



Quality, Health , Safety, Security & Environment Bulletin (QHSSE)

HEROES at Sea

MARFLET MARINE S.A.

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WE SALUTE YOU!

Thank you to all our seafarers for keeping the global energy supply chain uninterrupted despite the lockdown.

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Our crews, our heroes at sea

Seafarers have been the unsung heroes of this pandemic, as the world relies on them to transport more than 80% of trade by volume, including vital food and medical goods, energy and raw materials, as well as manufactured goods across the globe. They have also been collateral victims of the crisis, as travel restrictions have left tens of thousands of them stranded on ships, or unable to join ships.

The difficulties surrounding repatriation and crew changes also have a major impact on the shipping industry and have been identified as a priority issue, with IMO and other organizations urging governments to intervene. The matter has been taken up by the UN Secretary-General, who expressed his concern about the growing humanitarian and safety crisis facing seafarers around the world, and called on all countries to formally designate seafarers and other marine personnel as “key workers” and ensure crew changeovers can safely take place.

Mr. Guterres reiterated this call in his World Maritime Day message on 24 September 2020.

“We are on the verge of a humanitarian crisis and a real safety issue – we cannot expect seafarers currently on ships to stay at sea forever.”

As of 23 April 2021, 58 IMO Member States and two Associate Members have designated seafarers as key workers.

Member States are:

Azerbaijan, Bahamas, Bangladesh, Barbados, Belgium, Brazil, Canada, Chile, Croatia, Cyprus, Denmark, Dominica, Egypt, Finland, France, Gabon, Georgia, Germany, Ghana, Greece, India, Indonesia, Iran (Islamic Republic of), Ireland, Italy, Jamaica, Japan, Kenya, Kiribati, Lebanon, Liberia, Marshall Islands, Moldova, Montenegro, Myanmar, Netherlands, New Zealand, Nigeria, Norway, Panama, Philippines, Poland, Portugal, Republic of Korea, Romania, Saudi Arabia, Singapore, Slovenia, South Africa, Spain, Sweden, Thailand, Turkey, United Arab Emirates, United Kingdom, United States, Venezuela (Bolivarian Republic of), Yemen.

The Associate Members are:

Faroese and Hong Kong (China).

However, the situation remains complex, and difficulties are still reported. In some cases, the key worker designation may only apply to nationals of a particular country and restrictions still apply to seafarers from other countries - leaving foreign crew unable to transit through that country for repatriation.

This article posted on the IMO website describes the sentiments of the Marflet Marine management and shore team who want this bulletin to be a tribute to our own heroes:

the Captains and Crew of Marflet Marine fleet

represented by the crews currently on board the ships:

Panagia Thalassini



Loukas I



Markos I



Virgen del Cisne



Virgen de la Aurora



Virgen del Quinche



CAPTAIN & CREW M/T "PANAGIA THALASSINI"

Rodriguez Dominguez, Daniel	Master
------------------------------------	---------------

Ioseliani, Alexandre	Ch. Mate
Lopez Ticona, John Alexander	2nd Mate A
Hilario, Jefferson Garay	2nd Mate B
Roig Roig, Antoni	3rd Mate
Peña Lindao, Luis Alberto	Ch. Eng.
Garcia Alelis, Robert Dennis	1st A.E.
Loresco, Noven Ajito	2nd A.E.
Bernaola Saenz, Diego Armando	3rd A.E.

Hernandez Hernandez, Josue Manrique	Electrician
Capilitan, Ruben Calugas	Fitter

Parin, Elmario Columna	Bosun
Diola, Roland Lacerna	Pumpman
Aguilas, Jonathan Acero	A.B.
Castillo, Nelson Agpalo	A.B.
Lintag, Noel Bamba	A.B.
Hobrero, Marvin Jr. Biding	Oiler
Gasangan, Neil Daga	Oiler
Jalbuna, Alan Senial	Oiler

Mapacpac, Christopher Logmao	Ch. Cook
Rivarez, Jose Alberto Onat	Catos
Sagrario, Tedie Duterte	Catos

Martinez Alvarez, Aida	Deck Cadet
Supervielle Berges, Fernando Javier	Deck Cadet
Ferrando Garcia, Rafael	Deck Cadet



M/T " PANAGIA THALASSINI"



CAPTAIN & CREW M/T "LOUKAS I"

Dimaandal Gail De Claro	Master
-------------------------	--------

Kvitchatyy, Oleksandr	Chief Officer
Rojas , Archie Sevilla	2/Off-A-
Villas, Lloyd Artiola	2/Off-B-
Rodriguez Mendez, Noelia	3/Off
Relox, Erwin Rago	C/Eng
Gito, John Dominic Niervo	1/AE
Navarro, Ivan Greg Barillo	2/AE
Hernandez, Lloyd Vincent Dugkem	3/AE

Ortega, Roger Tolentino	Fitter
Lumagui, Janssen Ruaya	Elec.

