INTERNATIONAL MARITIME ORGANIZATION

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MSC-MEPC.3/Circ.5
22 July 2021

CASUALTY-RELATED MATTERS*
REPORTS ON MARINE CASUALTIES AND INCIDENTS

Communication received from the Government of Chile

1 A communication has been received from the Government of Chile providing a compendium related to "Lessons Learned in Accidents Occurring to Merchant, Fishing and Sport Vessels, Port, Diving and Aquaculture Vessels".

2 At the request of the Government of Chile, the above-mentioned compendium, annexed hereto, is circulated to Member States, as well as international organizations and training institutions, for their information.

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* In order to facilitate the identification and retrieval of information circulated by means of joint MSC-MEPC circulars, from now on such information will be disseminated through the following circular series:

1 Organization and methods of work, as MSC-MEPC.1/Circ…
2 General matters, as MSC-MEPC.2/Circ…
3 Casualty-related matters, as MSC-MEPC.3/Circ…
4 Port State control-related matters, as MSC-MEPC.4/Circ…
5 Survey and certification-related matters, as MSC-MEPC.5/Circ…
6 National contact points for safety and pollution prevention and response, as MSC-MEPC.6/Circ…
7 Human element-related matters, as MSC-MEPC.7/Circ….

MARITIME ACCIDENTS INVESTIGATION AND ANALYSIS DIVISION

CHILEAN NAVY
DIRECTEMAR

LESSONS LEARNED

FROM ACCIDENTS INVOLVING MERCHANT, FISHING, AND SPORT VESSELS, AND PORT, DIVING, AND AQUACULTURE OPERATIONS.

COURTESY TRANSLATION
ORIGINAL LANGUAGE SPANISH

EDITION №1/ 2020

TO MERCHANT, FISHING AND SPORT VESSELS CREWS, MARITIME AND PORT ENTREPRENEURS, PORT AND CHANNEL PILOTS, DIVERS, AQUACULTURE AND PORT WORKERS

The Directorate General of the Maritime Territory and Merchant Marine, to accomplish its mission and in compliance with the provisions established by international laws and conventions, investigates marine casualties and incidents to determine their causes and circumstances, in order to acknowledge their risks and prevent them from reoccurring.

Maritime activities are certainly one of the main pillars in the development of our nation. They are performed in a hazardous environment which requires competent and informed people who do not repeat dangerous behaviours and conditions that have demonstrated to cause losses and unwanted situations.

Although the complete reports of the investigations are available on the website of DIRECTEMAR (https://investigacion-acc.directemar.cl/buscador), I wanted to go a step further and share our experiences with the national and international maritime community, aiming to contribute to the safety of human life at sea and preserve property and the marine environment.
This compendium titled ***"Lessons Learned from Accidents involving Merchant, Fishing, and Sport Vessels, and Port, Diving, and Aquaculture Operations"*** gathers events, conditions and dangerous decisions, focusing on the lessons learned. This document is not intended to establish guilt or liability, its only purpose is to prevent accidents.
I hope that this first compendium of lessons learned contributes to Maritime Safety, so that, God willing, crews, workers, entrepreneurs and the Maritime Authority keep working together with greater determination and conviction for the maritime development of Chile and the enhancement of our Nation.

IGNACIO MARDONES
VICE ADMIRAL
DIRECTOR GENERAL

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PROLOGUE

The lessons learned from the following marine accidents have been analysed from the perspective of continuous improvement to safety pursued by the International Maritime Organization (IMO) and the Directorate General of the Maritime Territory and Merchant Marine (DIRECTEMAR).

The sole purpose of this compendium is to prevent accidents in the future by determining their causes and circumstances, following the criteria established in IMO Resolution MSC.255(84) “Casualty Investigation Code.”

Consequently, the names of people involved in them have been redacted, as there is no intent to establish responsibility or guilt. However, the investigation does not refrain from thoroughly exposing the causes, even when they may allow establishing responsibility or guilt.

This summary of lessons learned includes the accidents considered more relevant from the perspective of what can be learned from them. Their investigation and analysis have been conducted independently of the Summary Maritime Inquiries instructed and have not been made for litigations, and therefore must be deemed inadmissible for any legal proceeding aiming to establish obligations or responsibilities.

Once they reach the target audience, lessons learned are intended to motivate a change in behaviour and in the way safety is managed on board ships, at ports, and in other maritime operations, and they are the only way to avoid repeating these unwanted accidents.

Let us not make the same mistakes twice.

ESTANISLAO SEBECKIS
CAPTAIN
MARINE ACCIDENT
INVESTIGATOR
DIRECTEMAR

SINKING OF PASSENGER SHIP DUE TO CONTACT WITH ANTARCTIC ICE

NARRATIVE:

On 23 November 2007, the Liberian-flagged passenger cruise **MV Explorer**, with 154 people on board, sunk in the Bransfield Strait due to **uncontrollable leaks**, caused by damage to the quickwork, when they **crossed a floating ice zone**. The bridge team assessed the ice as "first year ice", but among them there were floebergs, much harder mass of ice. The ship had 28 years of service and an **ICE-A1A1 class hull**, but as it was not calibrated, some plates may have been weakened.

The hull was punctured in the cabins area, near the waterline, in a high deck. Because of the design, the water ran through drains to a compartment of the engine room bilge and from there it was pumped out to the sea.

The flooding of an electrical panel caused **a blackout that shut down all the pumps**, including the portable ones that were installed, so the flooding became uncontrollable. This, added to the low temperature of the water, caused hypothermia in the crew and the panels covering the hull made it difficult to find the failure.

The abandonment was effective, it started early and in fair weather conditions, which minimized the impact of the **failure of the lifeboats engines** that did not start due to the low temperature. All the passengers and the crew were rescued unharmed by other ships and finally sheltered in Chilean and Uruguayan Antarctic bases. The ship sank in 1300 metres of water with 210 m3 of diesel oil in the tanks.

LESSONS LEARNED:

1.- For Antarctic navigation, it is necessary to have crews experienced in Antarctic ice reconnaissance or to board authorized pilots.

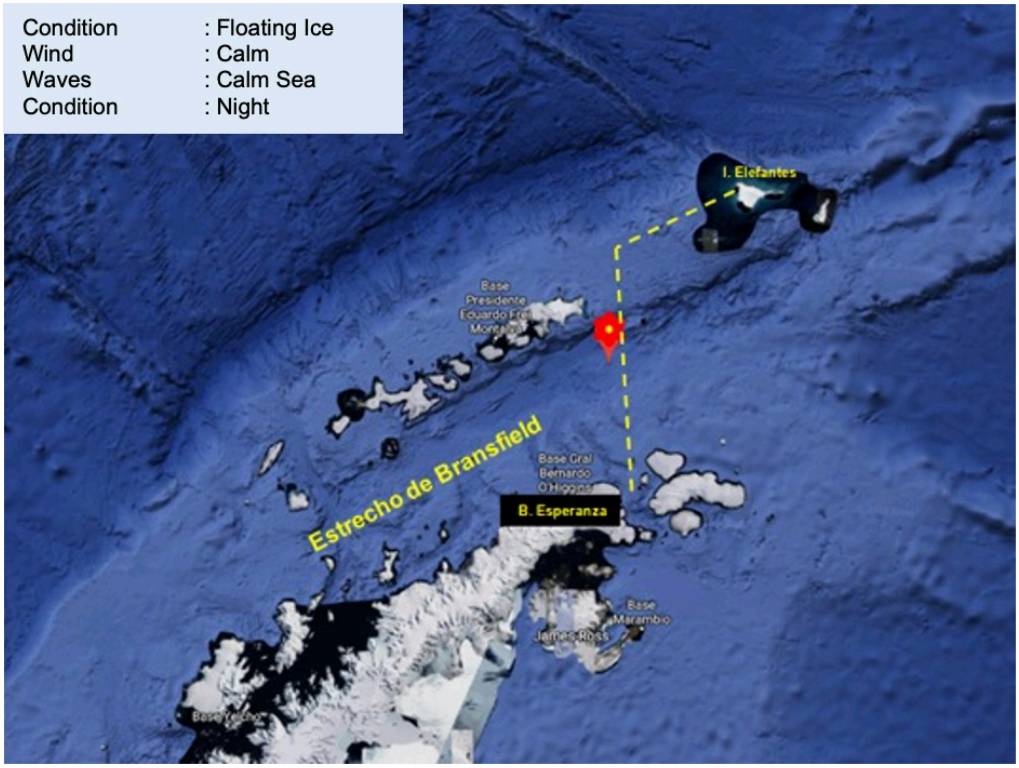
2.- Navigation through Antarctic ice must be carried out at moderate speed as the force with which the ice hits the hull increases exponentially with speed.

3.- Ships operating in Antarctica require procedures, equipment, and crew training on damage control, to successfully address hull damage and seawater floodings at low temperature.

4.- Masters of ships with leaks must order to prepare the abandon ship procedure early to prevent floodings from becoming uncontrollable.

5.- Lifeboat engine preparation and warm up are unavoidable tasks in Antarctic territory, due to the difficulties of starting cold.

6.- Appropriate ship hulls servicing and plate calibration before operating in Antarctic waters are priority to ensure they will withstand hitting hard ice.


Condition : Floating Ice
Wind : Calm
Waves : Calm Sea
Condition : Night
I. Elefantes
Base Presidente Eduardo Frei Montalva
Estrecho de Bransfield
Base Gral Bernardo O'Higgins
B. Esperanza
Base Marambio


Name : Explorer
Type : Passenger Ship
Length : 73 m Beam: 14 m
Draught : 4.2 m GT: 2,346
Construction : Steel, 1969
Flag : Liberia
Chilean Navy / AP

GROUNDING OF A BULK CARRIER RIDING AT ANCHOR UNDER BAD WEATHER, IN SAN ANTONIO

NARRATIVE:

On 16 August 2012, the Hongkongese bulk carrier **Ocean Breeze**, riding at anchor in the Port of San Antonio, dragged and grounded on the beach, due to **a storm, with winds of 30 knots and abnormal 4 to 5 metre waves**, dully announced in consecutive forecasts.

Local guidelines, the sailing directions, and the Guide to Port Entry recommended that, **under bad weather, ships riding at anchor must set sail**, as the holding ground was bad and there were experiences from similar groundings. The Master had instructed to notify him in case of dragging.

The ship started dragging without the crew noticing, because the officers were mainly reading the information from the GPS but not entering it into the navigational chart.

At the 4 a.m. relief, t**he coming watch team noticed the dragging but did not notify the Master**, as they considered it was temporary.

Two hours later, when the ship was too close to the breaking seas, **the Master was notified**.

Emergency departure was not ordered.The regular departure procedure considered running the main engine with an electrical engine, which got stuck **when the propeller touched the sand bottom. This delayed the engine starting for an hour.**

The port tugs assisted promptly but **could not tow due to the rough swell. Navy helicopters rescued all the crew.**

The investigation showed a **fatigue condition of the Master and the watch officer**, who had been on sea service for 8.5 and 11 months straight, which would explain the delay in their reaction under a high-risk situation. The ship and its grain cargo were declared a total loss and its dumping generated a high cost.

There were no oil spills.

LESSONS LEARNED:

1.- In case of bad weather forecasts, it is safer to navigate than to ride at anchor in unsheltered ports. Ships must sail before the winds and swell become stronger.

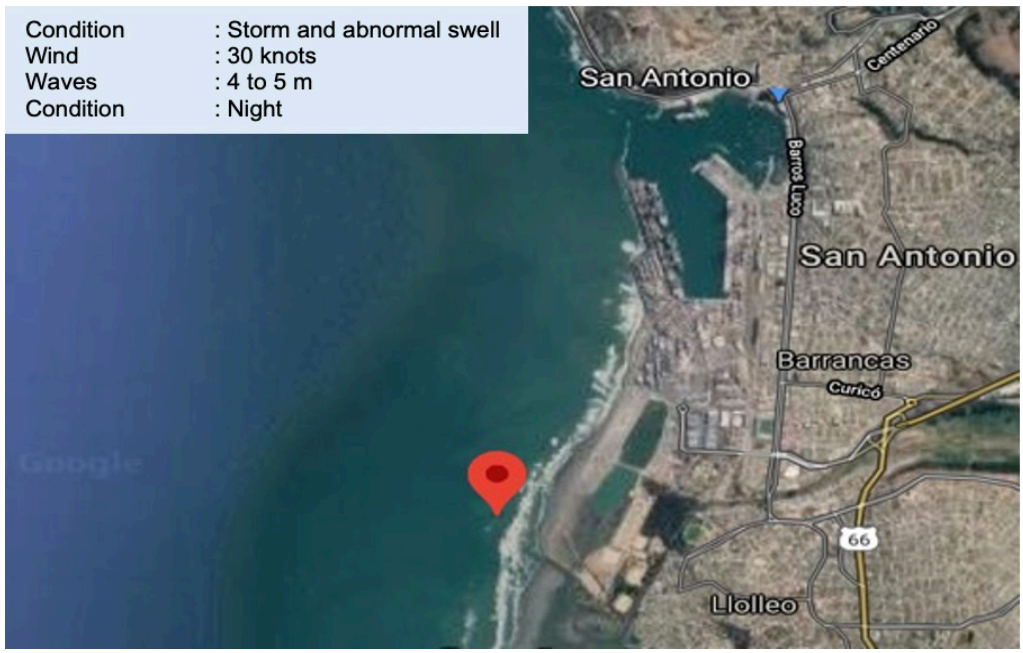
2.- When dragging, the emergency must be declared immediately, and lower more shackles or deploy a second anchor and help the anchoring with engines full ahead. Never run the engine if it is not secured!

3.- Ships must comply with local safety dispositions for bad weather. Captain of the Port's Offices and Ship Agents must ensure that non-Spanish speaking crews are properly aware of the warnings.

4.- Fatigued crews due to insufficient rest, sleep deprivation and/or serving at sea for more than 6 months straight, have reduced capacities, affecting their decision making.

5.- Radars and other navigation equipment have security alarms to prevent anchors from dragging. Safety zones must be established, and alarm activation must be verified.

6.- Numeric data shown by GPS only allow visualization of a ship's position when entered into a nautical chart.


Condition : Storm and abnormal swell
Wind : 30 knots
Waves : 4 to 5 m
Condition : Night
San Antonio
Centenario
Barros Luco
San Antonio
Barrancas
Curicó
66
Llolleo
Google


Name : Ocean Breeze
Type : Bulk Carrier
Length : 190 m Beam: 32 m
Draught : 12 m GT: 30,067
Construction : Steel
Flag : Hong Kong China

COLLISION BETWEEN A BULK CARRIER AND A WELLBOAT IN THE GULF OF CORCOVADO

NARRATIVE:

In June 2012, the bulk carrier **Tacora** and the Chilean-flagged wellboat **Seigrunn** collided while navigating the Gulf of Corcovado. Both ships resulted damaged, with no injured people or pollution. **Both ships detected each other** visually and by radar long beforehand, and always had enough open waters to perform the crossing situation provided in **Rule 15 of the International Regulations for Preventing Collisions at Sea**, which indicates that the bulk carrier should have slowed down and steered to starboard to avoid crossing ahead of the wellboat coming from starboard. When the wellboat noticed the imminent collision, they told the Tacora off over voice communication and informed they would slow down to let the bulk carrier cross.

The manoeuvre was not the solution kinematically, as there was still a risk of collision. At the last moment, the bulk carrier steered to port, but the wellboat drove its bow into the starboard side of the **Tacora**.

The radars and other aids to navigation in both ships always alerted the risk of collision.

Both watch officers had considerable experience as such, but the bulk carrier's watch officer considered that his ship was larger and had the preference for passing, becoming aware of the risk only minutes before the collision.
The safety procedures established a "safety zone of minimum approach to other ships" and to notify the Master when this was breached. However, the Masters noticed the risk only seconds before the collision, so their actions focused on offering mutual help.

There were no people injured or oil spills.

LESSONS LEARNED:

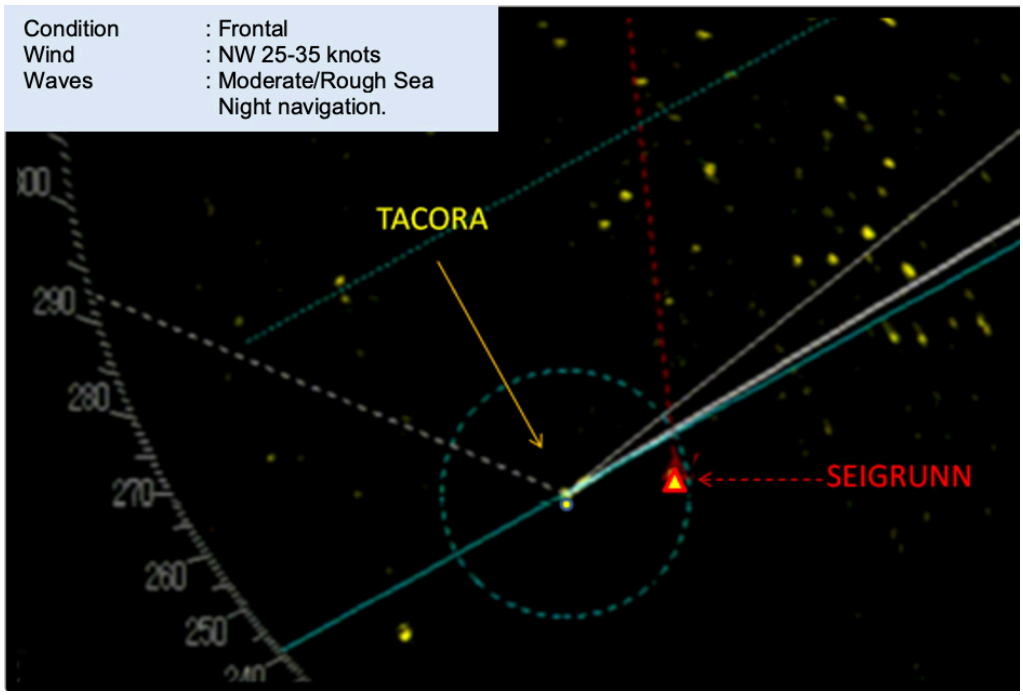
1.- Coordinating over channel 16 the omission of rules from the International Regulations for Preventing Collisions at Sea can lead to misunderstandings. It is safer to perform the appropriate rule in advance and with determination than coordinating different manoeuvres.

2.- In the face of a potential collision, both ships must steer.

3.- Navigation lights are enough help to adequately comply with rules, but the radar and the AIS offer early alerts of contacts, and course and speed information, which facilitates an early kinematic solution.

4.- The Master has the right to be informed by the watch officer about any possibility of another vessel entering the predetermined safety zone of minimum approach. Compliance with this implies auditing the Master and the Company.

5.- Always make sure that collision sound alerts are activated.


Condition : Frontal
Wind : NW 25-35 knots
Waves : Moderate/Rough Sea
Night navigation.
TACORA
SEIGRUNN
300
290
280
270
260
250


Type and Name : Bulk Carrier **Tacora**
Length : 183 m
Beam : 28 m
Draught : 11 m
GT : 22,208
Construction : Steel 1984
Flag : Chile


Type and Name : Wellboat **Seigrunn**
Length : 52 m
Beam: 10 m
Draught : 6.5 m
GT: 906
Construction: Steel, 2011
Flag: Chile

OIL SPILL AND FIRE OF A CAR CARRIER, IN SANTOS, BRAZIL

NARRATIVE:

In the morning of 16 February 2008, the car carrier **Río Blanco** spilled oil to the sea while loading in Santos, Brazil, before departing for Chile. Hours later, there was a fire in its engine room, resulting in the death of 2 Officers by suffocation and 1 crew member by burning.

The spill was due to the wrong alignment of the valves, which overflowed while interconnecting diesel and fuel oil tanks. The failure was not detected because the automatic sounding system was defective and there were no instructions to manually control the level in all tanks, as the safety procedure indicated.

The fire happened when a circuit full of oil was opened and it poured onto a hot generator engine while looking for the origin of the spill and disassembled valves without draining the lines.

The intensity of the fire was due to the pressure of the oil column because of the height difference between the deck and the engine room, which created a big blowtorch at height. The area and heat of the focus, and the blackout in the ship because there were no emergency generators, prevented the use of manual extinguishers. Since two Officers were trapped in the engine room, the CO2 cylinder bank was not released to prevent risking their lives.

The way of escape was blocked in a few minutes, through a corridor and a metallic ladder with no fire protection; many crew members escaped climbing the propelling engine.

Firefighters could not rescue people or extinguish the fire, which ended hours later after consuming the oil in the circuit and the lubricant running from a tank through a glass level not closed.

LESSONS LEARNED:

1.- Opening an oil circuit is a high-risk task that requires supervision by the Ship Operator and support from the shipyard.

2.- Line flushing is mandatory after an oil task.

3.- To diverge from the established procedures is to leave risks uncontrolled. Sounding all the tanks during oil-related tasks allows to detect unwanted transfers of oil between tanks and take actions to prevent overflows and spills.

4.- Abandoning the engine room in the face of a major fire is vital to allow the release of the CO2 bank. This requires the crew to know and practice the ways of escape regularly.

5.- Weaknesses in the ways of escape of the engine room must be fixed previously. The RIO BLANCO did it late, installing a ladder and a hatchway to the upper deck, which could have prevented deaths and damage.

Name	: **Río Blanco**
Type	: Car Carrier
Length	: 190 m Beam: 30 m
GT	: 41,208
Construction	: Steel 1981
Flag	: Chile

SINKING OF A PASSENGER ROLL ON-ROLL OFF, IN KIRKE NARROWS

NARRATIVE:

On 18 August 2014, at 9.48 a.m., while crossing Kirke Narrows from Puerto Natales to Puerto Montt, the Chilean flagged ro-ro ship **Amadeo I**, measuring 127 m lengthwise and a tonnage of 9,737, hit bottom at South Point of Merino Island.

The navigation of Kirke Narrows **did not comply with the recommendations of the Sailing Directions of the Chilean Coast**. When the ship navigated against the current and far from the time of stand, the Master was forced to steer at large rudder angles, in the middle of dangerous overfalls due to the strong current.

A mistake in the execution of helm orders, noticed late by the bridge team, prevented the correction of the course and the ship grounded in the 5.1 m shallows of Merino Island.

Due to the fast flooding and the uncontrollable heeling caused by the leaks, the Master **declared general average and grounded the ship on the coast**, which did not prevent the total loss of the ship and its cargo or the sea pollution from the oil. This resulted in a high-cost wreckage removal.

The casualty did not cause injuries to people, but it was highly possible due to difficulties in the disembarkation. This situation could have been worse if the ship had transported the total number of passengers authorized.

The dangerous decision of navigating a difficult passage without following the Sailing Directions **was recurrent, and the risk was taken to follow the itinerary of departures and landfall programmed** by the Company.

LESSONS LEARNED:

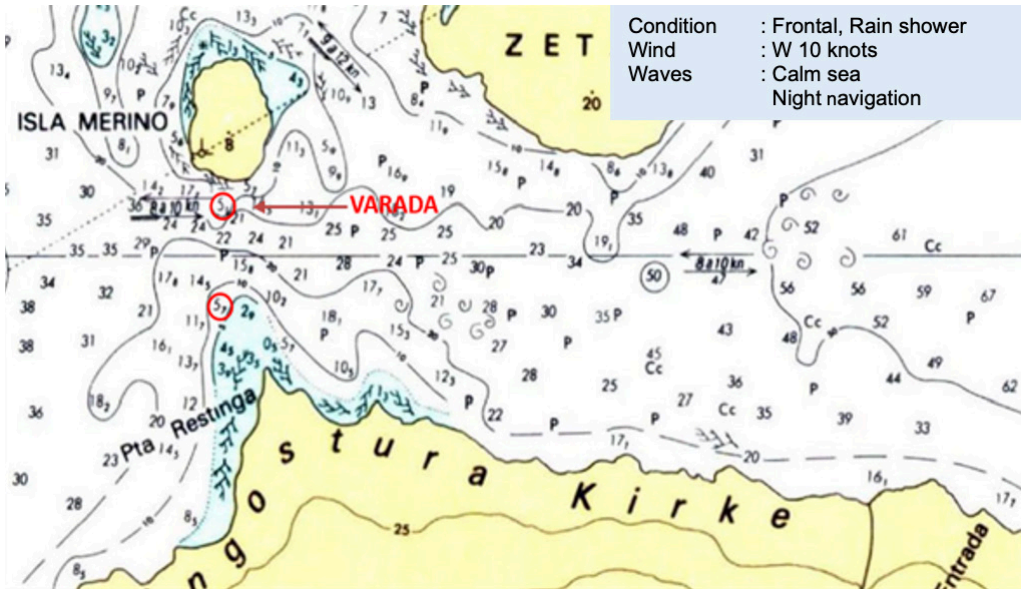
1.- The pressure to follow itineraries based on economic criteria is a source of danger and must be avoided, as this encourages crews to take higher risks.

2.- Ignoring the precautions indicated in the Sailing Directions of the Chilean Coast increases the risk of grounding and sinking exponentially.

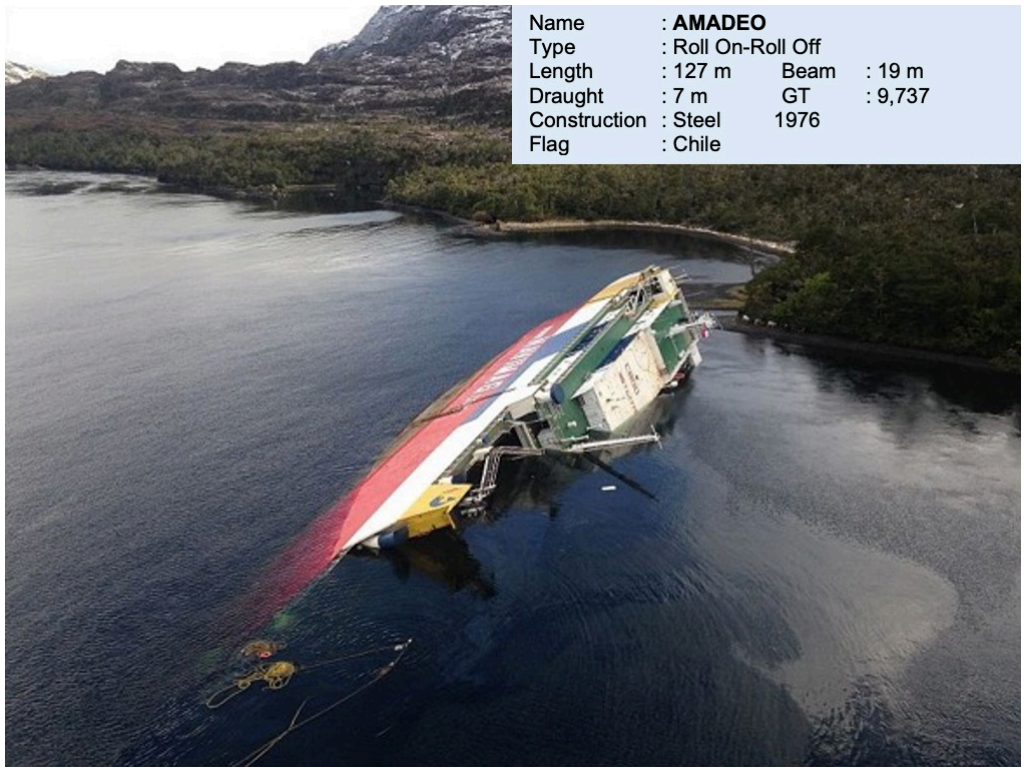
3.- Helmspersons executing tiller orders the wrong way round is a recurring error. It is particularly important to control them using the helm indicator when navigating difficult passages.

4.- Roll On-Roll Off vessels built before October 1989 were designed with holds that do not have enough cross subdivision, which makes it difficult to stop leaks in damage condition. Hence, they require plans and crew that are highly effective in controlling damage.

5.- Declaring general average to avoid common damage to compromised interests in the maritime expedition, as the Commercial Code of Chile states, is an alternative that Masters should consider, especially to minimize damage to people.



Condition	: Frontal, Rain shower
Wind	: W 10 knots
Waves	: Calm sea
	Night navigation



Name	: **AMADEO**		
Type	: Roll On-Roll Off		
Length	: 127 m	Beam	: 19 m
Draught	: 7 m	GT	: 9,737
Construction	: Steel	1976	
Flag	: Chile		

GROUNDING OF A PASSENGER SHIP, IN SANTO DOMINGO POINT

NARRATIVE:

On the morning of 5 February 2015, The **MV Skorpios II**, with 89 passengers and 23 crew members onboard, **grounded in Santo Domingo point**, while navigating from Castro to Puerto Montt **under good weather conditions**. Passengers were rescued by ships of the Chilean Navy and there were no people injured.

The ship refloated with the next tide, without damages to the hull or pollution.

The grounding was due to fatigue, as the Watch Officer fell asleep in the bridge.

Officers were not having enough rest because even though there was a three-watch system established, they actually run a two-watch system that included the Master, who had multiple functions and did not keep watch.

The crew complied with the minimum safe manning, but the minimum rest time was not guaranteed, which would prevent fatigue, because the 6-day, 5-night itinerary of the ship used the same crew every week with two watches, in voyages through channels with 4 intermediate ports, which is highly demanding. Additionally, officers used some of their little time to converse with passengers.

To keep pilots awake, the Ship Operator installed a bridge navigational watch alarm system (BNWAS), a button that must be pressed regularly. **The alarm ended up being counter-productive**, as its flawed design allowed the watch officer to deactivate it, just as it happened.

LESSONS LEARNED:

1.- Fatigue is caused by sleep deprivation, insufficient rest, severe stress, excessive workloads, and/or long periods on board. Its effects include falling asleep unwillingly and misinterpreting dangerous situations, as attention is focused on less relevant issues.

2.- Preventing fatigue is a responsibility of the ship owner, the operator, and the Master. They must plan voyages with enough manning, ensuring that the crew gets 7 to 8 sleep hours daily, considering port watches and navigation, departures, landfalls, drills and other programmed activities.

