is simply no better partner for us as we aim to solve one of the major environmental challenges of our time: Keeping in mind that marine transport is expected to triple from 2015 to 2050, we still need to reduce carbon and other emissions from the shipping industry,"* said **Tore Enger**, CEO of TECO.

*"This is the perfect one-two punch. In the short term, we need to clean up the emissions from the current fleet. In the longer term, hydrogen is the obvious answer. After having proven their usefulness in larger land vehicles, fuel cells will in the coming years play a role in reducing greenhouse gas emissions from the marine industries."*



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*Source: https://vpoglobal.com/2020/09/18/teco-to-boost-shippings-decarbonisation-with-marine-hydrogen-fuel-cell/*

# USCG TO TEST AUTONOMOUS VESSEL FOR ITS MISSIONS

by SAFETY4SEA

The US Coast Guard will soon acquire a new autonomous vessel for testing and evaluating the capabilities of available autonomous vessel technology, as part of its regulatory changes for the development of autonomous maritime systems.

Boston-based Sea Machines Robotics announced it has partnered with Louisiana-based shipbuilder Metal Shark Boats, to supply the USCG's Research and Development Center (RDC) with a new Sharktech 29 Defiant vessel.

The 29-foot, welded-aluminum mono-hull pilothouse vessel features autonomous-command and remote-helm control technology, offering the USCG the capabilities of transit autonomy, collaborative autonomy, collision avoidance and remote vessel monitoring.


During demonstrations scheduled for October off Hawaii, the RDC team will test and evaluate the Sharktech vessel's autonomous capabilities for their potential in supporting USCG surveillance, interdiction, patrol and other missions.

Following the Hawaii demonstrations, the autonomous vessel will return to the RDC's New London facility, where it will be used in additional testing to investigate application to various Coast Guard missions.

"The exercises will ultimately help us determine how, when, and if this innovative technology can be used to support personnel who are executing a variety of Coast Guard activities," said USCG's Derek Meier, assistant demonstration director.

In 2019, Sea Machines partnered with Metal Shark to make available the Sharktech 29 Defiant vessel to commercial markets, under Metal Shark's stock boat program.

Most recently, in July, Sea Machines partnered with Huntington Ingalls Industries to accelerate the deployment of self-piloting technologies in the rising market of unmanned naval boats and ships.

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*SOURCE: https://safety4sea.com/uscg-to-test-autonomous-vessel-for-its-missions/?utm_source=noonreport&utm_medium=email&utm_campaign=smart*


# MARITIME PARTNER DELIVERS NORWAY'S LARGEST AMBULANCE BOAT

by Maritime Partner AS

On 12-October-2020 in Ålesund, Norway, **Maritime Partner AS** delivered to **Loppa Legeskyssbåter AS** the MV Thea Jensen, a Loppa Ambulance boat.

After four months of outfitting at Maritime Partner's shipyard in Ålesund, Norway's largest ambulance catamaran has been handed over to shipowner Loppa Legeskyssbåter. It is Maritime Partner's build number 2168.

She will be stationed in Øksfjord in the North of Norway and will be operated in the area of Loppa, Hasvik and the outer Altafjord. The shipowner has an 8 + 1 + 1 year contract with Finnmark Hospital in Hammerfest to operate the service.

The boat is designed with a lot of new features that owner and crew have seen the need for but have not had the opportunity to install on existing boats. The equipment will facilitate work on board the boat that will operate in some of the most challenging waters in North Norway.

Among other things, a new foil system for ride comfort have been tested during the sea trials. This is a completely new product that is designed to reduce rolling / stamping in the sea by about 30%. The Wavefoil system has worked very well during testing and probably have an efficiency that exceeds calculations. The result is that crew, patients and passengers have a much calmer journey.

The emergency room (ER) is equipped with two stretches and the most modern equipment for efficient treatment of passengers in transport. The cabin is very spacious and with location aft it will be the quietest place on board in bad weather. Access to the Emergency Room is primarily via an advanced stretcher lift which is located aft.

When you get onboard, there is heating in all decks. All exterior areas are monitored by CCTV cameras, so the bridge always has an overview of everyone onboard with their safety in mind. An advanced night / ice camera is also installed to maximize security during winter transit.