De Paz, Denis Hombria	Bosun
Caballero, Jonh Paul Cantos	Pump.
Casenas, Danilo Costales	A.B. -1-
Domalaon, Ding Galindez	A.B. -2-
Paligumba, Lovel Jame Villanueva	A.B. -3-
Aldamar, Jayson Seguero	Motorman-1
Tirol, Brian Estorgio	Motorman-2
De Vera, Wilfredo Dino	Motorman-3

Tanio, Jose Bernal	C/Cook
Lolo, Marlon Mapalo	Cat/Os
Reyes, Richard Napili	Cat/Os

Martinez Iopez, Elena	D/Cadet
Velazquez Perez, Borja Jesus	D/Cadet
Rodriguez Rodriguez, Cristo Jose	D/Cadet
Goroza, Edison Calderon	Elec. JR



M/T "LOUKAS I"



CAPTAIN AND CREW M/T "MARKOS I"

Tkachov, Ruslan

Master

Bondarenko, Vyacheslav	Ch. Mate
Pons Vidal, Cristofol	2nd Mate A
Dorado, Kevin Gil Casio	2nd Mate B
Carril Chorro, Mario	3rd Mate
Ivanov, Alexander	Ch. Eng.
Fuentebella, Neil Arvin Caberoy	1st A.E.
Anticona Sotelo, Gianfranco Abel	2nd A.E.
Teodosio, Benny Sadiasa	3rd A.E.

Atok, Juanito Jr Jometelco	Bosun
Ramos, Bernard Atendido	Pumpman
Varona, Stephen Viñas	A.B. 1
Villanueva, Jefer Villaruel	A.B. 2
Causarin, Reginard Peñalba	A.B. 3
Malong, Archie Wilfred Labiaga	Oiler 1
De Asis, Richard Esquillo	Oiler 2
Gonzales, Edgar Navanes	Oiler 3

Leyesa, Victor Jose Olmilla	Electrician
Marquez, Glenn Ramirez	Fitter

Martinez Alcaina, Judith	Deck Cadet
Morera Chiva, Judit	Deck Cadet
Borysenko, Borys	Deck Cadet
Moreno, Christian Hernandez	Electrician Jr

Esquero, Dennis De Guzman	Ch. Cook
Acosta, Romredo Jamin	Catos
Balen, Richard Wong	Catos



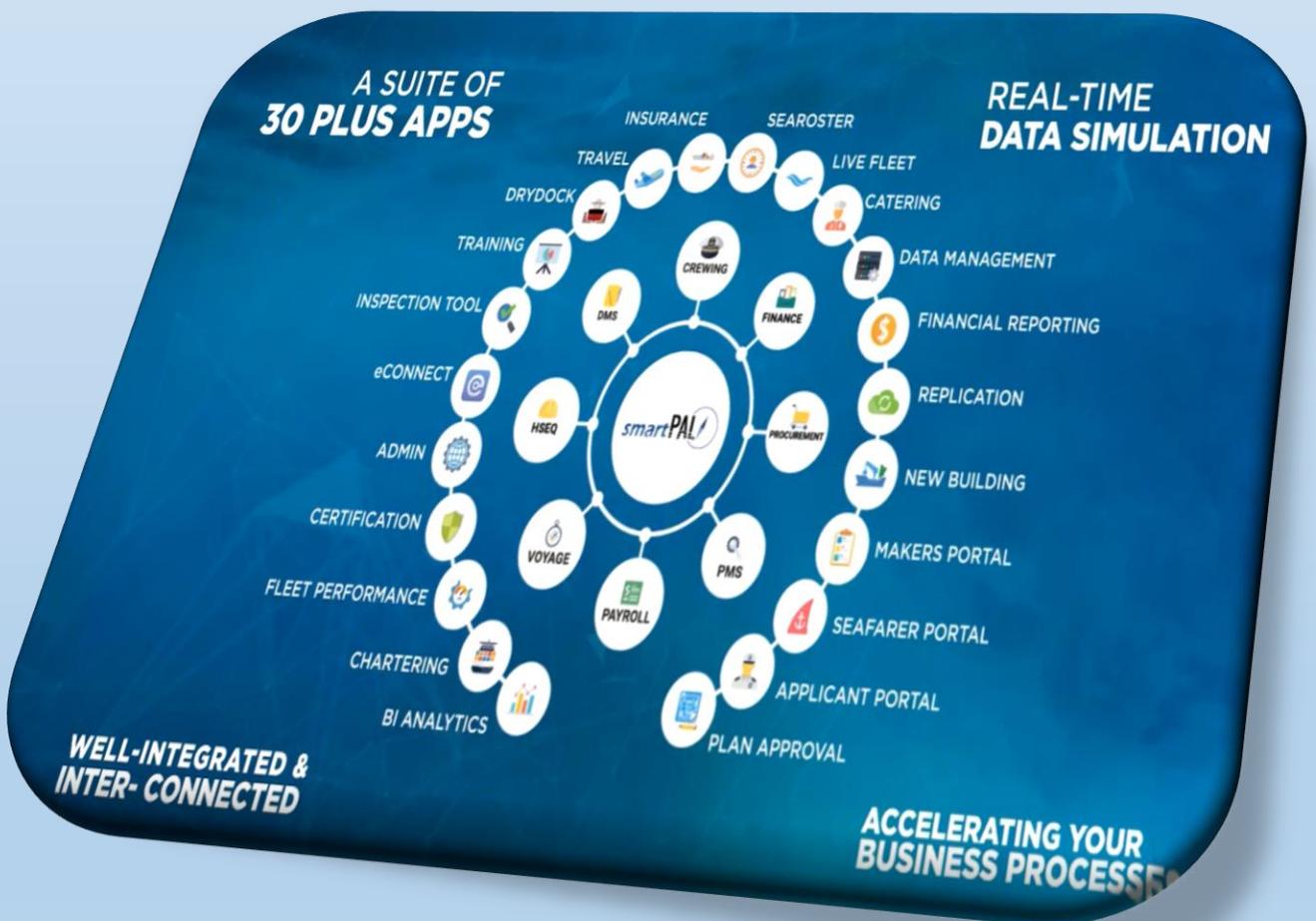
M/T "MARKOS I"





MARFLERT MARINE is already investing resources to promote a cloud based web ERP solution which will accelerate our business process, enabling seamless communications between vessel crew and office staff to continuously improve our way to connect with everything related with ship managements.