3.- When stress hits a fatigued person, it is normal that sleepiness reaches an uncontrollable level.

4.- Interaction between the crew and passengers at the expense of sleep time must be controlled, as it may affect safety.

5.- Bridge navigational watch alarm systems (BNWAS) do not mitigate the dangerous effects of fatigue.

6.- Deactivated alarms generate dangerous conditions, due to possible inattention to the risk they are supposed to control.

Wind : Calm
Waves : Calm Sea
Night navigation

Name : **Skorpios II**
Type : Passenger ship
Length : 68 m Beam : 10 m
Draught : 3 m GT : 1,544
Construction : Steel 1984
Flag : Chile

SINKING OF A FISH FACTORY SHIP, IN TRINIDAD GULF

NARRATIVE:

On 24 February 2011, the Chilean fish factory ship **Faro de Hércules** heeled, capsized, and sank when fishing in Trinidad Gulf, with winds that reached 45 knots and 4 to 4.5 m waves, resulting in 4 people missing and 38 rescued.

The flooding began in the factory when water broke the fish hatch and run in, as well as through a hose with water running and the 3 scuppers to drain waste, which were left open and submerged when the ship heeled.

The initial **heeling** was due to the wind against the side, added to the speed of the ship, which increased the effect of the swell and the leaking water, which in turn increased the heeling and the free surface. **Water tightness** in the factory was necessary and a known risk, since another similar ship of the Company had capsized when its factory flooded. Even then, there were no flooding alarms nor procedures established to guarantee water tightness in the facility.

Risk management: With a 50% of the factory flooded, the ship would capsize. The Master took 25 minutes to notice that the heeling was not due to the wind. This made the management of the flooding unsuccessful, as a great volume of water had entered, and they were unable to stop the leak. **The order to abandon ship** was not given, despite the considerable heeling and uncontrollable flooding. The accurate perception of danger made the crew activate and board the lifeboats, preventing more deaths. At a 90° heel, the DISTRESS signal was activated, and a VHF radio was taken on board a lifeboat.

Catch bonuses influenced the decision to operate under bad weather, and other 5 previous ship losses led the Company to financial failure.

LESSONS LEARNED:

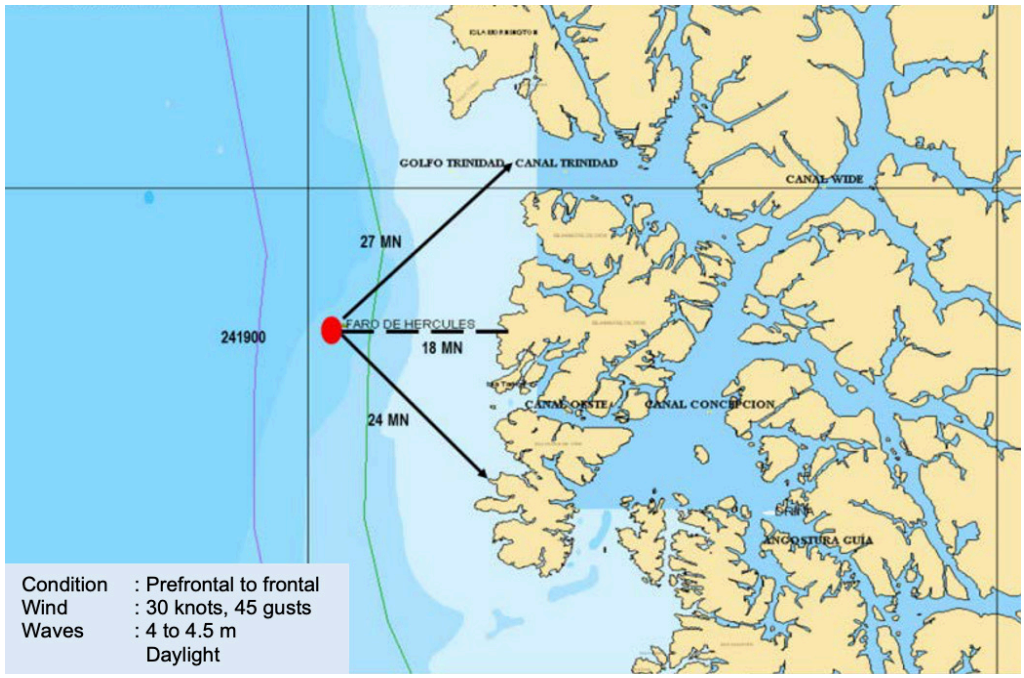
1.- Catch bonuses create an incompatible relation of "earnings vs safety", making crews more prone to take risks.

2.- Procedures to establish and maintain water tightness are imperative, especially under bad weather conditions, and every crew member is responsible for them.

3.- Critical safety weaknesses are risks that the crew must be aware of and check constantly.

4.- Under uncontrolled conditions, and especially when there is risk of sinking, the Master has the obligation to formally alert the crew and the Maritime Authority and give the order to prepare the abandonment of the ship. Abandon ship orders are easier to cancel than to improvise a successful abandonment.

5.- The activation of the DISTRESS signal must not be delayed until the last moment, as the emergency itself may prevent its use. Portable VHF equipment are useful to communicate with SAR teams.


GOLFO TRINIDAD
CANAL TRINIDAD
CANAL WIDE
27 MN
241900
FARO DE HERCULES
18 MN
24 MN
CANAL OESTE
CANAL CONCEPCION
ANGOSTURA GUIA
Condition : Prefrontal to frontal
Wind : 30 knots, 45 gusts
Waves : 4 to 4.5 m
Daylight


Name : Faro de Hércules
Type : Fish Factory
Length : 52 m Beam: 9.5 m
Draught : 3.7 m GT: 752
Construction : Steel, 1986
Flag : Chile
FARO DE HERCULES
IMBORNALES
VENTANA DE ACCESODE PESCA

SINKING OF A FISHING MOTOR BOAT, IN PUNTA ÁNGELES, VALPARAÍSO

NARRATIVE:

On 11 June 2017, at night and 2 miles from the Punta Ángeles lighthouse, the artisanal fishing boat **Daphne Carolina** sank, resulting in the disappearance of 2 of its 3 crew members.

A severe swell affected the vessel when it returned from fishing, loaded with 1100 kg of cuttlefish. The maximum capacity of the boat, according to the operator, was 1400 kg in light condition and in sheltered waters. **It sank overloaded into the open sea under rough conditions**, transporting 1500 kg including the catch, 3 crew members, fuel, fishing gear, and a 60 Hp outboard motor. To facilitate the job, the load was stacked in the back, which increased the aft draught and caused **a dangerous decrease in the freeboard**. This allowed the swell to run over the transom and added to turning off the motor and the free surface effect, the boat was left vulnerable to the swell.

Rescue. The crew was unable to bail out the flooding, and since the sinking was imminent, they sent a distress signal via a mobile phone and donned their lifejackets. Two of the fishermen were unable to fasten the lifejackets due to the volume of their warm clothes and went missing.

The crew could not fire **SOS flares** as they lost them when hit by a wave. **The vessel**, built in glass fibre, was a variant of the Japanese model that **had the reserves of buoyancy and the interior subdivisions removed** to gain hold space and facilitate the movement of the load from bow to stern. **The boat sank, but when the load was dumped, the tip of the bow refloated**, and the only survivor could hang from it until he was rescued. This was not possible with the other two fishermen as they did not know how to swim.

LESSONS LEARNED:

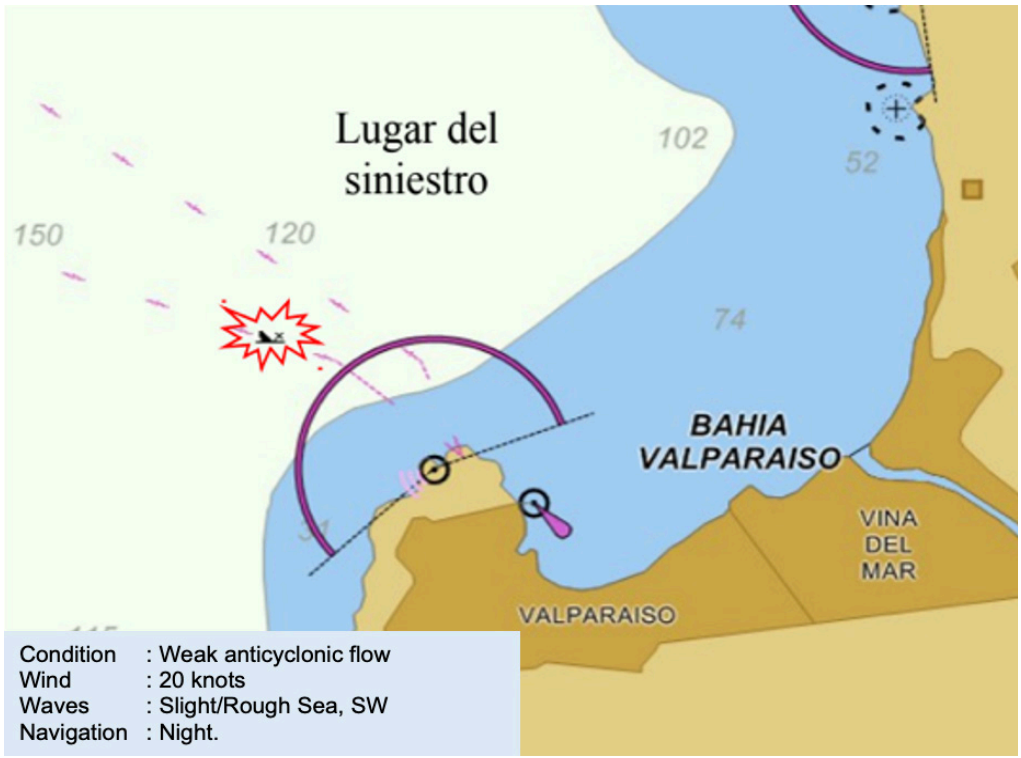
1.- Smaller vessels ARE NOT designed to navigate rough waters or under bad weather. In ocean coasts, returning to port is the most dangerous part, as the SW or NW swell always implies quartering or following seas.

2.- Overloaded boats have an increased risk of sinking if waves hit them from the stern, as the increase of trim and the decrease of freeboard allow water to run over the transom and flood the vessel. This risk also increases when load is stacked in the stern, when abruptly stopping the push-off, when there is free surface, and when using oversized outboard motors.

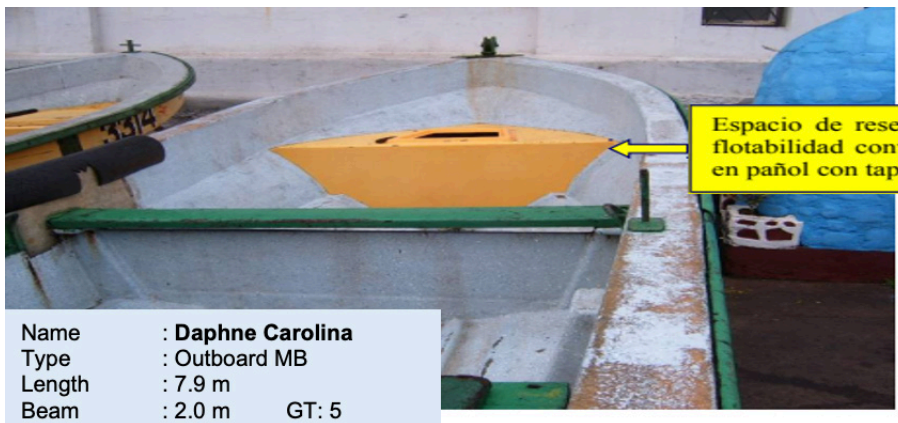
3.- Increasing the profitability of a boat at the expense of its reserve of buoyancy is a bad deal. With this reserve, boats that sink refloat when part of the cargo is dumped, serving as lifeboat and protection against hypothermia. It is a good plan to adapt them for this purpose, also considering freshwater and emergency oars.

4.- Lifejackets are useful only when they are worn permanently, as there is no time to fasten and don them properly during an emergency.

5.- Learning to swim can save your life.



Condition : Weak anticyclonic flow
Wind : 20 knots
Waves : Slight/Rough Sea, SW
Navigation : Night.



Name : **Daphne Carolina**
Type : Outboard MB
Length : 7.9 m
Beam : 2.0 m GT: 5
Construction : Glass Fibre

HAND ENTANGLEMENT ON BOARD A FISHING VESSEL, IN PATILLOS

NARRATIVE:

On 10 March 2018, on board the Chilean **HSFV Don Gino**, one of the Fishing Deck Ratings suffered the amputation of a phalanx of one of the fingers of his right hand, during the fishing operation, when he adjusted a bight in the line he was hauling, without previously stopping the engine of the winch, which resulted in his hand being entangled between the rope and the winch.

Weather conditions were fine, with calm waters and a gentle breeze. All fishing systems were operative and in good maintenance condition. The injured **seafarer was experienced**, with 8 years as crew member, 2 of them on board the **HSFV Don Gino**, and more than 3 years as winchman in fishing operations.

An analysis of the actions performed by the seafarer in the 96 hours prior to the accident determined that he was **fatigued at the time of the accident** due to sleep deprivation.

Fishing performance bonuses generated a collective interest not to delay the fishing operations when a good shoal was found, which explains the dangerous decision made by the personnel.

A few minutes after the accident, the injured seafarer was assisted by the First Mate and the Master, who gave first aid correctly and were able to stop the bleeding and minimize pain. Three hours and 45 minutes after the accident, the seafarer was disembarked and taken to a medical centre.

LESSONS LEARNED:

1.- One of the adverse effects of fatigue is misinterpreting situations and being unable to foresee the seriousness of dangers.

2.- The safe procedure to resolve entanglements, bights, and kinks of lines during winch operations is as follows:

- *Stop the hauling;*
- *Inform the bridge;*
- *Use a stopper to release the winch tension before handling lines in the head.*

3.- Offering performance bonuses in dangerous operations like fishing has a negative effect in safety, as the crew is tempted to bypass safety procedures to get the largest catch possible.

4.- Maintaining medical equipment and crew trained in first aid aboard fishing vessels is crucial to save the lives of injured seafarers.

Condition : Anticyclone
Wind : 8 to10 knots
Waves : Smooth Sea
Daytime Operation

Name : **Don Gino**
Type : High Seas Fishing Vessel
Length : 33 m Beam: 9 m
Draught : 3.7 m GT: 332
Construction : Steel 1995
Flag : Chile

GROUNDING OF A PASSENGER SHIP, IN PÍA FJORD

NARRATIVE:

On 23 November 2005, the Panamanian passenger ship **Antarctic Dream**, under good sea and wind conditions and two pilots on board, **run aground in the access to fjord Pía.**
At the departure, it was not considered to enter said fjord and the decision to do so was made near the new destination, **nobody on board** had experience on this route and **the ship had a draught 30 cm bigger than the limit** established by the sailing directions.
As the narrow channel to access the fjord is 100 metres wide and 10 metres deep, the sailing directions recommend entering it steering to 040° to pass 3.2 cables from Punta Pasada. When approaching the access, the navigational watch officer and the pilot had a **discrepancy in the reading of the passing distance.**

On the radar, it was estimated that the ship was off-track to port and passing 2,9 cables from Punta Pasada. Even when the pilot did not agree with the information of the watch officer, the course was modified 13° to starboard of the recommended track. Minutes later, **the ship run aground on a submerged rock of the Arturo Shallow, which was not in the nautical chart.** There were no damages to the propeller or the rudder, which allowed the ship to exit the fjord without difficulties **with the high tide, noticing that the big rocks visible on the radar with the low tide had disappeared** under the water, which would explain the shorter radar distances measured, as the stones that appeared with the low tide were measured instead of the shore.

LESSONS LEARNED:

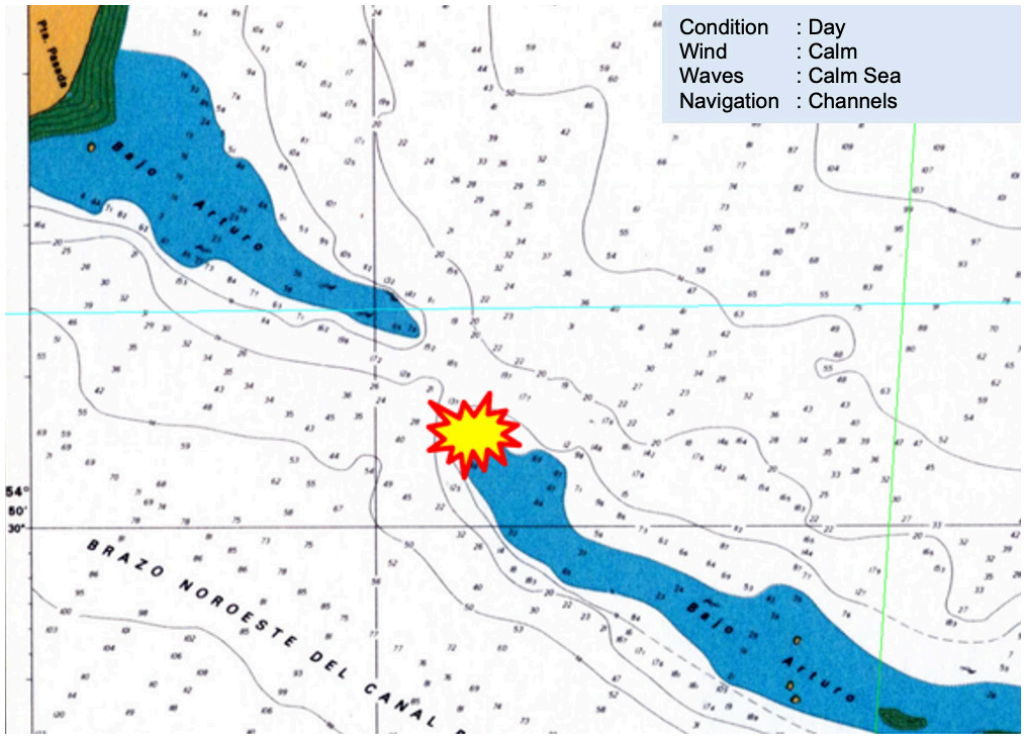
1.- Even when nautical charts do not show major dangers, the precautions in the sailing directions, especially draught limits, passing distances, etc., are the safe minimums, and it is risky to ignore these limits, as sounds may vary, and these documents gather the experiences of other navigators.

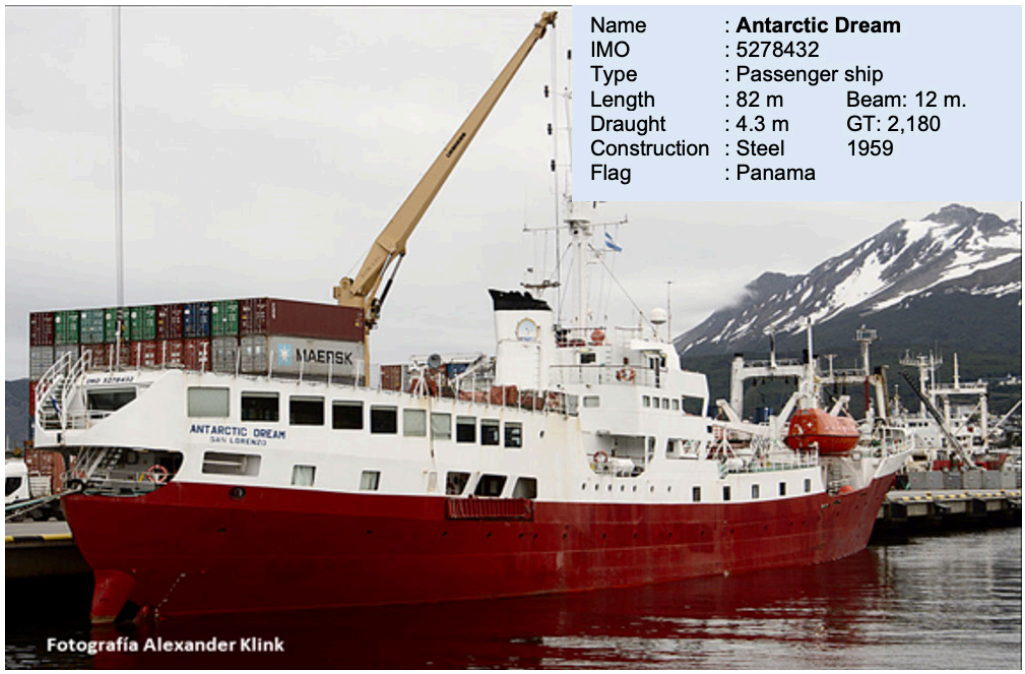
2.- In areas of great tide fluctuation, radar distance measurements may vary when measured with high or low tide, due to the configuration of the coast and the rocks that appear and disappear.

3.- Experience does not replace previous familiarization with navigation required to safely navigate difficult, restricted or shallow zones.

4.- Piloting a ship through a safety narrow channel with 40 metres to each side requires to initiate a precise navigation with a thorough series of positions, in an adequate navigational chart prepared for this purpose, followed by regular situations.

5.- Any deviation from the planned course, especially in channels, requires planning a new modified course, as established in STCW (section A-V111/2, part 2). Pilots, before recommending changes, must verify suitability in terms of ship size, type, and flag, according to navigation risks and navigation, mooring and departure authorizations issued by the Maritime Authority for that particular ship.


Condition : Day
Wind : Calm
Waves : Calm Sea
Navigation : Channels
Pta. Pasado
Bajo Arturo
54°
50'
30"
BRAZO NOROESTE DEL CANAL
Bajo Arturo


Name : Antarctic Dream
IMO : 5278432
Type : Passenger ship
Length : 82 m Beam: 12 m.
Draught : 4.3 m GT: 2,180
Construction : Steel 1959
Flag : Panama
MAERSK
ANTARCTIC DREAM
Fotografía Alexander Klink

ENGINE FIRE AND SINKING OF A PASSENGER SHIP, IN MANSA BAY

NARRATIVE:

On 27 April 2002, the passenger **MV Terra Australis** was near Mansa Bay, heading from Punta Arenas to Valdivia for repairs in a shipyard, without passengers and with a reduced crew of 22 people, when **its engine caught on fire due to fuel leaks from the generators supply circuit.**

Since engineer officers had a two-shift watch system, **a rating was authorized to perform duties as "officer of the watch."** In the face of a full-blown fire at night, and **not having the necessary competencies, he was not able to execute the procedures, nor was he able to activate emergency systems**, which led to the fire becoming uncontrollable.

The engine room had a fire alarm system, ventilation closures, remote stopping of fuel, a bank of CO2, and fireproof doors, among other extinguishing systems that were not used.

The officers were not able to control the emergency because, **when the door was left open, the highly toxic smoke quickly spread through the accommodation area** and impeded the work of the fire response teams, **resulting in the death by suffocation** of a deck rating. The vessel adrift was abandoned and the castaways were rescued, uninjured, by the **MV Vicuña**.

Finally, the ship run aground in Punta Llesquehue. There was no oil pollution detected.

LESSONS LEARNED:

*1.- **Officers should not be replaced by ratings**, since they lack the necessary competencies to make decisions when faced with new situations or apply emergency procedures.*

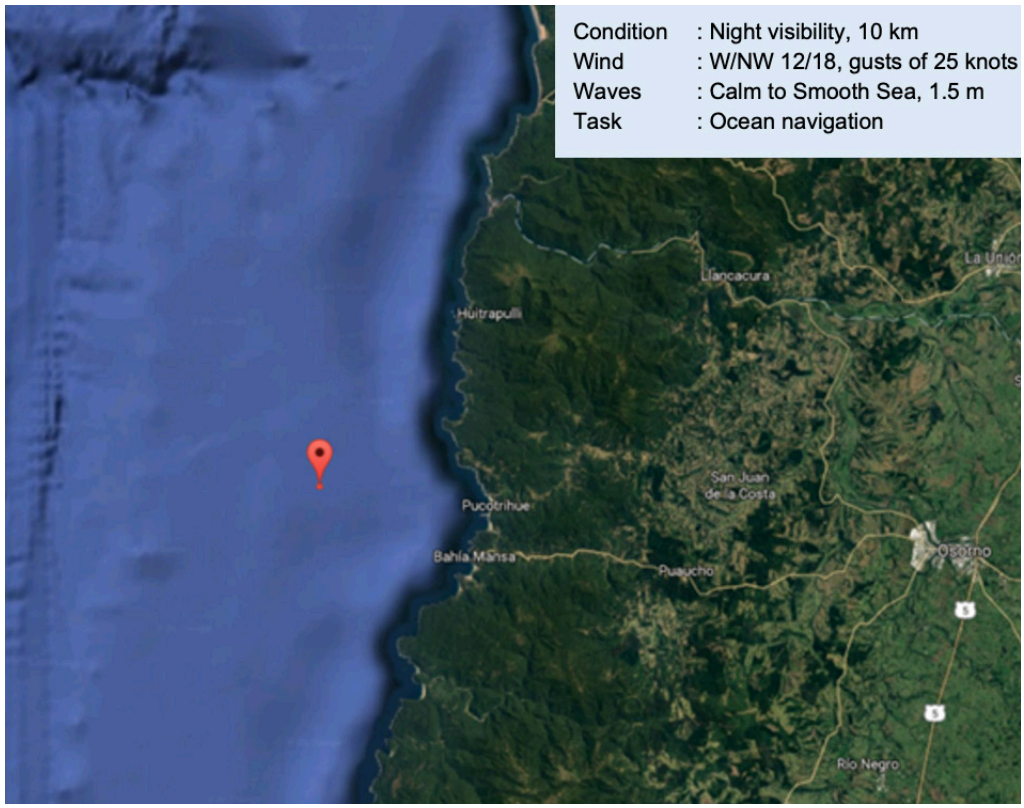
2.- Minimum safety manning should be complemented by ship operators taking into consideration the workload of the crew, which usually increases before a vessel goes into dock.

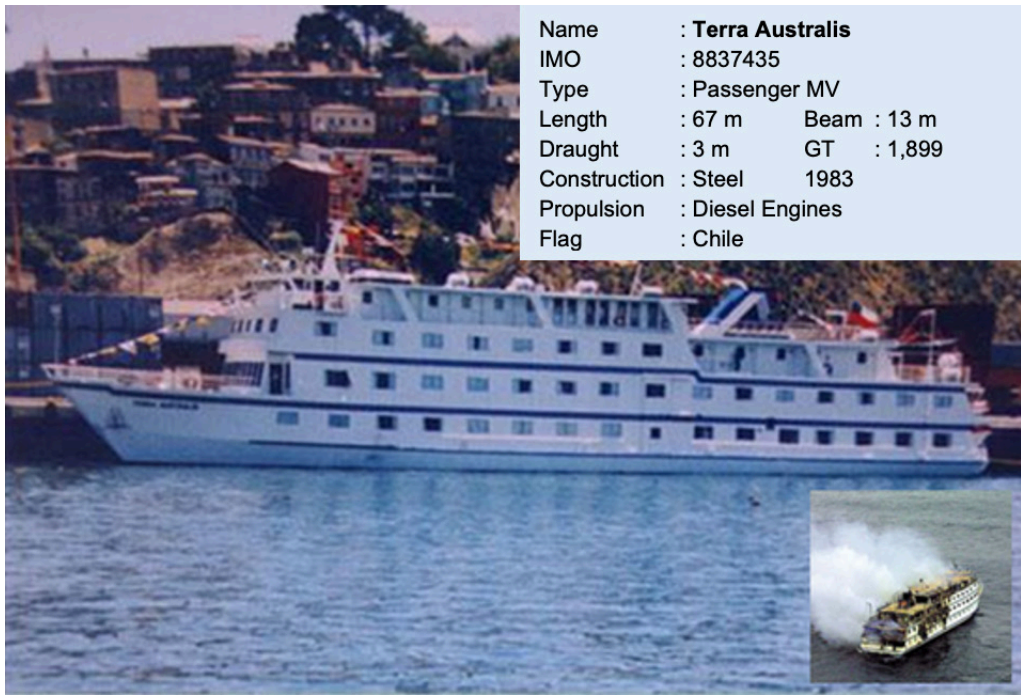
*3.- When a fire occurs in the engine room, **the most important action is to sound the general alarm**, as quickly as possible, so passengers may evacuate towards safe areas and the crew may act according to plan. Then the fire can be fought.*

4.- All firefighting plans should include stopping the fuel supply, closing vents and accesses, using the most appropriate extinguishing method, and deploying all means available to cool bulkheads and avoid the propagation of fire and smoke to other areas of the vessel.

*5.- If the fire becomes uncontrollable, the engine room should be abandoned, **making sure that doors and vents are shut** before remotely activating the bank of CO2.*

*6.- Fuel pipe breaking due to vibrations is common on board. Limit the vibration of pipes. **Do not repair them**, install new ones!*


Condition : Night visibility, 10 km
Wind : W/NW 12/18, gusts of 25 knots
Waves : Calm to Smooth Sea, 1.5 m
Task : Ocean navigation
Llancacura
Huitrapulli
Pucatrihue
San Juan de la Costa
Bahía Mansa
Puaucho
Osorno
Rio Negro


Name : Terra Australis
IMO : 8837435
Type : Passenger MV
Length : 67 m Beam : 13 m
Draught : 3 m GT : 1,899
Construction : Steel 1983
Propulsion : Diesel Engines
Flag : Chile

GROUNDING OF A GENERAL CARGO SHIP, IN THE ENGLISH NARROWS

NARRATIVE:

On 29 June 2007, the general cargo ship BBC Ecuador navigated the English Narrows in the South of Chile, at 14 knots against a weak current. Two pilots had piloted the ship seamlessly from Posesión Bay and they prepared the steering and propelling systems for the narrows, with two hydraulic pumps in parallel in the servo motor, two in-line generators, both anchors ready to be cast, the engine in manoeuvring condition and the rudder tested, without noticing deficiencies. The balanced rudder, similar to a Becker, had a high efficiency and quick response, which was known to the bridge team and the pilots.
At the time of the accident, the Master, two pilots, the watch officer, a helmsman and a lookout were in the bridge.
After several turns without deficiencies in the steering system, and when the helmsman was executing the instructions of the Pilot, in order to stop turning in Paso Curvo, the steering system did not work, and the rudder got stuck at 30° starboard.