In front of the ER, there is a spacious passenger lounge, with seats for 8 passengers as well as a galley and two cabins for crew rest. The passenger lounge is separate from the ER and ensures that doctors / nurses can treat patients undisturbed. The spacious bridge contains a small office and 4 suspension chairs for the crew. The boat is equipped with the latest in navigation, communication and monitoring.

| **Main dimensions Alusafe Cat21** | |
|---|---|
| Maximum Length | 22.90 meters |
| Total Width | 7.80 meters |
| No. of Passengers / Crew | 8 / 2 |
| Speed | 30 knots |
| Engine / Propulsion | Volvo IPS 1050 |
| Building Material | Aluminium |

**Maritime Partner AS** sells and builds high speed boats of their own design. With customers all over the world, more than 2,200 boats have been delivered to-date.. A wide variety of boats are manufactured such as offshore rescueboats, workboats, patrolboats, tourist boats and other high-speed boats under the brand names **Alusafe**, **Seabear**, and **Weedo**.

# SCRUBBERS HAVE A LOWER CLIMATE IMPACT THAN LOW-SULPHUR FUELS, MARPOL STUDY FINDS

by SAFETY4SEA

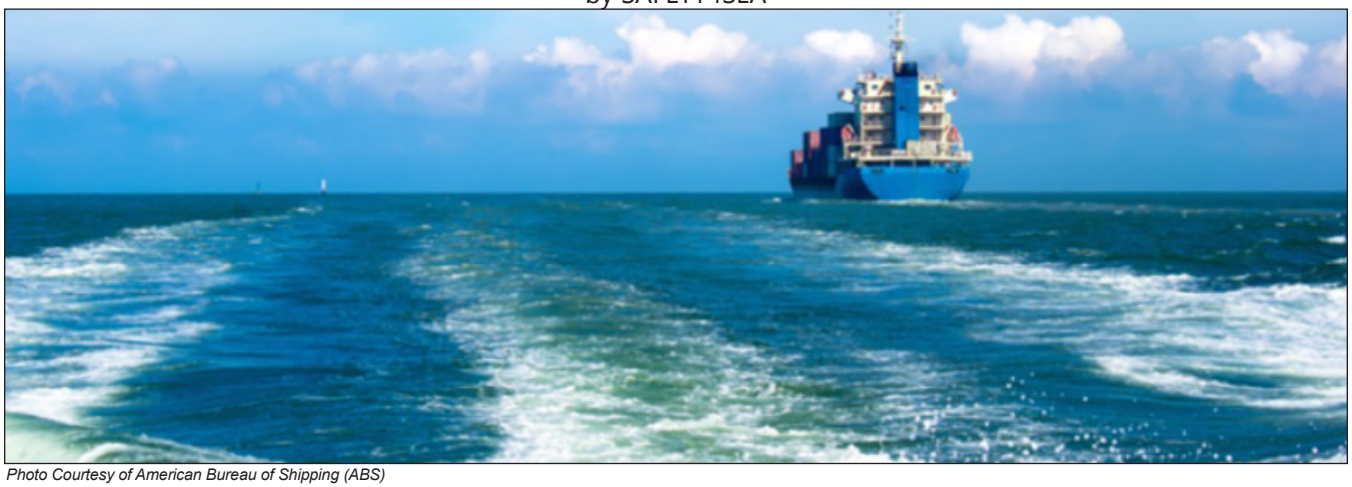

*Photo Courtesy of American Bureau of Shipping (ABS)*

**CE Delft issued a new study, in which it finds that scrubbers have a lower climate impact than low-sulphur fuels.** Specifically, the study finds that the CO2-emissions associated using a scrubber vary between 1.5% and 3% for a number of representative ships. In many cases, the emissions caused by the production of low-sulphur fuels for these ships are higher, depending on the quality of the low-sulphur fuel, the refinery and the crude oil slate. This is the main conclusion from the new study, Comparison of CO2 emissions of **MARPOL Annex VI** compliance options in 2020, issued by **CE Delft.**