The app developed by Mariapp (*Smart Pal 4,0*) has been successfully installed on more than a thousand vessels and connecting 30,000 seafarers all around the world and it will provide a suite of 30 plus Apps integrated and inter-connected in real time.



Smart Pal will be firstly installed on MT PANAGIA THALASSINI and MT SANTIAGOS I, replacing our existing and current PMS and procurement system. Moving forward to a more flexible and efficient app with a dynamic workflow configuration and developing a End to End integration with financial and accounting department.

Following module will be installed on board our good vessel:

- PMS
- CREWING
- FINANCE
- PROCUREMENT
- VOYAGE
- CHARTERING
- HSEQ



BEST PRACTICES REPORT (2ND. Q)



MARFLET MARINE S.A.

BEST PRACTICE

RESCUE BOAT / FREEFALL BOAT SEARCH LIGHT

The Rescue Boat and the Freefall Boat are provided with a search light, in order to find a person or object lost at sea, so its operational status is very important within the boats.

The connectors of these lights corroded quickly due to the elements (humidity, salt), causing them to malfunction. This Best Practice focuses on the correct maintenance of these lights. For this reason, it is recommended to stow it inside a sealed bag, with a silica gel packet / sachet to avoid the humidity of the air and increase the durability of the search lights.



D/C ELENA MARTINEZ LOPEZ

Best Practice received from M/T LOUKAS I

BEST PRACTICE

This best practice is related with situations where the crew members lives are compromised. At the moment to abandon ship, exist the possibility that not all the crewmembers were at the same liferaft, so it could be necessary identify the rescued ones and the remaining ones, that could be still lost, maybe for something like communicate to their families or notify to their embassy.

So this best practice is based on printing the crewmembers list as many as liferafts and boats we can find on board, modifying it size into a small one. This crewmember lists can be replace with new ones when its required during the weekly or monthly inspections.



Deck Cadet
Cristo Rodriguez

Best Practice received from M/T LOUKAS I

MARFLET MARINE S.A.

MT PANAGIA THALASSINI

THE IMPORTANCE TO HAVE A FFB INVENTORY LOCKER WELL ORGANIZED

- BY 3rd/OFF ANTONI ROIG & D/C AIDA MARTINEZ -
- M/T PANAGIA THALASSINI -

FOLLOWING LSA CODE, ALL THE EQUIPMENT INSIDE THE FREE FALL BOAT SHALL BE KEPT FREE FOR FENDING-OFF PURPOSES, SECURED WITH LASHINGS AND STORED INSIDE LOCKERS OR COMPARTMENTS.



ALL ITEMS SHALL BE SECURED IN SUCH A MANNER AS NOT TO INTERFERE WITH ANY LAUNCHING OR RECOVERY PROCEDURES, AND PACKED IN **SUITABLE** AND **COMPACT** FORM TRACKING TAKING IN ACCOUNT SOLAS, LSA CODE AND LSA MAINTENANCE INSTRUCCIONS FROM THE COMPANY.



HERE IS WHERE COMES OUR BEST PRACTICE: MARKING ALL THE ITEMS IN THE INVENTORY COMPARTMENT WITH THE DYMO, WITH THE MAIN OBJECTIVE OF FIND ANY EMERGENCY EQUIPMENT IN AN EASIER AND QUICKER WAY.



THREE ADVANTAGES:

- AS A SAFETY PURPOSE:
IN CASE OF EMERGENCY ANY CREW MEMBER CAN OPEN THE COMPARTMENT AND DISTINGUISH DIRECTLY WITH JUST READING WHAT THERE IS INSIDE.
- EASY CHECKS DURING WEEKLY AND MONTHLY INSPECTIONS.
- A WELL ORGANIZED COMPARTMENT WILL GIVE VERY GOOD IMPRESSIONS TO ANY SURVEYOR WHILE INSPECTION.

Best Practice received from M/T Panagia Thalassini

WATER ANALYSIS AND CHEMICAL TREATMENT, PROTECTION PERSONAL EQUIPMENT WILL BE USE BEFORE START JOB, AS FOLLOW:

1. APRON.
2. FACESHIELD
3. RUBBER GLOVES.
4. ADVISE TO ENGINEER ON WATCH OR 1 ASSISTANSE ENGINEER.



2AE. – NOVEN LORESCO



Best Practice received from M/T Panagia Thalassini

MAINTENANCE MAIN AIR COMPRESSORS, BEFORE COMMENCED JOB, AS FOLLOW:

- 1. CUTT OFF POWER CONTROL.**
- 2. WARNING NOTICED POSTED ON PLACED.**
- 3. ADVISE TO ENGINEER ON WATCH OR 1 ASSISTANSE ENGINEER.**



3AE. – DIEGO BERNAOLA



Best Practice received from M/T Panagia Thalassini



MARFLET MARINE S.A.

BEST PRACTICE - SAFETY LOCKER INVENTORY AND MAINTENANCE

The safety locker it is the store on board, there are placed inside all the spares and tools needed for the correct maintenance of life saving and firefighting equipment, such as lifejackets, lifebuoy rings, fire hydrants, fire extinguishers, etc.

