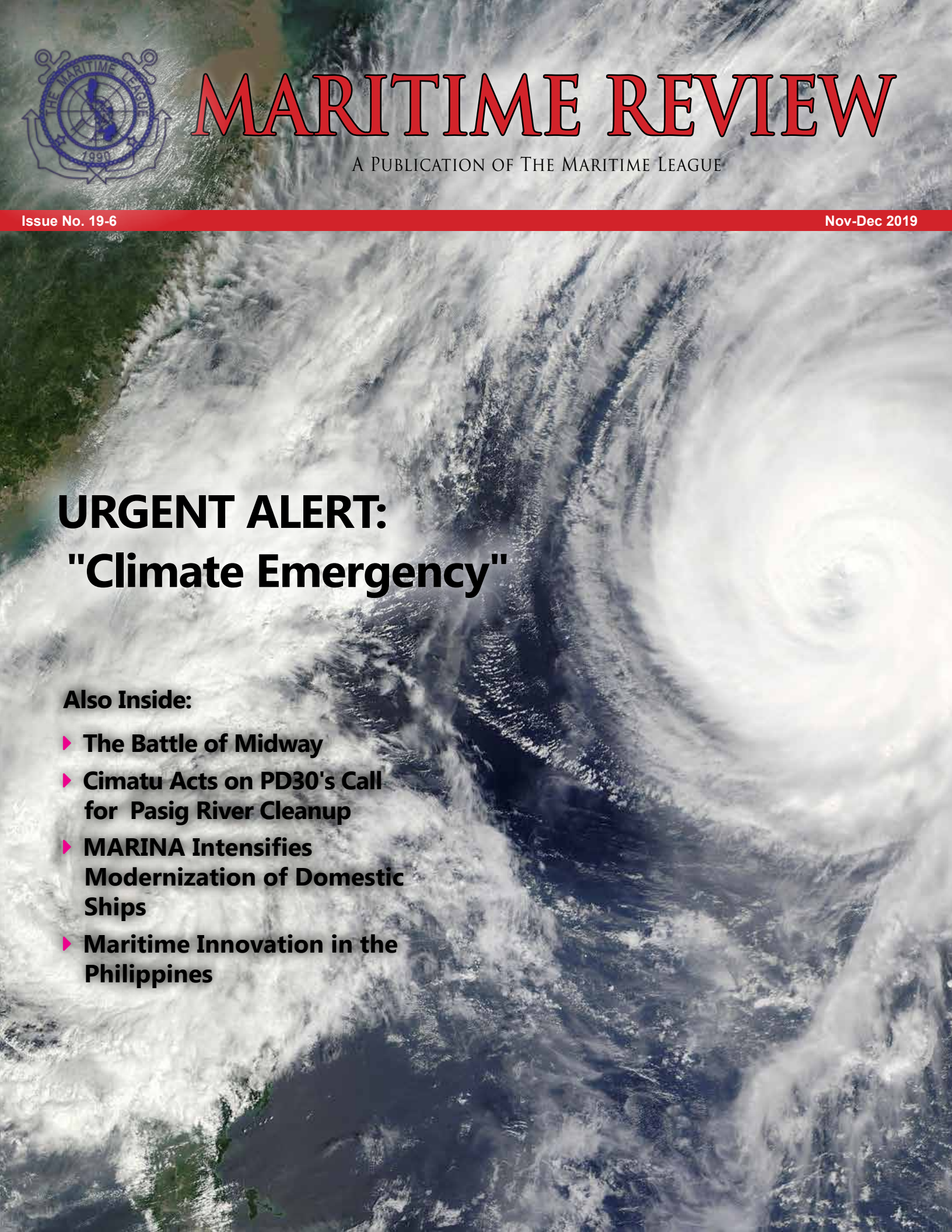

MARITIME REVIEW

A Publication of The Maritime League

Issue No. 19-6 Nov-Dec 2019

URGENT ALERT: "Climate Emergency"

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A satellite image of a hurricane whose frequency, radius of maximum winds, and severity create floods, storm surges and wind-related damaes to life and property.

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URGENT ALERT: "CLIMATE EMERGENCY"

by VAdm Emilio C Marayag Jr AFP (Ret)

The latest warning issued in early November 2019 by thousands of scientists from 153 countries about instituting measures that would effectively address **Climate change** speaks volumes in terms of human nature's resistance to change. According to the scientists, Mother Earth *"clearly and unequivocally faces a climate emergency."* She has registered faster than expected acceleration of global warming.

This alert came out despite the various initiatives since the 1970s starting with the First World Climate Conference (1979) followed by the Rio Summit (1992), Kyoto Protocol (1997), and the most recent Paris Agreement (2015). No less than the UN Secretary General Antonio Guterres acknowledges that the world's biggest threat to the society and the future generations is **Climate change**. He declared, *"We face a direct existential threat... we are at a defining moment."* His view closely resembles the long-standing view of former US Vice President Al Gore, a leading advocate of **Climate change** mitigation.

Scientific records show that the earth' s temperature started to rise when the Industrial Revolution commenced in the mid-1800s. This era required enormous energy supply of fossil fuels that emitted carbon dioxide (CO2), one of the greenhouse gases that pollutes the air and the oceans, and damage the ozone layer. About 90% of the CO2 emissions come from the fossil fuels such as coal, oil, and gas. Extracting these energy sources disturb and destroy the habitat of certain wildlife populations. When transported, these fuels pose risks of spillage and leakage.

Mother Earth "clearly and unequivocally faces a climate emergency." She has registered faster than expected acceleration of global warming.

The rise in human population has led to excessive food consumption, and the adoption of a wealthy lifestyle ushered the discovery of energy-consuming products. As human population increases the livestock population and food production centers increase. Similarly, affluent living via air, land, and sea travels increase energy demand and pollution of the environment. These conditions disrupt ecological balance and deplete the world's resources including tree/forest cover. Consequently, the per capita CO2 emission increases leading to temperature rise. To some, prosperity is the main culprit in **Climate change**. But to Philippine President Duterte, prosperity should not be at the expense of the environment. Speaking in this year's ASEAN Summit in Thailand, President Duterte said, *"ASEAN should not sacrifice the environment and the region's biodiversity, particularly in the maritime domain, in its quest for progress."*

The warning from the world scientists is based on the frequency and severity of environment-related events over specific periods like wildfires, cyclones and hurricanes, avalanches, heat and droughts, snow and hailstorms, flooding, pestilence and diseases, effects of increasing sea levels, and others. These are associated with the temperature rise caused by the 56% increase in CO2 emissions, or a total of 1.5 trillion tons, from 1751 to 2017. In 2017, the worldwide CO2 emission stood at 36.2 billion tons.

Over the years, there have been new inventions that generate power with minimal CO2 emissions compared with fossil fuels. The introduction of clean and renewable energy sources like water (hydroelectric and wave-activated generators), wind, geothermal, solar, and nuclear, helped arrest CO2 emissions but insufficient to supply the world's electric power requirements. In the Philippines, **First Gen Corporation** put up wind and solar power projects in the Ilocos Region and geothermal power plants in Bicol, Leyte and Mindanao. Several independent power producers established small solar power projects catering to a limited number of households.

The search for cleaner technology continues. In China's Greater Bay Area, an environmental industry alliance, employing 44,300 employees, emerged to conduct studies to assure energy sufficiency, find alternative energy sources, seek environmental solutions, produce green electronic devices, and manufacture water disposal and recycling equipment. Proper disposal and recycling of plastics would reduce pollution in the marine environment. Likewise, other nations are embarking on research and development in mitigating the effects of **Climate change**.

The consequences of unabated CO2 emission in the atmosphere are not limited to earth's physical configuration but also the sources of food and energy supply. The bush and forest fires in eastern Australia, Indonesia and some parts of the United States, the hot climate spell in southern Africa, and the heavy smog in New Delhi, India affect ecological balance in those areas. Many other places experience varying environmental changes like the effects of sea level rise, and more destructive cyclones.

To the credit of these concerned world scientists, they recommended several measures to avert the catastrophic consequences of **Climate change**. They propose a shift from gross domestic product growth and pursuing affluence to sustaining the ecosystems and improving human wellbeing by prioritizing the basic needs and reducing inequality. Specifically, they suggest a sharper focus on 6 major areas: **energy** (efficient use and conservation practices), **nature** (restoring the ecosystems), food (eat plant-based food), **economy** (carbon-free economy and reduction of social inequality), **short-lived pollutants** (limit emissions of hydroflourocarbons, methane and other harmful gasses), and **population** (strengthen human resources while lowering the fertility rate). These recommendations would require drastic individual and government actions including more research and development to capture and find good uses of CO2 and to reduce the 80 million annual increase in human population.

This renewed and urgent call of the world scientists reflects a similar warning by Sir Winston Churchill on the occurrences of strong and disastrous Atlantic hurricanes in 1936, to wit: *"The era of procrastination, of half measures, of soothing and baffling expedients, of delays, is coming to a close … In its place we are entering a period of consequences."* ⚓

THE BATTLE OF MIDWAY

by Commo Carlos L Agustin AFP (Ret)

A colleague posted about having seen the movie **Midway**, just released last week, and suggested that it is a good movie to watch. While on a 4-day layover at SBMA, part of a long-planned participation in Anvaya Cove's annual Pawikan Cup, I decided to check it out and behold! It was playing at Ayala Mall's Harbor Point at the former US Naval Base.

It was a movie planned for release prior to US Veterans Day, set on the day World War I ended in 11-November-1919. (The US Embassy commemorates this every year at the US Military Cemetery at the BGC)

As ***Time*** described it,

*Director Roland Emmerich's new movie, **Midway**, out Friday, is based on the true story of the* **Battle of Midway** *Island. Fought June 4 through 7, 1942, the U.S. victory at **Midway** is considered by many as the moment when the U.S. regained its military dignity six months after the Japanese bombed Pearl Harbor on 7-December-1941."*

*This new movie has been cast by its creators as an attempt to restore cinematic dignity to the historic battle; another Hollywood film called **Midway** came out in 1976, but has been criticized for casting actors much older than those who fought the battle, putting events out of sequence and recycling footage from earlier movies about the war. So the filmmakers wanted to give this major turning point in World War II the major motion picture it deserved.*

*"The Pacific campaign is long and complicated, and gets overshadowed, in our attention, by what was happening in (sic) with the Nazis in Europe," says screenwriter Wes Tooke. "But it's an amazing comeback story. I hope that the movie relaunches an interest in learning about **Midway**."*

(The above quotes are from https://time.com/5711705/ midway-movie-true-story/ and much of the information that follows are derived from reading that item.)

I have been an admirer of many personalities that were there in that significant battle as well as most of the campaigns and battles of that period. After all, I studied World War II from the naval point of view mostly, including having an instructor in Naval History who served in the Pacific Theater during the war. Likewise, in the mid-50s, the series Victory at Sea was being shown and I watched many episodes of it when able. One such hero in my mind was **VADM Raymond A Spruance** (later ADM), who orchestrated the US side of the **Battle of Midway** and the Philippine Sea, temporarily replacing **VADM William "Bull" Halsey** (later ADM), who was asked by **COMPACFLEET**, **ADM Chester Nimitz** to "go to sick bay" due to a skin ailment, and he reluctantly acceded).

Spruance became US Ambassador to the Philippines in 1952, and was still the Ambassador when I went to PMA in 1955. He could have been a 5 star Admiral, towards the end of the war but the last slot given by the Navy for the 4 allowed by Congress went to the other finalist, **Adm "Bull" Hallsey**. According to Thomas Buell in The Quiet Warrior (1974), **Spruance**'s reaction to that choice was: "So far as my getting five star rank is concerned, if I could have got it along with **Bill Halsey**, that would have been fine; but, if I had received it instead of **Bill Halsey**, I would have been very unhappy over it."

How important was the **Battle of Midway** in World War II?

After the war, many AFP officers remember **Midway** as a stop in the long hop to the Continental US. Prop-driven Douglas DC-4s and later Boeing Constellations had to refuel often, and

Midway was the last one before Hickam AFP in Honolulu. The **Midway** Islands are part of the Hawaiian archipelago, located northwest of Honolulu, but not part of TH (Territory of Hawaii, now a State) annexed by the US in 1867, taken over by the Navy in 1903, purportedly to provide logistics closer to the Philippine Islands, which was important as a US foothold in Asia.

The movie showed clearly how in early 1942, U.S. Navy cryptanalysts had learned about Japan's plans for a big attack in the Pacific "at a place yet unknown" to them but later confirmed when the US base at **Midway** sent out a false message that it was short of fresh water, and Japan inadvertently mentioned that in a directive, confirming that the location for the attack was **Midway**. US Naval intelligence also concluded that the date was June 4 or 5 and reasonably obtained the order of battle of the Japanese striking force.

The Japanese considered **Midway** Island in the mid-Pacific, which lies 1, 300 miles northwest of Pearl Harbor as next in importance to Pearl Harbor to U.S. operations in the Pacific. If captured, **Midway** would be their stepping-stone to Pearl Harbor, the Alaska Territory and the Continental U.S.

But **Midway** was ready, not so much as its island defense forces but the strength of the forces around **Midway**, yet unknown to the Japanese. Marine Corps fighters, Army bombers, were ready to track fleeing Japanese zeros back to their carriers; Navy dive bombers and torpedo planes and fighters, pursued returning planes back to the Japanese main force. It was a victory.

As radio silence was in effect, the complete result was not clear to U.S. headquarters in Pearl Harbor. **Admiral Chester William Nimitz** and the Army Pacific Commander **Lt. General Delos Carleton Emmons** had to wait for reports from planes arriving from **Midway**. Initial reports to Washington were cautiously worded, and even the Battle Report was not impressive: As ***Time*** reported on the message:

> *A momentous victory is in the making…Pearl Harbor has now been partially avenged. Vengeance will not be complete until Japanese sea power is reduced to impotence. We have made substantial progress in that direction. Perhaps we will be forgiven if we claim that we are about midway* to that objective. The battle is not over…"*
>
> *Critically, four of Japan's six aircraft carriers sank. In terms of manpower, according to the WWII museum, the Japanese lost 3,057 men, while the U.S. lost about 362 men. In terms of war assets, the Japanese also lost a cruiser and hundreds of aircraft, while the U.S. lost a carrier, a destroyer and 144 aircrafts.*

Two of the great admirals participated in **Midway**, "and they complemented each other perfectly," wrote ***Time*** in its review of the movie:

> *As Citino describes them, William "Bull" Halsey (played by Dennis Quaid) was "the spirit of the U.S. Navy," known for "always charging ahead" and his aggressive war maneuvers, even if that meant sailing into a typhoon. However, he didn't get to command during **Midway** because he had to receive medical attention for a skin condition. Chester Nimitz (Woody Harrelson) was one of the war's top planners, known for his cerebral approach. Lt Colonel Jimmy Doolittle (Aaron Eckhart) became famous for the bombing of Tokyo two months prior, now known as the Doolittle Raids. To make sure Japan wouldn't be caught off guard like that again, the Imperial Japanese Navy kept expanding in the Pacific and thus zeroed in on **Midway**, leading to the great battle in June.*
>
> *Rear Admiral Edwin Layton (Patrick Wilson) was a naval intelligence officer to Nimitz who played a key role in figuring out that the Japanese had their eye on **Midway**. After that battle, he received the Distinguished Service Medal because he "analyzed and precisely evaluated the capabilities and intentions of the enemy's air, sea and ground forces" and provided "timely and accurate intelligence information, vital to the security of our fighting forces and essential to their successful operations, contributed inestimably to our victory over the enemy." His story became more well known after his memoir "And I Was There" that came out in 1986, two years after his death.*

And of course **VAdm Raymond A Spruance**, as I described earlier.