**MARPOL** sets limits for the sulphur content of fuel oil. As of January 1st, 2020, the sulphur content of fuel oils used outside **Emissions Control Areas (ECAs)** is 0.50% m/m. Inside ECAs, the limit has been 0.10% m/m since 2015. In practice, there are two options to comply with the MARPOL Annex VI Regulation 14:

1. Using a scrubber in combination with fuel oils with a sulphur content that is higher than 0.50% or 0.10%;
2. Using fuel oil with a sulphur content of 0.50% **Very Low Sulphur Fuel Oil (VLSFO),** or 0.10% or less **Ultra Low Sulphur Fuel Oil (ULSFO)**, respectively.

Both options, according to the study, result in an increase of well-to-wake CO2 emissions. Specifically, a scrubber requires energy, which is generated by engines running on fuel oil, and thus generates CO2. In addition, there are emissions associated with manufacturing scrubbers and emissions on the seawater.

Also, desulphurization in a refinery requires hydrogen, which is generally produced from methane, emits CO2 in the process, as well as energy.

This report quantifies and compares the CO2 footprint of both options. The use of a scrubber results in an increase of CO2 emissions between 1.5% and 3% for a range of ships.

Desulphurization leads to an improvement of the fuel quality in terms of aromatics content and viscosity.

The increase of emissions associated with desulphurization in a refinery are higher than 1% and in many cases multiple times higher, along with the quality improvement of the fuel, the refinery layout, and the crude used.

*"This study provides a comprehensive overview of the climate impacts of different options to reduce sulphur emissions. It shows that in many cases, the carbon footprint of using a scrubber is lower than low-sulphur fuels,"* stated **Jasper Faber**, Director of Aviation and Maritime at **CE Delft.**

The study used various reference ships and data about the scrubbers received from manufacturers, which they would have installed on the selected reference ships.

These include:

- Cruise ship (100,000 GT);
- Small container ship (4,000 TEU);
- Large container ship (18,000 TEU);
- Bulk carrier (80,000 dwt);
- Oil tanker (200,000 dwt).

As for desulphurizing fuel oil, its CO2 footprint depends on the crude oil used and the layout of the refinery. The study analyzed the CO2 impact of two options: hydro-treatment of residual fuel, and hydro-cracking in combination with hydro-treatment. In these cases, the fuel quality improves.

In addition, many low-sulphur fuels have better qualities as far as viscosity and aromatics content are concerned, than required by the applicable standards.

Finally, the study found that by just removing the sulphur, it generates less CO2 emissions than the use of a scrubber.

But sulphur removal in the refinery along with fuel quality improvement results in more CO2 emissions than using a scrubber, proving the scrubbers have a lower climate impact than low- Sulphur fuels.

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*The study has been commissioned by three EGCS suppliers, Alfa Laval, Yara Marine, and Wärtsilä. The Study is available HERE https://safety4sea.com/scrubbers-have-a-lower-climate-impact-than-low-sulphur-fuels-study-finds/*


# KONGSBERG MARITIME AND MASSTERLY TO EQUIP AND OPERATE 2 ZERO-EMISSION AUTONOMOUS VESSELS

by Kongsberg Maritime

**Kongsberg Maritime** and **Massterly** (a Kongsberg Wilhelmsen joint venture) have signed contracts with the leading Norwegian grocery distributor ASKO to equip two new vessels with autonomous technology, and to manage their operations at sea. With Norwegian companies delivering around 60% of the investment, this is a major milestone for the growth of sustainable maritime operations in Norway. The fully electric ships will replace 2 million kilometers of truck transport, saving 5,000 tons of CO2 every year.

**ASKO** – currently transporting their cargo by more than 800 trucks daily – is committed to sustainability and is investing heavily in new technologies such as electric and hydrogen-powered vehicles. At present, road transport is the single mode of transportation to link their warehouses on the western side of the Oslo fjord with their distribution center on the eastern side. The new RORO (Roll on, Roll off) vessels will replace the current solution with a zero emission transport alternative.