The anchors were cast, and the engine was set to reverse, but it did not prevent the ship from hitting the bow against the Medio Canal Island at 10 knots. The engine and the hit against the coast propelled the ship astern and was firstly controlled with the engine and the bow thruster.
The rudder worked again after a reset. The failure was probably caused by an excess of pressure in the hydraulic circuit of the servo motor. The ship travelled astern to Puerto Edén for makeshift repairs to the hull, and then departed to the dock. The grounding did not injure people or cause oil spills.

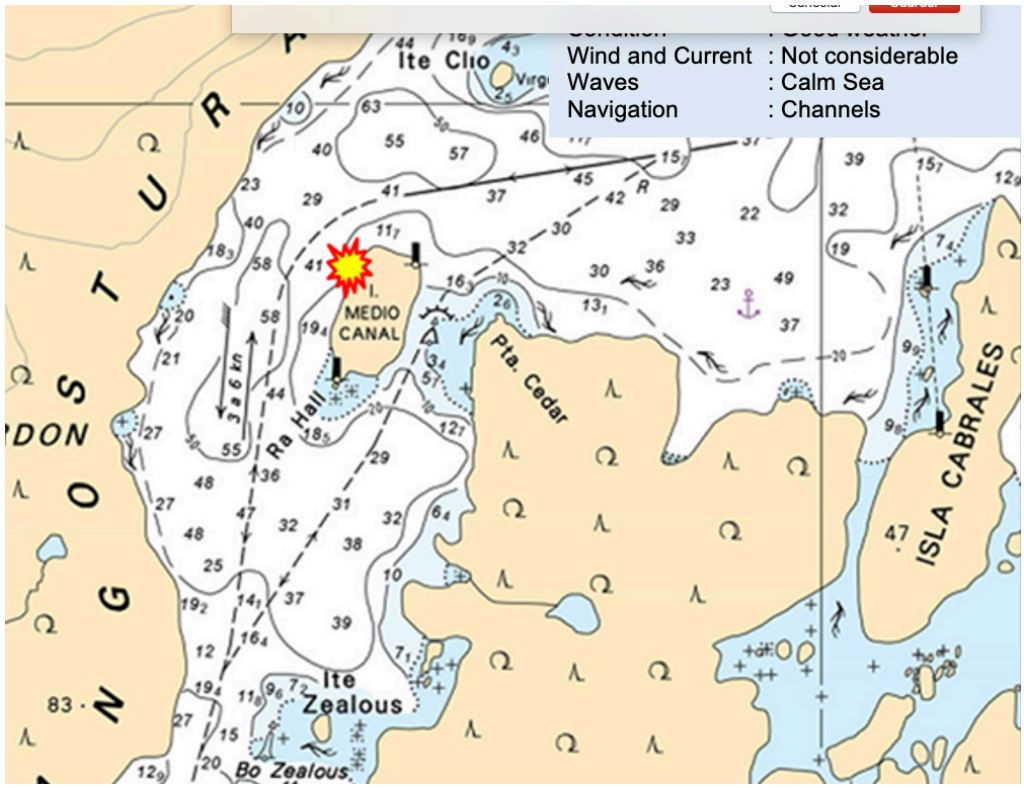
LESSONS LEARNED:

1.- Balanced rudders are highly efficient and are commonly operated at small rudder angles, so the probabilities of failure are increased when they turn to one side or are operated at angles higher than 30 degrees.

2.- Usually, only one hydraulic pump of the servo motor is used. Using the second pump connected to the line allows to overcome a potential failure in one of them, but it also has caused rudder failures when, under an excess of pressure due to the malfunction of the relief valve, the protection system activates and disables the servo motor.

3.- The preparation of a ship to navigate difficult passages is vital, but it can also be a double-edged sword if carried out in the dangerous navigation zone, as redundant equipment may be activated, and unexpected conflicts or failures may occur.

4.- Grounding barriers in case of failure in the steering system in shallow waters, anchors ready to be cast, and engines in manoeuvring condition have proven to be effective in the reduction of velocity and kinetic energy when running aground (1/2 the mass multiplied by velocity squared), even though they do not prevent it, reducing damages to the hull significantly.


Wind and Current : Not considerable
Waves : Calm Sea
Navigation : Channels
I. MEDIO CANAL
Pta. Cedar
Ra Hall
ISLA CABRALES
Ite Zealous
Bo Zealous


Name : BBC Ecuador
IMO : 9222352
Type : General cargo
Length : 117 m Beam : 6.6 m
Draught : 6 m GT : 5,548
Construction : Steel 2001
Flag : Antigua and Barbuda
Fotografía Ken Lubi

SINKING OF AN OVERLOADED BARGE, IN TIERRA DEL FUEGO

NARRATIVE:

On 31 January 2000, the barge **Enap I** sank close to the Percy pier. **Heading from Tierra del Fuego to Laredo Bay with bad weather conditions, overloaded** with two gas trucks, which reduced the freeboard and due to the lack of water tightness in the ramp, the main deck was constantly flooded with sea water. Because of rollings, the accumulated **water entered the engine room through the access watertight door that was kept open** during navigation.

The late detection of flooding, due to an **unguarded engine room** and apparently no activation of alarms, caused free surfaces and constant high angles of list, which resulted in a poor isolation of electric circuits and pumps that **finally disabled the liquid transfer systems and the propulsion.**

Officers were operating in a two-shift watch system and were not familiar with the barge because this was their first voyage. Pumping actions were not completed as they decided to abandon the ship, leaving the ballast tanks connected to the sea, which contributed to the sinking.

The crew was unable to abandon the ship by their own means, as lifeboats did not inflate because of maintenance deficiencies and the rubber boat went adrift due to bad operation.

Passengers and crew were successfully rescued by tugboats activated by the Maritime Rescue Coordination Centre of the Chilean Navy, who towed and anchored the barge semi-submerged in the coast, where it sunk **due to the lack of rescue actions.** The shipwreck caused a **mild oil spill.**

LESSONS LEARNED:

1.- **It is extremely risky to operate an overloaded ship and it is even worse with bad weather.**

2.- Before departure and during navigation, it is **crucial to establish and keep the water tightness in the ship.** *Otherwise, the free water will be able to flood and damage the lower compartments (engine, servomotor and holds).*

3.- Constant heeling and unusual rollings are a sign of movement of cargo and flooding.

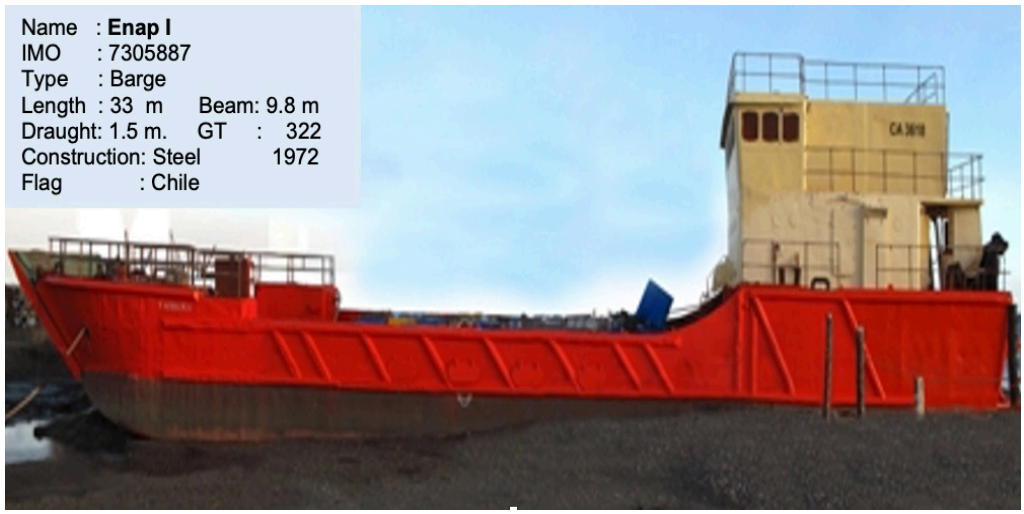
4.- Engine rooms require a permanent supervision from the Officer in charge of the watch in the engine room to control the possible risks of fire, flooding and system failures.

5.- Alarms are part of the risk control. It is important to verify its activation and proper functioning regularly. The opposite leads to assume a dangerous normality when it is not the case.

6.- Crews with experience but unfamiliar with a vessel can make serious mistakes during the process of learning the procedures to properly operate the systems.

7.- When Masters are also acting as Officers in charge of a Navigational Watch, the function of supervision and control can be affected.


Condition: Anticyclone
Wind : 8 to 10 knots
Waves : Smooth Sea
Daytime Operation
Puerto Zenteno
Puerto Percy
9
BAHÍA GENTE GRANDE
Chabunco
Tres Puentes
Punta Arenas
ISLA TIERRA DEL FUEGO


Name : **Enap I**
IMO : 7305887
Type : Barge
Length : 33 m Beam: 9.8 m
Draught: 1.5 m. GT : 322
Construction: Steel 1972
Flag : Chile

FIRE AND GROUNDING OF A CONTAINER SHIP, IN MESSIER CHANNEL

NARRATIVE:

On 25 June 2012, the container ship **Condor** was navigating the Messier Channel heading Punta Arenas, when a **fuel return pipe in the propulsion engine** broke.

In the face of bad wind conditions and the proximity to the coast, the Master decided not to stop the engines and postpone repairs. After 20 minutes, there was a huge fire when the fuel reached the engine exhaust manifold, which had lost its thermic isolation. It was impossible to control the fire with portable extinguishers, so the engines were stopped and the CO2 cylinder bank was activated, which finally extinguished the fire.

The ship was adrift until it ran aground in the coast as the anchoring operation was not effective due to the channel depth. Subsequent bad weather fronts caused damages in the propeller and leaks in the engine room.

It was not the first time that oil pipes broke down as a result of the vibrations caused by the cavitation in the propeller during bad weather. On those occasions the engine was immediately stopped which prevented a fire.

Failure probabilities increased when the **fatigued pipes were welded and reused.**

The engine manufacturer had anticipated an immediate **procedure** to stop the leak: "**close the valve** mounted in the fuel pump inlet", **action that the engine crew ignored**, and decided on the wrong option of soaking rags to contain the warm oil.

There were no injured people or signs of pollution as a result of the casualty. The ship had to be towed to the shipyard.

LESSONS LEARNED:

1.- The recurrence of failures with a high risk of causing a fire, floods or limitations to the propulsion and steering systems, among others, must be investigated by the ship owner/operator, and in compliance with the International Safety Management Code (ISM Code), causes must be eliminated, and appropriate procedures must be developed for a good performance of the crew.

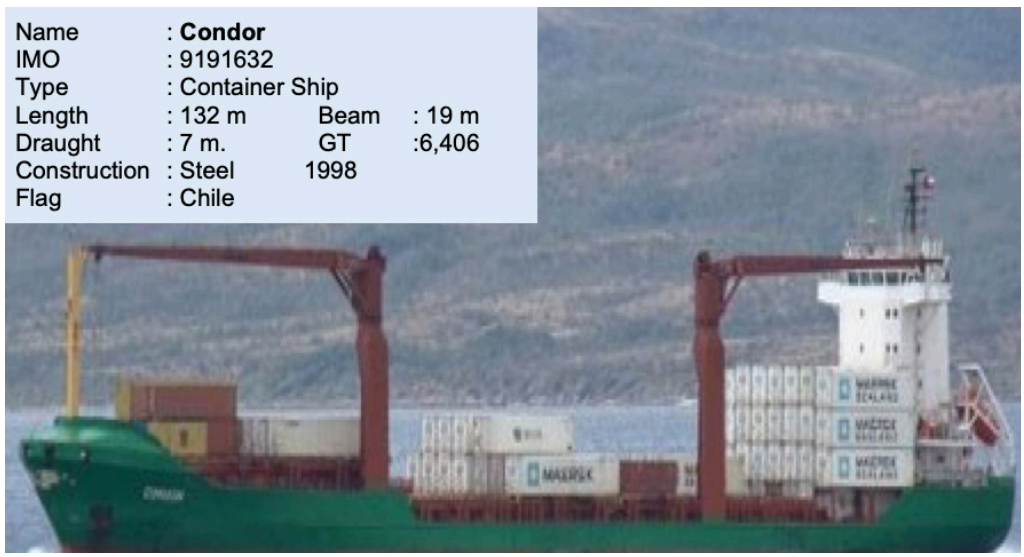
2.- Leaking pipes due to material fatigue are common on board. Limit the vibrations in the pipes and always replace with a new piece, do not repair. Verify the stock on board.

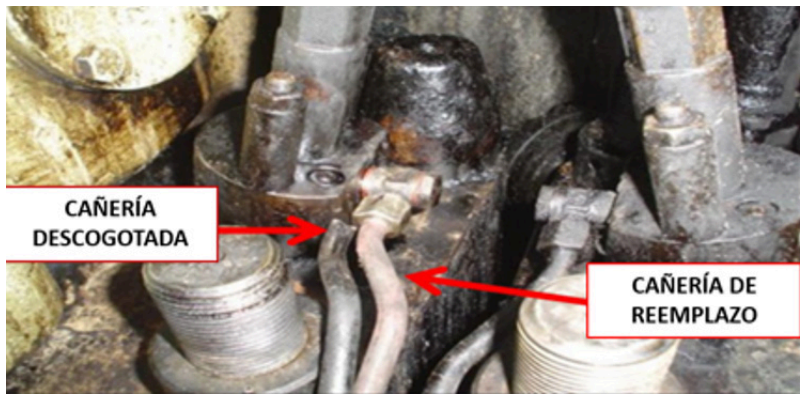
3.- In the event of a serious imminent risk of fire, the Management Level (Master and Chief engineer officer) must activate a fire emergency plan in a preventive way, with enough firefighters and equipment required to extinguish any threat of fire.

4.- The hot spots of any system must be thermally isolated to prevent the inflammation of possible fuel leaks.

5.- Any small fuel leak will eventually lead to a fire and that is why they should be prevented.


GOLFO DE PENAS
Condition : Front
Wind in the channel : NNW 30/50 knots
Waves in the channel : 2 to 3 metres
Daytime Operation
Isla Wager
Isla Byron
INCENDIO
VARADA
Isla Merino Jarpa
CANAL MESIER
Isla Juan Stuven


Name : Condor
IMO : 9191632
Type : Container Ship
Length : 132 m Beam : 19 m
Draught : 7 m. GT :6,406
Construction : Steel 1998
Flag : Chile


CAÑERÍA DESCOGOTADA
CAÑERÍA DE REEMPLAZO

COLLISION BETWEEN A BULK CARRIER AND THE MECHANICAL PIER IN GUAYACÁN

NARRATIVE:

On 26 June 2008, the bulk carrier **Tacora**, loaded with 24,976 tonnes, arrived to the pilot boarding point at a speed of 6 knots, **2 knots over the safety speed.** This hampered the boarding of the pilot, who had been recently authorized in the port. Once they reached the bridge, the pilot stopped the engines and turned heading to the leading lights to anchor, but when taking the new course and even though the wheel was fully turned, the ship **continued to move to port, heading to the pier**, which was 4 cables away.
He ordered full astern, but the Master, a Chilean officer with a vast experience, disagreed and ordered to kick ahead to push the bow away, which was **contrary to the manoeuvring characteristics of the ship**, which needed 3 cables to stop the headway of 5.6 knots following a "full astern" order.

For half a minute the order was "slow speed ahead" but the ship kept the course heading to the pier, increasing its speed to 5.6 knots. **The pilot decided to abort the berthing**, ordered "half astern" and to change the tugboat to the other side to turn the bow to starboard. Seconds later, the master ordered "full astern" and finally "repeat astern". **The tugboat did not have the time to act and the ship eventually collided with the pier**, causing damages to the port structure and the bow, but no injured people or oil pollution. They did not anchor because it was considered dangerous. **The Port Manoeuvrability Study established a maximum speed of 3 knots for the approaching and 2 knots for anchoring**. The fact that the ship received the pilot at a higher speed explains that he did not have time to study the curve evolution characteristics of the ship.

LESSONS LEARNED:

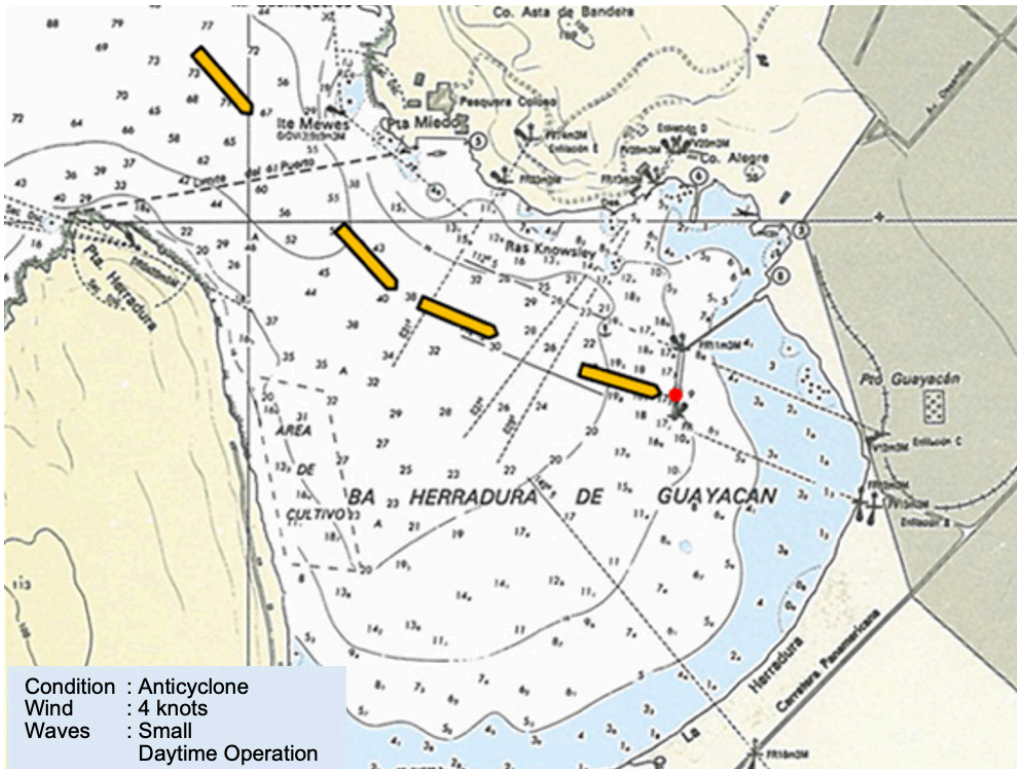
1.- In ports where Chilean vessels are allowed to receive pilots with a headway and engines on to save time, it is important to have a previous plan and preparation, ensuring the approaching will be done according to what the Manoeuvrability studies establish. This should allow the sharing of information between the ship and the pilot to agree on a common manoeuvre that includes the provisions of the Captain of the Port, the manoeuvring characteristics of the ship, the loading conditions and the weather.

2.- Trying to save time by approaching at a speed higher than 3 knots is nonsense since tugboats and lateral propellers are less efficient.

3.- Manoeuvrability studies are technical documents that, considering the risks, describe how to perform port manoeuvres, and they establish maximum parameters. There is a high probability that exceeding those parameters will result in accidents.

4.- Every manoeuvring decision must be based on real data provided by navigation equipment and the evolution characteristics of the ship. Trusting only in the professional criteria and a navigation based on assumptions will result in mistakes.

5.- During an emergency, the use of anchors should not be doubted, as they will reduce the speed and damage in case of groundings or collisions with the port facility.


Co. Asta de Bandera
Pesquera Colleo
Pta Miedo
Ile Mewes
Co. Alegre
Ras Knowsley
Pta. Herradura
Pto. Guayacán
AREA
DE
CULTIVO
BA HERRADURA DE GUAYACAN
Herradura
Carretera Panamericana
Condition : Anticyclone
Wind : 4 knots
Waves : Small
Daytime Operation


Name : Tacora
IMO : 8312760
Type : Bulk carrier
Length : 183 m Beam : 28 m
Draught : 8.5 m. GT : 30,028
Construction : Steel 1985
Flag : Chile

GROUNDING OF A BULK CARRIER, IN ANTOFAGASTA BAY

NARRATIVE:

On 31 October 2005, **at night** and with clear visibility, the Hongkongese bulk carrier **Eider grounded in the coast** of Antofagasta bay, when executing anchoring manoeuvres without a pilot. To reach the anchorage point recommended by the Maritime Authority, **they used a GPS with the WGS-84 reference system and did not notice that there was an error of 500 metres** when graphically representing a point in the UKHO 3077 Chart, which refers to Datum PSAD-56. When they noticed that they had only 5.7 metres of water under the keel and they were not at the recommended anchorage point, they decided to sail. **They heaved anchor** without notifying the Maritime Authority or requesting support from pilots or tugs. Affected by winds of up to 21 knots to the coast, the ship **started to drag**. The use of its engine, even with two shackles in the water, could not prevent the **Eider** from **running its stern aground in the rocky area**. Four hours later, with the help of the tide, two tugs, and the advice of the Port's Pilot, the bulk carrier refloated. There were no injured people, 147 m3 of oil were spilled, and there was **severe damage to the hull and the marine environment**. The ship was unable to control the course and notice that the GPS information was leading them to a destination different than the expected, due to the absence of a track traced in the chart with notable points and reference distances to the anchorage location, even when the bridge team checked both radars.

The urgency to change the anchorage point was not properly weighed against the risks of a nocturnal manoeuvre with slight sea, in ballast condition, and with force 4 wind, taking into account that they would have daylight in 3.5 hours, the tide was starting to rise, and they could ask for a tug or a pilot.

LESSONS LEARNED:

1.- Voyage planning requires thorough preparation of the navigation equipment and the course in the nautical chart, making sure to use the same georeferencing system.

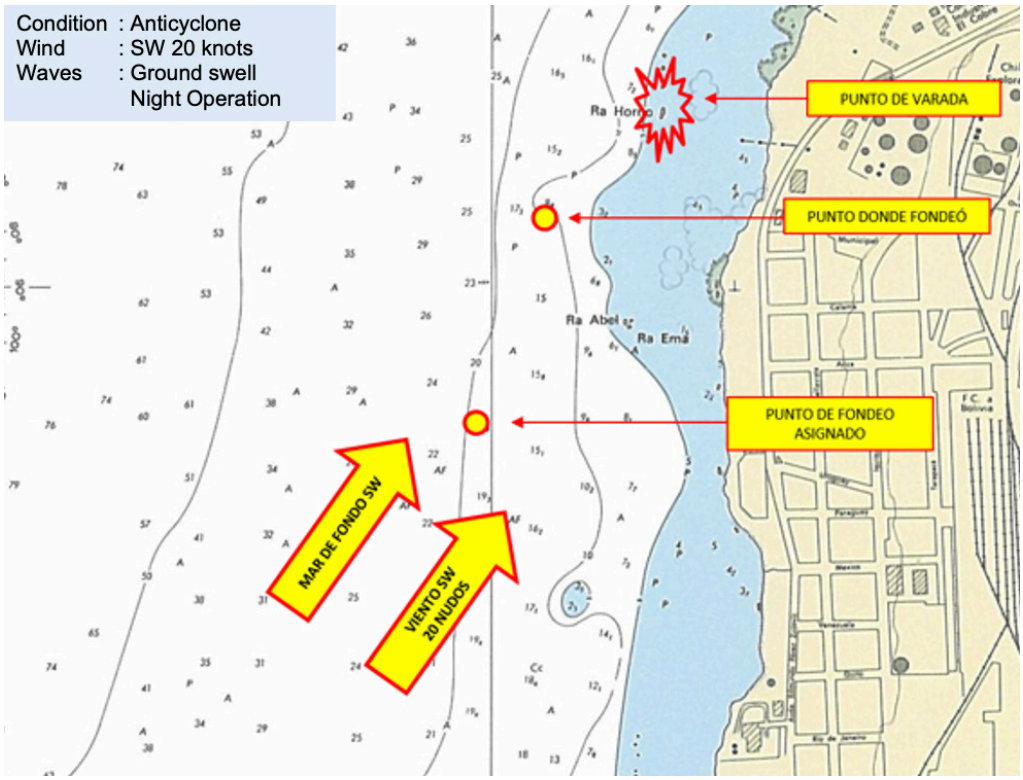
2.- GPS position is only reliable when represented in the WGS-84 geodetic system chart.

3.- Navigating near the coast is always risky and requires an adequate control of the course to the planned anchorage point. Positioning only with GPS, refusing to effectively use radars, alidades, and other positioning means available, does not allow to detect possible errors and divergences.

4.- Sailing directions and other nautical publications, especially the Guide to Port Entry, provide enough information on landfall safety.

5.- Waiting at the pilot boarding point and using their services to anchor will always be the safest option, especially when the port is not familiar.

6.- When leaving a shallow anchoring point under de effect of rough sea and/or strong wind, the use of engines is vital to avoid dragging and a possible grounding. It is preferable to wait for better conditions and request the assistance of tugs and the port's pilot.


Condition : Anticyclone
Wind : SW 20 knots
Waves : Ground swell
Night Operation
PUNTO DE VARADA
PUNTO DONDE FONDEÓ
PUNTO DE FONDEO ASIGNADO
MAR DE FONDO SW
VIENTO SW 20 NUDOS
Ra Abel
Ra Ema


EIDER
HONG KONG
Name : Eider
IMO : 9285938
Type : Bulk Carrier
Length : 200 m Beam : 24 m
Draught : 15 m GT : 22,792
Construction : Steel 2004
Flag : Hong Kong

GROUNDING OF A BREAKBULK CARGO SHIP, NEAR GUÍA NARROWS

NARRATIVE:

20 February 2010, the Hongkongese **BBC Leer** navigated the Sarmiento Channel heading North, at night, loaded with 14,300 tonnes of fertilizers. When steering from 330° to 296°, to head for Guía Narrows, the ship **went off its track** and grounded in the East bank. A Chilean channel pilot was in charge of the bridge and, in the turning point, ordered "port five" in English to the Russian helmsman. The order was correctly executed and verified in the helm indicator by the Pilot. To notice the steering, the Pilot went to the bow window to see the lights of the Isla Guard and Porpoise Point lighthouses, one to the side. From there, **the Pilot could not see the helm indicator and nobody else was controlling the tiller orders from the bridge.**
To stop steering, the order "starboard ten" was given and the ship turned to starboard quickly because it had a Becker helm, then the order "midships" was given. The Master, from the radar, informed they were turning to starboard, so the Pilot ordered "port 5", and then increased to "port 10". The Master noticed that they were still turning to starboard, so the Pilot ordered "midships", "port 5", and then "port 10." Despite these orders, the ship kept turning to starboard because the helmsman, who was not competent in English, had executed all the tiller orders the wrong way round, and nobody in the bridge noticed the error. The helmsman had made this mistake before, but it was not assessed as dangerous.

The **Leer** suffered damage to its double-bottom and did not spill oil or damage people.

LESSONS LEARNED:

1.- Errors and failures that occur in the bridge pose a high risk and require immediate action and notification to Watch Officers for them to be alert to possible repetitions and to be able to take actions accordingly.

2.- Even the most experienced helmsmen can make mistakes. To prevent them from happening, the safety procedure requires them to repeat the order given and inform their execution. The person who gave the tiller order must ensure that the angle and side of the steering are correct, using the helm indicator.

3.- Wheel orders given in English and executed by helmsmen and pilots who are not native speakers of this language increase the risk of making mistakes.

4.- Pilots must prepare the equipment with the Watch Officer and, in addition to positioning the ship, they must verify the correct execution of tiller orders, especially when the Pilot is far from the helm indicator and cannot do it personally.

5.- The onboard pilotage service is consultative. In the face of an imminent risk of grounding or a dangerous discrepancy regarding the navigation, especially when previous instructions have not reduced the risk, Masters must act with determination, taking control of the bridge.

Name	: **Leer**
IMO	: 9161168
Type	: Breakbulk/Container carrier
Length	: 153 m Beam : 24 m
Draught	: 13.5 m GT : 13,066
Construction	: Steel 1997
Flag	: Hong Kong

SINKING OF A CARGO SHIP TRANSFORMED INTO WELLBOAT, IN PUERTO MONTT

NARRATIVE:

On 21 August 2013, the Chilean **MV Isla Guar** sunk when navigating the Reloncaví Sound, under fine weather conditions. The ship has just been **modified to transport live fish**, installing 9 tanks of 45 cubic metres each, placed over a new high tween deck. To oxygenate the fish, a sea water damming circulation system was installed, capable of pumping 630 m3/h. One hour after departing, the ship **listed 5° to starboard**, which was corrected by draining a ballast tank. The ship listed again and **increased** to 45°, flooding the engine and the hold, until the stern sunk, at 200 m and 3 miles from the coast. **The watch team did not pay attention properly to the initial listing**, and only instructed the engine officer to right the ship, ballasting and draining tanks. Due to this, the origin of the listing remained unknown.

Investigative simulations showed that the most probable cause of the flooding and consequent listing was a breakage **in the seawater circulation system, made with PVC pipes**. As the pumping did not stop, the tween deck and a ballast tank flooded. The listing was **increased by the freeboard in the fish tanks**, as they drained partially due to the loss of circulation pressure and the lack of retention valves. The adaptation did not have a comprehensive design approved, which generated design risks unknown to the crew.

The accident caused the total loss of the ship and its cargo, without noticeable pollution from the oil. Since lifeboats did not inflate, the abandonment of the ship was carried out using the auxiliary boat. People were rescued unharmed by **MB Serranía** and Navy units.