Time also describes the significance of the **Battle of Midway**:

> *At one stroke, the dominant position of Japan in the Pacific was reversed, British Prime Minister Winston Churchill wrote in his post-war account of World War II. "The annals of war at sea present no more intense, heart-shaking shock than these two battles, in which the qualities of the United States Navy and Air Force and of the American race shone forth in splendor."*
>
> *"The second six months of war last week began for the U.S. at the point where the first six months should have started," **Time** reported in its 22-June-1942 issue. "The loss of the Philippines, of Guam and Wake, had not been undone. But **Midway** was what Pearl Harbor should have been. The two canceled out. In three days of concentrated destruction off **Midway**, the U.S. had restored the balance of Pacific naval power. Thus for the U.S. began Phase II of the war."*
>
> *Critically, for Americans who feared a repeat of Pearl Harbor, Japan "lost much of her Navy's striking power at sea," the story noted. "Without that power, Japan cannot bring the war to the U.S. or even to the remaining U.S. strongholds in the Pacific." Military leaders in Washington knew **Midway** was an "essentially defensive" victory and "a crippling, but not a knockout blow." As a top Navy official in Washington D.C. put it, "I would not say that they [the Japanese] have been defeated yet; they have 'withdrawn.'*

The use of B-24 bombers figured in the preliminary operations prior to the **Battle of Midway**. That exploit of the Doolittle Raiders in April 1942 added to the desire of the Japanese to neutralize **Midway** to be rid of threats southeast of Japan, as well as their strategic plan to invade Hawaii. But moreover, it gave them a sense of vulnerability and the fear that final victory might not be theirs after all.

Time also reported that on 21-October-2019 a research vessel, operated by the late Microsoft co-founder Paul Allen's Vulcan Inc., had discovered two of the Japanese carriers that sunk during the **Battle of Midway**.

Those were not the only ones found by Allen. Five years ago, he visited the Philippines and uncovered the wreck of the 70,000-ton super battleship Musashi, sank by an aircraft carrier in the **Battle of Sibuyan Sea**. The Maritime Forum was given an account of that recovery during MF 101 at MAAP on March 2015 by the Romblon Cultural Heritage Association (ROCHAI). Retired PNP **BG Dominador Resos Jr**, who initiated the establishment of the Romblon War Memorial and called attention to the need to locate the wreck of the Musashi, organized the group. Another report just came in last week of another sunken World War II vessel found, which had figured in the **Battle of the Philippine Sea** in October 1944.

Which battle will be the sequence to the **Midway** movie named as their next project together with a message citing the **Philippine Army-USAFFE** defenders of Bataan and Corregidor for delaying the Japanese timetable by 3 months that, in turn, contributed towards enabling the US to better prepare for the long war? ⚓

MARINA TO INTENSIFY MODERNIZATION OF DOMESTIC SHIPS

The Maritime Industry Authority (MARINA) will intensify the modernization of domestic ships to provide safer, more convenient, and more comfortable sea transportation services to the riding public.

As directed by the Department of Transportation (DOTr) Secretary Arthur P. Tugade, the MARINA will encourage more ship operators, particularly those engaged in short distance travel, to invest on fast crafts, and Roll-On / Roll-Off (RORO) ships.

The agency shall also further uphold public welfare by ensuring strict compliance with insurance coverage for sea passengers and by conducting aggressive nationwide awareness campaigns on the domestic ship modernization program.

Operators of wooden-hulled cargo and passenger ships who will not comply with the MARINA's phasing-out program shall be prevented from renewing their Certificates of Public Convenience (CPCs). There shall also be no further registration and issuance of statutory documents, not even to newly-constructed wooden-hulled ships.

Moreover, the MARINA, through its regional offices, shall ensure the accessibility of lifesaving equipment / appliances at all times. Sea passengers of open-decked fast crafts, on the other hand, shall be required to wear life jackets all throughout the voyage.

In coordination with the Philippine Ports Authority (PPA), the MARINA shall implement and utilize electronic passenger ticketing system before the end of 2019.

There shall also be a review of ship design, specifically regarding the use of canvass awning for overhead cover, protection against sea water splashes, and other purposes during voyage.

The modernization of the domestic shipping industry, which is part of the MARINA's 10-year Maritime Industry Development Plan (MIDP), is intended to enhance overall sea transportation experience for people, goods, and services to make the Philippine maritime industry – nationally integrated and globally competitive. ⚓

CIMATU ACTS ON PRESIDENT DUTERTE'S CALL TO CLEAN-UP PASIG RIVER

by DENR News

DENR Environment Secretary Roy A. Cimatu hit the ground running Wednesday as the newly appointed chair of the **Pasig River Rehabilitation Commission (PRRC)** in answer to President Rodrigo Roa Duterte's call to clean the **Pasig River**. The environment chief led a technical inspection of **Pasig River**, and pledged to get rid of informal settlers and go after polluters of the historic river. **Metropolitan Manila Development Authority (MMDA)** Chair **Danilo Lim**, and officials of the **PRRC**, the **Philippine Coast Guard**, and the **Department of Environment and Natural Resources (DENR)** joined **Cimatu** in the 2-hour inspection tour of the **Pasig River**.

As they traversed the length of **Pasig River** from Manila to Makati, **Cimatu** noted several violations including the 3-meter easement from the riverbanks. "We have the authority to restore the 3-meter easement, and MMDA and **PRRC** are working on this," **Cimatu** said. Based on Presidential Decree 1067 or the Water Code of the Philippines, banks of rivers and streams and shores of seas and lakes throughout their entire length, and within a 3-meter zone in urban areas are subject to the easement of public use in the interest of recreation, navigation, floatage, fishing, and salvage. However, MMDA Resolution No. 3, series of 1996, adopts the uniform 10-meter easement from the existing shoreline, banks or streams along the **Pasig River**. According to **Cimatu**, the 10-meter easement along the **Pasig River** is subject to expropriation.

The environment chief also saw some 1,000 informal settler families (ISFs) near Del Pan Bridge and vowed to relocate them. "Relocation is our priority. We will take immediate action. We will remove and relocate the ISFs in coordination with the National Housing Authority," he said.

Cimatu said that during his recent meeting with local government officials, including barangay captains, he warned them of administrative and criminal charges should they allow relocated ISFs to return to their previous settlements. The **DENR** chief said that outfalls discharging wastewater into the river will be checked to monitor water quality, as well as illegal discharges. "The moment we see a private outfall whose discharge is not according to standards, we will issue them a Notice of Violation (NOV)," **Cimatu** warned. He noted that establishments which were earlier issued NOV have been made to pay fines for every day that they did not comply. "We will not let this pass. We will bring these to the Pollution Adjudication Board," he added. **Cimatu** also said the regulated and proper use of the river will be observed, referring to the barges docked along the river that deliver raw materials to the factories, and to the makeshift junkshops along the riverbanks. "We have to move them out because they contribute to the low quality of the water in the river," said **Cimatu**.

The **DENR** chief also said that immediate action would be taken on the large amount of **water hyacinths** in the river. MMDA Chair Lim said a 600-meter trash trap has been installed to prevent **water hyacinths** to reach **Pasig River** from **Laguna Lake** but this was destroyed by the continuous rains, thus will have to be replaced. **Cimatu** also stressed the need to clean the esteros simultaneously and continuously to prevent the garbage from flowing to the river, and then to **Manila Bay**. The **Pasig River** tour gave **Cimatu** a picture of the water body's physical condition, as well as the structures and establishments in the riverbanks that affect the river's water quality.

On August 28, President Duterte issued **Executive Order No. 90** transferring the **PRRC** Chairmanship from the **PRRC** to **DENR** with hopes to revive the river with **Cimatu** at the helm. The President recently expressed dismay over the river's water quality describing it as "uncleanable" because the lack of zoning caused factories and houses along the river to discharge their waste to it.

Pasig River is approximately 27 km long and connects **Laguna de Bay** and **Manila Bay**. The main **Pasig River** passes through the cities of **Taguig**, **Pasig**, **Makati**, **Mandaluyong**, **Manila**, and the municipality of **Taytay, Rizal**.

The river system has four major tributaries —Marikina, Pateros-Taguig, Napindan, and San Juan— and 43 minor tributaries mostly located in Manila.

MAKING A CHOICE DEFENDING THE COUNTRY'S SEAS

by Brig Gen Manuel P Oxales AFP (Ret)

"The goal of the AFP Modernization Program reads: the Philippines has the longest coast line in the world next to Indonesia and Canada. The sea is extremely significant from an international, navigational, economic, geopolitical and strategic perspective. There is an urgent need to develop a modern and adequately equipped force that will ensure maritime and air space security."

- National Security Strategy 2018

The selection of very expensive military assets, which include major weapons and equipment such as aircraft, ships, missiles, artillery and tanks, facilities and support structures to protect and defend a country. It is a very crucial decision a government has to make. It is a classic choice of guns or bread. Have one, then lose or reduce the other. As resources are limited more budget for defense results in less for education, health, public works and the other sectors. Upgrading a war arsenal to make it more effective and lethal faces the same issue. The American Indians who faced the early European settlers had to replace their bows and arrows with flint rifles to protect and secure their lands. General Emilio Aguinaldo, who at 29 years of age headed the Revolutionary Army, would not rely on Katipunero bolos. His soldiers attacked armories to get Spanish Mausers. While on exile in Hong Kong, he bought arms using indemnity funds intended for the rebels provided by the Spanish colonial government under the **Pact of Biak na Bato of 1897**. From horses to motor vehicles in WW I or from artillery to missiles, propeller driven aircraft to jet-powered, and unmanned aircraft vehicles, today, the issue of upgrading the country's armed forces have to be resolved with limited resources and many competing demands under consideration.

Time, Effort, Expense, Significance (TEES). An oversimplified approach called by the acronym TEES may be applied on any activity or undertaking in an organization, an institution, in business or a policy issue in government. Applying resources, which include time of preparation, action to be taken, material, men and money needed in an activity of such importance where you have the best chance of success and the least failure, achieve the optimal results or most benefits, with the least risks and losses. Some writers in management call it cost benefit, cost effective analysis, or an efficiency test.

Sporting events familiar and popular to Filipinos may

exemplify this idea. Let us recall the FIBA world basketball tournament held in Shanghai, China last September 2019 where, the Philippines finished last, No. 32, with five straight losses. (In the 1950s, our team finished among the top 3 in a world basketball tourney held in a South American country). In terms of basketball height, strong bodies and arms to ward off guards and accurate shooting make scores. Height, which most Filipinos lack, is a prime advantage in shooting and guarding. But not so in professional boxing where Filipinos excel, and weight limits are set -- say for featherweight it is 119 to 126 pounds. The winning combinations are fast, strong hitting fists, ability to fend off or evade an opponent's fists, speed of foot movements, body and head that can take hits. A boxer can fight up or down a weight group like Senator Pacquiao who is a champion in 8 divisions. I cannot count how many world champions the Philippines had since the Americans introduced boxing to the country.

Top players in professional basketball are paid as much as P500,000 a month, imports get more. Big companies spend for costly franchise and support of basketball teams earning big through promotion of their products. Filipino boxers usually come from an impoverished background, do not get regular income (unless given by patrons) and as professionals, earn from fights. But in world feats, win or lose, they are paid in dollars, enough for a comfortable living, to buy a house, and send their children to school. Senator Pacquiao earned a windfall that ordinary mortals can only dream of. He was assessed billions of pesos in taxes, paid hundred millions more, spent hundreds of millions for hospitals, schools, sports facilities and multipurpose buildings in his home province. In both basketball and boxing sports, private parties and sport associations provide funds, and give attention and support. But it is in boxing where Filipino pugilists have had more wins, and become champions in regional and world tourneys. Their big earnings benefit more families and communities and bring more taxes to government. The prestige and honor they give to the country and people are incalculable.

Lessons from World War II. There is a vast ocean of difference between sports, which is a friendly competition, and war, a violent confrontation. In the latter, enormous resources in men and material are harnessed and expended, the means employed are lethal and the outcome may result in countless death, unimaginable destruction, defeat and dishonor to a country. To illustrate further, the above-mentioned approach in decision-making. Let me cite horrifying and disastrous events in WW II that serve as lessons in the acquisition of major military assets.

Germany built its largest battleship, the Bismarck, years before WW II began on 01-September-1939, when German Panzer tanks invaded, and **Stuka bombers** rained bombs on hapless Poland. The ship was armed with 8 16-inch guns and protected by 14-inch thick armor on the turret and 13 inches on the side. It was built to challenge the British Fleet composed of aircraft carriers, battleships, cruisers, destroyers and submarines, and which had almost complete dominance of the Atlantic Ocean and parts of the Mediterranean Sea. On its first offensive foray, it left North Sea in May 1941 bound for the Atlantic. Ten days later, on May 27, the British Fleet located, chased and hit it with a barrage of torpedoes and gunfire from ships and aircraft forcing the ship captain to scuttle the ship. It sunk with him and 2,000 sailors to the bottom of the sea. From thereon, Admiral Donitz, Chief of the German Navy, opted to fight undersea in the vast Atlantic Ocean where stealth, surprise and cunning favored him. A flotilla of submarines, very much smaller than a battleship in size and much less costly to build, destroyed hundreds of cargo ships and their escorts bound for allied countries in Europe, and Soviet Russia later.

On 10-December-1941, 2 days after the Japanese naval task force attacked the U.S. Naval fleet at Pearl Harbor, Honolulu, the Japanese Zeros, armed with torpedoes, took off from aircraft carriers and flew 500 miles towards Singapore island, located and sunk the British battleship, Prince of Wales, and Repulse, a battle cruiser then esteemed impregnable and invincible. Without naval protection, most aircrafts on land were destroyed and threatened with the cut of water supply from Malaysia. The Japanese Imperial Army was now the occupying force. Lt General Arthur Percival, after a few skirmishes, surrendered on 15-February-1942, 2 months after Japan invaded Malaysia. General Percival's army numbered 100,000 British, Australian, Malaysian and Indian troops versus General Yamashita's 30,000 soldiers.

After Japan lost 4 aircraft carriers in the Battle of Midway in May 1942, conversion of its biggest battleship (the Shinano of the Yamato class) into an aircraft carrier began, to carry 50 aircrafts, armed with 9 18-inch guns, protected by 26-inch thick armor on the turret and 16 inches on the side, with a speed of 27 knots. Built under high secrecy, the design was to strike at the U.S. fleet which now sailed unopposed in the Pacific after it had decimated the Japanese fleet in the Battle of Leyte Gulf in October 1944. Ten days after it was launched, a lone U.S. submarine stalked its prey, ambushed and sunk it with 4 torpedoes on 29-November-1944. The submarine was 1/5 of the battleship in size, and its 4 torpedoes cost less than 1 of the 18-inch guns of the battleship.