*"We have a clear ambition to be climate neutral and have set ambitious goals, including being a self-sufficient provider of clean energy and having 100% emission-free transport by 2026. These innovative ships are key to fulfilling that ambition and will form an essential component of a zero-emissions logistics chain linking our facilities,"* explains Kai Just Olsen, Director, ASKO Maritime. *"Fully electric trucks will take the cargo between the warehouses and the ports of Moss and Horten, and in shipments of 16, the trailers will be transported across the fjord on the battery-driven vessels. This solution is cost effective, sustainable and will remove trucks from a heavily trafficked road."*

**ENOVA** has supported the project – including the required port infrastructure – with 119 **MNOK**, in line with the Norwegian society's commitment to reduce emissions and transfer transport from road to sea, where feasible.

Kongsberg Maritime has a proven track record as an enabler for sustainable maritime logistics, and this ability has been further strengthened through the partnership with Wilhelmsen. The vessels will be equipped with the technology required for zero emission and unmanned operation by Kongsberg Maritime, while Massterly will ensure ship management and safe operations from their shore-based Remote Operations Centre. The two vessels will initially operate with a reduced crew, before moving towards unmanned voyages.

**Egil Haugsdal**, President, **Kongsberg Maritime**, said: *"When we teamed up with Wilhelmsen to form Massterly, this was exactly the kind of project we wanted to enable. By working together with us to bring autonomous, electric solutions into everyday use, **ASKO** is helping to achieve a sustainable, safer future for maritime operations while also demonstrating the efficiencies these technologies can deliver."*

**Thomas Wilhelmsen**, CEO of **Wilhelmsen Group**, added: *"The ASKO contract illustrates how Massterly is key in making autonomy a reality for short-sea shipping. We are proud to be the world's first ship management company to operate unmanned vessels for commercial use. Now we are one step closer to our goal of enabling sustainable trade: through cost effective, safe, and environmentally friendly logistics."*

Since the **ASKO** operation lies within Norway's coastal jurisdiction, the Norwegian Maritime Authorities (NMA) must be satisfied that a sufficient level of safety has been achieved before they will issue an approval of operation for these vessels. NMA will therefore follow the project through a detailed risk assessment, based on IMO 1455 guidelines with regards to equivalent and alternative designs, new technology, verification, and approval for operation. **DNV GL** will also support this process as an independent third party.

The vessels, which are due to be delivered early in 2022, have been designed by Norwegian vessel designer Naval Dynamics and will be constructed at the state-owned Cochin Shipyard in India. The functionality enabling autonomous operation will be implemented and tested after arrival in the operational area in Oslo fjord.

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*SOURCE: https://www.kongsberg.com/maritime/about-us/news-and-media/news-archive/2020/zero-emission-autonomous-vessels/*

# NEW NAVI-PORT TECHNOLOGY TO REVOLUTIONIZE PORT OPERATIONS

by Wärtsilä

At ports around the world, anchored vessels sit in the distance, waiting for permission to dock, resulting in fuel waste, higher carbon emissions, and congestion. Is there a solution to this problem? In most cases, cargo ships arriving at port are assigned a docking space on a first-come-first-served basis. This method of port arrivals has, in effect, created a queueing system that wastes fuel and produces excess greenhouse gas emissions. It's also a source of increased workload for captains and crews, who work on tight schedules only to sit in congested ports waiting for a berth.

A major source of inefficiency in port arrivals is that ships use "unnecessarily excessive speeds" only to reach port and have to wait for berthing slots or access to piloting or towage, according to Matteo Natali, General Manager of Business Development at Wärtsilä. *"Container ships spend on average 6% of their time at anchor waiting for berthing,"* says Natali. If a port implements a scheduling system that allocates berths to specific vessels and maintains continuous communication with the vessels to achieve just-in-time arrival, the need to anchor is significantly reduced. Even small changes to a ship's speed impacts fuel consumption.

An important reason just-in-time sailing has drawn support recently is the maritime industry's focus on achieving the sustainability goals to reduce greenhouse gas (GHG) emissions set forth by the **International Maritime Organization (IMO)** for 2050. Reducing the industry's carbon footprint requires making changes on many fronts. Compared to many other GHG reduction methods, aiming for just-in-time arrival is impactful, cheap, and able to improve operational efficiency if the industry is willing to adapt. While there are emission abatement technologies available on the market, the just-in-time concept optimizes voyages so that unnecessary fuel consumption and emissions are avoided.