LESSONS LEARNED:

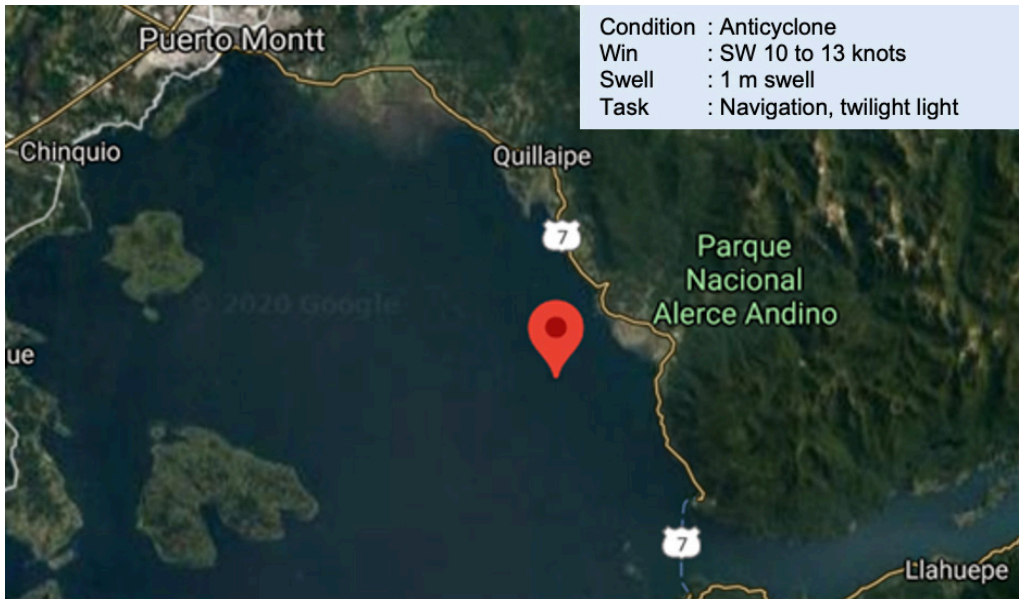
1.- As any permanent listing is due necessarily to weight loss, increase or sliding, and the most common cause is a leak, it is crucial to take action immediately to determine the origin and to control it.

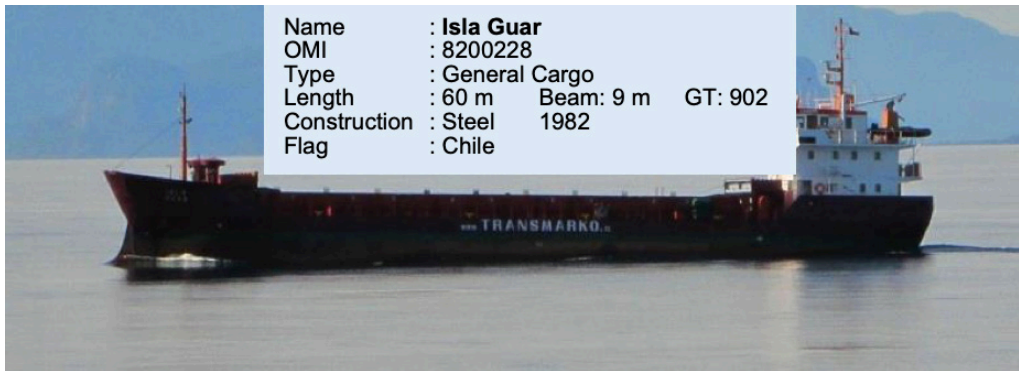
2.- Stabilizing a ship with an uncontrollable listing increasing the ballast is inconsistent and dangerous, as the reserve of buoyancy is reduced without resolving the cause of the listing.

3.- Ships transporting live fish in water tanks have considerable risks of freeboard and flooding, which increase with a low reserve of buoyancy.

4.- Controlling stability is a responsibility of Deck Officers and must not be delegated to engineer officers, nor depend on the decisions of fishing technicians on board.

5.- Ship adaptations must have a comprehensive design approved by the Maritime Authority, with any risks analysed and controlled, and previously establishing the ship operation philosophy, so once it is modified the crew can adopt it. The rules of ship classification societies are useful, as they provide constructive rules for the design.


Puerto Montt
Chinquio
Quillaipe
Parque
Nacional
Alerce Andino
Llahuepe
Condition : Anticyclone
Win : SW 10 to 13 knots
Swell : 1 m swell
Task : Navigation, twilight light


Name : Isla Guar
OMI : 8200228
Type : General Cargo
Length : 60 m Beam: 9 m GT: 902
Construction : Steel 1982
Flag : Chile
TRANSMARKO


ESTANQUES PARA
TRANSPORTE DE PECES


BARCO ESCORADO PREVIO
AL NAUFRAGIO

NEAR CONTACT OF CONTAINER CARRIER, WITH POLICARPO TORO PIER

NARRATIVE:

On 01 November 2016, the Portuguese **MV MSC Chloé**, when departing under adverse weather conditions from Site 1 of San Antonio Port, **drifted and was at serious risk of hitting** the Policarpo Toro pier due to an unwanted approach. For decades, the manoeuvring space in this port zone has decreased due to the increase in the size of ships, which motivated the Manoeuvrability Studies to set restrictions for the entry, stay and departure.

Since the **MV MSC Chloé** had a length of 300 m, it could only depart with a wind speed of 15 knots or less, current of 0.5 knots or less, and wave height of 1.5 m or less. When the loading finished, the port operator, the representative of the ship operator and **the pilots knew that the conditions were over the limits**, with gusts of 27 knots and waves of 3.0 metres. However, due to **operational and economic** reasons, they agreed to depart.

They added an extra tug to the task, for safety reasons, and expected the time of exposure to the wind to be minimized by the engine power of the **Chloé**. But **the large sail surface of the ship** and the containers it carried on its deck, made it drift and almost hit the port infrastructure. Two of the tugs were at risk of getting trapped between the ship and the pier, and eventually capsizing, given the speed of the ship in that moment.

The drift mentioned above could not be controlled properly by **the tugs**, since they were not made fast to the vessel and **delayed the repositioning, and one of the tugs erroneously** kept pushing in the same direction of the wind, which **was not noticed by the second pilot, who had an injured leg and decided to disembark early.**

The tugs lost pushing force when they were exposed to the swell and due to the speed of the ship.

LESSONS LEARNED:

1.- It is highly risky to break the restrictions set by the Manoeuvrability Studies, as they are the maximum acceptable parameters and have been calculated considering the balance of the forces involved, the risks, and the safety factors for unexpected events.

2.- When using pilotage advisory, operational limits and safety must be prioritized over commercial factors.

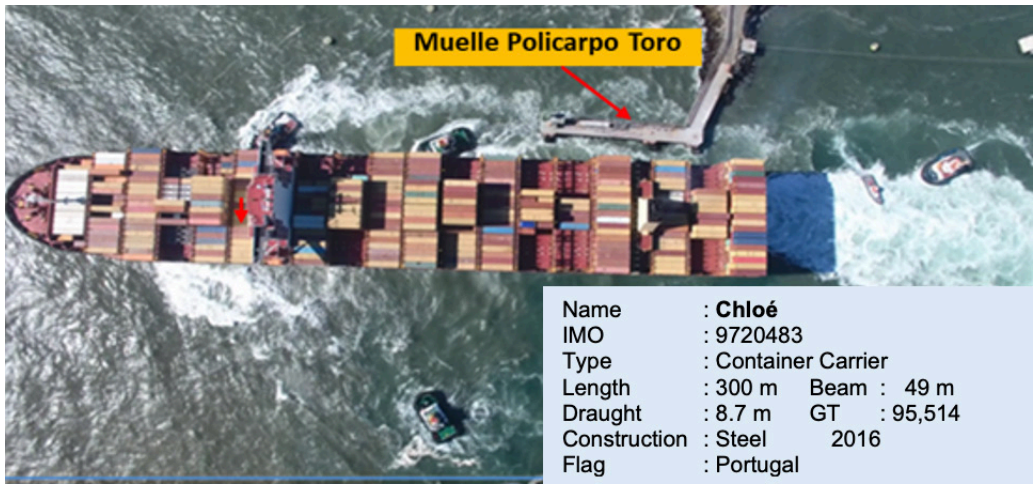
3.- Pilot disembarkation must be carried out at the designated spots and when the tugs have finished their task.

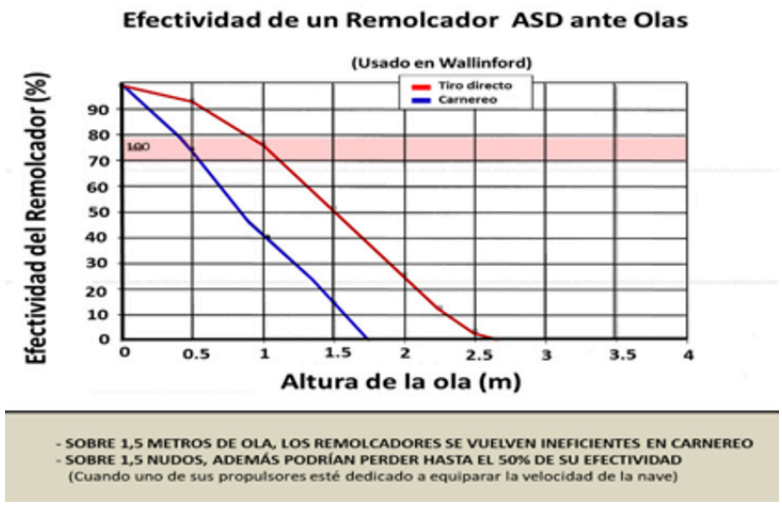
4.- The effectiveness of tugs is reduced when pushing and decreases due to the swell and the speed of the ship. An azimuth stern drive (ASD) tug becomes inefficient with waves of 1.5 m and loses up to 50% of its effectiveness with winds over 1.5 knots, as it uses a thruster to match the speed of the ship.

5.- The efficiency of bow and stern thrusters of the ships decreases with the rolling, and they become unable to operate over 2 or 3 knots.

6.- The crew of a ship must cooperate with the pilot, monitoring the manoeuvre and correcting mistakes.


Condition : Variable/Slight Sea
Wind : 20 knots/gusts of 27 knots
Waves : 3 m (at the breakwater)
Task : Departure with daylight.
Muelle Policarpo Toro
Condiciones hidrometeorológicas al zarpe


Muelle Policarpo Toro
Name : Chloé
IMO : 9720483
Type : Container Carrier
Length : 300 m Beam : 49 m
Draught : 8.7 m GT : 95,514
Construction : Steel 2016
Flag : Portugal


Efectividad de un Remolcador ASD ante Olas
(Usado en Wallinford)
Tiro directo
Carnereo
Efectividad del Remolcador (%)
100
90
80
70
60
50
40
30
20
10
0
0
0.5
1
1.5
2
2.5
3
3.5
4
Altura de la ola (m)
- SOBRE 1,5 METROS DE OLA, LOS REMOLCADORES SE VUELVEN INEFICIENTES EN CARNEREO
- SOBRE 1,5 NUDOS, ADEMÁS PODRÍAN PERDER HASTA EL 50% DE SU EFECTIVIDAD
(Cuando uno de sus propulsores esté dedicado a equiparar la velocidad de la nave)

GROUNDING OF CHILEAN RO-RO SHIP, IN ANTARCTIC TERRITORY

NARRATIVE:

27 March 2005, the roll-on/roll-off ship **Chinook grounded while riding at anchor in Caleta Potter**, Antarctic territory, under adverse weather conditions that had been properly informed by the Captain of the Port's Office of Fildes. The ship lowered its starboard anchor with **4 shackles**, on a muddy bottom between 30 and 43 metres deep. **With winds of over 60 knots, the chain was unable to hold the ship.**

The ship had not set an anchor watch nor had properly verified the ship's position, although it was a standing order, so the master, who was in the bridge substituting the Navigational Watch Officer, noticed the dragging late.

They decided to set sail, but the manoeuvre was delayed 15 minutes because the **main engine and the generators were not ready to start.**

With the thruster ahead, they heaved up the anchor, but the **strong winds embayed the ship against the shore** and made it ground sideways, in an area covered with ice.

They tried to refloat it by their own means unsuccessfully. Finally, they refloated the ship with the assistance of the Chilean Navy's icebreaker **Oscar Viel.**

The ship suffered **damage to the hull**, with leaks in the fuel tanks, but without oil spills. The propeller sustained damage to the blades, mainly from the attempts to refloat the ship. There were no injured people.

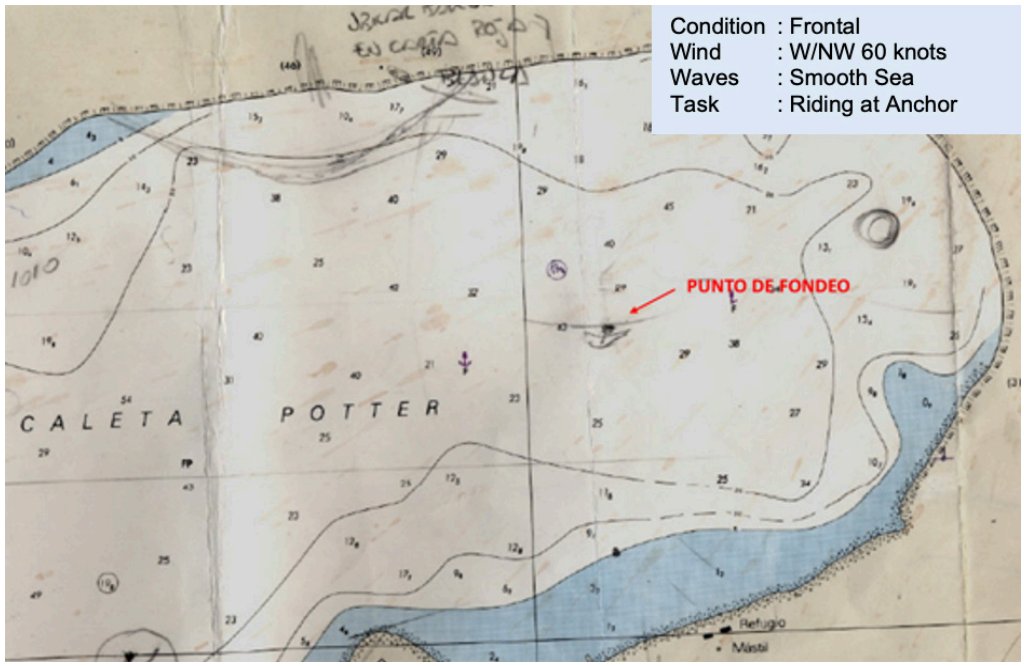
LESSONS LEARNED:

1.- Blizzards are characteristic of the Antarctic region and can easily gust to more than 50 knots. Therefore, riding at anchor should be planned beforehand, always anticipating bad weather. As a general rule, under good weather, the length of the chain should be at least 3 to 4 times the depth to the seabed, and 5 to 8 times under bad weather.

2.- When riding at anchor with strong wind, the engines should be ready and an anchor watch should be kept to detect potential dragging. The Watch Officer should verify the correct activation of the alarms that warn about changes in the ship's position and register regularly such changes on the nautical chart, as obtained by radar, markings and GPS.

3.- It is dangerous to sail when the ship is dragging, because hauling the chain will increase the dragging and its mechanical inertia, and the ship will depend solely on its engine power to avoid grounding. Due to this, it is preferable to secure the chosen anchoring spot, paying out more shackles and using the thruster to help anchoring until weather conditions improve and allow to sail.

4.- After grounding, it is vital to assess the damage before attempting to refloat the ship. Propeller and helm movements should be avoided until making sure they are not blocked. This will prevent damage to high-cost equipment or worsening the initial situation.


Condition : Frontal
Wind : W/NW 60 knots
Waves : Smooth Sea
Task : Riding at Anchor
PUNTO DE FONDEO
CALETA POTTER
Refugio
Mástil


Name : Chinook
IMO : 7023415
Type : Roll On- Roll Off
Length : 70 m Beam : 12 m
Draught : 3.7 m GT : 1,595
Construction : Steel 1970
Flag : Chile
LUGAR DE LA VARADA

GROUNDING OF GENERAL CARGO SHIP RIDING AT ANCHOR IN VALPARAÍSO

NARRATIVE:

On 6 July 2010, the **MV Cerro Alegre was riding at anchor without engines running when it grounded** on the shore of the Valparaiso bay, hit by a storm that had been duly forecast by the Captain of the Port's Office. The ship **was anchored west of Barón pier, at 2 cable lengths from the shoreline**, 35 metres deep , with a muddy bottom, **in an area that left it exposed to the surge from the north**, as it was outside the area sheltered by the breakwater of Valparaíso. Before the storm, the emergency crew (mainly repair personnel) reinforced the anchoring with a second anchor, **so starboard had 5 shackles in the water and port had 3**. In addition, a stand-by tug was hired , as a preventive measure against potential dragging.

By midday, the **Cerro Alegre** withstood **winds of 40 knots and waves of over 3 metres, which caused the starboard chains to break** due to the stress and wear of some shackles, which in some cases had the 60% of their original diameter. The port anchor had little chain in the water and was unable to hold the ship at the anchoring spot. After dragging for 7 minutes, the ship **grounded** with its bow to the East, close to the shoreline. This allowed the personnel of the Captain of the Port's Office to rescue the crew from shore.

As the tugboat was not ready, the high waves and the short time between the chain breaking and the grounding did not allow using the tug.

No injuries or oil spills were reported during the grounding. The ship was declared a total loss and was dismantled.

LESSONS LEARNED:

1.- The port of Valparaíso is not suitable for riding at anchor under stormy weather conditions.

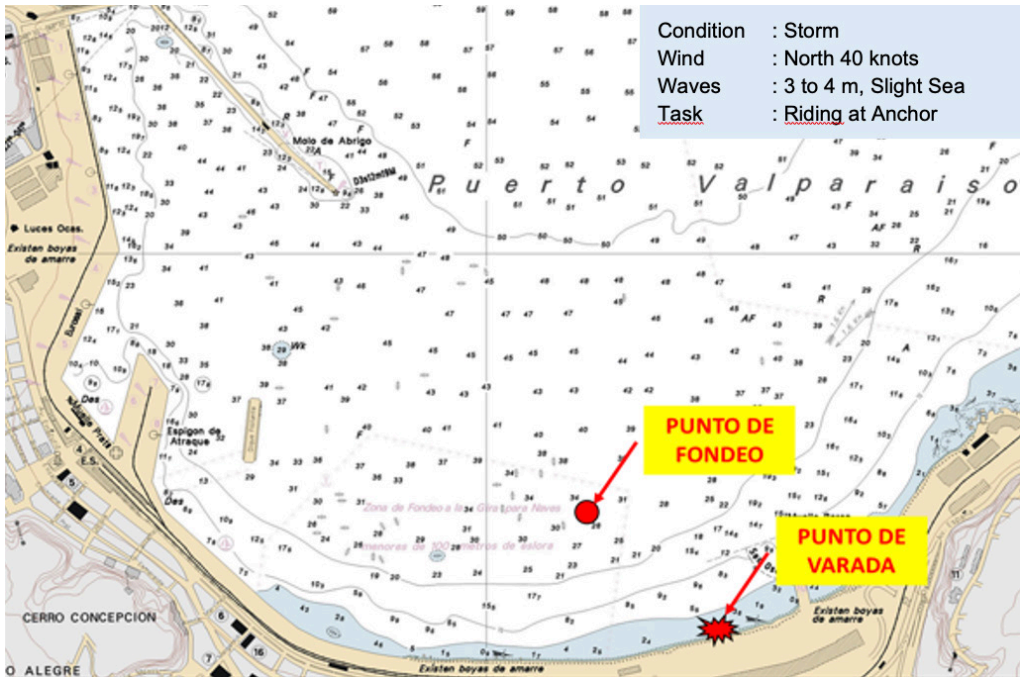
2.- Faulty or defective anchors or chains must be repaired by qualified personnel. Worn or deformed elements must be replaced. A broken link may put ships and those nearby at risk.

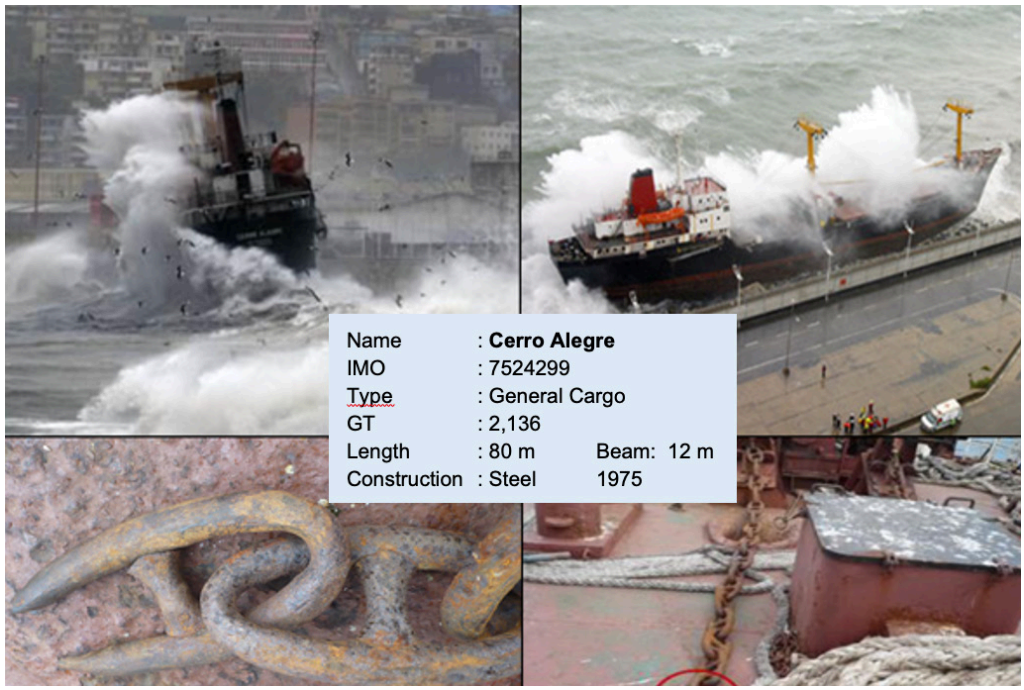
3.- For safe anchoring, the catenary should ensure a horizontal traction on the anchor ring under the ship's maximum effort. As a general rule, under good weather, the length of the chain should be at least 3 to 4 times the depth to the seabed, and 5 to 8 times under bad weather. It is important to consider the grip of the sea bottom.

4.- Riding at anchor with two anchors deployed requires both chains to work evenly in relation to the axis resulting from the swell, the wind, and the current. The amount of shackles in the water should be equal.

5.- Attempting towing as a solution to dragging under bad weather conditions can be ineffective if the towline is not fast before the bad weather. Towing with rough weather is dangerous for the crews and the ships, and is slow to carry out.

6.- If the ship is dragging anchor, more chain should be carefully payed out, and then stopped to release the capstan.


Condition : Storm
Wind : North 40 knots
Waves : 3 to 4 m, Slight Sea
Task : Riding at Anchor
Puerto Valparaiso
PUNTO DE FONDEO
PUNTO DE VARADA
CERRO CONCEPCION
Existen boyas de amarre


Name : Cerro Alegre
IMO : 7524299
Type : General Cargo
GT : 2,136
Length : 80 m Beam: 12 m
Construction : Steel 1975

COLLAPSE OF A CONTAINER SHIP CRANE, IN PUNTA ARENAS

NARRATIVE:

On 12 October 2012, when the container ship **Copihue** was riding at anchor at José de los Santos Mardones dock in Punta Arenas, carrying out the transfer of a 40-foot container, the **jib of the crane** collapsed falling inside the hold.

This collapse was **caused by a manufacture defect in the welding of the articulated joint of the jib crane**, which was not detected during the manufacturing process, nor in the static and dynamic tests conducted for 12 years before the casualty.

Staff from the stowage company manipulating the loading and operating the crane had the required skills, experience, and were provided with safety equipment and procedures for this kind of work. Their task was to load stacked containers in the dock using both cranes on board.

The weight of the containers met the safety standards for cranes.

Port workers, to prevent accidents from possible falling loads, **stood in safe places with low exposure to risk.** The only injured person was in the deck pulling the rope to guide the container through the hold hatch. **Although he bent down to protect himself with the coaming of the hold, the snap back of the lift wire was so fast that hit his head** causing a craniocerebral trauma, concussion, and injuries in the left forearm and leg.

The safety helmet was very important as it absorbed most of the energy of the wire, which saved his life. First Aid was provided on board, with the assistance of a nurse of a Chilean Navy vessel. Later, he was evacuated to a hospital.

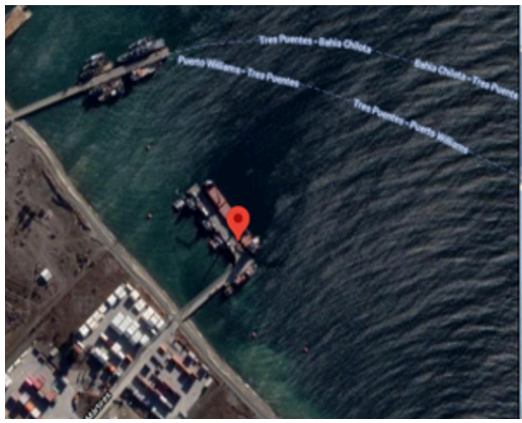
LESSONS LEARNED:

1.- Failures that cause the falling of suspended loads and snap backs of wires highly tensioned are events that happen very fast and are unpredictable. Keeping safe in protected places and the correct use of safety equipment, such as safety helmet with chin strap, have shown to be effective measures to save lives and reduce serious injuries.

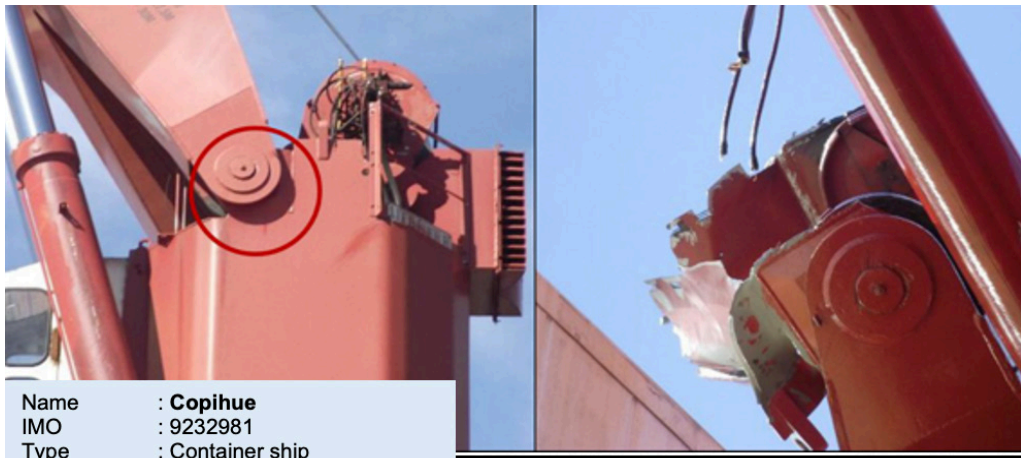
2- In many cases, paint covers existing cracks in the metallic structures of cranes and equipment that are subjected to huge loads. For this reason is recommended to perform nondestructive tests to welded and critical parts during dry docks.

3.- Having an effective capacity to provide first aid on board is crucial to stabilize a seriously injured person before the evacuation to a hospital.

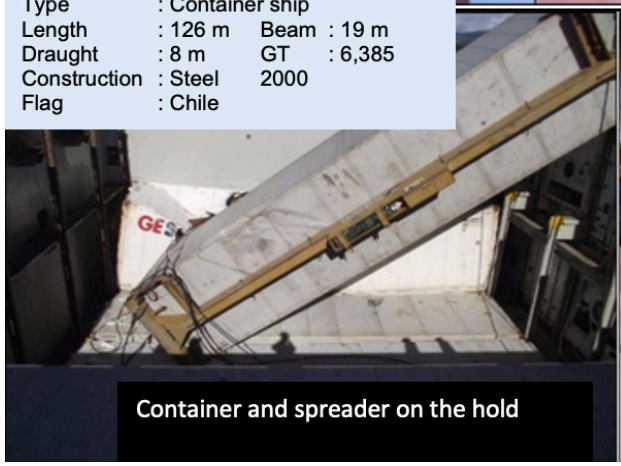
4.- Adoption of safety measures by port workers on board the vessel is under the responsibility of the Officer in charge of a watch and the stowage company, in compliance with safety procedures already established.



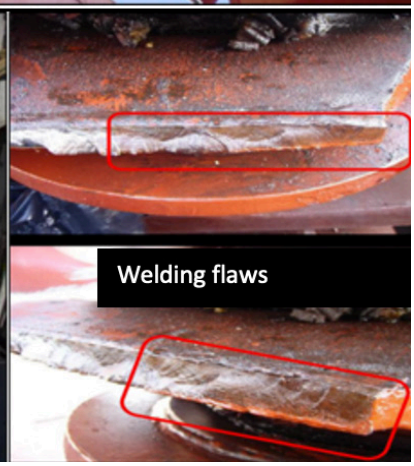
Condition : Good Weather
Wind : 10 knots
Waves : Calm Sea
Task : Loading in Port



Name : **Copihue**
IMO : 9232981
Type : Container ship
Length : 126 m Beam : 19 m
Draught : 8 m GT : 6,385
Construction : Steel 2000
Flag : Chile



Container and spreader on the hold



Welding flaws

GROUNDING OF GENERAL CARGO M/V, IN PULLUCHE CHANNEL

NARRATIVE:

On 23 April 2008, the Marshallese cargo ship **Faruk Kaan** loaded with 8,049 tonnes and having channel pilots on board, **grounded in a shallow** when crossing the Pulluche channel from South to North. The ship **exceeded in 50 cm the 7.5-metre draught recommended by the sailing directions as a precaution**, however, the bridge team agreed to continue the navigation, in order to heave to in face of bad weather conditions in the ocean route.