Unprotected, unescorted big and slow moving ships despite their powerful and long range guns and protected by very thick steel armor are sitting ducks to torpedoes launched from submarines and aircrafts, and surface ship attacks. Most navies of the world have decommissioned their battleships, which are now moored in harbors as museum pieces. In the closing years of the war in the Pacific, in a desperate gamble to overcome weakness in naval and airpower, Japan launched Kamikaze attacks, piloted aircrafts armed with powerful bombs to explode upon impact on an aircraft carrier, a battleship, and other big ships of the U.S. Navy. It was the harbinger of a new weapon to come: rockets, pilotless air vehicles, missiles, and **unmanned aircraft vehicles (UAVs)**, technically called Remotely Piloted Aircrafts, or drones. General Henry 'Hap' Arnold, commander of the U.S. Army Air Forces in 1945, as WW II in the Pacific was ending, had the foresight and said, "The next war will be fought by airplanes without men in them at all...It will be different from anything the world has ever seen."

Missiles and UAVs. On 18-September-2018, an incident happened that might further influence current thinking on the acquisition of major weapons and equipment for war. In a surprise attack, some 25 land-based low altitude cruise missiles and **UAVs** or drones armed with powerful bombs hit and destroyed 50% of the oil production of Saudi Arabia from which it derives 70% of its state revenues. While it has supplied only 5% of the world's demand for oil, its price per barrel shot up in the world market. How effective are air defense systems, detection and warning, and anti-missiles against low altitude flying drones? Saudi Arabia is the world's largest buyer of military hardware next to U.S. and China. Last year, it bought some $70 billion

worth of weapons mostly from U.S and Great Britain. **UAVs** have civilian and commercial, as well as military and police uses. They are currently used for reconnaissance, surveillance and armed attacks. In the past decades, they were employed in conflicts in the Balkans, countries in Africa, Middle East, and Central Asia. A complete **UAV** system that includes the cost of 4 unmanned aircrafts, the ground component, and electronics of a Predator model, cost about $40 million. Drones cost much less, are pilotless, and less costly to maintain.

Missiles, not Ships. This was the gist of the statement of **Roilo Golez**, who died last June. He was former National Security Adviser of President Gloria Macapagal Arroyo, a 3-term Congressman who strongly proposed missiles to protect the country' maritime space in response to the P60 billion proposal to buy 4 more frigates, to add to the 2 at present. He was a U.S **Naval Academy 1970** graduate, and a younger brother was a former FOIC of the **Philippine Navy**. He said 6 frigates could not patrol, watch, and protect a vast ocean of the country's EEZ, 200 nm (370 kms) from the territorial baselines and extended continental shelf (ECS), which extends to 320 nm out to sea to include the Philippine Rise, and which has a combined area of 531,000 kms, far larger than the 300,000 square km of the Philippine archipelago.

*(15 years ago as a Guest Speaker at the gathering of **PMA** alumni in Camp Aguinaldo,* **Golez** *compared the capabilities of the armed forces of ASEAN countries and warned that unless we update our military capabilities, we could not effectively protect our territorial space and maritime zones. In the early 1980s, as member of the planning staff at GHQ, we would land on an airstrip in Philippine occupied Kalayaan Island, which is part of the energy rich Spratly Islands and Islets claimed by several countries. We flew over these islands and we did not see any built up structures and nor runways in Mischief Reef and islets).*

Anti-Access-Anti-Denial. Sec **Golez**' position found support from a Washington based think tank, **Center for Strategic and Budgetary Assessment (CSBA)** that asked U.S. and her allies to help the Philippines acquire not frigates, but maritime surveillance aircraft to watch our maritime seas, anti-ship missiles to deter and destroy intruders and anti-aircraft systems to protect our missiles and bases. Planes can cover in just hours much larger areas than ships and their on-board radar can see beyond the horizontal limits of ships. Hidden on land, mobile anti-ship missiles can hit targets a hundred miles away. Cruise missiles in aircrafts can hit surface ships while out of range of their defensive guns. Land based concealed missile batteries can track and hit aircrafts before they can line up their targets. These A2/AD assets weapons and equipment will provide more surveillance and deterrence, and destructible capabilities at a cost much less than P75 billion for 6 frigates. (A2/AD is a strategy to deny an adversary from occupying or traversing an area of land, sea or air. It is not aimed at total prevention but to severely and sufficiently restrict, slowdown and endanger the opponent).

CSBA asked what could P35 billion (US$700 million) buy with less than one-half of the cost of 6 frigates. First, the Navy should buy marine patrol aircraft. Japan had already donated 8 T90 Beechcraft-design MPAs. Add a surveillance capable plane like the C295 ordered by PAF in 2014 from Europe Airbus joint venture with Casa Spain, which cost about $60 million. Less costly planes are CASAs, smaller C212 ($20 million) and Germany Dornier 228 ($12 million). Cost of one C295, two C-212s and 2 Dorniers would total $150 million including ancillary facilities.

For anti-ship missiles, Sec **Golez** recommended the purchase from India of 200 **BrahMos** supersonic AShM capable of hitting targets 300-400 kms away at $3 million each. Hence, the entire EEZ would be covered. The Army was already considering long-range anti-ship missiles. It budgeted $144 million for 12 launchers. It may opt for the 200 km range Type 88 or 12 AShMs by Mitsubishi. The **Philippine Navy** could get 50 **BrahMos** ($150 million) or 200 type 88s or 12s. These missile launchers are truck-mounted and mobile. That leaves $200 million towards air defense and fast missile crafts like Indonesia's KCR missile boats.

In sum, **CSBA** asked, "Which can monitor our vast seas more effectively and pose risks to intruders: 6 frigates with maybe 20 or so anti-ship missiles of 150-200 km range, costing $1.5 billion total; or 5 marine patrol aircrafts (plus 8 donated by Japan), 250 long and medium range mobile and camouflaged AShMs with air defense and fleets of KCR 40s and 60s, at half the price?"

(The discussions on Sec **Golez** and **CSBA**'s proposals, which included a list of A2/AD assets were excerpted from Mr. Ricardo Saludo's column, 'To Protect the Seas Get Missiles, Not Ships,' Manila Times, 29-August-2019).

These military assets have been in the pipeline or under consideration and evaluation as indicated in published reports and from the AFP Modernization Program. The Philippine Army has been evaluating 200 **BrahMos** AShMs, surface to air missiles, anti-missile warning systems from Israel and other countries, and the use of drones. The Philippine Air Force will complete its order of 12 FA-50 fighter jets and is considering fighter interceptors and radars offered by U.S. and other countries. It offered to buy 5 maritime patrol trainer aircrafts from Japan, and will acquire Scan Eagel **UAVs**. The **Philippine Navy** is evaluating proposals to install anti-ship missiles on board the 2 frigates, fast patrol crafts with anti-ship missiles, with longer range, speed of up to 50 knots, and anti-submarine helicopters. Current planning for acquisition of major military assets is from bottom to top, unlike many decades ago when in most cases, purchases/acquisitions would be handed down from 'upstairs'.

The major services have a much better knowledge and understanding of the environment where their assets will operate, and are aware of the strength and weaknesses of these assets as well as the threats they face. Hence, they are in a much better position to determine the most effective major weapons, equipment and facilities needed to perform their assigned mission and tasks. Many top officials of the DND and AFP have been schooled in management tools like systems analysis, operations research, cost effective analysis, war gaming and simulation, integrated defense planning and other decision-making approaches. Hence, we are assured of sound choices.

This paper is a modest contribution towards achieving a defense goal as envisioned in the National Security Strategy 2018. Let's get more bang for less buck, and less sitting fat ducks.

⚓ ⚓ ⚓

About the author: *Brig Gen Manuel P Oxales AFP (Ret) was with GHQ Plans in the early 1980s, and Wing Commander in Southern Mindanao. A Golden Aviators Awardee, he has published three books: "Advocacy," officially a designated reference at the NDCP, Public Safety College and two offices in the Senate; and "Advocacy Through the years," a reference of the AFP Education, Training & Doctrine Command; and "Two Stories of the February 1986 Philippine Revolution." He has an MBA from U.P.; MNSA from NDCP (Distinguished Graduate); and completed the U.S. Industrial College (ICAF) National Security Management program. He was a lecturer at NDCP, Ateneo, and U.P. Graduate School of Business.*

EXCELERATE RECEIVES NOTICE TO PROCEED FROM THE PHILIPPINES FOR FLOATING LNG TERMINAL

by Excelerate Energy Media

On 20-September-2019, **Excelerate Energy L.P. (Excelerate)** received the Notice to Proceed (**NTP**) from the **Philippine Department of Energy (DOE)** to develop a floating liquefied natural gas (**LNG**) import terminal in the Bay of Batangas per the DOE's guidelines for "Rules and Regulation Governing the Philippine Natural Gas Industry." The project, **Luzon LNG**, will supply natural gas, sourced from **LNG**, to existing and new gas-fired power plants in the region that provide electricity to Luzon including the area of Metro-Manila. This abundant and secure source of gas supply will augment the existing gas production from the domestic Malampaya fields, as reserves from these fields begin to deplete.

"We are pleased to have received this significant approval from the Government of the Philippines in supporting the country's long-term energy objectives – this is an important milestone to move the project forward," stated Excelerate Energy Chief Commercial Officer **Daniel Bustos**. *"We look forward to working with the government and private sector for the successful completion of the project that will enable* ***Excelerate*** *to invest in critical infrastructure allowing the country to continue on its current path of tremendous economic growth."*

The proposed project will be located offshore the city of Batangas to minimize the impact to the existing shipping traffic in the area and coastline. The terminal will utilize **Excelerate**'s state-of-the-art offshore technology specifically designed to perform in extreme weather conditions, like those of the Philippines, and has been proven at **Excelerate**'s operations in the Gulf of Mexico, the North Atlantic, Israel, and most recently, the Bay of Bengal.

"We commend the Government of the Philippines for requiring the structure of the project to include the challenging integration of **LNG** *supply, technical procurement and implementation, and user agreements to the benefit of the country. Excelerate is the only company with the experience to deliver all that is required for this complex project – this will not be our first time," continued Bustos. "We are in the unique position to offer the most industry experience to the Philippines to deliver a safe, efficient, and reliable project."*

Luzon LNG will combine all necessary elements to meet the region's natural gas requirements including a fully-integrated turnkey floating **LNG** terminal, arranging the necessary supply of **LNG** and distribution of natural gas to end-users across Luzon. **Excelerate** will develop, design, permit, construct, finance, and operate the terminal.

Following the **NTP**, **Excelerate** will seek the necessary permits and raise financing for the project.

Excelerate Energy L.P. is a US-based **LNG** company located in The Woodlands, Texas. **Excelerate** is owned by **George B. Kaiser** and is part of his energy group that also includes **Kaiser Francis Oil Co**, an E&P company with production in the U.S. and Canada along with significant midstream assets, and **Cactus Drilling Co**, the largest private drilling company in the US.

Excelerate is the pioneer and market leader in innovative floating **LNG** solutions, providing integrated services along the entire **LNG** value chain with an objective of delivering rapid-to-market and reliable **LNG** solutions to customers. **Excelerate** offers a full range of floating regasification services from FSRU to infrastructure development to **LNG** supply. **Excelerate** has offices in Abu Dhabi, Buenos Aires, Chittagong, Dhaka, Doha, Dubai, Rio de Janeiro, Salem, Singapore, and Washington DC. ⚓

TIME TO FIX PCSO AND STL

by Vicky Viray Mendoza

Photo credit: Ignitepinoy.com

For so long now, the **Philippine Charity Sweepstakes Office (PCSO)** has been invariably accused of corruption and poor governance.

The accusations are many – from systemic corruption; wrong beneficiaries; **LOTTO** business cornered by two players for almost 30 years now; delinquent **LOTTO** outlets; co-mingling of funds; paper supplier for 50 years; under-declaration of revenues to reduce taxes; misappropriation of funds; to malversation.

PCSO's Small Town Lottery (STL) is in truth a "**Jueteng**" redux, now under legal cover – with a high cost of franchise and "**Jueteng**" lords reportedly dominating the scene.

STL is, by and large, run via **manual and decentralized operations**. Thus, it is vulnerable to loose controls; rigged draws; under-collection and under-reporting of bets and other financial figures; collection difficulties; delayed or non-payment of prizes; collection leakages; and many more.

On the other hand, **LOTTO** is **electronic and centralized**. Thus, printing and collection of bets are monitored centrally and in real time; draws are public and transparent; bets and payment of prizes are monitored centrally, and settled immediately.

Yet on another note, another gaming agency, the **Philippine Amusement and Gaming Corporation (PAGCOR**, has done relatively well over the years. **PAGCOR** is a government-owned and controlled corporation established through Presidential decree. **PAGCOR** is the Philippines' third largest contributor of revenue to the government, after the Bureau of Internal Revenue and the Bureau of Customs.

The solution: **Merge PCSO with PAGCOR through legislation**, and perform the following:

- Focus on generating revenues through gaming and lottery;
- Allocate earnings, net of operating expenses, as funding for calamity-stricken areas, health care services, and the like, to the appropriate government agencies which should also take care of distributing such benefits; and
- **STL** is just a numbers game. It should be folded into Lotto, designed with electronic, centralized and transparent collections of bets, operating through small **LOTTO** agents.

After a thorough investigation, the urgent need to clean up **PCSO** and **STL** will be clear to our legislators.

At present, the privatization of **PAGCOR** & **STL** is under consideration. However, the bigger issue is gaming, which is generally a monopoly. But an evaluation of whether gaming would be better owned by either the government or the private sector, is another topic altogether. ⚓

TRAFFIC FLOW IS LIKE BLOOD FLOW

by Hon. Renato C Valencia, Former SSS Administrator

Photo Credit: Wheninmanila.com

Interestingly, traffic flow is like blood flow.

Blood circulation is one of the many parts and systems that comprise the human body – an almost perfect machine with a master template that enables the body to function as one.

When we are born, the blood circulates normally to distribute oxygen and nutrients to, and collect waste from body parts so that they can, as one body, function normally. The blood follows bodily functions so no blood gets lost or wayward, lest some organs get starved of oxygen or nutrients, and the body dies.

As we get older and indulgent, plaques from cholesterol build up on blood vessel walls and become blockages that slowdown or worse, stop blood flow. To normalize blood flow, blockages have to be removed, or a bypass is needed.

Air, sea and land traffic like blood flow, must have a master plan with designs and rules to ensure smooth flow. For example, too many air or sea arrivals at one time could cause land traffic. Surely, we have a master transportation plan. The question is – are we following the master plan?

In September this year, a recent study of the Asian Development Bank (ADB) finds Metro Manila is the most congested city in Asia, and that congestion arises when demand for travel exceeds the maximum capacity of the transportation network.

I can name so many blockages in our streets, mostly caused by poor engineering, education and enforcement – parking along busy streets takes away at least one lane; double parking robs another lane; jaywalking and potholes slow down traffic; vehicles stop or are trapped in intersections preventing vehicles from going forward on green light; busses and jeeps take and discharge passengers on the road instead of at bus stops; street repairs performed during business hours; intersections too close to each other; u-turn, instead of cloverleaf-type traffic flow in highways; frequent swerving; tricycles in busy streets; no by-pass road when clearly, the situation demands it; etc.

Photo Credit: UNTV.com

There are some suggestions to decongest Metro-Manila traffic such as – widening roads, modernizing mass transit buses, increasing point-to-point (P2P) buses, improving public railway systems in a major way, while reducing the number of private cars on the main arteries. Traffic congestion could be effectively curbed via car sharing or car pooling, having a minimum vehicle occupancy during peak hours (also called High Occupancy Vehicle or HOV), teleworking arrangements, one day home-study/online study per week, and above all, improving reliance and cleanliness of public transportation buses and railway systems such that the white collar worker would prefer to take public transportation to and from office on a daily basis than drive their car.