**Better communication, better planning.** Moving away from the current system isn't easy, however. *"For just-in-time arrivals to work, ports need to move to an orchestrated system where berth slots are allotted based on operations and availability,"* says Natali. To achieve an optimized system of just-in-time arrivals, ports and vessels need an open platform for transparent communication. While ongoing exchanges of information are crucial to achieving a system of just-in-time arrivals, currently a significant portion of communication in the maritime transport segment occurs via old-fashioned interactions including mail, telephones, and telefax. Wärtsilä technology is revitalizing the outdated methods for an updated and integrated solution. The company recently launched a new data-sharing system called Wärtsilä Navi-Port, a middleware that will be fully integrated with other voyage optimization tools in **Wärtsila's Fleet Operations Solution (FOS)** system, according to Natali. "Wärtsilä's Smart Marine Ecosystem approach is aimed at eliminating wasteful practices in shipping operations, and the Wärtsilä Navi-Port solution does just that," says Torsten Büssow, Managing Director, **Wärtsilä Voyage,** in a press release announcing the development.

**A solution for all segments.** A variety of factors can affect port arrivals and departures, which means that delays must be built into any maritime scheduling system. Navi-Port enables ship-to-shore communication to optimize voyage planning, weather routing, and fuel consumption. With Navi-Port, the designated just-in-time arrival information from ports is sent directly to a ship's navigation system. Ship Captains receive updates on new recommended times of arrival and can accept changes to optimize speeds for the amended planned time. **Navi-Port** sends data back to ports to update timetables when a vessel is delayed at sea.

**Navi-Port** technology has undergone successful testing as part of a joint project between **Wärtsilä**, **Carnival Maritime,** and **HVCC Hamburg Vessel Coordination Center**. Bureau Veritas Marine and Offshore has approved the technology's cybersecurity protocols. The tests highlighted the impact of just-in-time arrivals on improving efficiency, resource planning, reducing fuel consumption and carbon emissions, and also underscored the importance of just-in-time arrivals for all segments of the maritime industry dedicated to optimizing sustainability solutions. *"We are committed to making cruising more sustainable, and to setting an example in greener and safer operations,"* Michael Salzmann, Senior Nautical Superintendent at **Carnival Maritime** says in a press release. *"We have tested the Wärtsilä Navi-Port solution with two of our ships, the 'AidaSol' and the 'AidaPerla.' The ships' onboard Wärtsilä **NACOS** Platinum navigation systems were connected directly to Hamburg Vessel Coordination Center, which allowed continuous communications, and in just-in-time arrivals."*

**Creating a new mindset**. For the **Navi-Port** technology and a system of just-in-time arrivals to be wholly successful, however, Natali believes that more than technological developments are needed; maritime stakeholders must shift their ways of thinking about the traditional means of operation. In the shipping sector there are certain legacy processes or contractual frameworks that may be impacting the attractiveness of just-in-time sailing. By demonstrating the *"unprecedented saving"* and other benefits of just-in-time arrivals, Natali believes this new mindset is possible.

*"It is essential to create a wide network of connected ports and vessels. While Navi-Port can bring immediate benefits to the ship operators and the port community, the wider the network of connected users, the stronger the value of the system."* Natali says. Navi-Port was built to adapt to the infrastructure and technology in the current fleet. *"The key behind Wärtsilä Navi-Port is flexibility and inter-operability – Navi-Port can connect easily to any kind of vessel, navigation system, or port system,"* Natali says.

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*Source: https://www.hellenicshippingnews.com/new-navi-port-technology-to-revolutionise-port-operations/*


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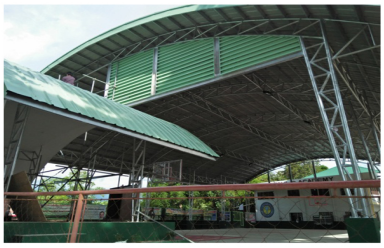



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## MAAP Profile

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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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Japanese Compact Ship Handling Simulator

## Our Curricula

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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