After crossing Roepke shallow the ship **deviated from the planned route**, passing close to a shallow with a sounding of 9.8 metres according to the chart, but there was an **unknown shallow** of 8.1 metres in the surrounding area, where the ship grounded, without getting stuck.

The Pilot in charge of the bridge was monitoring the route in the radar, through a parallel indexing, representing the position provided by the GPS on a Raster chart displayed on a laptop with a track recording system.

The Master and the Officer on duty were in the bridge but they were not involved actively in the navigation operation, and **they were not using the paper chart**, which is the only document with hydrographic validity. The grounding resulted in cracks and dents in the hull, without causing pollution to the sea or injuries in the crew. Damages were luckily repaired, which allowed them to continue their navigation to dock for permanent repair.

LESSONS LEARNED:

1.- Even when navigational charts do not show greatest dangers, the precautions established in the sailing directions like the restrictions of draught and length are the minimum for a safe navigation and to ignore these safety barriers is very risky, as there could be variations in the soundings or other anomalies.

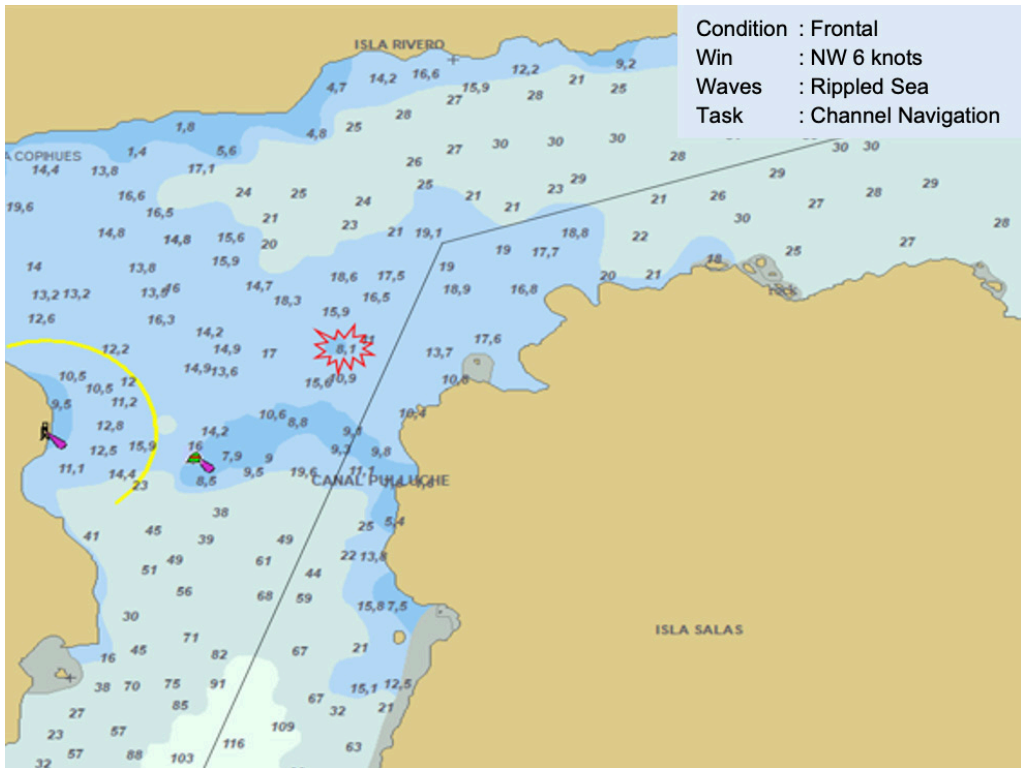
2.- The fact that the Master did not have the Sailing Directions of the Chilean Coast in English could be the reason why he did not assess in detail the new section of channels or object the Pilot's suggestion which exceeded the maximum draft recommended to navigate that channel.

3.- When choosing a route, you must consider the "squat effect" which causes the ship to be closer to the seabed when navigating shallow waters, and it is proportional to the speed of the ship.

4.- Pilots should not make recommendations contradicting the sailing directions. The Darwin channel was a better option to enter sheltered waters.

5.- It is important that Pilots become part of and reinforce the bridge team of the ship they are assisting, incorporating the Officer in charge of a navigational watch, to provide a better plan and track control.

6.- Parallel indexing is a good method to ensure that a ship keeps its track along the route already planned, but it does not indicate its progress. As this method is only an aid to navigation, other valid techniques must be used to fix the position, which has to be done at regular intervals and with greater frequency in dangerous areas, before and after changing the track.



Name : **Faruk Kaan**
IMO : 9165865
Type : General Cargo
Length : 106 m Beam : 20 m
Draught : 8 m GT : 7,739
Construction : Steel 2005
Flag : Marshall Islands

GROUNDING OF CARGO MV AT ANCHOR, IN PUERTO CISNES

NARRATIVE:

During the night of 03 January 2019, the Chilean **MV Conquistador grounded due to low tide** while at anchor in the bay of Puerto Cisnes. The ship **operated with two shifts**, as they had **one less Deck Officer and one less Engineer Officer than the established minimum safe manning.**

To be able to sleep, they programmed some nights with the vessel riding at anchor and the Master kept watch until midnight and then was relieved by the **Deck officer who was authorized to sleep.** Such a decision caused a dangerous condition, **as the bridge was unattended** and without the capacity for a prompt response in case of dragging or any other potential risk when a vessel is at anchor.

As the vessel was mainly conducting logistic and service work for aquaculture centres, departures and landfalls were constant, making impossible for the crew to have a full rest, causing fatigue and affecting decision making skills.

The anchorage point chosen was a beach area close to the mouth of a river, and because of the changing conditions, sounding information was not available, making this area not suitable for navigation of large vessels, and especially not for riding at anchor.

The grounding did not cause injury to people, or damage to the environment or the vessel, which was refloated at high tide.

LESSONS LEARNED:

1.- One of the effects of fatigue is the wrong interpretation of dangerous situations, as the attention of the fatigued person is focused on less important issues. In part, that can explain the dangerous choice of the anchorage area.

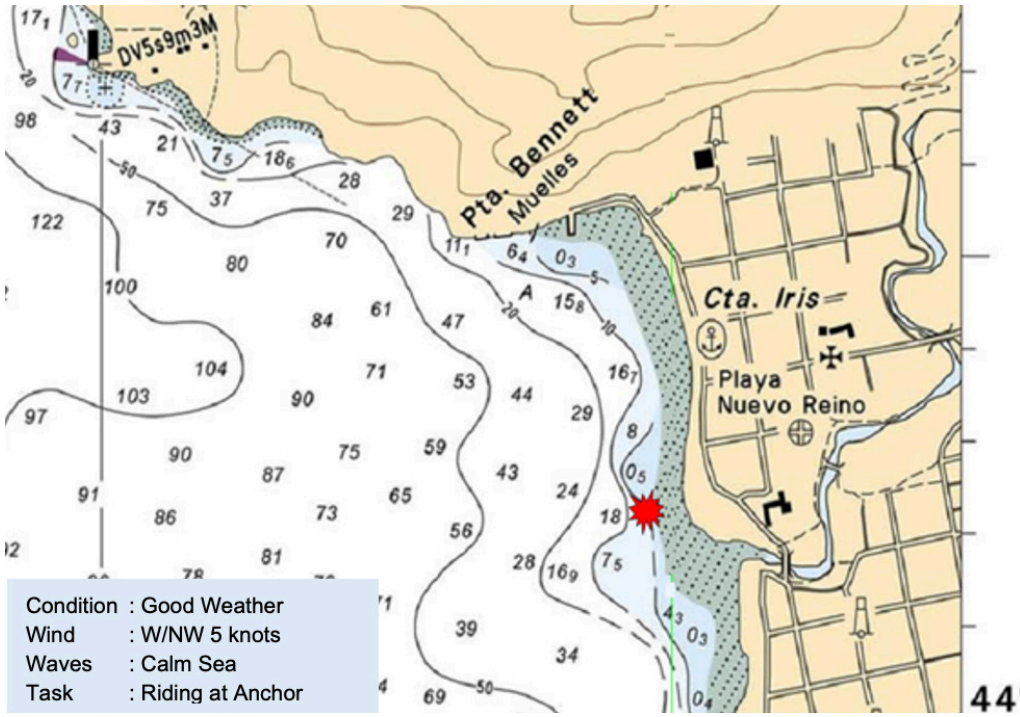
2.- The Shipowner and the Operator must prevent fatigue programming voyages with enough manning so they can rest between 7 and 8 consecutive hours, taking into account port and navigation watches, departures and landfalls, exercises and any other activity scheduled.

3.- Surveillance in the bridge must be permanent, whether the vessel is at port or navigating.

4.- Operating a vessel with a crew smaller than the recommended minimum safe manning will definitely cause fatigue and accidents.

5.- Due to the risk of grounding, large ships should not navigate or stay in areas where there is no sounding information available, as it is the only way to know how much water the ship will have under the keel under low tide conditions.

6.- Ships are fitted with echo-sounding devices with shallow water alarms, which are an effective tool to prevent ships from running aground, but only if it is activated correctly.



Condition : Good Weather
Wind : W/NW 5 knots
Waves : Calm Sea
Task : Riding at Anchor

Name : **Conquistador**
IMO : 8019629
Type : General Cargo
Length : 54 m Beam : 12 m
Draught : 4 m GT : 994
Construction : Steel 1980
Flag : Chile

RO-RO PASSENGER SHIP HIT A LIGHTED MARK, IN CANAL TENGLO

NARRATIVE:

During the night of 25 December 2017, the passenger ship **Jacaf went adrift** when departing from Puerto Montt. **Due to the wind, she hit the single-pile lighted** mark Tenglo Este, which remained inoperative without causing any damages to the structure of the ship or limitations to continue the navigation.

Machinery of the ship was working well and minutes after the departure the ship **stopped due to a slip of the operator**, plus **deficiencies in the "List of departure procedures"**. The main engine's **fuel valves were closed** and once the remaining fuel was consumed the engines stopped. Once the mistake was detected and corrected, propulsion was restored.
With the vessel adrift at a speed of 6 knots and affected by NE winds and 8 knots, it was predictable she would move to the piles marking the waterway. Although they had bow anchors and ropes, the **bridge team did not perform anchoring** manoeuvers that could have avoided the contact with the pile or at least reduced damages, and they only used the helm and waited until the ship was fully operative.

The departure checklist included the main actions to prepare the ship for sailing, but it **was not complete and was misleading**, as "opening the valves of the fuel supply system" was not included. On the contrary, in order to protect engines, there was an order of keeping the valves closed at port, but opening them was not mentioned in said instructions.

LESSONS LEARNED:

1.- When there is an emergency that requires stopping the headway or avoiding the free movement of a vessel, the more useful and effective manoeuvre is anchoring, which is possible even when the ship has suffered a blackout.

2.- The speed of the vessel is not an impediment to emergency anchoring, as systems are designed for those situations. Even if the anchor chain breaks, its use will reduce damages to the ship, the port infrastructure or other ships.

3.- Checklists are very useful, but if they are not made by qualified personnel and/or the processes are not appropriate, they may lead to serious mistakes. It is always advisable that crew members make sure that critical actions are included in the checklist and that it covers risks that must be controlled.

4.- Many ships have gone adrift due to poor alignment of fuel and cooling circuits of propulsion engines; therefore, monitoring them must be a priority for Engineer Officers in a management level.


Condition : Good Weather
Wind : NE 8 knots
Waves : Calm Sea
Task : Departure
Salfa
Diego Portales
Parques Terminal
Zona Naval
Aduana
Bello
La Trinchera
Costanera
Embarcadero
Puntilla Tenglo
Austr - Puerto Montt - Chaitén
M/N JACAF
PILOTE HINCADO
TENGLO ESTE
Puerto Montt - Chaitén


Name : Jacaf
IMO : 8969331
Type : Ro-Ro Passenger Ship
Length : 69 m Beam : 14 m
Draught : 2.5 m GT : 1120
Construction : Steel 2002
Flag : Chile
Naviera Austral
© Alex Haro Brintrup
MarineTraffic.com

SINKING OF AN ARTISANAL FISHING VESSEL, AT ANCHOR IN ARICA

NARRATIVE:

On Wednesday, 16 May 2018, when the artisanal fishing vessel **Kairos was at anchor** in the fishing cove of Arica, with **no crew** on board and **affected by moderate sea conditions** that were duly forecast, **cut moorings and drifted to a rocky area.**

The ship was towed and moored at the original anchoring location, **with no evidence of damages or visible leaks at a first examination by the operator.**

A few hours later, the ship heeled over due to a **flooding in the engine room** caused by an undetected leak. The portable bilge pump installed for that purpose was unable to control the leak and the ship sank completely at the anchoring location.

The cove in Arica's Port is known for suffering from the effects of the roughness of sea. Mooring ropes and lines are subject to constant pulls caused by waves. However, **the mooring line snapped mainly due to wear and the poor condition of the line that was holding** the vessel.

The uncontrolled flood was the result of the initial damage to the fiberglass hull caused by rocks, which worsened when the vessel was anchored in an area exposed to slight sea.

As the vessel was unmanned at the time of the flooding, it was not possible to have a prompt response or to take the vessel to a shallower area.

LESSONS LEARNED:

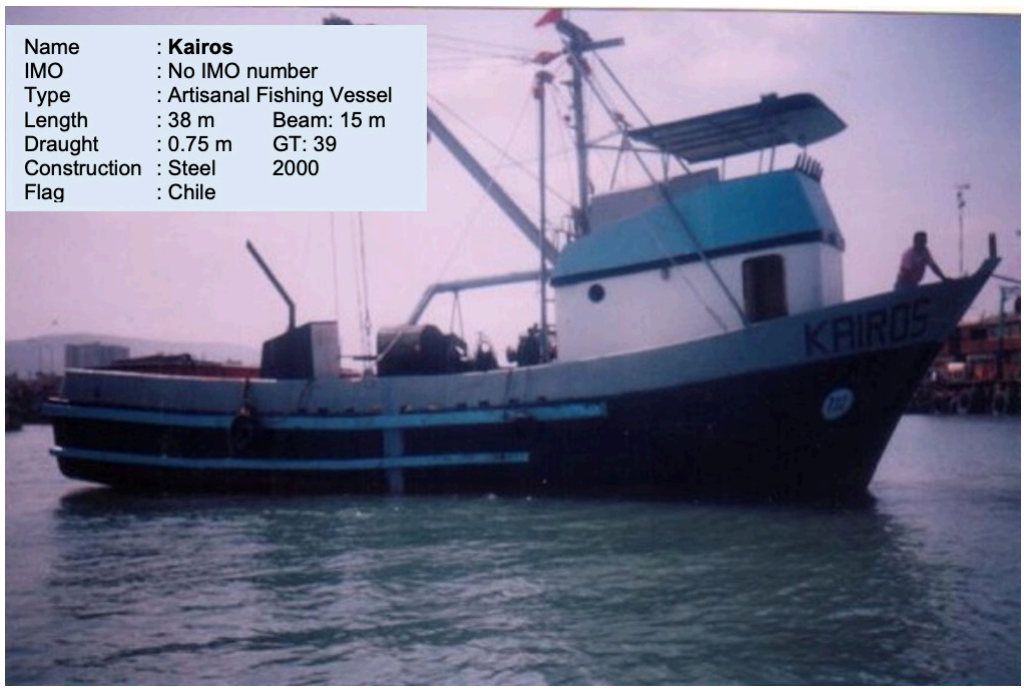
1.- Leaving the vessel at anchor, unmanned, in an exposed or semi-exposed anchorage when there is a slight sea forecast, is risky, as it is impossible to have a prompt response in case of dragging or snapped mooring lines.

2.- Plastics reinforced with fiberglass have a very high mechanical resistance and modulus of elasticity. Unlike steel hulls, fiberglass hulls break when the capacity to suffer reversible deformation is exceeded. Depending on the case, this could cause the loss of material pieces (therefore, immediate leaks) or cracks. Cracks in hulls produce less significant leaks, but when subjected to new stress from waves or the inadequate distribution of cargo, the damage can increase dramatically and the subsequent leaks too.

3.- When a ship runs aground, which exerts a considerable amount of stress on specific spots, you must assume the occurrence of floodings, and install a surveillance and response system in case of leaks, and also carry out a detailed internal and external check out of the hull to discard damages and cracks.

4.- Current mooring and anchoring lines have a life cycle of up to 10 years, depending on the material it is made of. Its resistance is reduced when exposed to sun, humidity, chemicals and oils, as well as when they are subjected to stresses that almost break them, such as rubbing with ropes, manholes, rough surfaces or sharp edges, which cut and weaken fibers. Simple knots can reduce the resistance of a rope in a 20%.


Condition : Night
Wind : Calm
Waves : Ground Swell
Task : Riding at Anchor
Muelle ENAPU Perú
TPA
Puerto de Arica
Estación de Ferrocarril
Arica - La Paz
Google


Name : **Kairos**
IMO : No IMO number
Type : Artisanal Fishing Vessel
Length : 38 m Beam: 15 m
Draught : 0.75 m GT: 39
Construction : Steel 2000
Flag : Chile
KAIROS

CRANE COLLAPSED OVER A BULK CARRIER, IN MEJILLONES PORT

NARRATIVE:

On 10 February 2007, **the jib of crane** No. 1 of the Maritime Port Terminal of Mejillones **collapsed**, falling over the hold of the bulk carrier **Miden Max**. There were no injured people. The jib collapsed when the grab bucket was lifting 20 tonnes of coal, without activating any alarm or the grab bucket getting stuck on any structure of the ship's hold.

The crane had 13 years of operative life and a maximum capacity of 20 tonnes. Months before the collapse, the jib had undergone **unfinished repairs** due to a crack. In that occasion, fatigued iron planks were not replaced, instead, they were reinforced with two rhomboid-shaped metallic planks welded on the outside.

After the repair, the maximum load for the the crane was not **limited, and it was even operated with the maximum extent** of the arm and 23 tonnes.

Comparative studies with a similar crane showed flaws in the construction of the collapsed jib, both were certified to lift the same weight but the thickness of the **steel was 27% less in the collapsed jib.**

In addition to the previous flaws, there were some errors in the setting of the **alarm system and in the overload automatic shutdown, which were causing fatigue of the material** when the overloaded grab bucket was lifted several metres before the alarm activated, and by the abruptness of the automatic shutdown which generated unwanted vibrations when interrupting the movement of the suspended load.

The crane manufacturer was bankrupt.

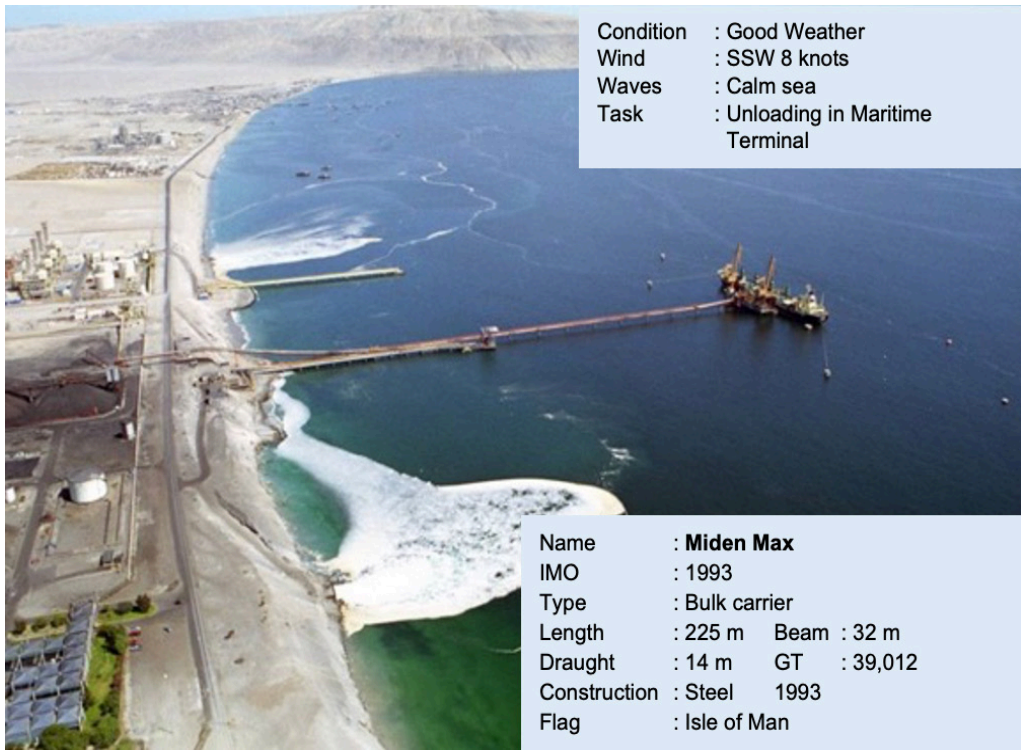
LESSONS LEARNED:

1.- Material fatigue is a process of progressive localized structural alteration occurring in a material subjected to cyclic stresses and strains at certain spot, which may end up cracking or fracturing after a sufficient number of fluctuations.
Operating cranes and jibs at their capacity limit will almost certainly cause fatigue and catastrophic failures.

2.- When detecting cracks and deformations caused by fatigue, not only repairs should be done to replace fatigued material, avoiding provisional patches, but also a study must be done to control the causes of the fatigue, otherwise the failure will occur again.

3.- The selection of grab buckets for bulk cargo must be done in a way that the maximum volume to be grabbed does not exceed the maximum load allowed by the design of the crane. There are grab buckets that are automated and others with the capacity to install spill plates to reduce the capacity in case of heavier loads, preventing to exceed the crane lift maximum capacity.

4.- The correct alarm setting is an important task because if the selected option does not prevent the risk from happening and operators do not know about the default; they will not acknowledge they are operating outside safe parameters, which will cause failures and accidents.



Condition	: Good Weather
Wind	: SSW 8 knots
Waves	: Calm sea
Task	: Unloading in Maritime Terminal

Name	: **Miden Max**		
IMO	: 1993		
Type	: Bulk carrier		
Length	: 225 m	Beam	: 32 m
Draught	: 14 m	GT	: 39,012
Construction	: Steel	1993	
Flag	: Isle of Man		

GROUNDING OF A TANKER, IN SAN VICENTE BAY

NARRATIVE:

On 10 November 2007, the tanker **High Endeavour grounded in the shallow Roca Villa de Burdeos** when departing at night from ENAP terminal C in San Vicente bay.

The vessel had changed the port of arrival, without **having the cartography of the bay, departing with only a part of the chart covering from Valparaíso Bay to Arauco Gulf, scale 1:500.000, inappropriate to fix the position, forcing the ship to sail based on assumptions.**

Departure was assisted by a port pilot, who returned the control of the bridge to the Master at the disembark point and recommended him to continue navigating heading 267° until they pass Roca Villa Burdeos buoy abeam starboard, and then to turn starboard to enter the exit channel of the Traffic Separation Scheme.

The officer in charge of the navigational watch left the bridge to monitor the disembarkation of the Pilot, meanwhile, the **Master was sending departure messages to Ship Owners and, at the same time, continued operating the ship, instructing three changes in the course to starboard, which headed the ship to a shallow, duly marked.**

The lighted buoy "Roca Villa de Burdeos" was a port lateral mark which was operative and according to the international lateral maritime buoyage system B, vessels must leave the port on the starboard side. But that did not happen, even though the navigation equipment was operative and the buoy was reflected in all radars, and this mistake was also not noticed by the watch officer when he returned to the bridge.

The ship resulted with three ballast tanks in free communication with the sea, without reporting injuries or spills.

LESSONS LEARNED:

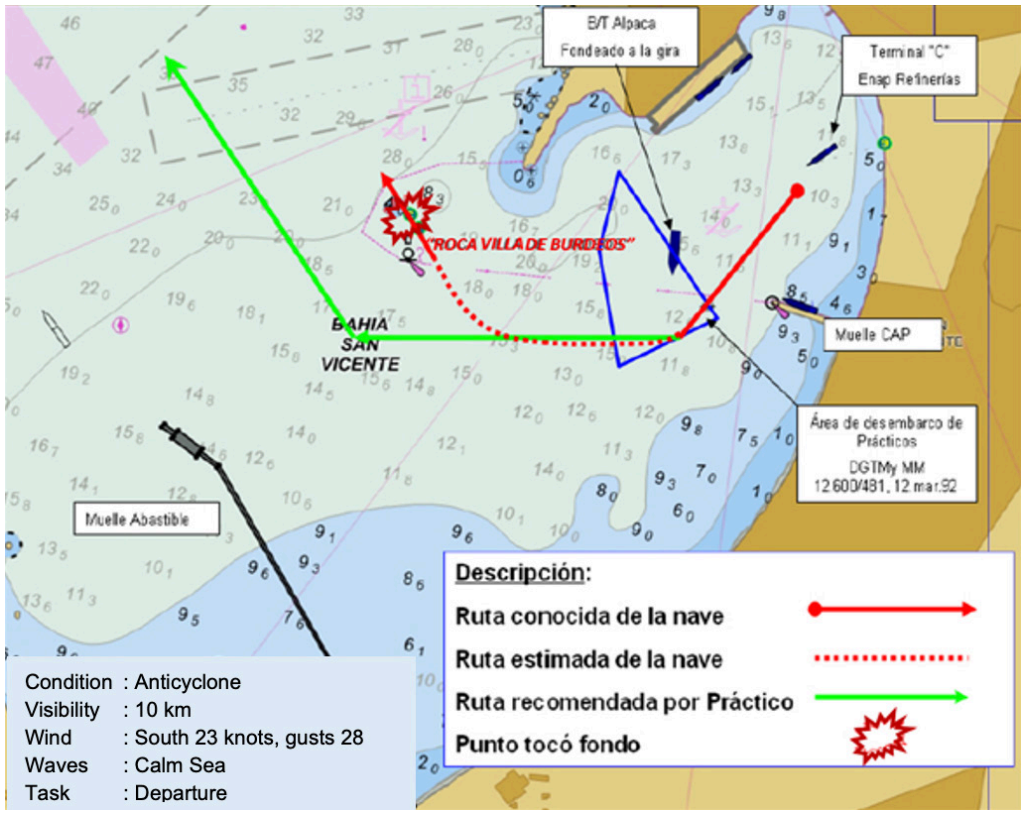
1.- It is essential to have the exact positioning of the ship during landfalls and departures, which cannot be done without a nautical chart with an appropriate scale, to plot the track and mark hazards.

2.- Route or port modifications force to change the voyage planning, meaning charts and nautical publications should be completed plotting the new track in the chart with a proper scale, mark dangerous areas, routing and ship reporting systems, Vessel Traffic Services and areas environmentally protected.

3.- An appropriate control of navigation to avoid hazards certainly considers prioritizing tasks such as to control the advance and positioning of the ship over those that are administrative in nature.

Distraction and discontinuity during navigation have shown to be causal factors of accidents; therefore, to authorize relief or temporary absence of the officers in charge of a navigational watch during a landfall or departure maneuver can have drawbacks, as well as when the Master monitors the maneuver and simultaneously performs other administrative or commercial tasks.

4.- Monitoring the disembarkation of the pilot during night exposes the Officer to intense lights that reduces the visual capacity, affecting the surveillance on the exterior of the bridge and the adequate control of navigation.


B/T Alpaca
Fondeado a la gira
Terminal "C"
Enap Refinerías
"ROCA VILLA DE BURDEOS"
BAHIA
SAN
VICENTE
Muelle CAP
Área de desembarco de Prácticos
DGTMy MM
12.600/481, 12 mar.92
Muelle Abastible
Descripción:
Ruta conocida de la nave
Ruta estimada de la nave
Ruta recomendada por Práctico
Punto tocó fondo
Condition : Anticyclone
Visibility : 10 km
Wind : South 23 knots, gusts 28
Waves : Calm Sea
Task : Departure


Name : High Endeavour
IMO : 9272931
Type : Chemical/Oil Tanker
Length : 183 m Beam : 32 m
Draught : 12 m GT : 30,028
Construction : Steel 2004
Flag : Liberia
d'AMICO
HIGH ENDEAVOUR

ACCIDENT OF AN ENGINEER OFFICER OF A FACTORY SHIP, IN THE ATLANTIC

NARRATIVE:

On Wednesday, 19 March 2014, when sailing close to the Islas Malvinas, the 1st engineer, chief engineer of the factory ship **Globalpesca II, lost his balance and suffered the amputation of his right hand thumb** when he was inspecting the motor system of a conveyor belt. Changing the traction chain of the conveyor belt required **removing the protection of the moving parts**, so the chief engineer officer took this opportunity to visually check the correct operation of the system. This **work was carried out under risky conditions** as the fishing ship was navigating with wind force 7 and a very rough sea, and in addition, in order to see the whole system working, he had to bend down in a very small place and get dangerously close to the chain gears.

The Engineer officer was about 20 cm away from the conveyor belt, **in squatting position and on tiptoes** (very unstable position) **when the machine started running.** The **ship rolled causing him to fall over**, holding instinctively to the chain, which amputated the first phalange of his thumb. The **crew provided first aid and controlled the haemorrhage with a tourniquet.** Later, he was disembarked in Stanley Port and taken to a health centre.

There were other ways to monitor the proper functioning of the recently replaced chain.