A first step to address our traffic congestion problem in Metro-Manila is to designate a Traffic Czar. In my opinion, the best person for this job is the PNP NCR Head, with all the resources and authority this position holds. These will prove essential and critical in traffic management.

The **PNP NCR Head** can be tasked to remove all road blockages and enable bypasses to ensure smoother traffic flow in Metro-Manila. He would have authority to direct and redirect traffic in primary, secondary and tertiary roads without any hindrance from the Metro-Manila city mayors. ⚓

SSA'S IMO SULPHUR LI

by Singapore Shippi

2020 GUIDANCE

6 Months (M) Planning

M6 – FUEL OIL SYSTEM READINESS
Segregation modifications for fuel oil tanks system completed, system lines tested, and crew familiarization training conducted, action plan agreed with manufacturers completed

M5 – OIL TANKS READINESS
Tank cleaning for designated fuels storage arranged, lub oil spare tank arrangement for dual fuel carriage, additional containment system for the possible overflow of sludge volume due to tank cleaning requirements

M4 – SAMPLING READINESS
All sampling points identified and appropriate sampling valve installed, procedure for onboard and in-use samples completed and crew familiarization training conducted

M3 – PROCUREMENT READINESS
Procurement contracts and quality procedure/certification to purchase compliant fuels from bunker suppliers along vessel routes negotiated and agreed, disposal of non-compliant fuel with buyer(s) arranged and permit obtained

M2 – ON-BOARD READINESS
Fuel switch-over requirement arranged and full training on the utilization/ switch-over operation as well as handling unavailability of compliant fuel for crews completed, issuance of reminder that non-compliant fuel needs to be disposed

M1 – COMPLIANCE READINESS
Ship maintenance regime to include mitigating compatibility issues, carriage ban arrangement, emission monitoring, equipment inoperability, CEM malfunction etc.

5 What-If Scenarios

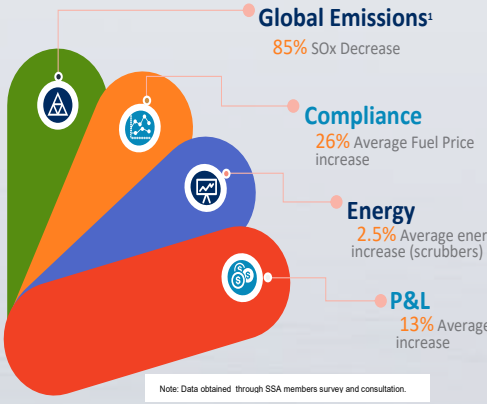
? Compliant Fuel not available at port
- Submit Fuel Oil Non-Availability Report (FONAR) to next port of call & inform Port State/Flag State
- Report to IMO MARPOL Annex VI GISIS module
- Submit evidence to support efforts to obtain compliant fuel
- Arrange to lift compliant fuel at the first available port of call

? Scrubber System not in operation
- Inform Flag & Port State for non-functional scrubber
- Make arrangement to repair scrubber at nearest port of call
- Update SSEP Log Book
- Inform port state for non-availability and make arrangement for bunkering of compliant fuel
- If repair duration is uncertain, consult the administration

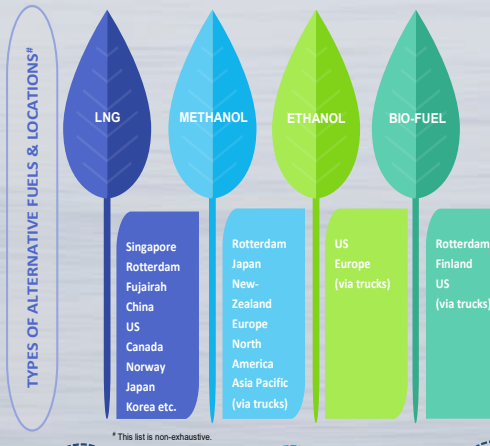
? Analysed VLSFO results have uncertainties
- Raise Bunker Dispute Form
- Run additional purification/filtration with low throughput for fuel with high cat-fines
- Adjust heater or use chiller to improve fuel viscosity and to maintain viscosity within the Engine Maker's Recommendation limit
- Commingle with compatible fuel/or use appropriate additives to improve stability
- For high sulphur content exceeding limit, make preparation to debunker non-compliant fuel

? Carriage of Non-Compliant Fuel on-board
- Make arrangement to dispose non-compliant fuel (HSHFO) by 1st March 2020 due to "Carriage Ban"
- Clean system & tanks to bunker compliant fuel
- Obtain a Carriage of Non-Compliant Fuel exemption letter from Flag State, to be produced to Port State Control from 1st Jan 2020 onwards

? Ports & sea areas prohibit scrubber discharges
- Perform change-over to compliant fuel using the fuel change-over calculator prior to entering prohibited areas
- Switch to closed loop system, if available
- Make arrangement with reception facilities to collect scrubber effluent discharges for closed/hybrid scrubber



Note: Data obtained through SSA members survey and consultation.



This list is non-exhaustive.

COMPANY DOCS
- > Ship Management System updated
- > Ship Implementation Plan reviewed
- > Fuel Oil Changeover Plan prepared & reviewed
- > Crew Preparedness Training Plan executed
- > RA & Mitigation Plan for use of DM/RM onboard reviewed
- > Carriage Ban instructions prepared
- > Commingling instructions prepared

CLASS DOCS
- > EIAPP New Certificate Received
- > Amended NOx Technical File (obtained only in case of changing component)
- > CEM documentation maintained both onboard and in cloud
- > IMO GSIS System familiarisation conducted
- > Fuel system plan approval received (needed in case of line modifications)
- > Onboard Monitoring Manual approved
- > SOX Emission Compliance Plan approved

S D
- >SEEMP doc
- > Tank & So booklet con correct visco
- > Maintenan incorporate equipment
- > Section H Book Part 1 requirement
- > Procedure machinery completed
- > Procedure segregation grades of fu
- > ECGS Tech Scheme A/B

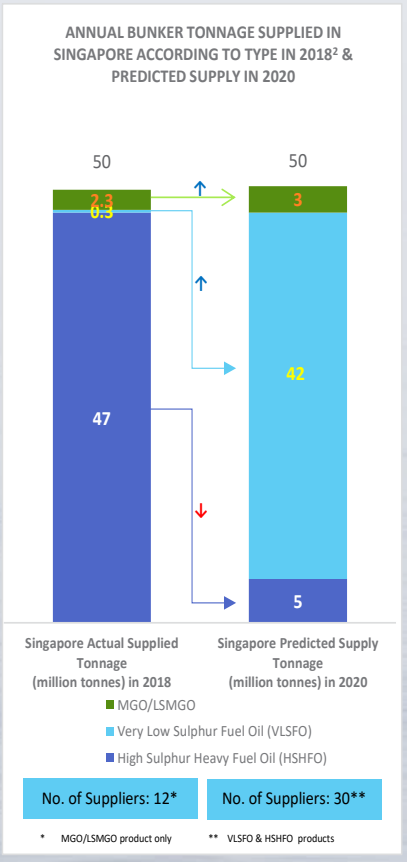
1 https://safety4sea.com/imo-sets-2020-as-implementation-date-for-0-5-sulphur-cap/

2 http://www.mp

IMIT 2020 GUIDANCE

ng Association (SSA)

IMO SULPHUR LIMIT



RECORDS & FORMS

SUPPLY CHAIN DOCS

ument updated
unding Sensors
figured with
osities/temp
nce Log
d with new

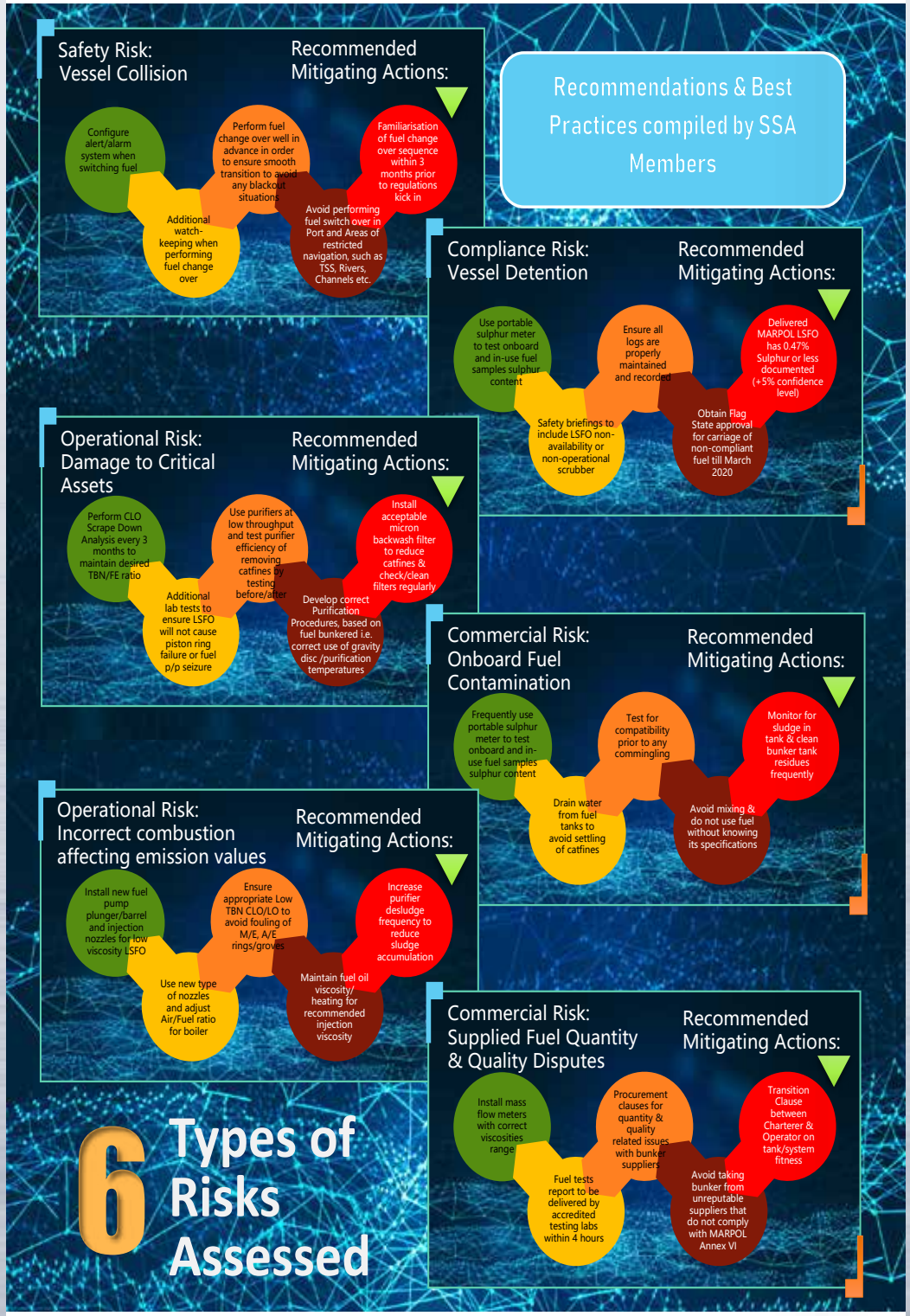
of Oil Record
new recording
ts incorporated
s to verify
performance

s for
of various
el oil carried out
nical Manual for
received

>3-years Bunker Delivery Notes (BDN) Records indicating % of Sulphur content available on board
> FONAR Form Instructions disseminated & contact list of FONAR recipients developed
> Fuel change over instructions updated
> EGC Record Book updating instructions incorporated

> BDN to indicate less than 0.5% of Sulphur Content and does not exceed the maximum allowable limit if no scrubber is installed onboard vessel after Jan 2020
>Certificate of Quality (COQ) from suppliers received

a.gov.sg/web/portal/home/port-of-singapore/services/bunkering/bunkering-statistics



Brought to you by Singapore Shipping Association
Special Thanks to SSA Committees Chairman & Members who participated in reviewing this document.

Contact SSATech Desk: +65 6305 2272

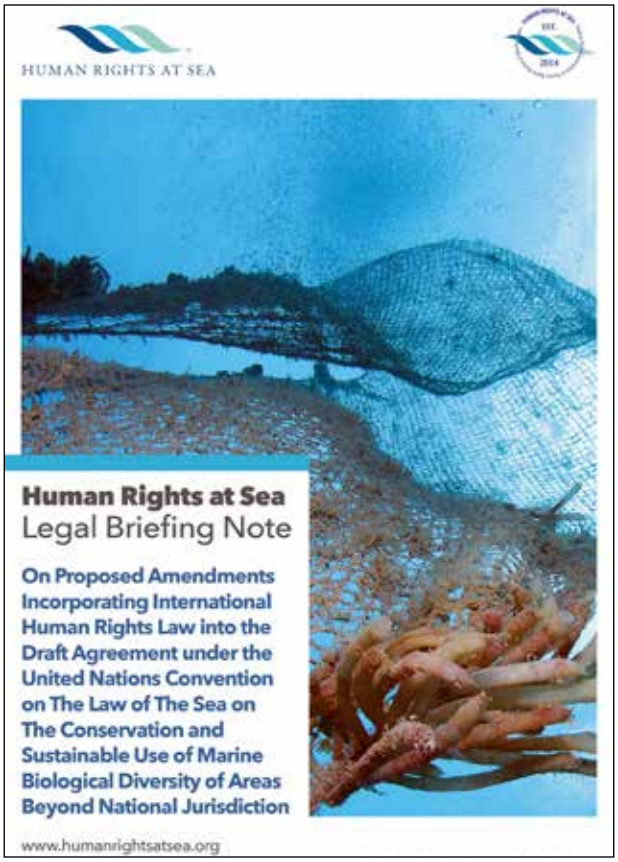
INTERNATIONAL HUMAN RIGHTS LAW PROPOSED AMENDMENTS FOR NEW UN OCEANS TREATY

by Human Rights at Sea News

London. UK. Human Rights at Sea published a short independent legal briefing note on proposed amendments to the draft agreement under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction to include **International Human Rights Law**.

These amendments note an absence of human rights references reflecting protection of any degree for human intervention at sea needed to support, uphold and enforce such a new treaty.

While human rights are not the focus of the draft agreement, the charity believes the agreement should explicitly refer to the applicability of international human rights standards in its implementation. There is an increasing recognition on the international front that environmental issues and human rights are inextricably linked, and this is the case as much at sea as it is on land.



The 30-August-2019 report from the third session (16-30 August 2019) in New York of the **Intergovernmental Conference** on the proposed international legally binding instrument, which is stated as coming into effect in 2020, headlined that delegates stressed the treaty needed to be robust and practical in application.

Drafts have dominantly focused on the conservation and marine bio-diversity aspects of the proposed treaty leaving a gap for the protections of the people who will be required to ensure the treaty's success at sea.

Human rights apply at sea as they do on land, but there still remains a gap in the legislative framework concerning the laws of the sea, which does not explicitly refer to international human rights law. **Human Rights at Sea**, as an independent civil society NGO, has initiated proposed minor amendments which if implemented could make a significant difference to the international reinforcement of human rights at sea. Further, it has linked the amendments to the developing **Geneva Declaration on Human Rights at Sea**, the aim of which is to raise global awareness of the abuse of human rights at sea and to mobilize a concerted international effort to put an end to it.