It is important when an officer sign on a vessel that has not been on for a long time ago, to check this spares that are placed inside the safety locker in order to know the availability of them and commence a planning of full maintenance of the equipment of which is responsible. Moreover, in case of urgent necessity of tools or spares, we can know immediately where to look for them faster.

This Best Practice recommends to all officers to keep this space with an updated inventory at all times as well as clean and tidy. It is also a good reference for preparing safety equipment requisitions, requesting only the exact quantities of spares/stores needed on board.



2OFF CRISTOFOL PONS VIDAL



Best Practice received from M/T MARKOS I

NEAR MISS REPORT 2ND. Q.

MARFLET MARINE S.A.

NEAR MISS REPORT FORM

VESSEL NAME: MARKOS I	PORT/ T EA: AT SEA
DATE: 13-JULY-2021	TIME: 10:00 LT
ORIGINATOR NAME: CRISTOFOL PONS VIDAL	RANK: 2 ^{N*} OFFICER
DESCRIPTION OF EVENT: DURING ROUTINARY INSPECTION OF FFE, A FIRE HYDRANT WAS OPENED FOR CHECKING ANY INTERNAL LEAKAGE. SUDDENLY, THE BLANK CAP WAS VIOLENTLY EJECTED	
BREACHES OF REGULATIONS: CONSTRUCTION OF HYDRANT NOT ACCORDING SOLAS REGULATIONS	
POSSIBLE CONSEQUENCES! (e.g. Personal injury' fall, hit, bum, etc; Damage: oollision, fire. Pollution, etc; or Any other) PERSONAL INJURIES ON HANDS, ARM OR FACE	
RELEVANT FACTORS/CONDITIONS SURROUNDING THE EVENT: (e.g. adverse weather, sea conditions, lighting, etc) GOOD WEATHER, SLIGHT SEA, DAYLIGHT	
DIRECT CAUSE: NEGLIGENCE/ LACK OF SUPERVISION	
ROOT CAUSE: BLANK CAP OF HYDRANT, NOT FITTED WITH HOLE TO PERMIT THE SAFE RELEASE OF ANY ACCUMULATED AIR OR PRESSURE PRIOR REMOVAL OF BLANK CAP	
ACTION TAKEN ONBOARD TO AVOID RE-OCURENCE: ALL HYDRANT BLANX CAPS SOUND WITH THESE CHARACTERISTICS (A TOTAL OF 15) HAVE BEEN REMOVED AND HAVE BEEN SENT TO ENGINE WORKSHOP IN ORDER TO ADD A SMALL HOLE ON THE BLANK CAPS.	



BEFORE:

2nd. Mate Cristofol Pons



AFTER:

Best Practice received from M/T MARKOS I

BEST PRACTICES WINNERS PAGE

Deck Cadet Helena Martinez



2nd. Mate Cristofol Pons



Deck Cadet Cristo Rodriguez

BEST PRACTICES WINNERS PAGE

2AE. – NOVEN LORESCO



3AE. – DIEGO BERNAOLA



**3er. Mate Antoni Roig
Deck Cadet Aida Martinez**

HEALTH AWARENESS

Mental wellness, while often overlooked, is an important aspect of the health and wellbeing of the crew aboard a ship. Accidents or incidents resulting from a seafarer's mental breakdown will have significant consequences for the company and ship's crew. In the seagoing community an understanding and engagement in matters of mental health is vital. In this guidance, we will review some of the common risk factors of a developing mental health condition and recommend measures to prevent or treat an occurrence onboard. Recognizing the developing symptoms, or early warning signs, can and will make a difference.

There are many different conditions that are recognized as mental illness(es). Some of the more common types include:

Anxiety - intense, excessive and persistent worry and fear about everyday situations. Often, anxiety disorders involve repeated episodes of sudden feelings of intense anxiety and fear or terror that reach a peak within minutes (e.g. panic attacks).

Depression - a mood disorder that causes a persistent feeling of sadness and loss of interest.

Eating disorders - involve extreme emotions, attitudes, and behaviors involving weight and food, commonly taking form as anorexia, bulimia, or binge eating.

Impulse control and addiction disorders - People with impulse control disorders are unable to resist urges or impulses to perform acts that could be harmful to themselves or others. Pyromania (starting fires), kleptomania (stealing), drug/alcohol abuse, or compulsive gambling are examples of impulse control disorders.

HEALTH AWARENESS

Post-traumatic stress disorder (PTSD) - people with PTSD often have lasting and frightening thoughts after experiencing a terrifying or traumatic event such as sexual assault, death of a loved one, or disaster.

Obsessive compulsive disorder (OCD) - a constant fear that compels a person to perform rituals or “compulsions”.

Common stress - leading to erratic or unpredictable actions.

While all of them are different, without effective treatment for the ailing seafarer, these illnesses could result (and have resulted) in serious consequences for the ship and its operation.

Stress can have mental, physical, emotional, and behavioral effects on a person.

You may recognize small changes in an individual or feel that “something is just not right.”

Early intervention can help prevent an illness from worsening

10 WAYS TO ENSURE WELLBEING OF SEAFARERS AT SEA

Seafaring being a job primarily requiring a tough mental constitution, seeking help with regard to mental health issues is daunting even on a personal level, seemingly perceived as a jab on one's weakness.