LESSONS LEARNED:

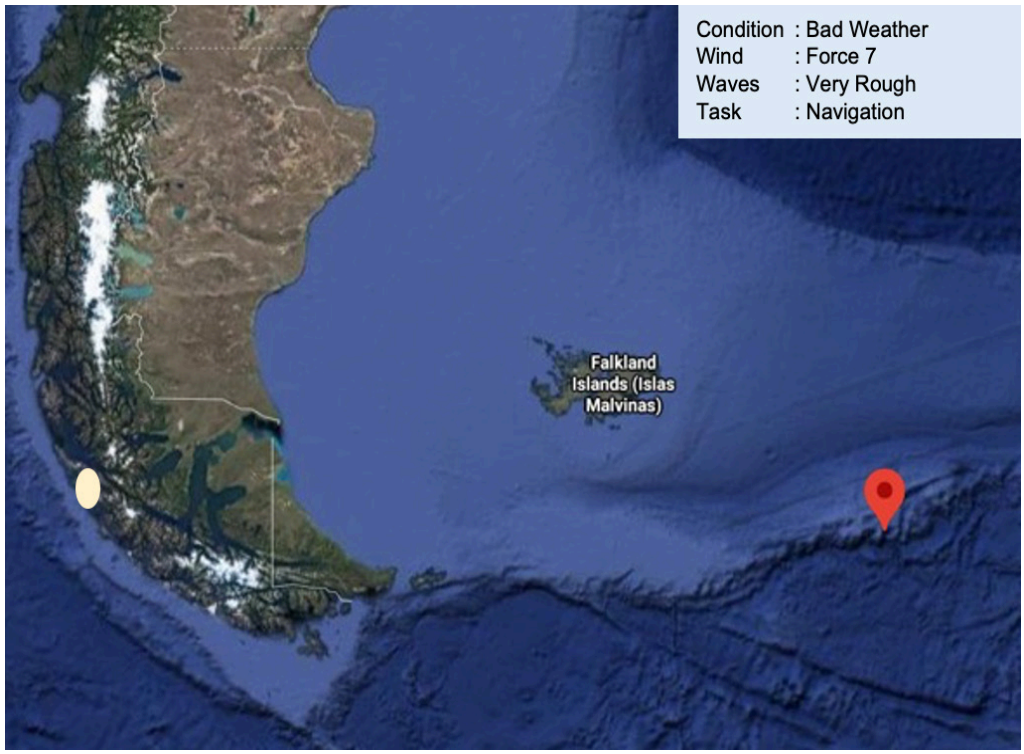
1.- Maintenance work that involves some kind of risk should be scheduled preferably during dry docks or when in port.

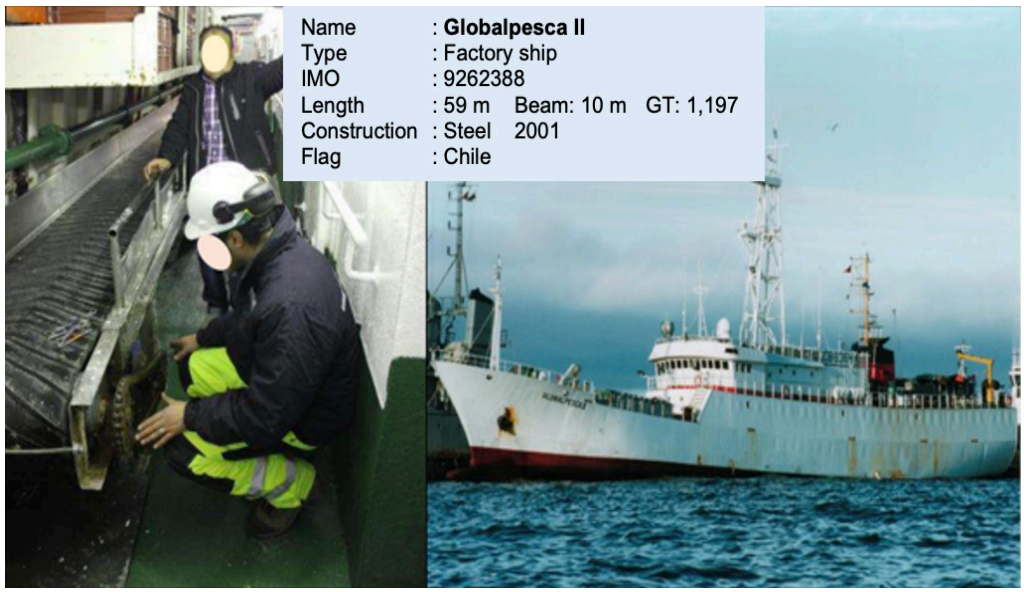
2.- Any machine with parts in movement should not be operated without the required security. If during an emergency a dangerous mechanism in movement must be checked while navigating, an indirect observation method should be preferred, such as records or pictures of the system, before considering putting at risk the physical integrity of the crew members.

3.- Chief engineer officers are in charge of adopting safety measures to be followed by the engine room crew. These measures can be very lax when it is the chief who exposes to the risk, which should be taken into account when reinforcing the concepts of keeping yourself safe.

4.- During intense rolling, non-urgent risky tasks should be postponed.

5.- The survival of a serious injured person on board depends on the capacity to provide effective first aid. Medical knowledge and behaviour of those who have this responsibility is as crucial as having the instruments and supplies required to stop a haemorrhage or to treat other conditions.º


Condition : Bad Weather
Wind : Force 7
Waves : Very Rough
Task : Navigation
Falkland
Islands (Islas
Malvinas)


Name : Globalpesca II
Type : Factory ship
IMO : 9262388
Length : 59 m Beam: 10 m GT: 1,197
Construction : Steel 2001
Flag : Chile

SINKING OF ARTISANAL FISHING VESSEL IN PUNTA PUCHOCO

NARRATIVE:

On 9 March 2019, the artisanal fishing vessel **Herlibet**, under good weather conditions, with 6 crew members and 25 tonnes of sardine on board, **capsized when navigating** from the fishing areas to Coronel port.

Before the bilge alarm was activated, the crew felt a **big hit in the hull** and due to the big amount of water leaking into the engine room, the ***drainage system was unable to control the flooding.*** After 25 minutes, the vessel sank 50 meters deep and 3 miles to the NW of Punta Puchoco. The crew activated the lifeboats and shot flares. The survivors were rescued, uninjured, by Doña Sandra II. **This wooden hull ship of artisanal construction was 23 years old.**

All the safety certificates required were in force, but because it was an old ship sailing at 7 knots and fully loaded, it was unlikely to withstand the impact of a large derelict to its quickwork without causing leaks.

Once the emergency was declared, no one from the crew inspected the engine room or the hold, so they were **unable to determine the area or the magnitude of the damage.** Navigation was conducted during night, diminishing the probability to detect a dangerous, half immersed object adrift.

The use of a drainage pump was the only action to control the flooding.
There were no signs of oil pollution.

LESSONS LEARNED:

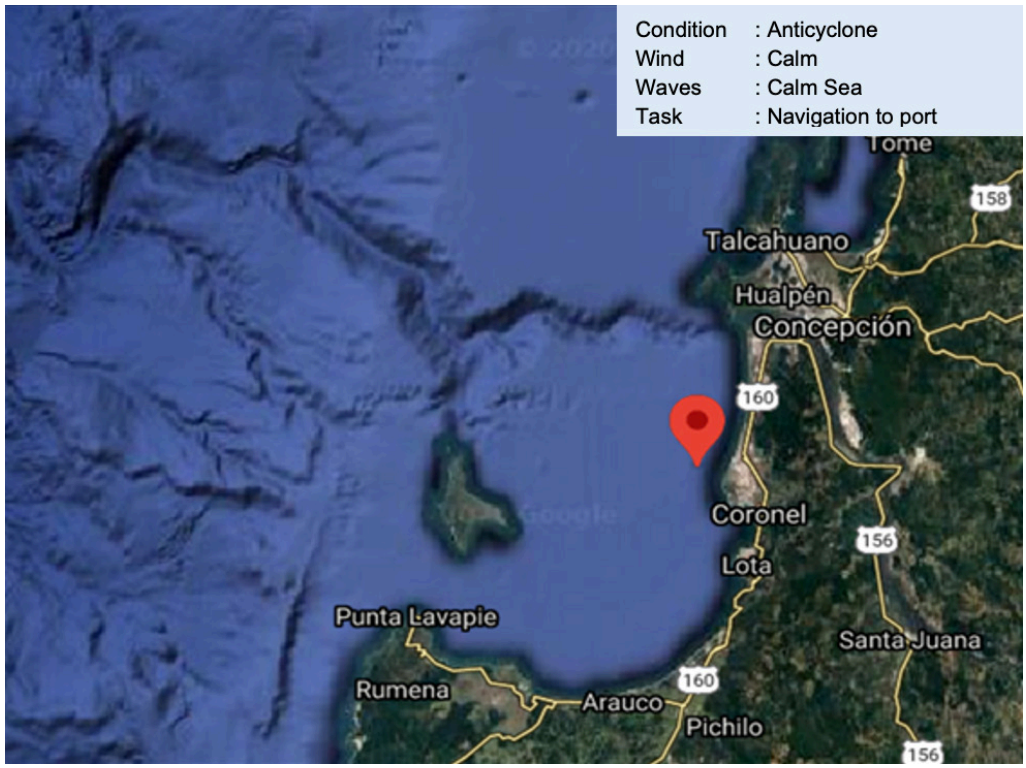
1.- In order to keep afloat a ship with a damaged quickwork, it is crucial to detect, limit and confine leaks, as the bilge pump drainage capacity is usually not enough.

2.- Artisanal fishing vessels have two big compartments, the fish hold and the engine room, compartments that should always remain watertight, so as to avoid being flooded simultaneously in case of a leak.

3.- A timely order to abandon the ship, the correct activation of the lifeboats, plus the effective warning and distress call are fundamental steps to prevent the loss of life in an imminent wreck.

4.- Given the danger that derelicts represent to the navigation of small vessels, it is important to raise awareness and encourage artisanal fishing vessels and large ships to report sightings to the Captain of the port´s Offices, so the maritime authorities can disseminate the information through safety warnings.

5.- Mobile phones have shown to be very effective for distress calls.


Condition : Anticyclone
Wind : Calm
Waves : Calm Sea
Task : Navigation to port
Tome
158
Talcahuano
Hualpén
Concepción
160
Coronel
156
Lota
Punta Lavapie
Santa Juana
Rumena
160
Arauco
Pichilo
156


Name : Herlibet
Type : Artisanal Fishing
Length : 12 m Beam: 4 m GT: 15
Construction : Steel 1996
Flag : Chile
PSR
HERLIBET
2240

FALL FROM THE PILOT LADDER OF A TANKER SHIP, IN LAITEC

NARRATIVE:

During the night of 17 July 2001, in the pilot boarding area of Laitec, **one of the pilots** who was getting on board an unloaded tanker ship under bad weather conditions at night, **fell hitting the stanchion and the deck of the pilot boat. He passed away when he was being evacuated** by sea to Quellón. The ladder, a mix of a pilot ladder and an accommodation ladder, had no deficiencies and complied with the safety requirements; in fact, it was used by another pilot before without inconvenience.

The fall occurred after he had climbed 6 meters and was preparing to pass to the accommodation ladder. The officer monitoring the boarding at the main deck did not notice any sign of alert or unexpected movement.

Paramedics in the **Obo Saphire** provided first aid and oxygen to the pilot. Although he regained consciousness at first and was able to speak, they could not revert the progressive deterioration of his health condition.

Preventive tests certified he was fit to carry out his duties as pilot, and **reported other conditions like hypertension controlled with medication, overweight, and smoking.** During the navigation to the embarkation area, the pilot did not show any anomalous condition or behaviour, but he had smoked several cigarettes before climbing the ladder.

The autopsy protocol showed that **the fall was caused by an acute myocardial infarction** and that sudden cardiac death "could not be prevented despite timely and effective assistance". He suffered fractures in the ribs and right arm when he hit against the boat.

LESSONS LEARNED:

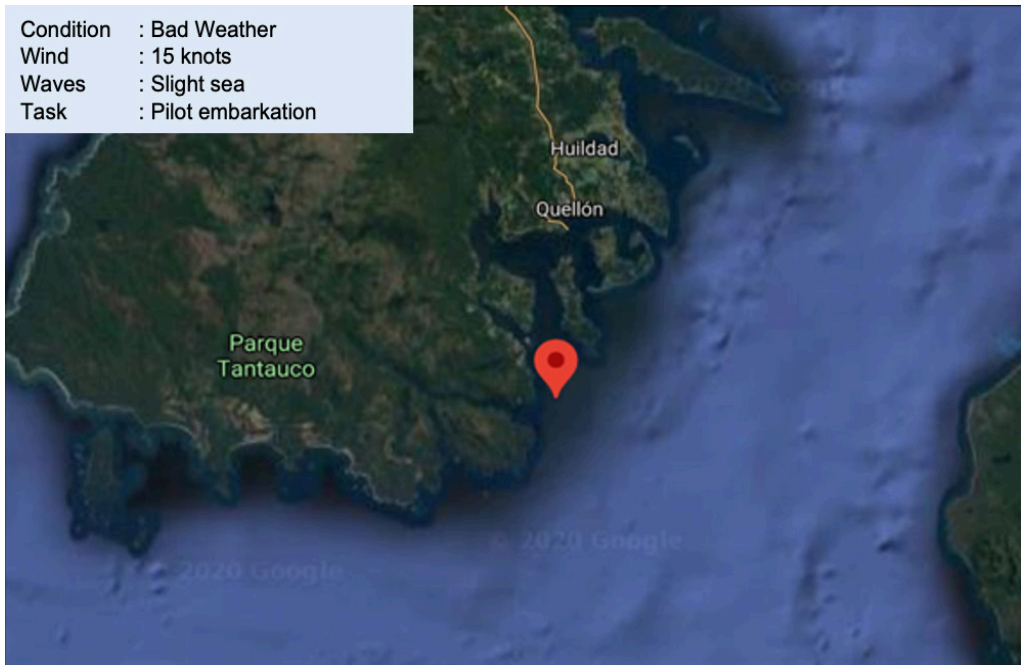
1.- Climbing a pilot ladder is a high intensity exercise with the risk of fall. Therefore, it requires good health condition, being in good shape and warming up before doing it. Overweight and smoking increase the risk of heart attacks, being the pilots themselves the firsts who are required to control these conditions.

2.- Those who provide first aid to persons that have fallen to a same or different level without an external cause must consider the option of a heart attack as very likely, and act accordingly.

3.- Vessels with high gunwale must use the accommodation ladder to keep the extension of the pilot ladder to a maximum of 9 meters.

4.- The Officer monitoring the embarkation must stand on the low platform of the accommodation ladder to give confidence and help the pilot in the moment he is passing to the other ladder, keeping contact with the bridge in case they need to act quickly in an emergency, and cooperating to keep the vessel with the required lee to facilitate the recovery of a man overboard.

5.- Pilot boats after disembarkation must adopt a position that allows them to recover a man overboard promptly, which has shown to be a difficult task.


Condition : Bad Weather
Wind : 15 knots
Waves : Slight sea
Task : Pilot embarkation
Huildad
Quellón
Parque
Tantauco
© 2020 Google


DISPOSICIÓN COMBINADA DE ESCALA DE PRÁCTICO Y ESCALA REAL
PARA NAVES CON FRANCOBORDO DE MÁS DE 9 METROS
ESCALA DE PRÁCTICO
Debe sobresalir, al menos, 2 metros por encima de la plataforma inferior
La escala debe estar bien sujeta al costado del buque a 1,5 metros por encima de la escala real
Una escala de práctico requiere una subida de no menos de 1,5 metros y de no más de 9 metros
ESCALA REAL
sujeta al costado del buque
Máximo 45° de inclinación
Debe mirar hacia popa
Plataforma inferior horizontal
La meseta inferior deberá estar, por lo menos, a una distancia de 5 metros de la superficie del mar
← POPA PROA →
Oficial responsable en contacto con el Puente

PORT WORKER CRUSHED IN PUERTO ANGAMOS

NARRATIVE:

The night of the Monday, 5 March 2018, when starting the third watch in the container yard of Puerto Angamos, one of the freight handlers of the port got caught between the crate he was taking materials from and a container.

The entrapment happened when the workers were removing materials to start working in cupper consolidation tasks in the port's container yard. **At the same time a forklift was working** rearranging crates with the remaining material, and without previous notice it pushed a crate close to the workers, catching one of them against a container who could not escape due to his position.

Due to the entrapment, the worker suffered a mid-distal third left tibia and fibula fracture. He received first aids in the port's facilities and then was transferred to a hospital.

Weather conditions and luminosity in the area were appropriate to perform the tasks.

In its safety procedures, the Port Company prohibited the risky condition of having in the same place people and machinery in movement. Therefore, **the transgression occurred due to a lack of planning and supervision of the tasks and to the forklift operator's decision** to continue moving cargo in an area with workers.

LESSONS LEARNED:

1.- Any loading or unloading task is dangerous. Therefore, they must be planned and supervised from the beginning by the Company in charge. It is the only way to control risks.

2.- The Company's safety procedures related to the risks of each task must be considered "safety measures", and chiefs and supervisors must debrief workers about them at the beginning of every shift and as many times as necessary.

3.- Workers are responsible for adopting safety measures, complying with them and enforcing them, as their safety and lives depend on it.

4.- It depends on the workers to stop any working machine that mistakenly enters their work area, for their own personal safety.

5.- Due to the speed of their work and the visual limitations around stacks, port machinery operators cannot work in areas with people exposed to the load and the machinery itself.

¡Stop, clear the area, and check, then proceed! *(It will take less time than explaining why an accident happened.)*


Wind : Calm
Condition : Night
Luminosity : Appropriate
LUGAR DEL ACCIDENTE
Mirador Puerto de Mejillones


Hapag-Lloyd

GROUNDING OF A GENERAL CARGO SHIP IN ISABEL ISLET, SHOAL PASSAGE

NARRATIVE:

On 17 July 2001, the Lithuanian refrigerated cargo ship **Eridana** grounded in the Shoal passage when it navigated unloaded from South to North and entered the Smith channel in absolute darkness, with calm seas and wind. During the first turn, the pilot in control of the bridge noticed that the ship reacted slowly, and increased to 15° of rudder the original 5° ordered.

When performing the third turn, to change from the 040° course to the 343° course after ordering 10° of port rudder, the ship turned slowly and even when they increased to 15° it was not enough, and with engines ahead, it grounded in the Isabel islet. Navigation systems, steering, and lighthouses were fully operational.

The pilot controlled navigation using the parallel index lines technique, not positioning the ship at regular intervals or before turning. He was not clearly informed of the turning conditions or the speed of the ship, and estimated 12 knots, but according to the RPM, it was 16 knots. The Master and the other Pilot monitored the crossing. The watch officer controlled the rudder orders and mistakenly used the GPS to fix the position in the nautical charts not referred to datum WGS-84. The grounding caused serious damage to the holds, oil tanks, and engine room, and spilled 19.6 m3 of oil. Using the lifeboats, the crew abandoned the ship and got sheltered in the Fairway lighthouse. Nobody was injured. The ship was refloated and taken to the sea.

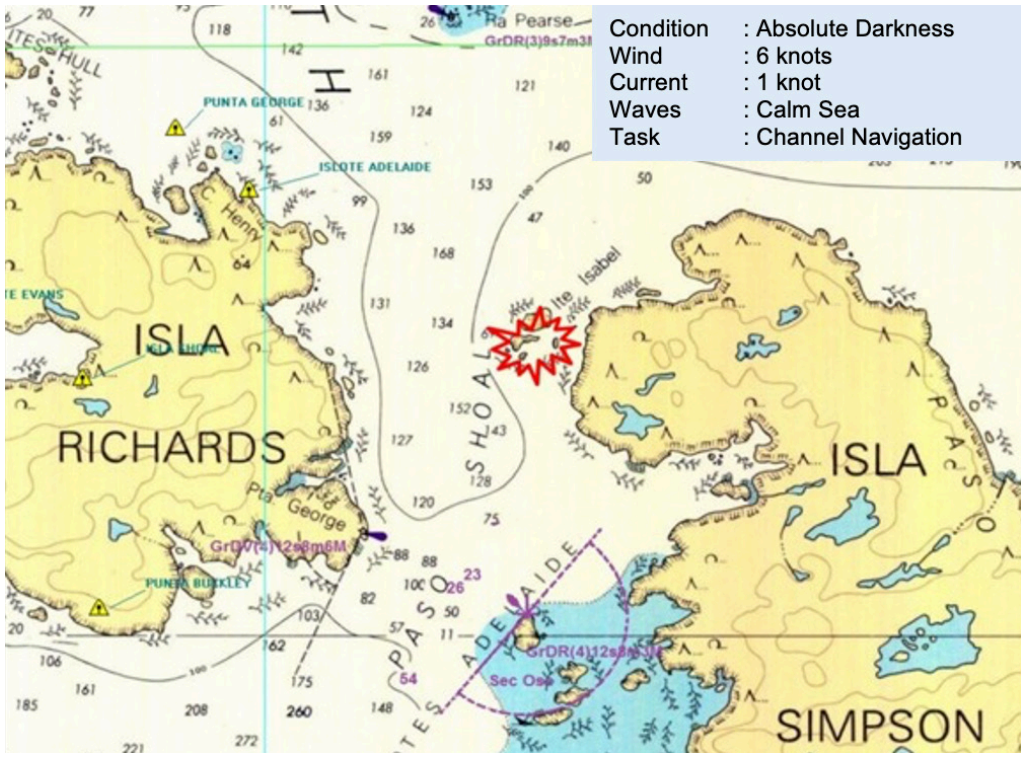
LESSONS LEARNED:

1.- The information interchange between the Master and the Pilot in relation to the characteristics of the ship, such as turning circles and stopping distances, is vital for the safe control of a ship. According to IMO Resolution A.960(23), presenting the pilot card and additional information is mandatory.

2.- The parallel index is a good control method to keep the ship on its track along a previously planned course, but since it does not show the advance of the ship, it does not replace other methods that fix the position in the nautical chart, which also allow to obtain information on the real speed of the ship when used regularly.

3.- The beginning of a sharp turn must be planned beforehand, considering the turning circles, the speed, and the adequate rudder degrees, so when the ship is on track when the maneuver is finished. There are methods to control the turning radius (STCW 95, Section A-10, ability to use the information obtained from rate-of-turn indicators correctly) and other techniques available.

4- Before turning, there must be an appropriate positioning of the ship, and it is preferable to begin with high angles of rudder, as it is easier to hold a turn than to speed it up.


Condition : Absolute Darkness
Wind : 6 knots
Current : 1 knot
Waves : Calm Sea
Task : Channel Navigation
ISLA
RICHARDS
ISLA
SIMPSON
PUNTA GEORGE
ISLOTE ADELAIDE
PUNTA BUCKLEY
Ra Pearse
Ite Isabel
PASO


Name : Eridana
IMO : 7812866
Type : Refrigerated Cargo Ship
Length : 138 m Beam : 18 m
Draught : 7 m GT :5,707
Construction : Steel 1978
Flag : Lithuania

COLISSION BETWEEN A PASSENGER SHIP AND AN ARTISANAL FISHING VESSEL, IN SOBENES PASSAGE

NARRATIVE:

On 22 April 2009, the small artisanal fishing vessel **Don Armando sank due to a collision** with the passenger ship Skorpios III when navigating the Unión Channel, at night and under bad weather conditions. A diver who **did not have the minimum abilities required** was in control of the fishing vessel temporarily, because the Master registered with the Maritime Authority had decided not to embark. The navigation and propulsion systems of both vessels were operative and they sighted each other at a mile, when the **Skorpios III** navigated the Sobenes passage from East to West and the fishing vessel was on a general South course through the Escobar Doxrud passage. They coordinated through VHF to pass on the port side of the other, which would happen in the fork of both passages and the route to the South of Jaime island.

For this purpose, the artisanal fishing vessel turned to starboard with a **NW wind of 30 knots that made it drift**, delaying its way towards the West shore of the channel. When the Skorpios III reached the fork and turned to starboard, the bridge team of the fishing vessel saw both lights coming from the side and **mistakenly considered they would not cross** before the bow of the passenger ship. **Without previous notice, they turned to port, changing the passing side.** When the Skorpios III noticed they were going to collide and did not understand the manoeuvre, they gave an astern order. On the other hand, the fishing vessel did not stop its engine and its starboard quarter hit the stem of the **Skorpios III**, and its bow hit the boat that the passenger ship was towing. **The Don Armando** was semi-submerged and the crew had to abandon it using the lifeboat. All of them were rescued unharmed by the **Skorpios III**. There was no evidence of spilled oil.

LESSONS LEARNED:

1.- Handing the control of the ship over to people not qualified is always the cause of multiple accidents, as the risks will not be detected on time and they will be unable to solve new problems.

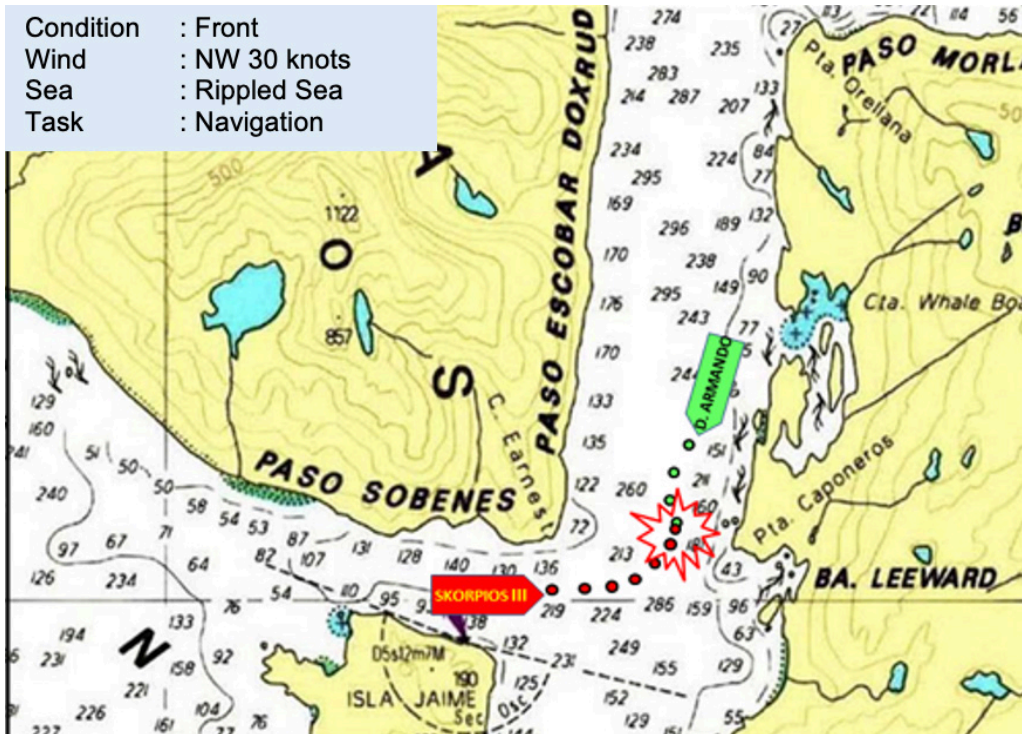
2.- COLREG, Rule 9, "Narrow channels" indicates that a vessel proceeding along the course of a narrow channel shall keep as near to the outer limit of the channel which lies on her starboard side as is safe and practicable.
Rule 14, "Head-on situation", indicates that when two power-driven vessels are meeting on reciprocal or nearly reciprocal courses so as to involve risk of collision each shall alter her course to starboard so that each shall pass on the port side of the other.

3.- Additionally, Rule 6, "Safe speed", should be considered, which indicates that turning ability in the prevailing conditions shall be taken into account.

4.- The correct assessment of the manoeuvrability considering the state of wind and sea is vital for a safe navigation, especially on board small vessels.

5.- It is highly risky to change a crossing manoeuvre that is already coordinated, without previous notice and at the last minute.

6.- In the face of a risk of collision, even vessels with the priority must steer to avoid it. Decreasing the speed can help minimize the damage.



Name : **Skorpios III**
IMO : 9143908 GT : 1,597
Type : Passanger Flag: Chile
Length : 69 m Beam: 10 m
Draught : 2.9 m

Name : **Don Armando**
Type : Artisanal Fishing
Length : 14 m Beam : 4 m
Draught : 2.9 m GT : 1,597
Construction : Wood 2020

FIRE IN CARGO HOLD OF A BULK CARRIER, IN SAN ANTONIO

NARRATIVE:

On 27 February 2007, the Bulk Carrier **Port Victoria** anchored at the San Antonio port. It transported sunflower pellets from Argentina to Puerto Panul terminal, and informed that it had a seat of fire in hold no. 5, port bow section. The Maritime Authority classified the load as IMO risk class 4.2 and instructed to keep holds hermetically closed and a watch ready to react immediately. The temperature of the lateral bulkheads of the holds was taken and they concluded that hold no. 5 was the only one too hot, so the ship was authorized to anchor and unload.

Then the hold covers were taken off, they noticed a significant condensation of water vapor, both on the lower part of the covers and on the internal lateral bulkheads of the hold.

In the area of the seat, there were only burned grains and no smoke or flames. There was also a significant accumulation of waste from aluminum hydroxide tablets used during the embarkation as a grain disinfectant, and moisture areas were fungus grew.

During the unloading, they saw intermittent plumes of smoke twice and low flames at specific spots. The burning grains registered temperatures of 70° C and were unloaded directly to the pier floor. The healthy grains were unloaded as usual without any inconvenience.

There were no people injured or oil spilled. The ship was inspected by inspectors of the Maritime Authority who did not find deformations.