Proposed Amendments:
ADDITIONAL CLAUSE IN THE PREAMBLE:

"Recognizing the need to promote and encourage the respect for human rights and fundamental freedoms for all without distinction as to race, sex, language, or religion in achieving international cooperation to solve international problems," (Based on UN Charter); or

"Recognizing that the human rights and freedoms set out in the Universal Declaration on Human Rights apply on sea as they do on land."

ARTICLE 4: Relationship between this Agreement and the Convention and other [existing] relevant legal instruments and frameworks and relevant global, regional and sectoral bodies….

3. This Agreement shall be interpreted and applied in a manner that [respects the competences of and] does not undermine [existing] relevant legal instruments and frameworks [including international human rights laws] and relevant global, regional and sectoral bodies, and that promotes coherence and coordination with those instruments, supportive of and do not run counter to the objectives of the Convention and this agreement [or the purposes contained in the UN Charter]; or

[5. The provisions of this Agreement shall be interpreted and applied in a manner that respects the rights and freedoms set out in the Universal Declaration on Human Rights and other relevant international human rights laws.]

Human Rights at Sea Founder, **David Hammond**, commented: *"This is probably the best and only opportunity in recent time to update the international Law of the Sea regime to become wider in effect, not just for the safeguarding of marine bio-diversity and conservation essential for the sustainability of our oceans for future generations, but for all persons living, working, transiting, or engaged in any other type of activity at sea in territorial and international waters around the globe."*

Human Rights at Sea will be passing its recommendations to the **UN** and State government departments. ⚓

The Castillo de San Marcos National Monument in St. Augustine, Florida, stands sentinel over Matanzas Bay. The coquina structure remains sturdy after 3 centuries.

WHAT ARE COQUINA AND TABBY?

by NOAA

Coquina and **tabby** are "bullet-proof" building materials born of the sea. Nearly every child who's played on the beach has built a simple sand castle by creating a turret with an upturned bucket of sand. Others, more elaborate (and typically built with help from an ambitious parent), boast multiple structures surrounded by moats and rivers that ebb and flow with the motion of ocean waves.

But did you know that near St. Augustine, Florida — the nation's oldest city — there exists an actual "castle" made of sand? Located on 20.5 acres on the western shore of Matanzas Bay, the **Castillo de San Marcos National Monument** is the oldest (circa 1695) and largest masonry fort in the continental United States.

The Castillo's masonry, or stonework, is largely comprised of **coquina** (Spanish for "small shells") — a natural concrete derived from the ocean. **Coquina** is a rare form of limestone composed of the shell fragments of ancient mollusks and other marine invertebrates, which, over time, are glued together by dissolved calcium carbonate in the shells. Coquina is also the name of a common tiny clam found everywhere on Florida beaches. Their shells, which come in countless colors, are reflected in the Castillo's muted hues.

As a building material, **coquina** is lightweight, easy to find (it's indigenous to the Florida coast), easy to use, and nearly indestructible. Not only is coquina bullet-proof, it is virtually cannon-ball- proof! Due to its plentiful microscopic air pockets, **coquina** is easily compressed. In days long past, cannon balls fired at the Castillo simply lodged in its walls. Which, one supposes, is why the old fort still stands after 300 years. One of the best places to see **coquina** in its natural state is **Washington Oaks Garden State Park** near Palm Coast, Florida, about 30 miles south of St. Augustine. The park's picturesque coquina outcroppings are some of the largest on the Atlantic Coast.

A related building material is **tabby**, often called coastal concrete, which is basically manmade **coquina**.

Tabby is composed of the lime from burned oyster shells mixed with sand, water, ash, and other shells. As far back as the 1600s, Spanish and English settlers used **tabby** to build their homes and other structures, and to pave their roads, throughout the coastal Carolinas, Georgia, and Florida.

The natural coquina outcroppings at Washington Oaks Gardens State Park near Palm Coast, Florida, are among the largest on the Atlantic Coast. Credit: Washington Oaks Gardens State Park.

Many **tabby** buildings still stand today, including Georgia's **Fort Pulaski** near Savannah and the **R.J. Reynolds Mansion** on Sapelo Island. These historic structures, among many others, are testament to both the ingenuity of early Americans, and the untold bounty of the sea. ⚓

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ADVANCED ANTI-SUBMARINE WARFARE OFFICER STUDENTS TRAIN IN US NAVY'S NEWEST COMBAT TRAINER

by U. S. Navy

US NAVAL STATION SAN DIEGO –Naval Surface and Mine Warfighting Development Center (SMWDC) and the **Center for Surface Combat Systems (CSCS)** hosted 10 students school on 20-September-2019 in **CIAT**, the Navy's newest combat trainer, or the **Combined integrated Air & Missile defense/anti-submarine Warfare Trainer**, to increase operator lethality of **Advanced Anti-Submarine Warfare Officers (ASWO)**.

The students will Fleet-up aboard the same ship to become **ASWO**, or they have orders to report as **ASWO** aboard warships homeported in San Diego, California; Everett, Washington; Rota, Spain; Norfolk, Virginia; and Pearl Harbor, Hawaii. **CIAT** represents the **US Navy**'s investment in modernized training. Over the past decade, advances in technology have reshaped the operational capabilities of US Surface Fleet –those same advances are now fundamentally transforming the way **SMWDC** and **CSCS** develop combat ready ships and battle-minded crews. "We're excited to have our students in the **CIAT** lab for the very first time," said Mr. Mo Okita, **SMWDC** Sea Combat Division's Training Systems lead and course supervisor for ASW training. "In the Advanced ASW Officer course, we look to capitalize on the capabilities here in **CIAT** to deliver a warfighting training curriculum that is realistic, relevant, and just as complex as the threat environment our deployed ships are sailing into."

Through the lab's high fidelity threat modeling and scenario visualization, students are able to prosecute adversary submarines using the same consoles aboard their warships in a realistic training environment. The cooperative working relationship between **SMWDC** and **CSCS** Det San Diego, and the close proximity of the trainer are added benefits of using **CIAT**.

"There is so much capability here," said **Lt jg Betty Yi**, who

was selected to Fleet-Up as **ASWO** aboard USS Sterett (DDG 104). "We have transitioned from school house lectures to action-based scenarios. We are all walking away better prepared for deployment." **Warfare Tactics Instructors (WTI)** at **SMWDC** and **CSCS** who teach **Anti-Submarine Warfare/Surface Warfare (ASW/SUW)** understand the significance of visualization. "The value of our training determines the success of Sailors," **said Lt Dan Walker**, an **ASW/SUW WTI** assigned to **CSCS** Det San Diego. "We're investing in the ASW curriculum and **CIAT** facility because we understand that when a ship leaves the pier - her mission could depend on it."

The **CIAT** will be also be available to the **ASWO** graduates to ensure that their newly found proficiency is maintained. Lt jg Cara Pastrana, the prospective **ASWO** aboard USS James E. Williams (DDG 95) sees the value in bringing her future team back to **CIAT** for additional training. "**CIAT** is our answer to maintaining the tactical edge," said Pastrana. "With the new **CIAT** facility in Norfolk, I plan to make training visits a priority for our team, we have to keep training."

SMWDC is a subordinate command of **Commander, Naval Surface Force, US Pacific Fleet**. It exists to increase lethality and tactical proficiency of the Surface Force across all domains. **SMWDC** HQ is at Naval Base San Diego with four divisions in Virginia and California focused on **ASW/SUW**, Amphibious Warfare, Integrated Air and Missile Defense, and Mine Warfare.

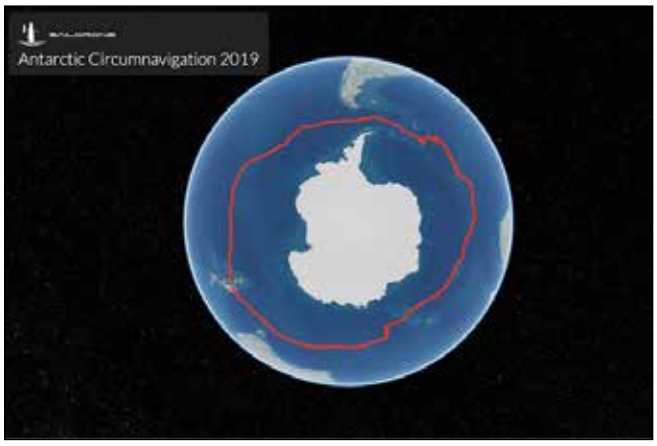
CSCS headquarters' staff oversees 14 learning sites and detachments located throughout the continental US, Hawaii, and Japan. It manages and operates a **Naval Education and Training Command** training division in Rota, Spain. **CSCS** delivers specialized training for officer and enlisted Sailors to tactically operate, maintain, and employ shipboard and shore-based weapons, sensors, and command and control systems utilized in today's **US Navy**. ⚓

SAILDRONE COMPLETES FIRST AUTONOMOUS CIRCUMNAVIGATION OF ANTARCTICA

by Vicky Viray Mendoza

A seven-meter (23-foot) long, wind-powered unmanned surface vehicle (USV) called a **Saildrone** has become the first unmanned system to circumnavigate Antarctica. The vehicle, known as SD 1020, was equipped with a suite of climate-grade sensors, and collected data in previously uncharted waters, enabling new key insights into ocean and climate processes.

The 196-day mission was launched from Southport in Bluff, New Zealand, on 19-January-2019, returning to the same port on August 3 after sailing over 22,000 km (13,670 miles or 11,879 nautical miles) around Antarctica. During the mission, the vehicle survived freezing temperatures, 15-meter (50-foot) waves, 130 km/h (80 mph) winds, and collisions with giant icebergs.



SD 1020 circumnavigated the **Southern Ocean**, *a mission of 22,000 kilometers, in 196 days, the first unmanned system to complete an Antarctic circumnavigation.*

Non-profit **Li Ka Shing Foundation** sponsored this mission. All data is made publicly available at no cost in order to accelerate our understanding of critical processes affecting humanity. The mission is also an educational outreach initiative, aiming to expose future generations to the rapid changes taking place in the Antarctic. **Saildrone** and the **1851 Trust** partnered to develop a series of STEM lesson plans rooted in science, math, technology, and engineering, which are available to teachers free of charge on the **Saildrone** website at **Saildrone**.com/antarctica.

Science collaborators on this **First Saildrone Antarctic Circumnavigation** include experts from: **US National Oceanic and Atmospheric Administration (NOAA)**, the US **National Aeronautics and Space Administration (NASA)**, Australia's **Commonwealth Scientific and Industrial Research Organization (CSIRO)**, the Palmer **Long-Term Ecological Research (LTER)**, the **Scripps Institution of Oceanography, the Southern Ocean Observing System (SOOS)**, the **Japan Agency for Marine-Earth Science and Technology (JAMSTEC)**, the **Korea Polar Research Institute (KOPRI)**, the **Norwegian Polar Institute**, the **University of Exeter**, the **University of Gothenburg**, the **Department of Marine Science**, **University of Otago**, and the **New Zealand National Institute of Water and Atmospheric Research (NIWA)**.

A video was taken from SD 1020's onboard camera showing the extreme conditions in the **Southern Ocean** *during the 2019 Antarctic Circumnavigation.*

The science

The **Southern Ocean** plays a key role in regulating heat and carbon for our planet. It is so remote and inhospitable that even big ships avoid it in winter. But the nimble and robust **Saildrone** not only survived the **Southern Ocean** winter but streamed back vital new data from previously unsampled territory.

"One of our largest 'blind spots' in terms of our climate knowledge and its future prediction lies in the **Southern Ocean**. This is mostly due to the serious lack of observations, in particular in winter, in this remote and harsh environment. This leads to a poor understanding of how these polar oceans function," said **Sebastiaan Swart**, co-chair of the **Southern Ocean Observing System (SOOS)**. "These exciting, high-resolution observations from **Saildrone** during its circumnavigation of the Antarctic provide valuable ground-based datasets for scientists to understand the **Southern Ocean** better and evaluate the models we use to predict weather and climate."

The top of the wing to the bottom of the keel is loaded with science sensors.

Carrying an instrument developed by **NOAA** to measure carbon fluxes very precisely, the **Saildrone** provided important new data on the rates of carbon uptake in the **Southern Ocean**.

"There's a lot left to be learned about the ocean's uptake of CO2 emissions, especially in the **Southern Ocean**. Up until a few years ago, the **Southern Ocean** was understood to be a large CO2 sink. Yet, that understanding was based primarily on observations made from ships that steer clear of the harshest weather in the **Southern Ocean**, leaving winter months undersampled," said explained **Dr. Adrienne Sutton**, an oceanographer with the **NOAA Pacific Marine Environmental Laboratory (PMEL)** Carbon Group. The PMEL Carbon Group has been involved in all **Saildrone** missions related to CO2 to date.

Dr. Sutton said, with the deployment of carbon sensors on profiling float, and the **Southern Ocean** Carbon and Climate Observations and Modeling (SOCCOM) project, scientists started to get a broader seasonal distribution of observations. They found less of a CO2 sink than previously thought.

The **SOCCOM** floats measure seawater pH and use empirical relationships to calculate seawater partial pressure of carbon dioxide (pCO2), which introduces some uncertainty relative to a direct measurement. This has generated an active discussion centered on the uncertainty in the calculated pCO2 from the float measurements and whether the weakened CO2 sink, as observed by the floats during 2014–2017, was just natural variability.

Over the course of the mission, the **Saildrone** rendezvoused with a few of the **SOCCOM** floats.

"Having another autonomous platform that can survive the **Southern Ocean** is both a technological feat and an opportunity to get us closer to solving the ocean CO2 sink puzzle! Preliminary results suggest that we also observed CO2 outgassing during winter months in the same region as the floats measured previously. CO2 outgassing from the ocean to the atmosphere occurs when ocean pCO2 levels are higher than atmospheric levels," explained **Dr. Sutton**.


Saildrone *onboard cameras also capture images of the local wildlife.*

"Our initial findings are that the **SOCCOM** floats match the **Saildrone** pCO2 to within their stated uncertainty," said Nancy Williams, Assistant Professor at the University of South Florida College of Marine Science. "These crossovers provide great opportunities for validation and context between two very different and complementary datasets. Sustaining both of these types of observations will be extremely helpful for improving our understanding of the **Southern Ocean**'s role in the global carbon budget, and I can't wait to dive into this new dataset."

The **Saildrone** also took reference measurements near moored buoys.

"High quality and reliable data are needed for research use. For the **Saildrone** sensors, careful calibrations are done before deployment, and other checks are made against similar measurements from a limited number of moorings and profiling floats in the region. The most recent comparison occurred south of Tasmania, Australia, where the **Saildrone** passed near one of only two **Southern Ocean** surface moorings equipped with similar sensors," explained Dr. Bronte Tilbrook, a biogeochemist studying ocean acidification and the global carbon cycle at CSIRO.

"The **Saildrone** technology is revolutionizing how data can be collected in the **Southern Ocean**, providing for the first time a way for crucial data to be collected throughout the year and in places that ships rarely visit. Applications include a better understanding of the amount of carbon dioxide taken up by the **Southern Ocean** and determining the changing environmental conditions and processes driving change," said Dr. Tilbrook.

All data from this mission has been made publicly available to the global scientific community and its use for science publications is encouraged. Please visit data.**Saildrone** .com and/or contact us for more information.