- 1 **INCREASING SHORE LEAVE:**
- 2 **PREVENTING ABANDONMENT OF SEAFARERS:**
- 3 **STEPS TO IMPROVE MENTAL HEALTH:**
- 4 **IMPROVING GLOBAL WAGES OF SEAFARERS:**
- 5 **TAKING STEPS TO PREVENT CRIMINALIZATION:**
- 6 **ON-TIME REPATRIATION:**
- 7 **MORE ACCESSIBLE SUPPORT FROM ORGANIZATIONS:**
- 8 **PROPER AND STRINGENT IMPLEMENTATION OF MLC CONVENTION:**
- 9 **BETTER INTERNET FACILITY**
- 10 **KEEPING A CHECK ON FRAUD AGENTS AND CORRUPTION:**

COVID-19 / DELTA VARIANT

Even as crew began to feel some hope—or at least cautious optimism—early this summer that the pandemic could recede to the background, there was still the threat that new mutations of the COVID-19 virus could bring it back, and it might be even stronger.

A major worry right now is Delta, a highly contagious SARS-CoV-2 virus strain, which was first identified in India in December. It swept rapidly through world, where it is now the predominant variant.

The Delta variant is described as more transmissible than the common cold and influenza, as well as the viruses that cause smallpox or Ebola

The highest spread of cases and severe outcomes is happening in places with low vaccination rates, and virtually all hospitalizations and deaths have been among the unvaccinated. But vaccinated people also can transmit Delta.

Here are four things you need to know about the Delta variant.

- 1. Delta is more contagious than the other virus strains.**
- 2. Unvaccinated people are at risk.**
- 3. There is still more to learn about Delta.**
- 4. Vaccination is the best protection against Delta.**

COVID-19 / DELTA VARIANT

The most important thing you can do to protect yourself from Delta is to get fully vaccinated

Whether or not you are vaccinated, you must follow COVID-19 Outbreak management plan guidelines

Face masks can provide additional protection and the WHO has encouraged mask-wearing even among vaccinated people.

Marflet Marine, despite all the obstacles and difficulties encountered, has managed to vaccinate all the crews of the ships of the fleet except the crew of the Markos I

The Virgen de la Aurora, all crew vaccinated at Chalmette (USA) on 09.06.2021

The Panagia Thalassini, all crew vaccinated at Vancouver, W. on 22.06.2021)

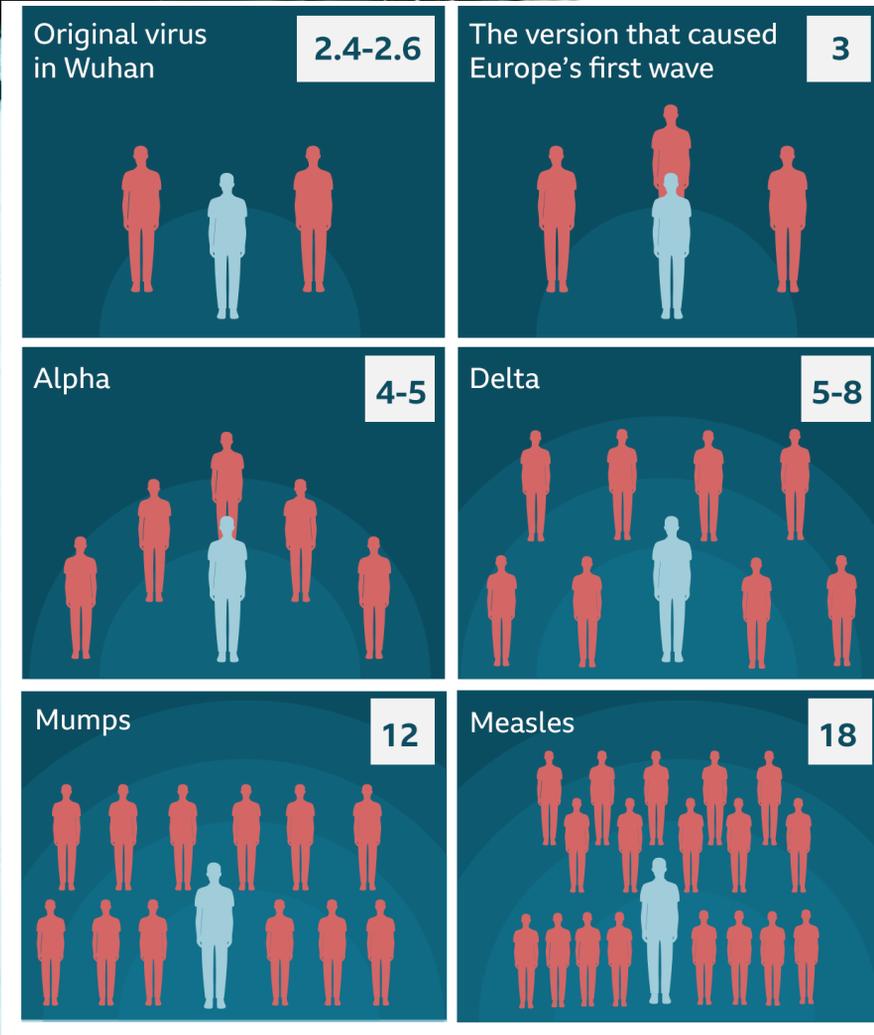
The Virgen del Quinche, all crew vaccinated at Beaumont (USA) on 11.06.2021