LESSONS LEARNED:

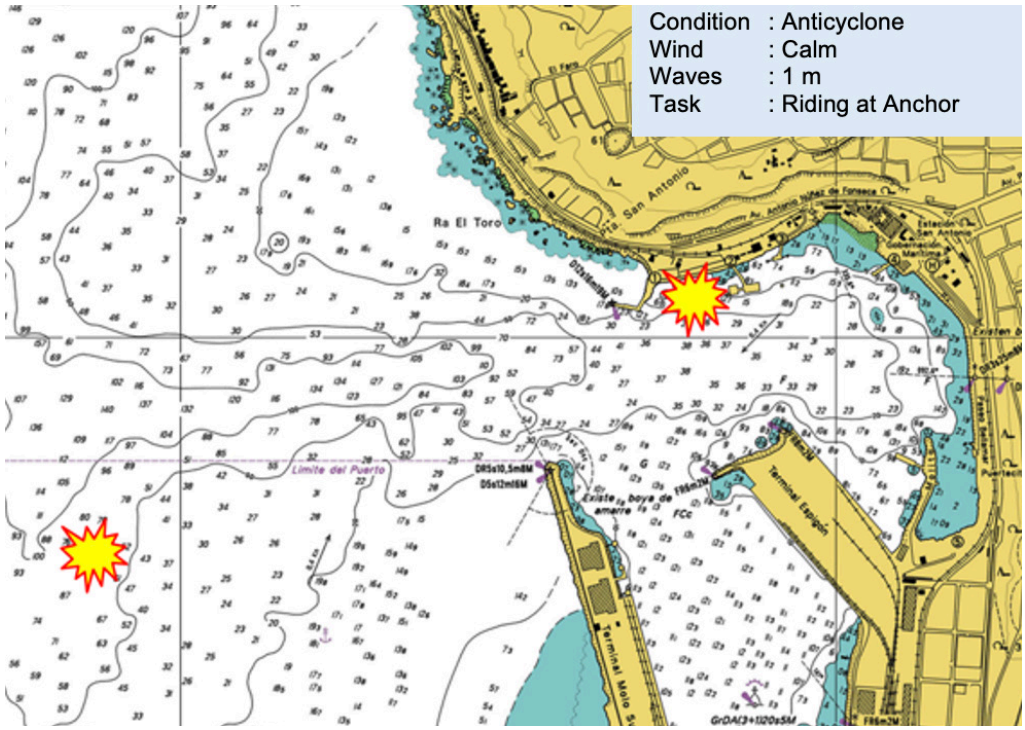
1.- Cereals are organic products that absorb oxygen and release carbon dioxide and water vapor, generating heat. They cannot be preserved if humidity is over 13%.

2.- Sunflower pellets, like other vegetables in bulk, do not have explosive conditions, but when moisture increases, there is fat acidification and proteins are burned, which generates a source of heat that condenses humidity and increases temperature, which may lead to a spontaneous combustion process in a continuous cycle that feeds itself.

3.- Aluminium phosphide tablets in presence of high moisture or water, hydrolyse violently, and are a highly combustible product that burns in air with a shiny white flame.

4.- Fermentation due to the activity of fungus and mould in the cereal mass inside a bulk storage, causes an insufficient natural circulation of air among grains, unable to liberate the heat produced, and due to the low specific heat, temperature can reach very high levels.

5.- To avoid spontaneous combustion of vegetable grains stored in bulk, it is vital to adopt measures at the moment of embarkation to avoid the presence of mould, fungus and additional water. During the navigation, humidity and temperature must be controlled.


Condition : Anticyclone
Wind : Calm
Waves : 1 m
Task : Riding at Anchor
Ra El Toro
San Antonio
Limite del Puerto
Terminal Espigón
Terminal Molo Sur


Name : Port Victoria
IMO : 9262637
Type : Bulk carrier
Length : 190 m Beam : 32 m
Draught : 11 m GT : 30,169
Construction : Steel 2005
Flag: Marshall Islands
PORT VICTORIA
Fotografia Aart van Bezooijen

GROUNDING OF A BULK CARRIER, IN THE ENGLISH NARROWS

NARRATIVE:

On 28 June 2018, the Bulk Carrier **Sumatra** grounded in the coast of Wellington island when it navigated in ballast condition North to South through Paso Curvo of the English Narrows, with two pilots on board. The ship entered the narrows at a time close to the stand, with North winds of 10 knots, which made it drift to the South. **The ship started crossing off-track and did not follow the sailing directions**, which noted the importance of not drifting to the South of the range of Disraeli island, as in that case the North edge of Medio Canal island would not allow to see the narrow channel of Paso Curvo and would force the ship to make a **sharp and uncertain turn to the new course**, which happened to the **Sumatra**.

They preferred to navigate on rough estimates, not using ranges or navigation equipment, or controlling the **turning speed or the future position**, even when the ECDIS and Winploterpilots predictors indicated beforehand that the ship would get off the recommended track and run aground. This did not allow the pilots or the bridge team to notice that **course changes were executed late and with low rudder angles**.

The aids and the navigation equipment were reliable and were always available.

Although the ship **grounded with engines full ahead**, there were no people injured or oil spills. The ship remained afloat, but unfit for navigation due to serious damage to the propulsion and steering systems.

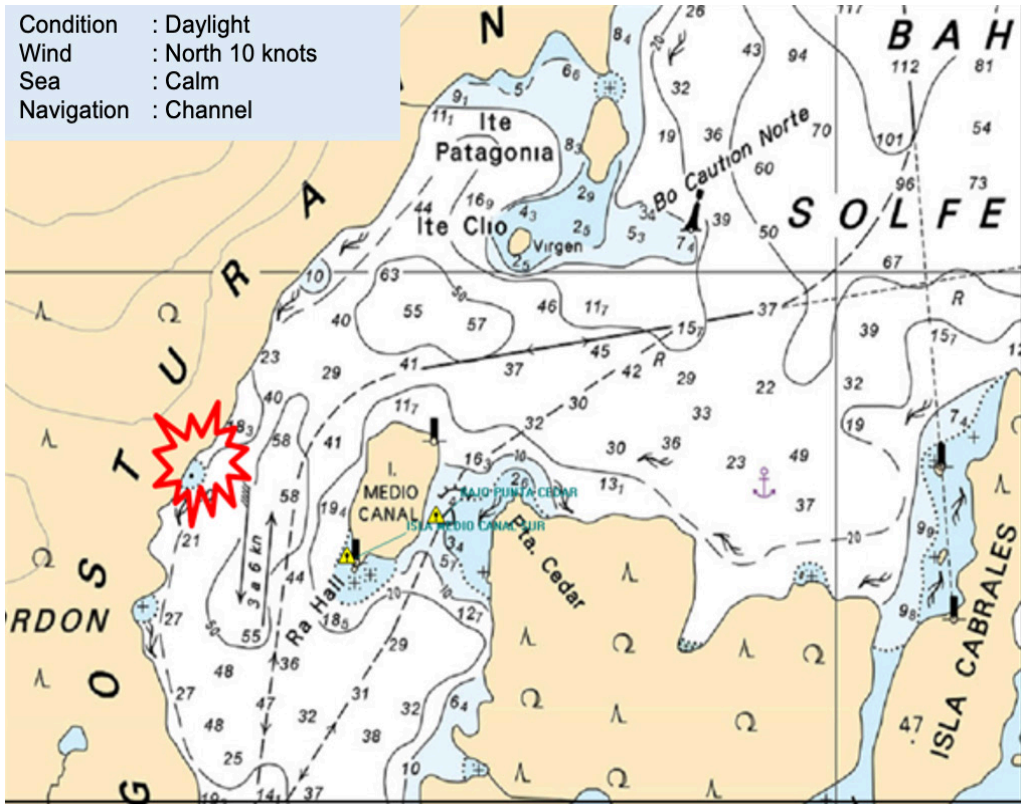
LESSONS LEARNED:

1.- Precision navigation must be planned beforehand by the Master in agreement with the pilots, considering the turning conditions of the ship, the aids to navigation, the sailing directions, and the navigation equipment, among others, in order to always maintain the ship on the track previously established.

2.- Turning radius control techniques, STCW 95 Section A-II/1, ability to use the information obtained from rate-of-turn indicators correctly, and other navigation techniques must be applied to plan every sharp turn so that after them the ship is perfectly stable and on its new track. The method allows to control that once the turn has begun it is carried out according to the plan.

3.- Before a turn, the ship must be on track, and it is preferrable to begin the turn with high angles of rudder, as it is easier to hold a turn than to speed it up. ECDIS, radars and the Winploterpilots, associated to GPS, provide information on the ship's future position during changes of course. The predictions of the ROT and COG (course over ground) are considerably useful.

4.- Pilots must be integrated into the bridge team and advice without contradicting the sailing directions or the best practices for navigation. Although it is simple, navigating on rough estimates and not fixing the position or using other **navigation equipment and instruments** *is a bad professional practice and must be rejected for being vulnerable, dangerous, and useless.*



Name	: **Sumatra**
IMO	: 9753260
Type	: Bulk Carrier
Length	: 139 m Beam: 32 m
Draught	: 10 m GT: 25,569
Construction	: Steel 2016
Flag	: Portugal

CONTACT OF A GENERAL CARGO SHIP WITH ICE, IN WIDE CHANNEL

NARRATIVE:

On 31 May 2004, the general Cargo Ship **Corcovado collided with a block of ice** while navigating the Wide channel, which caused a leak in the fore peak tank. The ship was **navigating in the night, in the middle of the channel, and in heavy rain.**
The radar showed that the navigation course was clear with some drifting ice to both sides of the channel.
There are safety warnings for the area indicating that channels in this zone are often blocked by plenty of drifting ice detached from adjacent ice shelves, and the necessary precautions must be taken, especially for night navigation.

The bridge **watch was kept only by the watch officer and a lookout/helmsman**, who checked the outside sporadically, as the ship run on autopilot.

The ship's administrator had given written instructions for low-visibility navigation in the presence of ice, which **included having the Master, the watch officer, the helmsperson and a lookout in the bridge, as well as reducing the speed, which was not executed.**

There were no people injured or oil spills.
The ship underwent makeshift repairs before resuming its voyage.

LESSONS LEARNED:

1.- Drift ice in austral channels is extremely dangerous for navigation as they come from ice shelves where the snow has been compressed for thousands of years, becoming hard enough to break the hull of the ships that hit them at a high speed.

2.- There is drift ice that shows little volume over the surface, which makes it difficult to be detected by radars. For this reason, it is important to detect them visually, a task that lookouts must take on with exclusive dedication.

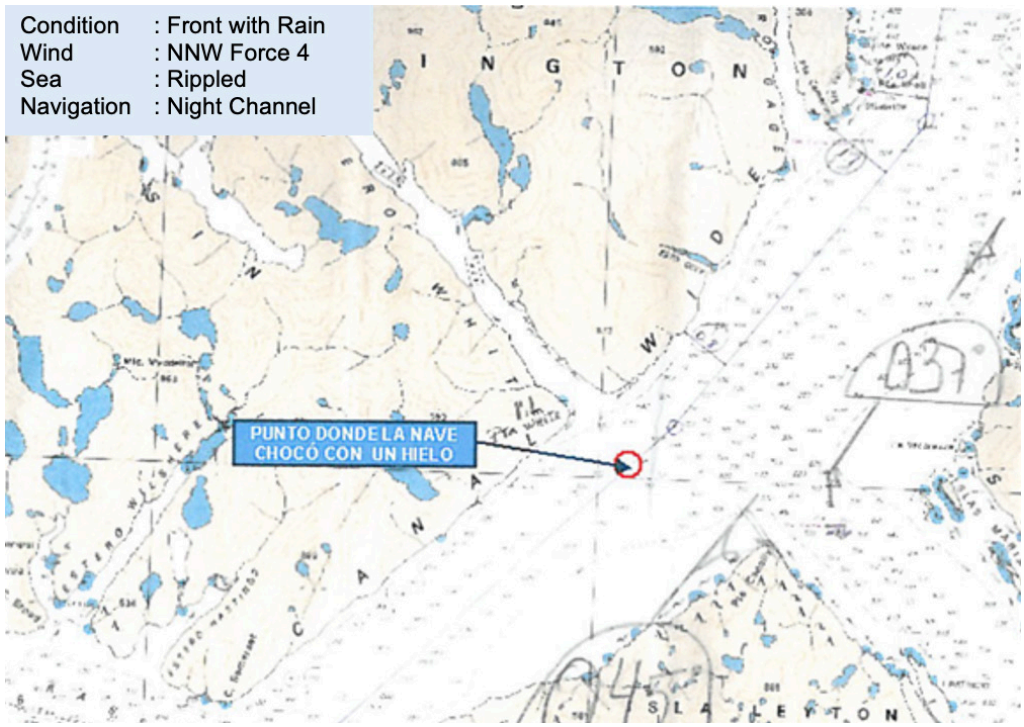
3.- Once ice is detected in the coast of a channel, the existence of ice in the navigation route must be assumed, and it is advisable to reduce the speed and strengthen the watch.

4.- Reducing speed is vital for minimizing the magnitude of the damage to the hull as a result of the contact with drift ice. Considering the kinetic energy (KE) formula:

*KE = Mass * Velocity2/2*

The considerable influence of velocity is clear, as its value is squared.

5.- Safety procedures established by ship operators must be implemented without exception every time a risk situation occurs.


Condition : Front with Rain
Wind : NNW Force 4
Sea : Rippled
Navigation : Night Channel
PUNTO DONDE LA NAVE CHOCÓ CON UN HIELO


Fotografía: Juan Carlos C.
Name : **Corcovado**
IMO : 8322052
Type : General Cargo
Length : 106 m Beam: 18 m
Draught : 5 m
Construction : Steel 1985
Flag : Chile

FIRE OF A PASSENGER LAUNCH, IN PILCOMAYO CHANNEL

NARRATIVE:

On 6 August 2017, the motor launch **Malena IV**, with 28 passengers on board, suffered an uncontrollable fire in its engine room while navigating from Puerto Aguirre to Puerto Chacabuco. After 50 minutes of navigation, the engineer officer noticed smoke in the engine room through a video camera. When he opened the door of the room, smoke and flames came out from inside and he could not control the fire with the portable extinguisher he was carrying. The fire water system was out of service, as the pump was activated by the main engine that was on fire. The engine did not have a CO2 cylinder bank. The emergency was declared through VHF, passengers gathered at the bow to protect themselves from the smoke, they wore the lifejackets, and tried to activate the lifeboat unsuccessfully. The three-people crew could not control simultaneously the fire and the abandonment of the ship, which caused people to panic on board and jump into the sea. The timely arrival of **ML Don Daniel** allowed the successful rescue of passengers and crew. The **Malena IV** had replaced the original engine for one higher and more powerful without the approval of the Maritime Authority, and the exhaust ducts were closer to the ceiling of the engine room, made of wood covered with carbon fibre, which overheated and caught fire. When the fire reached the engine fuel supply flexible ducts, the fire became uncontrollable.
The launch burned almost completely, but there were no people injured or oil spills.

LESSONS LEARNED:

1.- Fires on board ships represent one of the biggest risks, especially if they are small wooden vessels transporting passengers, as their fire resistance is low. Due to this, their design must consider equipment, crew, and adequate procedures to detect and extinguish a fire timely. The most critical areas are engine rooms and kitchens.

2.- In a fire on a passenger vessel, especially a small wooden one, evacuation of people on board lifeboats is critical, due to the risk of asphyxiation and the speed at which the fire spreads. Deploying an anchor to make the ship swing can be useful to control smoke.

3.- Significant transformations and repairs must be approved by the inspectors of the Maritime Authority, in order to verify the correct management of risks.

4.- Typical narrowness of engine rooms in small vessels makes it difficult to enter the area and fight a fire from the inside. That is why it is advisable to install fire extinguishers both fixed and remotely activated, which help prevent oxygen from entering the area and fuelling the flames.

5.- Fire pump motors must be independent and placed outside engine rooms.


PUERTO AGUIRRE
PUERTO AYSÉN
PUERTO CHACABUCO
Condition : Day
Wind : NE 10 knots
Waves : Rippled Sea
Navigation : Channels


Name : Malena IV
Type : Passenger Motor Launch
Length : 16 m Beam: 5.6 m
Motor : Diesel 400 HP GT: 48.3
Construction : Wood 2014
Flag : Chile
MALENA IV
PM07301

GROUNDING OF A BULK CARRIER, IN DARWIN CHANNEL

NARRATIVE:

On 7 August 2007, the Bulk Carrier **Ocean Crown**, measuring 190 meters in length, loaded with 49,850 tonnes, navigated the Darwin Channel during the night from East to West. The ship had two pilots on board who were in the bridge with the watch officer and a helmsman to provide advice. When the ship was near the Lobos islet, they noticed that the general cargo **MV Westerkade**, measuring 127 metres in length, navigated head-on and was ahead of what was previously coordinated. The pilot keeping watch on the **Ocean Crown** acknowledged that the **Westerkade** had the right-of-way in the channel and altered its navigation track to starboard, planning a course 3 cable lengths from Lobos islet as the chart did not show a dangerous edge.

The **Ocean Crown** passed at a distance of 2.35 cable lengths and grounded on an unknown rock with which the Sailing Directions of the Chilean Coast are consistent, as they recommend "navigating by the SW and 6.1 cable lengths" from these islets. Conveniently, both Masters were not informed of the crossing with the other ship in a dangerous area and were not in the bridge at the time of the incident. Even when there was available water space, the **Westerkade** kept its planned track through the centre of the channel and did not alter her course to starboard as the COLREG instructs. The **Ocean Crown** had leaks in the hold, the fore peak, and the fuel tanks, and underwent repairs before entering a dockyard. There were no people injured or oil spills.

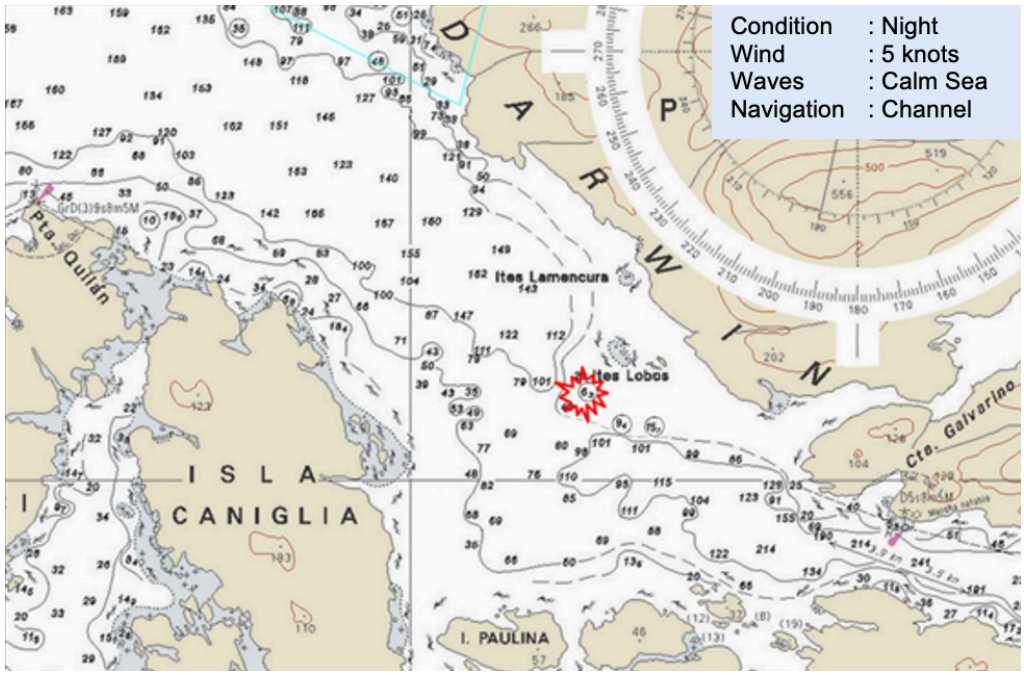
LESSONS LEARNED:

1.- Even when nautical charts do not show major dangers, the precautions recommended in the sailing directions are the minimum safe limits, especially safe passing distances from a danger and right-to-way in narrow channels, draught restrictions, among others, and it is dangerous to ignore them.

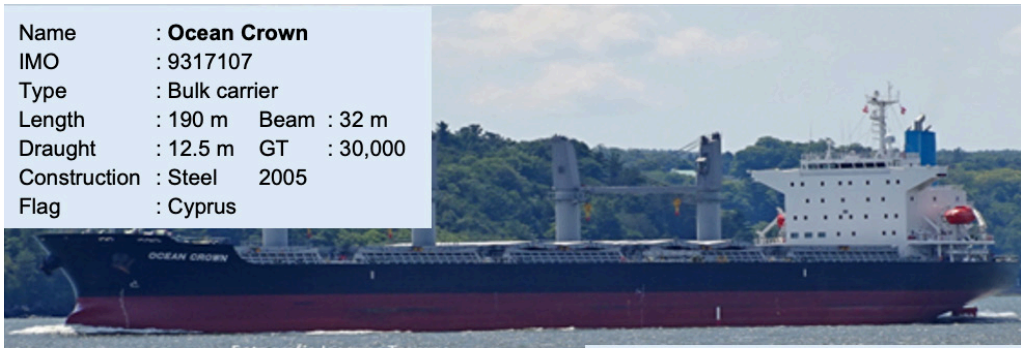
2.- If there are deeper waters, it is advisable to avoid planning navigation through routes over seamounts.

3.- When the sailing directions indicate a preferential right to enter channels or restricted waters, it does not mean COLREG rules can be overlooked. Therefore, if ships encounter head-on unexpectedly in those areas, both ships must keep as close as possible to the external limit of the passage, and must not get closer to the dangers than recommended in the sailing directions.

4.- Watch Officers and pilots must work as a unified bridge team to control the route exactly and inform the Masters in advance about the dangers that affect navigation, especially crossing situations with other ships in shallow or narrow waters and possible alterations to safety recommendations or procedures.

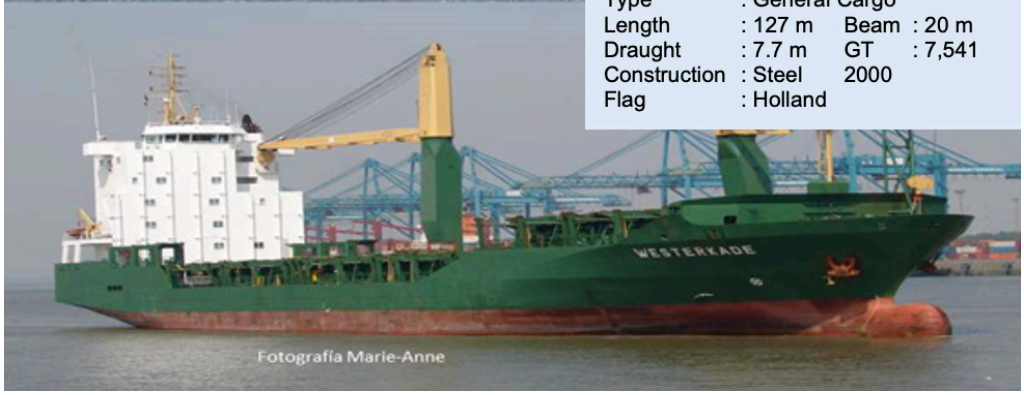


Name : **Ocean Crown**
IMO : 9317107
Type : Bulk carrier
Length : 190 m Beam : 32 m
Draught : 12.5 m GT : 30,000
Construction : Steel 2005
Flag : Cyprus



Fotografía Jacques Trempe

Name : **Westerkade**
IMO : 9202091
Type : General Cargo
Length : 127 m Beam : 20 m
Draught : 7.7 m GT : 7,541
Construction : Steel 2000
Flag : Holland



Fotografía Marie-Anne

DEATH ON BOARD A BULK CARRIER DURING A SHIFTING TASK

NARRATIVE:

On 11 October 2018, the Hong Kongese ship **Bulk Harvest** was loading an iron bulk cargo on the CMP mechanical pier, in Guayacán, shifting the cargo towards the stern, using their own transporting lines, **the bow starboard roller got off its axis and base, was ejected at a high speed against the infrastructure, ricocheted, and hit a seafarer on the back, who was operating the bow winch. The seafarer died there.**

By design, the roller was manufactured to withstand forces perpendicular to its rotation axis and had a nut that prevented the roller from getting off the axis when under axial traction. It was installed over a base which was not high enough in relation to the winch and allowed for significant axial forces. **Due to mistakes in the roller greasing procedure, the nut was not tightened properly when reassembled**, which damaged the thread and allowed the roller to get ejected from its chock at a high speed as the nut was unable to hold it. There was not an appropriate on board procedure for roller maintenance which could ensure that the nut was tight enough, so the majority of the ship's rollers were in the same situation of risk if subject to axial traction. It was not necessary to disassemble the rollers to grease them, because the manufacturer had installed grease fittings for this purpose.

LESSONS LEARNED:

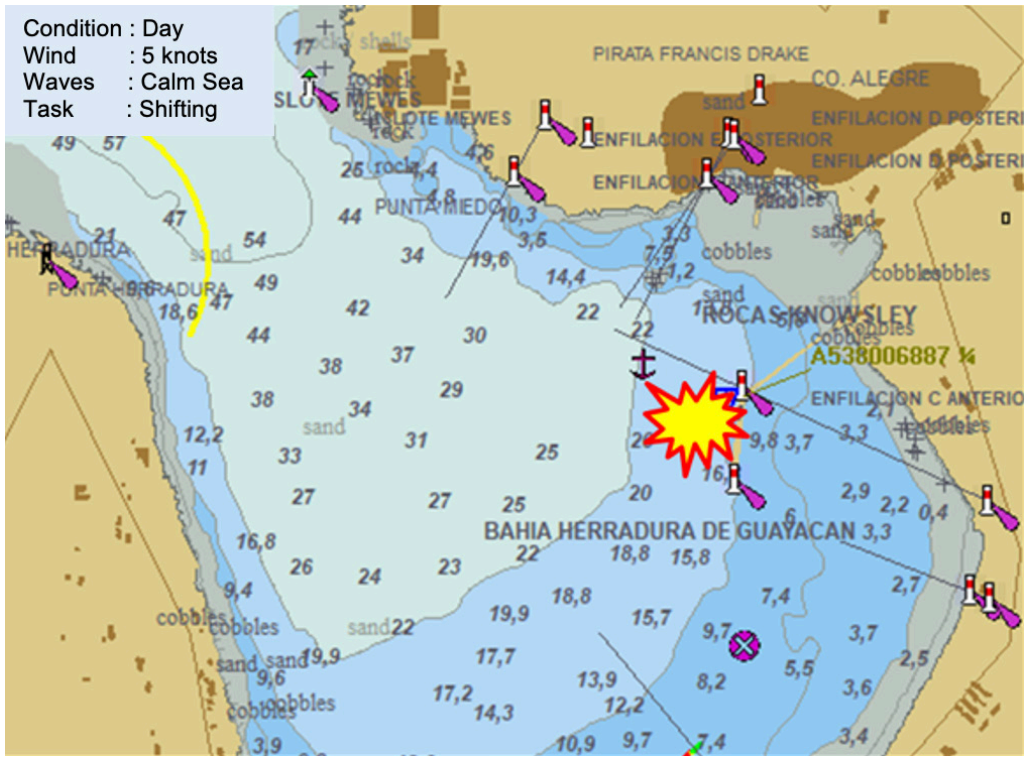
1.- It is dangerous to carry out shifting tasks with lines because they are subject to considerable tension, and any defect in its components may cause a serious accident and injure people.

2.- It is essential to protect oneself and not expose the body to a potential snap backs or equipment breaking or coming apart, such as rollers or chocks.

3.- The maintenance of winches and rollers must be carried out following the recommendations from manufacturers strictly. Maintenance tasks that require shipyard support must not be carried out on board by the crew, in order to ensure that they are performed correctly.

4.- Risk analyses must predict unsafe places for people in case of snap backs and object projections due to the breakage of rollers or other parts, and they must be duly informed to crew members involved in the manoeuvres.

5.- Loaded large ships must evaluate the convenience of using tugs for their shifting tasks not to overload the lines.



Name	: **Bulk Harvest**		
IMO	: 95670751		
Type	: Bulk Carrier		
Length	: 292 m	Beam	: 42 m
Draught	: 11 m	GT	: 91,971
Construction	: Steel	2012	
Flag	: Hong Kong		

SINKING OF A SMALL VESSEL, MOORED IN QUEILEN

NARRATIVE:

On 13 July 2018, during the night, the Chilean small barge **Art Rigov** was moored to a buoy at the Ramp 2 of Queilen, with 2 crew members asleep on board, and good sea and wind conditions. It sank suddenly, the seafarers could not escape alive and divers found them in the cabins. Hours before, while it was aground on the beach, it was loaded with stones in big bags using a backhoe, which weighted 10 tonnes added to the stone loads. The vessel had a wooden hull 8 years old, the air draught was covered in steel and the quickwork was covered in plastic reinforced with glass fibre, in order to stop leaks. Alongside the **Art Rigov** was another barge and her crew heard the ropes cut loose and saw the vessel capsize over her starboard side. The hull inspection showed a lack of watertight bulkhead below deck, a lack of caulking, and old damages to the wooden hull. The plastic covering had cracks that allowed leaking, probably during the loading due to deformations and specific stresses to the hull against the pebbly beach. The water leaked slowly accumulated in the stern side, in the engine area, and was not noticed timely, causing the sinking. The bilge alarm was functioning, but it was disabled from the switch in the bridge.

The sinking caused a minor oil spill.

LESSONS LEARNED:

1.- Disabled alarms create dangerous conditions, as there is a lack of attention to the risk they are supposed to control. It is highly advisable that disconnection switches are installed in boards with restricted access.

2.- Barge hulls suffer deformations and heavy localized stress when grounded, as beaches can be pebbly. In that condition, the risk of suffering leaks is increased when the ship is loaded with heavy cargo. Therefore, after refloating, rounds must be carried out below deck to detect potential leaks and verify the correct operation of bilge alarms.

3.- Wooden hulls require regular caulking, which must be done on its external face. If the quickwork is covered in plastic reinforced with glass fibre, it is not possible to caulk them, and the wooden hull loses its original water tightness over time, relying only on the plastic to keep afloat. If it gets cracked or broken, it will be extremely difficult to detect and control the leak from inside the vessel.

4.- Transverse water tightness is fundamental to control damages to the hull. Watertight bulkheads must be checked, tested, and repaired regularly and thoroughly.