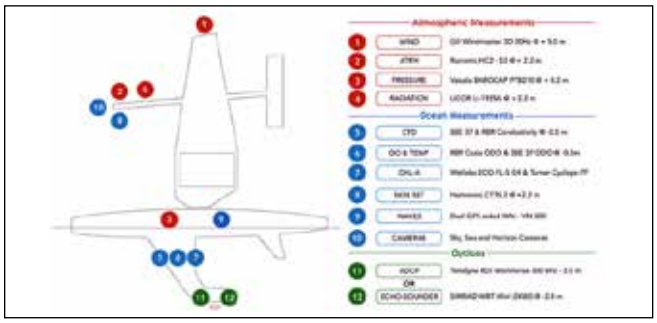
A platform for in-situ ocean observations

Saildrone USVs are designed for long-term ocean deployments, up to 12 months, yet burn no fossil fuels, hence have a zero carbon footprint once deployed. They are powered exclusively by the wind for propulsion and solar energy to power the onboard instruments.

Saildrone s carry a suite of science-grade sensors to collect meteorological and oceanographic data critical to understanding the changes taking place in the Antarctic ecosystem. The standard sensor suite includes instruments to measure air and sea temperature, barometric pressure, wind speed and direction, and wave height and period, as well as sky, sea, and horizon cameras. In addition to the ASVCO2, SD 1020's enhanced sensor package includes an Acoustic Doppler Current Profiler (ADCP) to measure ocean currents.

The secret weapon to take on Southern Ocean winters.

The standard configuration of a Generation 5 **Saildrone** includes a seven-meter (23-foot) hull, a 2.5-meter (8-foot) keel, and a five-meter (15-foot) tall solid wing. This regular **Saildrone** wing has an operational wind range up to 60 knots. However, the massive waves of the **Southern Ocean** were too much for this tall and slender wing. On two previous occasions, in 2015 and 2017, **Saildrone** s were deployed into the **Southern Ocean** to attempt the circumnavigation. In each case, after a short period of time, the mission was compromised and the **Saildrone** s had to sail back for repairs. The team learned a huge amount from these failures and designed a new type of wing specifically for the **Southern Ocean**. The lower aspect "square rig" is incredibly strong and is designed to deal with the huge forces of being rolled and submerged by 15-meter (50-foot) breaking waves.



Standard and optional sensors for the Generation 5 **Saildrone** *sensor package.*

SD 1022 and SD 1023 with the standard **Saildrone** *wing in Point Bluff, NZ.*

"While the square rig has less performance range than the regular **Saildrone** wing and struggles to sail upwind, it does a great job of sailing downwind and can still get you where you need to go in the **Southern Ocean**," said **Saildrone** founder and CEO Richard Jenkins. "You inevitably sacrifice maneuverability for survivability, but we have created something that gets the job done and that the **Southern Ocean** just can't destroy!"

SD 1022 and SD 1023 were released with "toughened" regular wings along with SD 1020 in January, but like their predecessors, both suffered storm damage in the first few days, while the square sail plowed on despite stormy conditions. SD 1022 and SD 1023 navigated back to New Zealand for repair and were redeployed in May with square wings similar to SD 1020. These two **Saildrone** s have recently successfully navigated winter conditions through the Drake Passage and entered the South Atlantic Ocean. Unlike SD 1020, the SD 1022 and SD 1023 are equipped with scientific echo sounders to study fish biomass in addition to the standard atmospheric and oceanographic standard instruments.

SD 1022 and SD 1023 were redeployed in May 2019 with square wings.

Future plans in the Southern Ocean

Saildrone is building a global fleet of unmanned surface vehicles, targeting planetary coverage.

"In terms of carbon and heat, the **Southern Ocean** is by far the most important ocean. Globally, the **Southern Ocean** takes up about half of all carbon and 75% of all heat that enters the ocean. This makes it disproportionately more important to place efforts and resources, such as those occurring by robotic platforms like **Saildrone** , into obtaining more scientific measurements in this polar region," said Swart of **SOOS**.

For **Saildrone** , this means the **Southern Ocean** is a key priority to instrument. **Saildrone** plans to deploy a fleet of vehicles to monitor the **Southern Ocean** on a persistent basis, a fleet of 10–20 **Saildrone** s sailing around Antarctica year-round.

SD 1020 sailing toward the sunrise on a rare calm day in the **Southern Ocean**.

"A monitoring system for the **Southern Ocean** is one of our highest priorities," said **Saildrone** CEO Jenkins. "Understanding heat and carbon fluxes, fish populations, and ocean acidification in the **Southern Ocean** are absolutely key to improve the understanding of our climate, and to the sustainability of life on this planet. Only very significantly increased measurement will enable meaningful predictions for the future."

Saildrone is grateful for the support of its sponsor and scientific collaborators on this historic mission. **Saildrone** would also like to say a special thank you to the Bluff Coastguard who assisted in towing SD 1020 into the harbor in Bluff, the staff and port of South Port in Bluff, NZ, and Biosecurity New Zealand – Tiakitanga Pūtaiao Aotearoa for inspecting the vehicle on its return.

⚓ ⚓ ⚓

Resources:

1. *"***Saildrone** *is first to circumnavigate Antarctica, in search for carbon dioxide," National Oceanic and Atmospheric Administration (NOAA), accessed 5-August-2019*
2. *Ashlee Vance, "***Saildrone** *'s Journey Around Antarctica Uncovers New Climate Clues," Bloomberg Businessweek, 5-August-2019.*

THE HISTORY OF NORWAY'S STADT

by Vicky Viray Mendoza

STADT is an awarded technology leader and has been in the power electronics business for more than 30 years. Through its extensive experience, focus on sustainable products and development of the patented **STADT Lean Drive** technology for electric propulsion of today, there have been major steps.

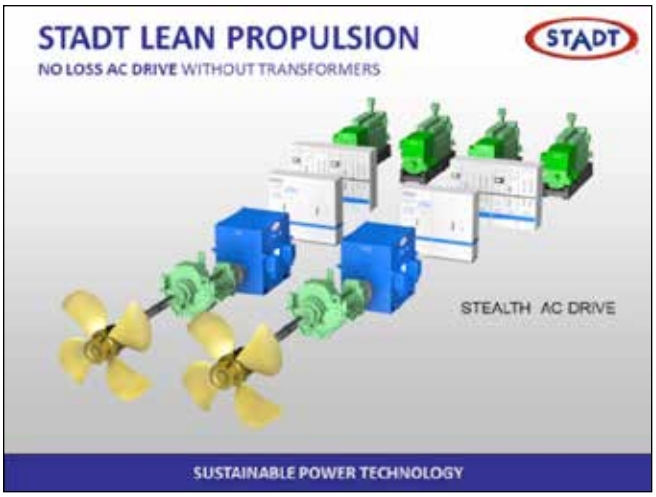
STADT CEO Hallvard L. Slettevoll

Hallvard L. Slettevoll founded **STADT** in 1985 in a family barn in his hometown **Gjerdsvika, Norway**. Slettevoll started developing the first generation of **STADT variable frequency drives (VFD)**, based on bipolar transistors with Phillips PWM control and switch mode power supply. The very first **VFD** was delivered to a local fish-farm company located in the neighboring village.

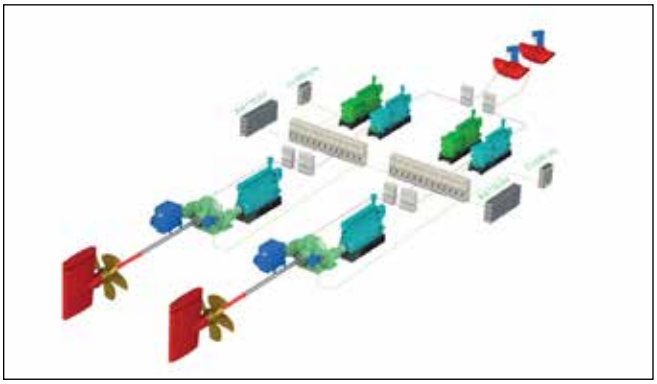
In 1988, the second generation **STADT VFD**, which was based on **IGBT** transistors, was released. The local hydro power-plant company, **Tussa**, and the Norwegian telecom company, **Telenor**, became regular **STADT** clients. But **STADT's** workshop (aka, the barn) burned to the ground on New Years Eve in 1992. All of **STADT**'s hardware was lost in the fire. **STADT** then moved to a new facility in **Gjerdsvika**, a closed-down shipyard, which offered much more space to increase production. By 1995, **STADT** was the first **Vacon** customer outside **Finland**, and this grew into a close cooperation over the years between **STADT** and Vacon. **STADT** started producing small 230 **Vac Vacon Drives** in **Gjerdsvika**, and used the **Vacon CPU** in the development of large drives for marine applications. In 1996, **STADT** landed a big contract with **TFDS** for the Coast Guard vessel ***K/V Tromsø*** for delivery of the third generation **STADT VFD** which was a 500 kW, 690 Vac water-cooled VFD running on a pump jet thruster. This was a big breakthrough. More contracts from TFDS came in.

Fast-forward to June 2017, **STADT AS** signed a contract with the Swedish defense and security group, **Saab AB**. The contract was about delivery of the patented electric drive system, the **STADT Lean Propulsion**, to be integrated in one of the ship projects of **Saab**. The **Lean** approach used an **AC Drive** technology with unique performance capabilities of stealth, noise-free, extreme reliability, and lifetime cost efficient, low weight, and compact footprint. **STADT CEO Slettevoll** said that the contract was an important part of their strategy to bring the **Lean Propulsion Design** into the international naval fleet market.

In January 2018, at the **Work Boat Show** in New Orleans, **STADT AS** of Norway signed an agreement with **W.A. Technical Sales** to represent them in the Gulf of Mexico, as part of STADT's worldwide expansion, targeting the maritime market globally.



The **STADT Lean Drive** technology, regarded as a very reliable patented technology, would be used for many kinds of electric ship propulsion solutions where power sources could be arranged in many combinations –LNG, MDO, HFO, batteries, and fuel cells. The drive technology is scalable from small to high-powered rating of 230V up to 15kV, without the use of big, heavy transformers. **ABS-**approved **STADT Lean Drive** was delivered to 16 vessels. **W.A. Technical Sales** CEO **Bill Meyer** said "the **STADT** technology with its remarkable track record worldwide, will have a major potential in the US in years to come."



In 2018, **Hurtigruten** began connecting to shore supply in Bergen via a 1400 kW **STADT ShoreCon** 50/60Hz, developed and made by **STADT**. It enables the ships to shut down its diesel generators while staying in harbor, reducing emission, noise and fuel costs. The **STADT ShoreCon** can also be located onboard the vessels for increased flexibility in shore power operations. In April 2018, **Topaz Master** and **Topaz Mariner** became **STADT**'s clients. These new **AHTSVs**, equipped with **STADT Lean Propulsion** are state of the art vessels with reduced fuel consumption and emission. They have the highest operational safety due to tremendous redundancy in the **STADT Lean Drive.**

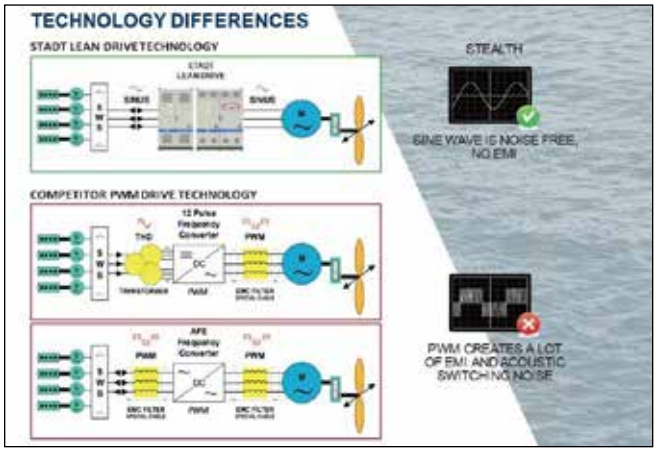
Later in 2018, **STADT** finalized installation of the **Lean Propulsion** system on the megayacht ***White Rabbit***, built at Echo Yachts in Perth, Australia. The ***White Rabbit*** is 3000 GT,

84 meters long, 20 meters wide, built of aluminum, and has a range of 5000 nautical miles. It is the first megayacht ever built in Australia with diesel-electric propulsion, and the world's largest trimaran superyacht. Endurance is important for such a ship.

Thus, weight, size and propulsion efficiency has been very important for this project. Two-geared **STADT AC induction** motors run the 2-shaft line CP propellers. This represents a highly efficient and low weight overall solution. The **STADT Lean Drive** technology ensures the propellers will not stop in the middle of the ocean. A noise-free ride is also essential for a megayacht. The patented **Sinusoidal** drive makes this possible with the **Lean Drive**, which is now used in naval ships for the same reason.

In March 2019, **STADT** signed up with a Nato-allied country to engineer new-generation naval ships using the Stealth AC Drive electric propulsion technology used in the Saab navy project. The propulsion solution is usable in any ship size due to scalability.

In July 2019, ***OceanXnorway*** by **Stormbringer** chose **STADT Lean Propulsion** as their partner for electric propulsion for their new megayacht series. ***OceanXnorway*** is based on a team of individual experts and selected collaborators. Members of the team have been engaged in various parts of the offshore industry for over 25 years in making Norway´s huge fleet of **Offshore Service Vessels (OSV's).**



At present, **STADT** systems and products are designed for the majority of vessel types with unique features of the **STADT Lean Drive** to deliver a superior system for the following segments: Naval, yacht, offshore, aquaculture, seismic, fishing, cruise, merchant, tanker & bunker, passenger, and energy systems.

STADT can deliver a range of marine propulsion products: System integration, lean drive, motor, switchboard, PMS, IAS, generator, energy storage, soft starter, AC Drive, and transformers. **STADT** is now increasing business development activities in Southeast Asia in co-operation with the company **Next Motion AS**.

John I. Myklebust, Senior Partner Next Motion AS

MARITIME INNOVATION IN THE PHILIPPINES

by Timothy Muelder

Without a doubt, the Maritime Industry in the Philippines is a vibrant cornerstone to the local economy and national workforce stability. To some extent, on an international level as well.

One doesn't have to look very far to understand how innovation with efficiency of operation and an ongoing focus to being environmentally sensitive is paramount in maintaining a balance of sustainability without undo harm to the environment.

At a recent **Maritime Forum** meeting, my friend and colleague, **Atty. Nanding Campos**, asked if I knew anything about a *"Hybrid Trimaran"* project underway in the Philippines. I confessed I didn't, but would look into it. What I found was truly exciting news from New Washington, Aklan.

Engineer **Jonathan Salvador** owner of **Metallica Shipyard** in partnership with **Aklan State University (ASU)**, **Maritime Industry Authority (MARINA)**, **DOST-Philippine Council for Industry, Energy, and Emerging Technology Research and Development (DOST-PCIEERD)**, and local government officials of **Aklan** have undertaken a project to build a *"Hybrid Electric Trimaran"* utilizing wave action to produce enough energy for propulsion of the vessel while at sea.

This trimaran is expected for ferry operations to transport 150 passengers plus some vehicles and cargo. For maneuverability while in port, and safety at sea, a duel system utilizing current available systems will be employed. This technology could have great benefit to commercial shipping as the average container ship burns over 100 tons of fossil fuel each year costing about 50 million dollars each. They also produce massive amounts of hydrocarbon pollution through the exhaust of both diesel fueled engines and bunker fuel steam/boiler driven propulsion systems.