The Virgen del Cisne, all crew vaccinated at Lake Charles (USA) on 18.06.2021

The Loukas I, all crew vaccinated at Limassol (Cyprus) on 05.08.2021

The Markos I, bound for Mexico, the crew will be vaccinated, if possible, at the first port of call Tuxpan (around 25,08.2021)

COVID-19 / DELTA VARIANT



COVID 19 variant and other diseases compare



VETTING FINDINGS (SIRE)

MJR	CHTR	SIRE OBSERVATIONS
EQUINOR	9.5	Mooring Lines LDBF (conventional ropes) values were not available at the time of inspection. Certificates were observed issued as per MEG3.
EQUINOR	10.38	440 Volt Switchboard located inside the engine control room. Insulation monitoring device was observed almost infinite, but the alarm setpoint was observed set at 0.5 megaohms. Similarly, the 220 Volt switchboard insulation monitoring device was observed indicating almost infinite megaohms, but the alarm setpoint was also observed set at 0.2 megaohms. Issue was immediately rectified by the Chief Engineer.

CDI FINDINGS

CHTR	CDI OBSERVATION
1.2.1	The Fire Safety Training Manual from the Crew Messroom was not ship specific. Operating instructions for the Emergency Generator and Emergency Fire Pump fitted on board the vessel had not been entered into the relevant parts this manual. Rectified during the inspection.
6.2.2	3 months Fuel oil pump emergency stops: last recorded test was 15 Feb. 2021. The test is required to be carried out quarterly by Company instructions. The record was two months out of date.
6.3.1	Workshop equipment: Homemade steel handles welded to 4x hammerheads located in the Pumpman's workshop on deck.
7.1.4	Emergency procedures are available and adequate for actions to be taken onboard in the event of an emergency situation in nearby proximity to the vessel (i.e. fire onboard a nearby vessel, a release within the terminal, etc.).

PSC FINDINGS



Congratulations
 Captain and Crew of the
 B / T Panagia Thalassini,
 zero deficiencies in the
 PSC carried out by
 USCG on June 22 in
 Vancouver (WA), it is a
 very good result that
 we are sure will be the
 result for the next
 inspections

Congratulations
 Captain and Crew of
 the B / T LOUKAS I,
 zero deficiencies in the
 PSC carried out by
 Paris MoU on August
 13 in Cartagena
 (Spain).
 Zero observations on a
 ship built in 2005, is
 proof of the good work
 of the Captain and his
 Crew



Environmental issues

Shipping's impact on air quality

Climate change is one of the most important environmental issues of our time. Climate change is caused by the increase in concentrations of greenhouse gases (GHGs) in the atmosphere. These increases are primarily due to human activities such as the use of fossil fuels

Ship emissions constitute an important gaseous and particulate pollution source on the global scale, which has become progressively more important in recent years due to increasing shipping activities

Poor air quality due to international shipping accounts for approximately 400,000 premature deaths per year worldwide. Through chemical reactions in the air, SO₂ and NO_x is converted into fine particles, sulphate and nitrate aerosols. In addition to the particles directly emitted by ships such as black carbon, these secondary particles increase the health impacts of shipping pollution. Tiny airborne particles are linked to premature deaths. The particles get into the lungs and are small enough to pass through tissues and enter the blood. They can then trigger inflammations which eventually cause heart and lung failures. Ship emissions may also contain carcinogenic particles.

On a global scale, the marine shipping industry's share of total emissions from human sources is:

CO₂

2.2%

per year

SO_x

13%

per year

NO_x

15%

per year

Environmental issues

Shipping's impact on air quality

This massive source of emissions cannot be ignored. Our fossil-fuel addiction is having a disastrous impact on the planet, particularly on our oceans. Increased heat and acidity, melting sea ice, and decreasing oxygen levels are wiping out coral reefs, threatening marine life, and undermining the ocean's ability to function as a key ecosystem and climate regulator. Considering that every second breath we take comes from the ocean, our own health is directly linked to that of this natural system.

The [Third IMO GHG Study](#) (2014) estimated that for the period 2007-2012, shipping emitted about 1,000 Mt CO₂ per year, equaling approximately 3.1% of annual global CO₂ emissions. The [latest update](#) to the study by CE Delft projects shipping emissions to increase by up to 120% by 2050 if other sectors decarbonise successfully. Under a business-as-usual scenario and if other sectors of the economy reduce emissions to keep the global temperature increase below 2 degrees Celsius, *shipping* could represent some 10% of global GHG emissions by 2050.

Shipping also contributes to *climate change* through emissions of Black Carbon, tiny black particles, produced by combustion of marine fuel. The highest amounts of black carbon particles are produced by ships burning heavy fuel oil. Black carbon accounts for [21% of CO₂-equivalent emissions from ships](#), making it the second most important driver of shipping's climate impacts after carbon dioxide. Currently there are no regulations controlling black carbon emissions from shipping.

Environmental issues

The bunker fuel

Heavy fuel for propulsion;
Diesel for auxiliary engines

Ships are a source of many pollutants

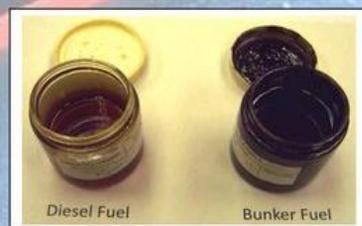
*Sulfur oxides (SO₂),
Carbon dioxide (CO),
Nitrogen oxides (NO_x),
benzene,
Particulate matter
Heavy metals*



SO₂ is a gas that in the presence of the aerosols from air can directly react with atmospheric oxygen to form sulfur trioxide (SO₃), which, reacting with the water in gaseous state origins sulfuric acid and contributes to the formation of **acid rain**

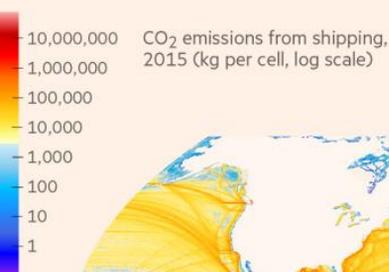


Effects caused by acid rain over a 60 years period in a **marble statue**. Castle Herten, Germany.