Condition : Night
Wind : Calm
Waves : Calm Sea
Task : Riding at Anchor
W-853
Queilen
Museo Refugio de Navegantes
Mirador Y Faro La Puntilla de Queilen


Name : Art Rigov
Type : Small barge
Length : 24 m Beam : 6 m
Draught : 1.5 m GT : 46
Construction : 2010
Wood covered with glass fibre
Flag : Chile
ART-RIGO
CHO 1837

SINKING OF A WELLBOAT, IN AHONI INLET

NARRATIVE:

On 17 October 2017, the Chilean wellboat **Seikongen** sank in the Ahoni inlet, Chiloé, while performing tests for loading and transporting live salmon. The ship had been built recently and had compartmentation and water tightness issues in the aquaculture pump room. The place, with large dimensions, housed the majority of the equipment, pumps, and aquaculture circuits and was connected to the cabins area through a non-watertight door, which helped the flood spread. The high flow and pressure of water increased the risk. A badly done welding broke and a manhole cover opened, allowing seawater in and then water from one of the fish holds, which made the ship trim by the head and list until sinking. The crew was unable to prevent it.

Some factors that contributed to the sinking were the late detection of the flooding, due to the bilge alarm being deactivated, and the lack of a proper risk analysis showing the crew emergency procedures in case of considerable flooding. The water entering the pump room could have been stopped automatically and quickly, but the remote control system stopped working and left open some key valves and the manual operation of the fish hold emergency draining system was not considered, among other possible actions. The ship was towed to the beach, but refloating was complicated due to the hydrogen sulphide from fish decomposition in the holds. There were no injured people, and a minor oil spill was detected.

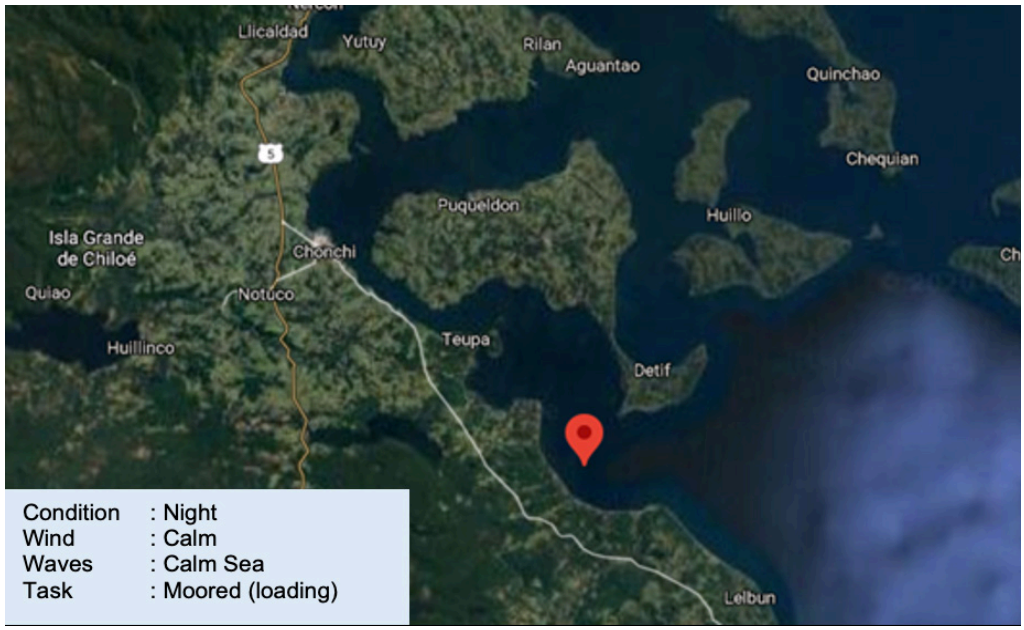
LESSONS LEARNED:

1.- Vessels like wellboats have a high risk of flooding, as their aquaculture plants transport considerable amounts of seawater permanently, and any operation mistakes or circuit failures can flood and list the ship quickly.

2.- The control of a flooding on board depends, firstly, on the ship's design subdivisions and, secondly, on the pumps required by the SOLAS Convention. This is why it is crucial that crew members really know the risks and have an adequate "Flooding Emergency Plan" providing pre-planned actions to take.

3.- Due to the mobility of the crews, ship Operators must evaluate and create risk matrices that derive on emergency plans. It is necessary to establish oversight systems to ensure that crew members are trained and have enough information on stability and damage control.

4.- Aquaculture plants designed for land-based operation are not safe for installation on board, and must be reviewed to adapt them and ensure manhole covers, materials and control systems are suitable and safe.



Condition : Night
Wind : Calm
Waves : Calm Sea
Task : Moored (loading)

Name : **Seikongen**
IMO : 9793985
Type : Wellboat
Length : 70 m Beam : 14 m
Draught : 3,8 m GT : 1,968
Construction : Steel 2017
Flag : Chile

DECOMPRESSION SICKNESS, SOUTH OF IQUIQUE

NARRATIVE:

On 24 April 2020, a small vessel skipper was performing extractive diving tasks for marine resources in San Marcos Cove when he suffered Type II Decompression Sickness (DCS). He had to be evacuated to the Hospital Regional de Iquique in a serious condition, and then transferred to the hyperbaric chamber in the Rescue Unit of the 4th Naval Zone Headquarters.

He had submerged three times for 50, 20, and 50 minutes and 25, 40, and 25 meters deep, respectively. This is a repetitive diving method with long periods and deep submersions, which is not covered in the decompression tables. Additionally, at the end of the third submersion, he lost the weight belt and resurfaced too quick from 25 meters, worsening the decompression problem.

The diver was not apt and even when he had suffered from DCS two times before, he said he did not know the decompression tables and the safe diving procedures derived from the Diving Regulations for Professional Divers. He did not have a diving assistant, and the ship and the diving equipment were not checked to ensure they were safe for supply to humans.

It is estimated that the age of the diver (23) was crucial for saving his life after the third serious DCS episode he suffered.

LESSONS LEARNED:

1.- Diving is a dangerous activity that requires specific knowledge and equipment suitable for the depth of work, and a considerable amount of supervision and support from the surface. There is a regulation that includes the decompression tables, diving planning, and an emergency evacuation plan, among other rules.

2.- Planning a diving operation aims to eliminate the residual nitrogen that accumulates in the human body after breathing compressed air under the water. The amount accumulated depends on the duration and the depth of the dives. If the nitrogen is not eliminated, there is a high probability of suffering from DCS, which may be fatal.

3.- Repetitive diving accumulates a higher amount of residual nitrogen.

4.- Diving below 20 meters requires the use of approved equipment and basic support from the surface. Only highly specialized divers are allowed to dive at 40 meters and below, and requires medical specialists and hyperbaric chambers on surface, among other equipment, in order to give advice or first aid quickly. Diving without being apt or complying with rules and having suffered DCS previously can lead to death.


Arica
Iquique
Calama
Condition : Day
Wind : Calm
Waves : Calm Sea
Task : Extractive Diving


Caleta San Marcos
Escuela Caleta San Marcos

AQUACULTURE WORKER'S FINGER AMPUTATION

NARRATIVE:

On 23 July 2012, in the Aracena 6 salmon farm, an aquaculture worker suffered the amputation of two fingers while performing fish harvesting tasks at a cage raft.

They were using 2 small motor vessels to pull up the net to harvest fish. The net got stuck on the railing of the floating cage. One of the aquaculture workers assigned to the task tried to release it using his hands. He was able to do so, but the movement of the net was extremely fast and he was not able to move away his left hand, which got trapped between the net and the railing for a few seconds.

He suffered severe injuries to his middle and ring fingers. Even when he was evacuated to a health centre, his fingers had to be amputated.

The harvest task requires considerable efforts to pull up the net, which can weight several tonnes. The fish farm had subcontracted a company for the harvesting work, a procedure that was familiar to the workers and was carried out successfully before.

None of the companies had provided the workers with the proper tools to manipulate the net and using their hands was a common practice.

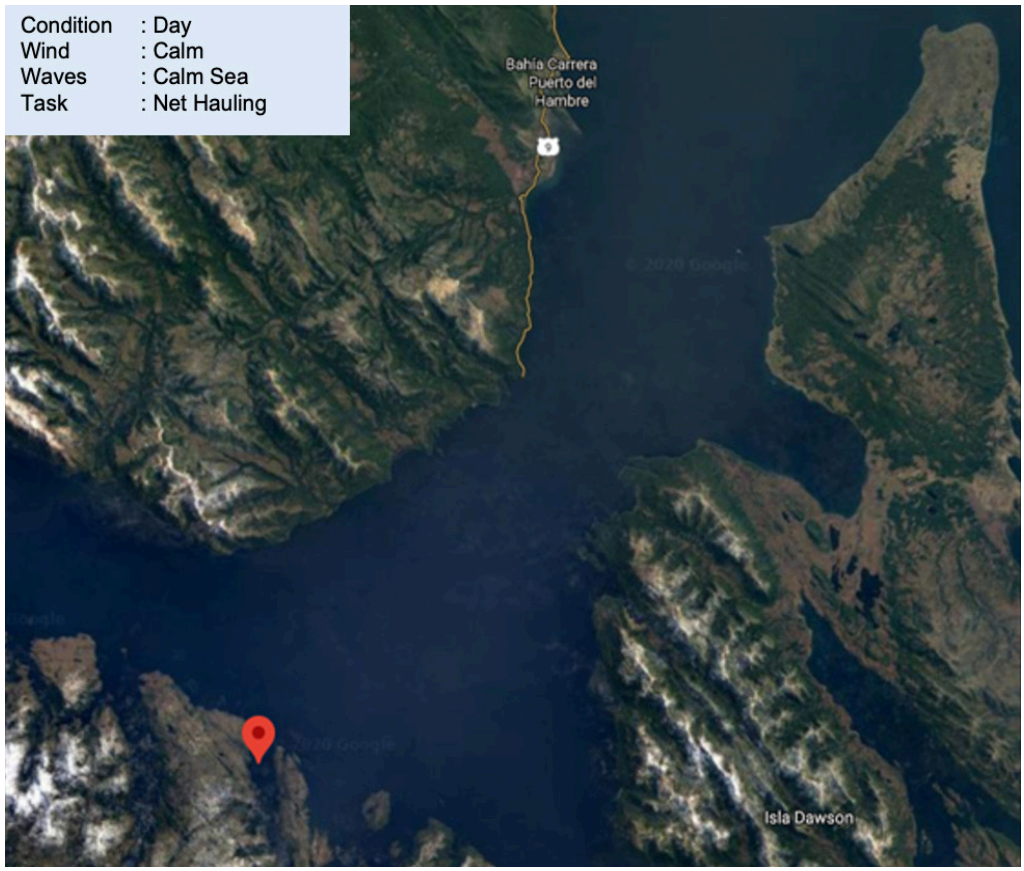
LESSONS LEARNED:

1.- When a net, line or cable is being hauled and gets stuck, it must be handled with a stick or another tool that allows to keep the body and limbs away from the area where the force is concentrated. Never use the hands or limbs! There is a high risk of getting entangled. Any element stuck and tense will move quickly when released and there is no time for those around to move away.

2.- The conformation of nets poses a risk of entanglement, as they have many spaces where a hand or finger can get stuck, and are made of resistant, thin fibers that can cut and peel limbs.

3.- When working with salmon nets being pulled up, always consider that if the pulling is stopped suddenly due to a line cut or another anomaly, the net will go back to the original underwater position, and everything holding it or over it will be submerged.

4.- All maritime tasks require a comprehensive risk analysis to determine safe procedures, and a supervisor to explain risks at the beginning of each task, which must be authorized to suspend tasks momentarily when a dangerous condition is detected.
Safe procedures must go along with proper tools and barriers.


Condition : Day
Wind : Calm
Waves : Calm Sea
Task : Net Hauling
Bahía Carrera
Puerto del
Hambre
Isla Dawson


Fotografía:
Agrotendencia

DEATH OF A BASIC LEVEL SHELLFISH DIVER, SOUTH OF PUERTO ALDEA

NARRATIVE:

On 20 June 2012, a basic level shellfish diver **died** when he was taken to a hospital after diving and suffering from **decompression sickness (DCS)**. He was diving to extract "huiro palo" algae from the south coast of Tongoy. This task requires a considerable physical effort to harvest the resource and deep submersions, as the resource can be overexploited and hard to find at depths above 20 meters. **He operated from the motorboat El Neurótico, without departure or inspection of the diving equipment, and without an authorized diving supervisor. He did not have a depth gauge, decompression tables or a diving plan.**
He submerged 3 times for 90 minutes each and another time for 60 minutes at depths below 21 meters (5,5 hours in total), without any decompressions. In the way back he showed symptoms of DCS. He **started a late decompression**, submerging at 12 meters for 90 minutes. After that, the symptoms remained, including headache, loss of muscle control, tachycardia, and compromise of consciousness. He was evacuated and **died of a cardiorespiratory arrest** in the ambulance. **The diving he performed**, considering the period of submersion, the depth, the great physical effort of the task, and the repetitions, **was not covered in the decompression tables.**

LESSONS LEARNED:

1.- Having a diving plan is essential, as it allows to use decompression tables to determine the maximum time of submersion and the decompression method to be used in order to prevent DCS, based on the depth to be reached. If a diving task have discontinuous times at depth (the diver resurfaces and submerges again), the probability of accumulating residual nitrogen increases, and the repetitive diving tables must be applied, which must be considered in the plan.

2.- The objective of planning is to eliminate the residual nitrogen that every human body accumulates after breathing compressed air under the water. The amount depends on the time and depth of submersion. This is why it is required to have a watch and a diving depth gauge to measure and register these data. If the nitrogen is not eliminated, there is a high probability of suffering from DCS. The diving supervisor must control and help to do this as planned.

3.- The maximum depth allowed for basic level shellfish divers using light semi-autonomous equipment is 20 metres. Breaking the rules of the Diving Regulations for Professional Divers is highly risky, as they are the minimum rules to prevent accidents, and it can lead to death or permanent disability.

4.- Self-care is essential.


Condition : Day
Wind : W 10 knots
Waves : Smooth Sea
Task : Extractive Diving
Lengua de Vaca
Puerto Velero
Tongoy
Puerto Aldea
Caleta Talcaruta
Pichingo
Guanaqueros
D-430
D-440
5


EL NEUROTICO

SINKING OF A SMALL BARGE, IN SKYRING INLET

NARRATIVE:

On 05 May 2019, the barge **Navsur IV** sank and 3 crew members disappeared, while navigating the Skyring Inlet, loaded with 55 tonnes of salmon feed. The ship departed in the night from Puerto Nuevo to Mina Elena, and faced bad weather conditions with NW winds of 37 knots and gusts of 40 knots. It is estimated that the ship navigated 40 minutes before sinking, after heeling permanently due to the unlashing of the big bags that were transported, caused by a considerable change of course. The Master did not have experience in navigating the zone and it was his second voyage. The dangerous sea and wind conditions were not duly assessed for night navigation.

The ship had an overload of 25% in relation to the maximum authorized and the lashing of the big bags did not prevent them from shifting laterally when the ship listed or was hit by strong billows.

The barge had been built recently and had objections in its stability analysis. For this reason, it was limited to transport a maximum of 40 tonnes under good weather conditions, as it is with any small vessel. The survey of the refloated hull showed that the access to the engine was open during the navigation, which added to the air supply ducts installed at a low height allowed for a progressive flooding of the engine room, as the ship was permanently listed.

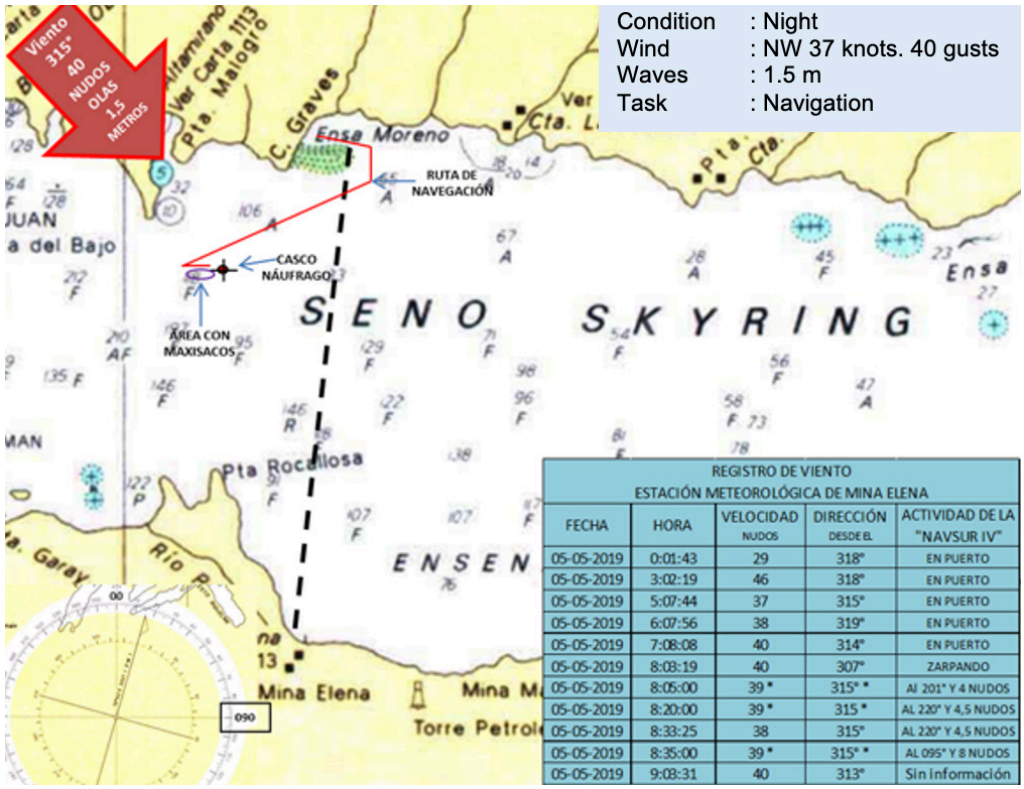
LESSONS LEARNED:

1.- Limitations to maximum cargo established by the Maritime Authority derive from stability studies and exceeding them implies a risk that under certain adverse conditions the ship's freeboard or upsetting arm may be surpassed, causing serious casualties.

2.- Big bags loaded with bulk cargo have shown to shift when the ship lists or is hit by billows. This causes a dangerous permanent listing, a condition that has led to sinking and abandonment of ships. Lashing the top of the big bags to each side of the ship is essential and unavoidable to prevent them from shifting.

3.- Small vessels are designed and authorized for navigation under good weather conditions only. In places where maritime authorities do not close or prohibit the transit of small vessels due to bad weather, the master or the ship operator must limit their small vessels based on the meteorological information and wind and sea conditions observed.

4.- While navigating, under good or bad weather conditions, vents, hatches, accesses to engine rooms and other interior areas of the ship must be closed hermetically to avoid flooding. Getting out without closing the access is a poor practice that must be corrected.



Condition : Night
Wind : NW 37 knots. 40 gusts
Waves : 1.5 m
Task : Navigation

REGISTRO DE VIENTO
ESTACIÓN METEOROLÓGICA DE MINA ELENA

FECHA	HORA	VELOCIDAD NUDOS	DIRECCIÓN DESDE EL	ACTIVIDAD DE LA "NAVSUR IV"
05-05-2019	0:01:43	29	318°	EN PUERTO
05-05-2019	3:02:19	46	318°	EN PUERTO
05-05-2019	5:07:44	37	315°	EN PUERTO
05-05-2019	6:07:56	38	319°	EN PUERTO
05-05-2019	7:08:08	40	314°	EN PUERTO
05-05-2019	8:03:19	40	307°	ZARPANDO
05-05-2019	8:05:00	39 *	315° *	AL 201° Y 4 NUDOS
05-05-2019	8:20:00	39 *	315 *	AL 220° Y 4,5 NUDOS
05-05-2019	8:33:25	38	315°	AL 220° Y 4,5 NUDOS
05-05-2019	8:35:00	39 *	315° *	AL 095° Y 8 NUDOS
05-05-2019	9:03:31	40	313°	Sin información

Name : **Navsur IV**
Type : small barge
Length : 19 m Beam : 7 m
Draught : 1 m GT : 46
Construction : Steel 2010
Flag : Chile

FIRE ON A PILOT BOAT IN THE STRAIT OF MAGELLAN

NARRATIVE:

On 17 August 2019, when the pilot boat **Ñandú** was departing from Punta Arenas heading to Félix lighthouse, **the engine room caught fire**, resulting in the total loss of the boat.

Following the activation of the smoke alarm, the crew tried to control the fire using portable extinguishers without success. They were assisted by other vessels and tugboats in the area, by cooling the hull from the outside. The fire became out of control mainly because the boat did not have a fire main, or a CO2 bank or any other remotely-controlled fire extinguisher system in the engine room, which together with the **small size of the damaged area made it difficult to access and stay inside.**

The crew was rescued without injuries and the boat was towed to Punta Arenas port to be inspected by the fire brigade. The fire started when the **rubber of the hose of the water-cooled exhaust system caught fire**, probably because the house clamps were not tight enough which caused the escape of high temperature gases inside the engine room. The exhaust system had operated for a long time without failure. There was no record of periodic replacement of the rubber hose.

If the fire had taken place in a remote location, without the prompt assistance of other vessels, the result could have had serious consequences for the crew.

LESSONS LEARNED:

1.- Pilot boats' engine rooms are usually small with very powerful engines which generate high temperatures in their exhaust gas systems.
This means that pipelines with hot gases are installed very close to bulkheads and other systems and equipment likely to catch fire. Any failure that allows hot gases to escape will easily cause a fire, which, if not detected and extinguished quickly, will become out of control due to the hydrocarbons stored there.

2.- The task of a fireman on board is doubly difficult, so it is essential to have a plan that, having assessed the risks of fire, foresees the actions and resources necessary to prevent and control them. Engine rooms and kitchens are the riskier areas.

3.- Small engine rooms with powerful engines that are usually unattended, require a fire detector (smoke and high temperature) and a remote-controlled fire extinguishing system. Equally important is the possibility to externally close the vents and have a water pumping system for external cooling, even when the main engines are out of service.

Condition	: Daytime
Wind	: SE 3 knots
Waves	: Calm Sea
Activity	: Navigation

Name	: **Ñandú**
Type	: Pilot boat
Length	: 28 m
Beam	: 6 m
GT	: 121
Construction	: Steel 2005
Flag	: Chile

COLLISION BETWEEN TWO PERSONAL WATERCRAFTS, IN CALAFQUÉN

NARRATIVE:

On 10 February 2018, **two personal watercrafts collided** in the Lican Ray Beach, Calafquén Lake, causing serious injuries to a 16 year-old girl, who eventually died while being treated at a hospital.

Both watercrafts had been rented by minors who were not required to have a valid licence nor had they been sufficiently informed of the regulations for preventing collisions and other safety instructions.

One of the watercrafts stopped for a moment as the driver needed to adjust her helmet, which was loose, to have better visibility. Apparently, the driver of the other watercraft did not see they had stopped, or at least not in good time, **hitting them at high speed**, and striking the two riders, who fell into the water.

Both watercrafts were operating within the area delimited for that activity and the procedure established by the rental company, that included the parents' permission and pre-release training, was not followed.

As a result of the collision, two people had minor injuries. **The 16 year-old driver** suffered severe blows and internal injuries, and even though she was rescued by the same people involved in the accident, **taken to the shore and transported to the Villarrica hospital, she passed away.**

The lack of knowledge and experience in the operation of the watercraft, speeding and, possibly, the use of **inappropriate helmets, which limited the visibility of the drivers**, were all factors in the accident.

LESSONS LEARNED:

1.- Personal watercrafts have powerful engines and reach high speeds, so when they hit unmoving objects and other crafts, they can cause severe injuries and even death to their riders.

2.- Personal watercrafts are not toys, therefore, according to the provisions of the Nautical Sports Regulations, their operation requires to have at least a coastal motorboat licence and in the case of minors, a notarized authorization from the father, mother or legal guardian.

3.- To guarantee safety, personal watercrafts owners and boat rental companies must ensure that safety regulations and provisions established by the manufacturer and the maritime authority are complied with.

4.- Helmets for personal watercrafts must have a wide field of view and, in terms of size, must fit snugly on the head and have four fastening straps.
A loose helmet does not provide protection and impedes visibility.

5.- Personal watercrafts should always be operated with life jackets and away from areas designated for bathers, sailing and rowing boats.
They need at least 30 or 40 meters to stop at maximum speed, so they should avoid getting closer to other watercrafts or obstacles within this distance.


Cajero Automatico BCI
Los Laureles
Cabañas El Roble Lican Ray
Chucao Lounge
MITSUKI SUSHI LICAN RAY
Café Restaurant Borde Lago
Playa Grande Lican Ray
Condition : Daytime
Wind : Calm
Waves : Calm Sea
Navigation : Sport


INGRESO PERPENDICULAR Y A BAJA VELOCIDAD
HASTA 100 MTS. PARA BAÑISTAS
ENTRE LÍNEA DE 100 Y 200 MTS. PARA EMBARCACIONES A REMO Y VELA
LÍNEA DE LOS 100 MTS. DESDE EL BORDE DE LA PLAYA
LÍNEA DE LOS 200 MTS. DESDE EL BORDE DE LA PLAYA
ZONA DE OPERACIÓN MOTOS DE AGUA
Armada de Chile
DIRECTEMAR

MAN OVERBOARD FROM ARTISANAL FISHING BOAT, IN LEMUY ISLAND

NARRATIVE:

On 24 January 2018 the artisanal fishing boat **Everest**, was riding at anchor during the night in the Detif inlet, Lemuy Island, with four people on board. When they woke up, **they realized that one of the crew members was missing.**

The **body of the missing person was found 12 meters deep** during a search done by a diver.

The deceased was not part of the maritime personnel and he did not have the required permits to board the vessel.

The boat had been extracting resources at the site and when the operation was completed the crew gathered on deck and **consumed alcohol for about four hours.**

After that, they all went to sleep, leaving **no one in charge of the watch.**

The **boat did not have a bathroom or handrails**, so it was assumed that due to the effect of alcohol and lack of familiarity with the boat, he had fallen overboard when he was leaning over the gunwale to dispose human waste.

The autopsy report informed drowning as the cause of death.

LESSONS LEARNED:

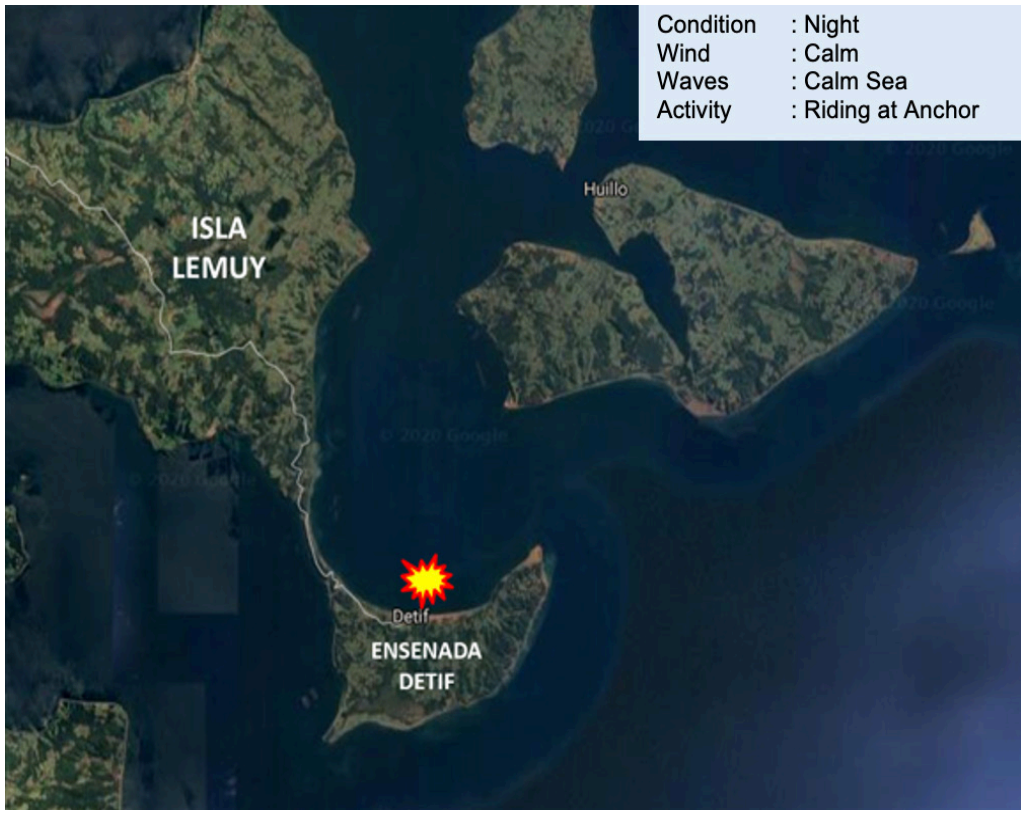
1.- Consumption of alcohol on board has been demonstrated to be the cause of serious accidents and this behaviour has been declared an offence punishable by the legislation in force. Inebriation can lead to balance problems, muscle incoordination (ataxia), and reduced capacity of decision making.

2.- The disposal of human waste without any kind of support or equipment is in itself a difficult and dangerous task that requires balance and good coordination, therefore, doing this with alcohol in the body increases the risks.

3.- Keeping a watch when vessels are riding at anchor or in port will allow to timely identify the different risks and to alert the crew members who are sleeping.

4.- Crew members that fall overboard and die due to drowning is something that occurs repeatedly over time and one of the aggravating factors is consumption of alcohol.
Providing small vessels with handrails and bathrooms to prevent crew members from falling overboard when they get close to the gunwale to dispose human waste are measures that have demonstrated to minimize the risk.

5.- Embarking untrained personnel as crew members is the origin of accidents, a risk that increases when there is consumption of alcohol on board.


Condition : Night
Wind : Calm
Waves : Calm Sea
Activity : Riding at Anchor
Huillo
ISLA
LEMUY
Detif
ENSENADA
DETIF


Name : EVEREST
Type : Artisanal Fishing Vessel
Length : 10 m
Beam : 3 m
GT : 10
Construction : Wood 1998
Flag : Chile