While the electric wave system would not be a total replacement for current systems, any reduction is a great leap forward. Wave propulsion systems are still in the early stages of development, but there is enormous potential for them to be used as an alternative energy source for much larger ships.

In discussions with **Nanding Campos**, he expanded this technology to possibly include refrigerated cargo holds for support to our local commercial fishing fleet.

It would be a *"mother ship"* on the high seas working with the commercial fishermen.

Depending upon the implementation costs of this refrigeration support, powered by trimaran design, the Philippine Government could offer Filipinos abroad to invest, possibly through "Bond Sales" in the project, to fight for and protect our EEZ in a Filipino Global Support action.

Looking beyond – possibly offering pay for support services to those others authorized to fish in Philippine waters, could also be initiated. It appears this idea might be advantageous to explore at higher levels. This could have enormous benefit as the fishing fleet could stay at sea longer without having to make multiple port runs to offload their catch, and also with multiple vessels serving as additional set of eyes in support of the **Philippine Navy** and **Coast Guard** in patrolling Philippine waters, allowing better utilization of the resources for coastal and EEZ safety.

One of the Maritime Presentations I recently attended discussed the ongoing news revolving around what the Philippines is not doing, or can't do. The presenter offered a different belief with a highly optimistic viewpoint. However, optimism is not enough.

In my opinion, this *"Hybrid Trimaran"* project showcases that forward-looking concept and can-do attitude of the Filiipino. I believe it should be supported, embraced, and expanded to help propel the Philippines to the forefront in the global maritime industry.

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










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WÄRTSILÄ SOLUTIONS TO SUPPORT HURTIGRUTEN'S GREEN PUSH IN EXPEDITION CRUISES

by Wärtsilä Press

The technology group **Wärtsilä** will supply a broad scope of solutions that will support **Hurtigruten**, the world's largest expedition cruise operator, in its push for greener and more sustainable shipping. **Hurtigruten**, considered one of the world's most sustainable cruise operators, is converting an additional three vessels to become premium, hybrid-powered expedition cruise ships. The order with Wärtsilä was placed in the second quarter of 2019, and covers the MS Finnmarken, the first of the three vessels to be upgraded. Following the conversion project, the 140 meter, 530 guest MS Finnmarken will be renamed to *MS Otto Sverdrup*.

The scope includes upgrading the ship's **Wärtsilä** engines for **selective catalytic reduction (SCR) technology** to restrict emissions of **nitrogen oxides (NOx)**. Four **Wärtsilä Nitrogen Oxide Reducer (NOR) systems** will be installed for this conversion. **Wärtsilä** will also deliver two **Energopac systems**. The integrated propeller and rudder design of the **Wärtsilä Energopac** utilises advanced hydrodynamic technology to optimize propulsion efficiency. This enables effective savings in fuel, costs, and emissions. The ship will also have the capability to operate on battery power to further lessen its environmental footprint.

"We have enjoyed a good customer relationship with Hurtigruten for many years, and we are pleased and honored to have been selected to supply our sustainable solutions to a company that is committed to protecting the environment. The fact that we could deliver Tier III certificates for the total installation was a significant factor in the award of this contract," says **Cato Esperø**, Head of Sales, Service Unit Nordics and Baltics, Wärtsilä Marine.

*"At **Hurtigruten**, the push for sustainable solutions and introduction of green technology is the core of everything we do. We operate in some of the most spectacular areas of the world. This comes with a responsibility,"* says **Daniel Skjeldam**, CEO of **Hurtigruten**.

The **Wärtsilä** equipment is scheduled for delivery in December of this year. **Hurtigruten** has announced that all new additions to its fleet, as well as its existing vessels, will be made compliant with the **IMO's Tier III** regulations.

Wärtsilä is a global leader in smart technologies and complete lifecycle solutions for the marine and energy markets. By emphasising sustainable innovation, total efficiency and data analytics, **Wärtsilä** maximises the environmental and economic performance of the vessels and power plants of its customers. In 2018, **Wärtsilä**'s net sales totaled EUR 5.2 Billion with approximately 19,000 employees. The company has operations in over 200 locations in more than 80 countries around the world. **Wärtsilä** is listed on Nasdaq Helsinki.

In the Philippines, **Wärtsilä** started operations in 1992 during the on-set of power crisis in the country. **Wärtsilä Philippines**, Inc. is a fully-owned subsidiary of **Wärtsilä Corporation**, a Finnish engineering company focusing on the marine and energy markets with products, solutions and services. Its in-situ field services and workshop in Laguna offers mechanical, electrical and automation services, which include engine overhauling, engine parts machining, governor calibration, and PLC modification. ⚓

GLOBAL MARINE INSURANCE PREMIUMS RISE BY 1%, BUT FUTURE MARKET DEVELOPMENT REMAINS UNCERTAIN

by IUMI News

IUMI: Total ship losses stand at 20-year low. Although the global fleet continued to grow at around 3% in 2018, the number of total losses (vessels over 500 GT) stood at a 20-year low. However, the continued erosion of the global premium base means that attritional losses are becoming much more significant, and the increased risk has the potential to impact all marine underwriting sectors in 2019. Photo credit: Safety4Sea.com

IUMI – the **International of Marine Insurance** – presented its analysis of the latest marine insurance market trends at this week's annual conference in Toronto, Canada. Marine underwriting premiums for 2018 were recorded at USD28.9 Billion which represents a single percentage point rise from 2017. With significant challenges facing the market, the modest increase is not significant to herald an upturn in the fortunes of the marine insurance sector.

Vice-Chair of **IUMI**'s Facts & Figures Committee, **Astrid Seltmann** explains: *"Changes to frame conditions are the most likely reason for the modest increase in premiums as opposed to any real market development. A continuing growth in world trade will have driven cargo premiums up by 2.5%; and the fluctuating oil price will be pressurising premiums from the offshore energy sector, which dropped by 3% in 2018."*

Ongoing global uncertainties, including the current tensions in trade, will continue to impact all sectors but specifically cargo and offshore energy. The continued downward adjusting of global trade growth is not helpful for marine cargo underwriting going forward. High levels of technical losses continue to blight all sectors, particularly hull and cargo, and 2018 will not be any different. A normalization of major losses after several relatively benign years is likely to offset any rise in premiums achieved this year. Premiums had already plummeted to truly unsustainable levels in 2017, and so any increase begins from a very low base.

Only when the 2019 statistics become available will we understand to what degree marine underwriting might have returned to profitability. A particular concern is the increase in the **frequency of fires** on containerships, particularly those starting in the cargo area of vessels such as the **Mærsk Honam** or the **Grande America**. This trend has been observed for some years and the newest statistics show a clear further increase in 2019. These fires pose a threat to the crew and cause severe damage to both vessel and cargo. IUMI is working with a range of industry bodies to improve the prevention of such events as well as fire-fighting capabilities onboard.

The USD28.9 Billion global income was split between these geographic regions: Europe 46.4%, Asia/Pacific 30.7%, Latin America 10.4%, North America 6.2%, Other 6.3%. The year 2018

saw Europe's global share reduce from 49.2% (2017) to 46.4%, and Asia's share increase from 29.2% (2017) to 30.7%. For global marine premium by line of business, cargo represents the largest share with 57.4% in 2018, hull 24.4%, offshore energy 11.4%, and marine liability (excluding IGP&I) 6.7%.

Cargo Sector. Premium income for marine cargo insurance was reported to be USD 16.6 billion for 2018, representing a 2.5% increase on the 2017 result. The modest increase is largely attributable to continued growth in world trade coupled with exchange rate fluctuations, which tend to affect cargo premiums more strongly than other sectors. Trade growth continues (albeit less optimistically) which should impact positively on this sector, macro-economic uncertainties such as national and regional trade restrictions as well as changes to economic and political frame conditions are likely to have a negative effect.

Covered risks are increasingly representing stock rather than transit exposure and accumulation risks continue to grow. The risk of large event losses, both nat-cat and man-made, is substantially increasing both on single sites and single assets. The 2017/18 underwriting years saw a relatively high nat-cat impact from hurricanes, earthquakes and flooding; and 2018 was heavily impacted by the cargo loss from ***Maersk Honam*** (15,000 TEU capacity). Technical loss ratios are relatively stable at around 70% in Europe. Asia is still a developing account and loss ratios are beginning to rise in that region, now approaching 60%.

Hull Sector. In 2018, global underwriting premiums for the hull sector achieved USD 7 billion, no change from 2017. A 0% change in premiums is a concern when set against a continually increasing global fleet and higher single risk exposure (and the related risk of unprecedented major claims) resulting from the trend for ever-larger vessels.

On a more positive note, claims frequency and cost per vessel is stable at a moderate level; and the long-term trend for total losses has also stabilized with a fluctuation below 0.1%. However, the incidence of major losses appears to have returned in 2019 after unusually low numbers during the period 2016-2018.

This is likely to impact on the 2018 and 2019 underwriting years. In addition, the 2018 fire at a major yard in Germany represented a new dimension of claims impacting the builder's risk portfolio. Although (due to long-term policies) it severely deteriorated the 2014 underwriting year results it may, nonetheless, add further pressure on the necessary recovery of the hull insurance market.

Throughout the period 2016-2018, the hull sector suffered few major losses with attritional losses accounting for an increasing share of the total claims costs. Income achieved during that period was not sufficient to cover these losses and there was no buffer to cover the major losses. In 2019, we expect to see premiums increase, albeit from a very low base. This should (marginally) alleviate the pressure on profitability but the return of major losses has the potential to offset this.

With results under pressure, the trend towards using more advanced methods of technical underwriting and better risk estimation continues. One of several means to estimate the future claims potential of a given portfolio is the use of detention data. Based on recent analysis by the **Nordic Association of Marine Insurers (Cefor)**, **Astrid Seltmann** demonstrated a close correlation (on a vessel-by-vessel basis) between the frequency and cost of claims and the level of related detentions.

Offshore Energy. Global premiums for the offshore energy sector were reported at USD3.4 Billion in 2018 representing a 3% reduction from 2017. It should be noted that the 2017 number was a 5% reduction from 2016; and the 2016 number was a 21% reduction from 2015. The majority of business in this sector is transacted in US dollars and so exchange rate fluctuations have very little impact. The drop in premium income has followed the slide in oil price but, fortunately, this appears to be flattening out. That said, ongoing trade tensions make any sort of price rally less certain. High profile losses in this sector and nat-cat events (mainly hurricanes) have had little impact on the market.

The prolonged downturn in activity has begun to reverse, albeit slowly, as the sector rebalances itself to operate within a lower oil price environment. Historically, there is an 18-month lag between improved oil prices and authorization for downstream expenditure. Reactivation will increase the risk of more claims.

Philip Graham, Chair of **IUMI**'s Facts & Figures Committee summed up: *"Since the 2018 **IUMI** conference, we've seen around 20 entities cease or severely restrict their hull or cargo underwriting activities. Whilst the modest growth in 2018 global marine underwriting premiums recorded this year is, of course, welcome it does not demonstrate any significant uplift to the current market and is more likely to have been driven by economic factors.*

That said-- I am hopeful that 2019 will bring more positivity. The hull and cargo markets appear to have bottomed-out and we are beginning to see a modest uplift, albeit from a low base. Profitability is likely to be pressured by the recent return of major losses, however.

More activity in the offshore energy markets is also good news, but reactivation of units adds to the overall risk profile. In short, the marine underwriting sector is characterized by uncertainty. At a macro-level this is created by political, economic and environmental factors; and at an industry level it is due to accumulations, a worrying and increasing incidence of major losses; and through a reactivation of the offshore sector."

IUMI's total world-wide premium includes data from all relevant marine insurance markets including Asia, Latin America and Africa. Care should be taken when making comparisons with earlier figures as data coverage varies in different years and a number of figures will be updated retrospectively.

Similarly, "global" loss ratios for hull, energy and cargo do not encompass all regions, and underwriting year results do develop over a couple of years due to a time lag in claims reporting and payments. Since 2017, **IUMI** has been able to show accounting year loss ratios originating from major Asian and Latin American markets, in addition to the underwriting year loss ratios reported from primarily major European marine insurance markets. When interpreting statistics, caution should always be applied regarding what the data actually relates to.

IUMI stresses that all figures released by **IUMI**'s Facts and Figures Committee are global market sums or averages. While these reflect the average performance of the marine insurance market, individual companies' or countries' results may differ substantially. As with all averages, individual underwriting units may over or underperform compared with the average. **IUMI** does not make any statements about what actual applied premium rates were or should be.

The aim of **IUMI** is solely to provide data as available and raise awareness for the importance of a critical Union evaluation of the risks covered. ⚓

CHOICES MADE NOW ARE CRITICAL FOR THE FUTURE OF OUR OCEAN AND CRYOSPHERE

by IPCC News

The latest **Intergovernmental Panel on Climate Change (IPCC) Special Report** highlights the urgency of prioritizing timely, ambitious and coordinated action to address unprecedented and enduring changes in the **ocean and cryosphere.** The report reveals the benefits of ambitious and effective adaptation for sustainable development and, conversely, the escalating costs and risks of delayed action. The ocean and cryosphere –the frozen parts of the planet– play a critical role for life on Earth. About 670M people in high mountain regions, and 680M people in low-lying coastal zones, depend directly on these systems. About 4M people live permanently in the Arctic region; and small island developing states are home to 65M people. Global warming has reached 1°C above the pre-industrial level due to past and current greenhouse gas emissions. There is overwhelming evidence that this is resulting in profound consequences for ecosystems and people. The ocean is warmer, more acidic and less productive. Melting glaciers and ice sheets cause sea level rise, and extreme coastal events are more severe.

The **IPCC Special Report on the Ocean and Cryosphere in a Changing Climate**, approved on 24-September-2019 by the 195 IPCC member governments, provides new evidence for the benefits of limiting global warming to the lowest possible level – in line with the goal that governments set themselves in the 2015 Paris Agreement. Urgently reducing greenhouse gas emissions limits the scale of **ocean and cryosphere** changes. Ecosystems and the livelihoods that depend on them can be preserved.

"The open sea, the Arctic, the Antarctic and the high mountains may seem far away to many people, but we depend on them and are influenced by them directly and indirectly in many ways – for weather and climate, for food and water, for energy, trade, transport, recreation and tourism, for health and wellbeing, for culture and identity. If we reduce emissions sharply, consequences for people and their livelihoods will still be challenging, but potentially more manageable for those who are most vulnerable. We increase our ability to build resilience and there will be more benefits for sustainable development," **Hoesung Lee**, Chair, **IPCC** said. Knowledge assessed in the report outlines climate-related risks and challenges that people around the world are exposed to today and that future generations will face. It presents options to adapt to changes that can no longer be avoided, manage related risks, and build resilience for a sustainable future. Adaptation depends on the capacity of individuals and communities, and resources available to them.