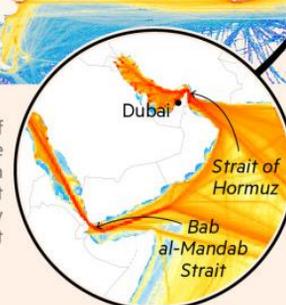


Only **asphalt** and **bitumen** are more thick than fuel oil!

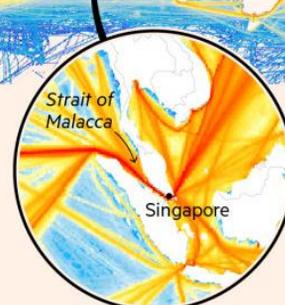
Shipping routes and maritime chokepoints



Rotterdam and Antwerp are Europe's largest ports. Ships sail to and from the northern ports through the busy Strait of Gibraltar



The EIA estimates that 30% of the world's crude and 30% of the global LNG trade moves through the Strait of Hormuz, making it the world's most strategically vital chokepoint



The Strait of Malacca is the shortest sea route between the Gulf and East Asian ports. Its narrowest point near Singapore is about 1.7 miles wide, creating a natural bottleneck

Environmental issues

Pollution Types from Marine Shipping

Carbon Dioxide (CO₂)

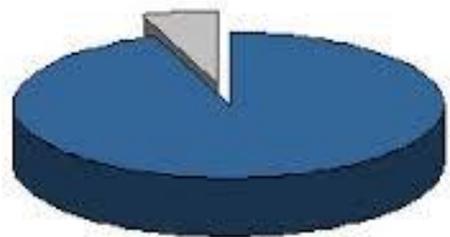
A major GHG contributing to climate change and ocean acidification.

- CO₂ contributes to widespread climate change by trapping the sun's heat. These climate changes include increased average and extreme temperatures and increases in hazardous weather.

- Climate change-induced extreme weather events such as heat waves, floods and major storms have a negative impact on human health and cause untimely deaths worldwide.

- When CO₂ is absorbed by seawater, the water becomes more acidic. This increase in acidity has adverse effects on marine life and ecosystems.

Sources of Carbon Dioxide Emissions



■ Fossil Fuel Combustion ■ All Other Sources

Environmental issues

Pollution Types from Marine Shipping

Nitrogen Oxides (NO_x)

A collection of gases of various combinations of nitrogen and oxygen that:

- Cause lung inflammation when breathed, increasing susceptibility to harm from allergens in people with asthma. NO_x may enter the bloodstream and with long-term exposure lead to eventual heart and lung failures.
- Interact with volatile organic compounds (VOCs) to create ground-level ozone, which contributes to eye, nose and throat irritations; shortness of breath; worsening of respiratory conditions; chronic obstructive pulmonary disease; asthma and allergies; cardiovascular disease and untimely death.
- Cause acidification of soil and water (acid rain).
- Decrease crop and vegetation productivity due to ground-level ozone, threatening food security.
- Flood ecosystems with excess nitrogen nutrients, leading to toxic algal blooms in coastal waters and inland lakes.