The **IPCC Special Report** is a key scientific input for world leaders gathering in forthcoming climate and environment negotiations, such as the **UN Framework Convention on Climate Change Conference (COP25)** in Chile in December. *"The world's ocean and cryosphere have been 'taking the heat' from climate change for decades, and consequences for nature and humanity are sweeping and severe,"* said **Ko Barrett**, Vice-Chair, **IPCC**. *"The rapid changes to the ocean and the frozen parts of our planet are forcing people from coastal cities to remote Arctic communities to fundamentally alter their ways of life,"* Barrett added. *"By understanding the causes of these changes and the resulting impacts, and by evaluating options that are available, we can strengthen our ability to adapt," Barrett said. "The Special Report on Ocean and Cryosphere in a Changing Climate provides knowledge for these kinds of decisions."*

Major changes in high mountains affecting downstream communities. People in mountain regions are increasingly exposed to hazards and changes in water availability. Glaciers, snow, ice and permafrost are declining, and will continue to do so. Hazards for people, through landslides, avalanches, rockfalls and floods will increase. Smaller glaciers in Europe, eastern Africa, tropical Andes, and Indonesia are projected to lose more than 80% of their current ice mass by 2100 under high emission scenarios. The retreat of the high mountain **cryosphere** will continue to adversely affect recreational activities, tourism, and cultural assets. As mountain glaciers retreat, they alter both water availability and quality downstream, with implications on sectors such as agriculture and hydropower. *"Changes in water availability will not just affect people in high mountain regions, but also communities further downstream,"* said **Panmao Zhai**, Co-Chair, **IPCC** Working Group I. *"Limiting warming would help adapt to changes in water supplies in mountain regions and*

beyond, and limit risks related to mountain hazards." Integrated water management and transboundary cooperation provide opportunities to address the impacts of less water resources.

Melting ice, rising seas. Glaciers and ice sheets in polar and mountain regions are losing mass, contributing to an increasing rate of sea level rise, together with expansion of the warmer ocean. While sea level has risen globally by around 15 cm during the 20th century, it is currently rising more than twice as fast –at 3.6 mm per year– and accelerating. Sea levels will continue to rise for centuries. It could reach around 30-60 cm by 2100 even if greenhouse gas emissions are sharply reduced and global warming is limited to well below 2°C; but will rise to 60-110 cm, if greenhouse gas emissions continue to increase strongly.

"In recent decades, the rate of sea level rise has accelerated, due to growing water inputs from ice sheets in Greenland and Antarctica, the contribution of meltwater from glaciers, and the expansion of warmer sea waters. This new assessment has revised upwards the projected contribution of the Antarctic ice sheet to sea level rise by 2100 in case of high GHG emissions. The wide range of sea level projections for 2100 and beyond is related to how ice sheets will react to warming, especially in Antarctica, with major uncertainties still remaining," said **Valérie Masson-Delmotte**, Co-Chair, **IPCC Working Group I.**

More frequent extreme sea level events. Sea level rise will increase the frequency of extreme sea level events, which occur for example during high tides and intense storms. Indications are that with any degree of additional warming, events that occurred once per century in the past will occur every year by mid-century in many regions, increasing risks for many low-lying coastal cities and small islands. Without major investments in adaptation, they would be exposed to escalating flood risks. Some island nations are likely to become uninhabitable due to climate-related **ocean and cryosphere** change, but habitability thresholds remain extremely difficult to assess. Increases in tropical cyclone winds and rainfall are exacerbating extreme sea level events and coastal hazards. Hazards will be further intensified by an increase in the average intensity, magnitude of storm surge and precipitation rates of tropical cyclones, especially if greenhouse gas emissions remain high. *"Various adaptation approaches are being implemented, often in response to flooding events, and the report highlights the diversity of options available for each context to develop integrated responses anticipating the full scale of future sea level rise,"* said **Masson-Delmotte**.

Changing ocean ecosystems. Warming and changes in ocean chemistry are disrupting species throughout the ocean food web, with impacts on marine ecosystems, and people that depend on them. To date, the ocean has taken up more than 90% of the excess heat in the climate system. By 2100, the ocean will take up 2-4 times more heat than between 1970 and the present if global warming is limited to 2°C, and up to 5-7 times more at higher emissions. Ocean warming reduces mixing between water layers and, as a consequence, the supply of oxygen and nutrients for marine life. Marine heatwaves have doubled in frequency since 1982, and are increasing in intensity. They are projected to further increase in frequency, duration, extent and intensity. Their frequency will be 20 times higher at 2°C warming, compared to pre-industrial levels. They shall occur 50 times more often if emissions continue to increase strongly. The ocean has taken up between 20%-30% of human-induced CO2 emissions since the 1980s, causing ocean acidification. Continued carbon uptake by the ocean by 2100 will exacerbate ocean acidification.

Ocean warming and acidification, loss of oxygen and changes in nutrient supplies, are affecting the distribution and abundance of marine life in coastal areas, in the open ocean and at the sea floor. Shifts in the distribution of fish populations have reduced the global catch potential. In the future, some regions, notably tropical oceans, will see further decreases, but there will be increases in others, such as the Arctic. Communities that depend highly on seafood may face risks to nutritional health and food security. *"Cutting greenhouse gas emissions will limit impacts on ocean ecosystems that provide us with food, support our health and shape our cultures,"* said **Hans-Otto Pörtner,** Co-Chair, **IPCC** Working Group II. *"Reducing other pressures such as pollution will further help marine life deal with changes in their environment, while enabling a more resilient ocean." "Policy frameworks, for example for fisheries management and marine-protected areas, offer opportunities for communities to adapt to changes and minimize risks for our livelihoods,"* **Pörtner** added.

Declining Arctic sea ice, thawing permafrost. The extent of Arctic sea ice is declining in every month of the year, and it is getting thinner. If global warming is stabilized at 1.5°C above pre-industrial levels, the Arctic ocean would only be ice-free in September –the month with the least ice– once in every hundred years. For global warming of 2°C, this would occur up to one year in three. Some people living in the Arctic, especially the indigenous peoples, have adjusted their traveling and hunting to the seasonality and safety of land, ice, and snow conditions. Some coastal communities have planned for relocation. Their success in adapting depends on funding, capacities, and institutional support. Permafrost ground that has been frozen for many years is warming and thawing, and widespread permafrost thaw is projected to occur in the 21st century. Even if global warming is limited to well below 2°C, around 25% of the near-surface (3-4 meter depth) permafrost will thaw by 2100. If greenhouse gas emissions continue to increase strongly, there is a potential that 70% near-surface permafrost could be lost. Arctic and boreal permafrost hold large amounts of organic carbon, almost twice the carbon in the atmosphere, and have the potential to significantly increase the concentration of greenhouse gases (GHG) in the atmosphere if they thaw. It is unclear whether there is a net release of CO2 or methane due to the ongoing thaw of the Arctic permafrost. In the future, increased plant growth can increase the storage of carbon in soils and offset CO2 release from permafrost thaw, but not at the scale of large changes on the long term. Wildfires are disturbing ecosystems in most tundra, boreal, and mountain regions.

Knowledge for urgent action. The report finds that strongly reducing greenhouse gas emissions, protecting and restoring ecosystems, and carefully managing the use of natural resources would make it possible to preserve the **ocean and cryosphere** as a source of opportunities that support adaptation to future changes, limit risks to livelihoods and offer multiple additional societal benefits. *"We will only be able to keep global warming to well below 2°C above pre-industrial levels if we effect unprecedented transitions in all aspects of society, including energy, land and ecosystems, urban and infrastructure as well as industry. The ambitious climate policies and emissions reductions required to deliver the Paris Agreement will also protect the ocean and cryosphere – and ultimately sustain all life on Earth,"* said **Debra Roberts**, Co-Chair, **IPCC** Working Group II.

SROCC provides the best scientific knowledge to empower governments and communities to take action, embedding scientific knowledge on unavoidable change and plausible futures into their own context, to limit the scale of risks and climate impacts. The report gives evidence of the benefits of combining scientific with local and indigenous knowledge to develop suitable options to manage **climate change risks** and enhance resilience. This is the first **IPCC** report that highlights the importance of education to enhance climate change, **ocean and cryosphere** literacy. *"The more decisively and earlier we act, the more able we will be to address unavoidable changes, manage risks, improve our lives and achieve sustainability for ecosystems and people around the world, today and in the future,"* she said. ⚓

ADDRESSING INVASIVE SPECIES IN SHIPS' BALLAST WATER - TREATY AMENDMENTS ENTER INTO FORCE

by IMO News

Amendments to an international treaty aimed at preventing the spread of potentially invasive species in ships' ballast water entered into force on 13-October-2019.

Ships regularly take on sea water in tanks to ensure their stability. Known as ballast water, this can contain many aquatic species, including in microscopic or larval form. These can become invasive and harmful if the ballast water is released, unmanaged, in a new location at the end of an ocean voyage.

The **International Maritime Organization (IMO)**, a specialized agency of the United Nations, adopted the 2004 **International Convention for Control and Management of Ships' Ballast Water and Sediments** (BWM Convention) to address the problem.

The **BWM Convention** entered into force in 2017. The amendments formalize an implementation schedule to ensure ships manage their ballast water to meet a specified standard, the "**D-2**" standard – aimed at ensuring that viable organisms are not released into new sea areas, and make mandatory the Code for Approval of Ballast Water Management Systems, which sets out how ballast water management systems used to achieve the **D-2** standard have to be assessed and approved.

This will help ensure that aquatic organisms and pathogens are removed or rendered harmless before the ballast water is released into a new location – and avoid the spread of invasive species as well as potentially harmful pathogens.

The amendments to the **BWM Convention** were adopted in April 2018. In essence, the schedule for implementation means that compliance with the D-2 standard set out in the Convention will be phased-in over time for individual ships, up to 8-September-2024. Over time, more and more ships will be compliant with the D-2 standard.

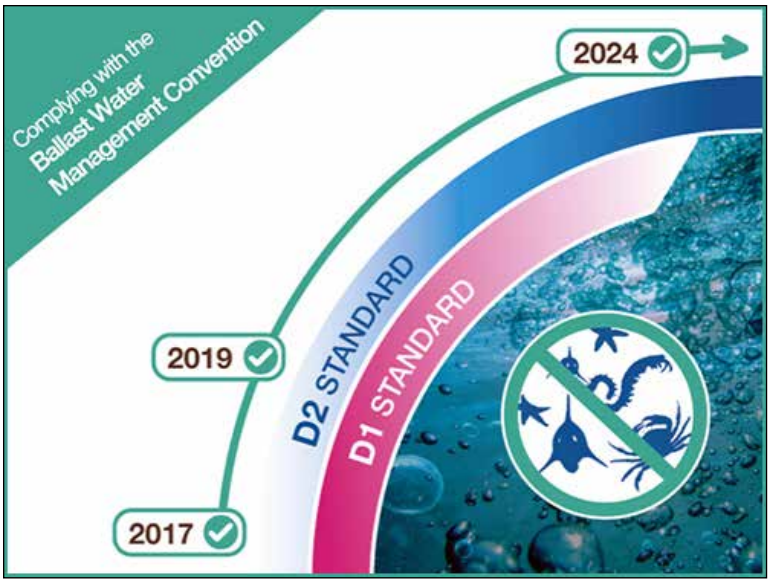
In many cases, meeting the D-2 standard will be achieved through fitting ballast water management systems. There are now many such approved systems on the market, ranging from those that use physical methods such as ultraviolet light to treat the ballast water, to those using active substances (chemicals). Those that use active substances have to go through a thorough additional approval process.

Other amendments to the **BWM** Convention entering into force on 13-October-2019 relate to survey and certification.

The **BWM Convention D-2 standard** – The **D-2** standard specifies that ships can only discharge ballast water that meets the following criteria:

- less than 10 viable organisms per cubic metre (m3) which are >= to 50 micrometers in minimum dimension;

- less than 10 viable organisms per milliliter which are between 10-50 micrometers in minimum dimension;
- less than 1 colony-forming unit (cfu) per 100 milliliters of Toxicogenic Vibrio cholerae;
- less than 250 cfu per 100 milliliters of Escherichia coli; and
- less than 100 cfu per 100 milliliters of Intestinal Enterococci.



The BWM Convention and the SDGs – Implementation of the **Ballast Water Management Convention** contributes to achieving a number of the **United Nations Sustainable Development Goals** (**SDGs**), i.e., **SDG 14** on life below water, which calls for sustainable use of the oceans; and **SDG 15**, which relates to biodiversity and curtailing the spread of invasive species.

The **BWM Convention requirements** – Since the Convention entered into force in September 2017, ships have been required to manage their ballast water to avoid the transfer of potentially invasive aquatic species. All ships must have a ship-specific ballast water management plan and keep a ballast water record book. Ships are also required to manage their ballast water to meet either the **D-1** ballast water exchange standard or the D-2 performance standard. The amendments in force from 13-October-2019 formalize the implementation schedule for the transition from the **D-1** to the **D 2** standard.

IMO – International Maritime Organization – is the United Nations specialized agency with responsibility for the safety and security of shipping and prevention of marine pollution by ships. ⚓

WHAT IS A SPONGE?

by NOAA

A variety of **sponges** *dot the seascape of Flower Garden Banks National Marine Sanctuary. From round to encrusting to branching, the colors and textures of* **sponges** *add to the complexity of the reef. Photo credit: G.P. Schmahl.*

Sponges — simple aquatic animals with dense, yet porous, skeletons — are highly adapted to their environments.

Sponges are found in a wide variety of colors, shapes, and sizes, and are often mistaken for plants. Scientists believe that their varied colorations may protect them from the sun's harmful ultraviolet rays.

Sponges have been around for a very long time, with certain species having a fossil record that dates back approximately 600 million years to the earliest period of Earth's history, Precambrian.

The approximately 8,550 living **sponge** species are scientifically classified in the phylum *Porifera*, which is comprised of 4 distinct classes: the *Demospongiae* (most diverse; 90% of all living **sponges**), *Hexactinellida* (rare glass **sponges**), Calcarea (calcareous **sponges**), and *Homoscleromorpha* (the rarest and simplest class, only recently recognized, with approximately 117 species).

While **sponges**, like corals, are immobile aquatic invertebrates, they are otherwise completely different organisms with distinct anatomy, feeding methods, and reproductive processes. The main differences are:

- Corals are complex, many-celled organisms. **Sponges** are very simple creatures with no tissues.
- All corals require saltwater to survive. While most **sponges** are found in the ocean, numerous species are also found in fresh water and estuaries.

Regardless of these differences, **sponges** are important inhabitants of coral reef ecosystems. A diverse **sponge** population can positively affect water quality on the reef as the **sponges** filter water, collect bacteria, and process carbon, nitrogen, and phosphorus. In nutrient-depleted coral reefs, some sponge species are thought to make carbon biologically available by excreting a form of *"sponge poop"* that other organisms feed on, thereby fueling productivity throughout the ecosystem. In this way, **sponges** protect the reef against extreme fluctuations in nutrient density, temperature, and light, benefiting the survival of other reef organisms.

A **sponge**'s skeletal type adapts well to its particular habitat, allowing it to live on hard, rocky surfaces or soft sediments such as sand and mud. Some **sponges** even attach themselves to floating debris! Rarely are they found completely free-floating.

As water filters through a **sponge**'s porous exterior, the sponge gains some motion, receives food and oxygen, and dispels waste. Inside the **sponge**, tiny hairlike structures called flagella create currents to filter bacteria out of the **sponge**'s cells and trap food within them. Their strong skeletal structures help **sponges** withstand the high volume of water that flows through them each day. ⚓

Maritime Academy of Asia and the Pacific - Kamaya Point

AMOSUP - PTGWO - ITF

Associated Marine Officers' and Seamen's Union of the Philippines-PTGWO-ITF

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MAAP Profile

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

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