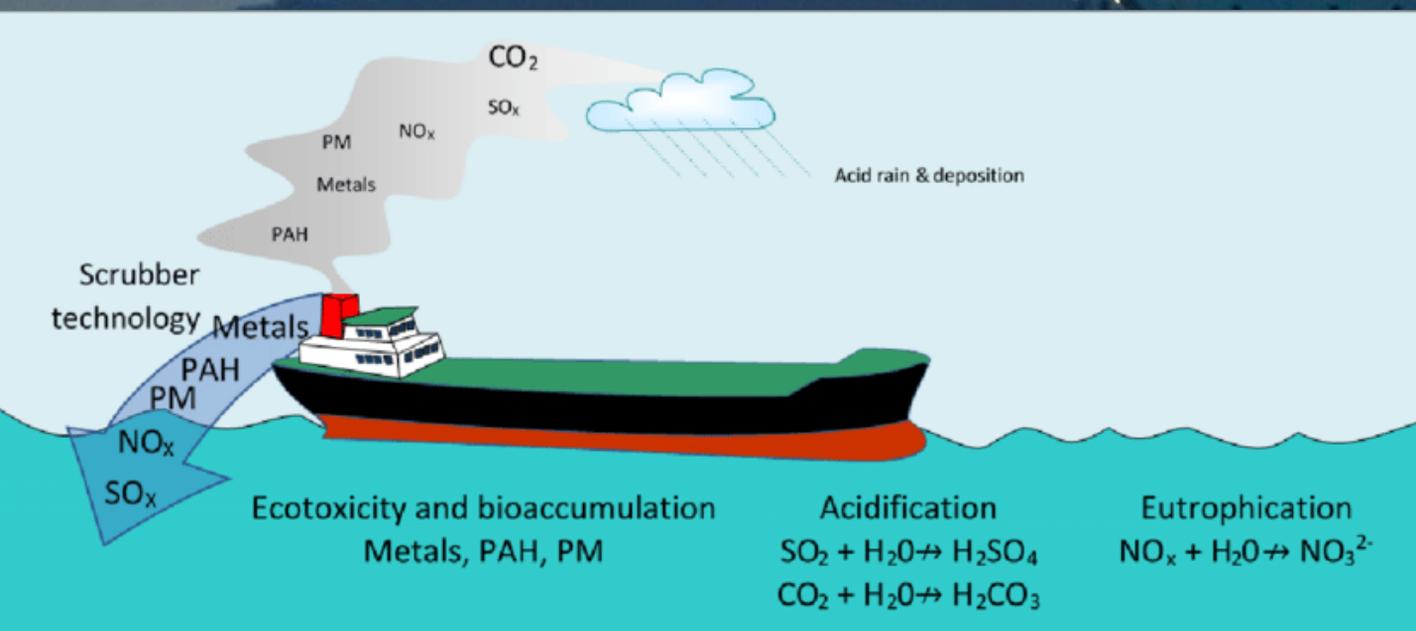
Environmental issues

Pollution Types from Marine Shipping

Sulphur Oxides (SO_x)

A collection of gases of various combinations of sulphur and oxygen that:

- Cause lung inflammation when breathed, increasing susceptibility to allergens in people with asthma. SO_x and may enter the bloodstream and with long-term exposure lead to eventual heart and lung failures.
- Cause eye irritation, increased susceptibility to respiratory tract infections, and increased hospital admissions for cardiac disease.
- Cause acidification of soil and water (acid rain).



Environmental issues

Pollution Types from Marine Shipping

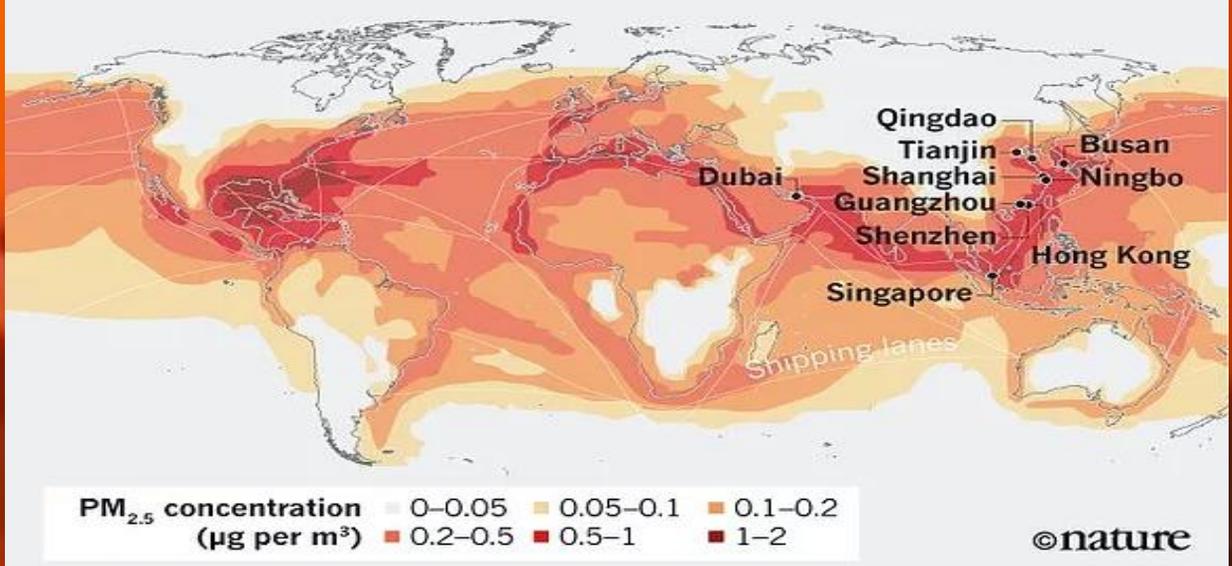
Particulate Matter

A collection of solid and liquid particles formed during fuel combustion that:

- Can be inhaled into people's lungs and then absorbed into the bloodstream, which has been linked to many negative heart and lung health outcomes, including cancers.
- Are a component of smog.
- Form "black carbon", the second largest contributor to climate change after CO₂. While airborne, black carbon absorbs solar energy and contributes to atmospheric warming, before falling to earth as precipitation that darkens snow and ice surfaces. High concentrations of black carbon on ice and snow significantly reduce solar energy reflected back into space – the albedo effect – and accelerate melting.

THE DIRTY TEN

Particulate matter less than 2.5 micrometres (PM_{2.5}) emitted from dirty marine fuel oil causes poor air quality along shipping lanes. Emissions-control zones omit the ten largest container ports, which contribute an estimated 20% of worldwide port emissions of nitrogen oxides and sulfur oxides.



The 'Juan Sebastián de Elcano' is a very well-known ship both at home and abroad,

This four mast brig-schooner with crossed foresail is also a floating Spanish embassy..

Her presence in foreign countries and ports contributes to the Spanish foreign policy. When showing the flag, apart from giving a good image, it allows Spanish citizens living abroad to step onto a 'small part of the Homeland'. Her silhouette is also easily recognized by most tall-ship lovers



As training ship, the 'Elcano' (as she is normally known) is entrusted with the formation and training of future Spanish Navy officers.