



How Ships Avoid Collisions (and Groundings)



Global Vehicle Densities on Our Road



64 Million Km
Of Roads Worldwide



1.6 Billion
Vehicles

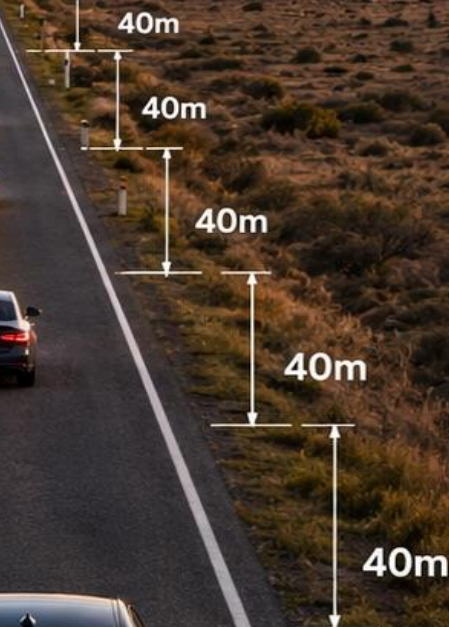


≈25 Vehicles
Per Km Of Road



≈1 Vehicle
Every 40 Metres

Global Movement
Connected World
↑ ↑ ↑





Global Shipping Numbers



Rule 19

The Oceans cover about 71% of the Earth
Ships carry 90% of global cargo by volume

Resulting Situation
Situation

Ship Category

Vessel Numbers

Merchant fleet

~ 119,000

Naval and Government

~ 50,000

Fishing Vessels

~ 4.9 Million

Recreational Craft

~ 30 Million

Approximate total

~ 35 Million



Global Shipping Density

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64 Million Km
Of Roads Worldwide



1.6 Billion
Vehicles



≈25 Vehicles
Per Km Of Road



≈1 Vehicle
Every 40 Metres



≈1 Vessel
Per 10 Km² Of Ocean



And Yet



United Kingdom

Dover

Folkestone

Calais



France

Boulogne-sur-Mer





Singapore/Malacca Strait

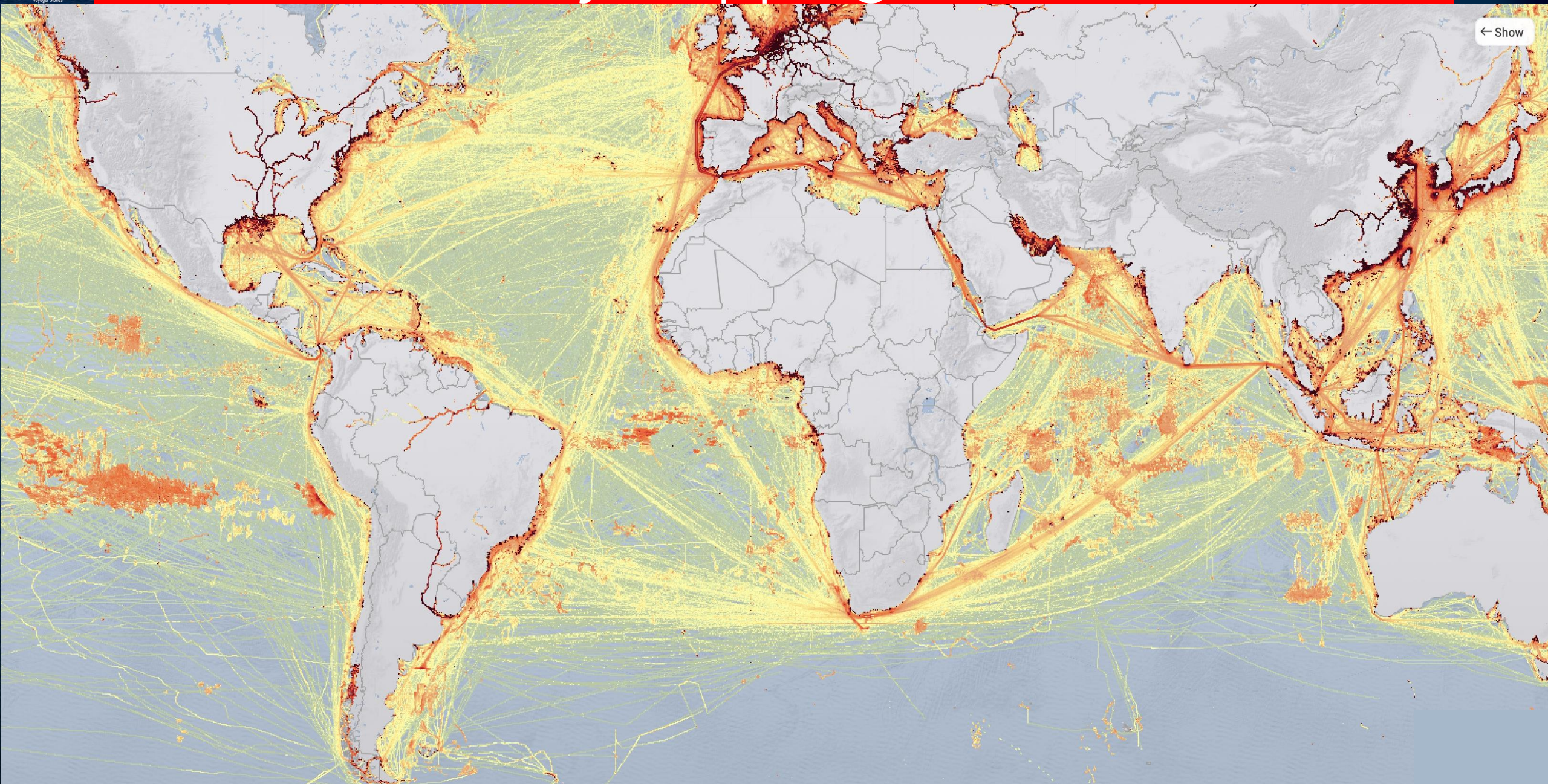
- At any one time, there are approximately 1,000 vessels within the Port of Singapore's limits
- A ship arrives or departs Singapore every two to three minutes





Busy Shipping Lanes

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Coral Expedition Grounding



Lack of Attention to Detail

- Voyage planning did not adequately account for survey limitations
- Navigation practices in poorly charted waters were not adequate
- Use of Electronic Navigational Charts versus local knowledge was not appropriate

CORAL ADVENTURER
Passenger Ship

Ship Photos: 55

PG OBM
DREGERHAFFEN

Reported ETA: 2025-12-26 20:00

ATD: 2025-12-25 17:03

Speed/Course: 0kn / 0°

Draught: 4.3m

Received: 13 hours, 9 minutes ago (AIS source: Roaming)





Guiding All Mariners



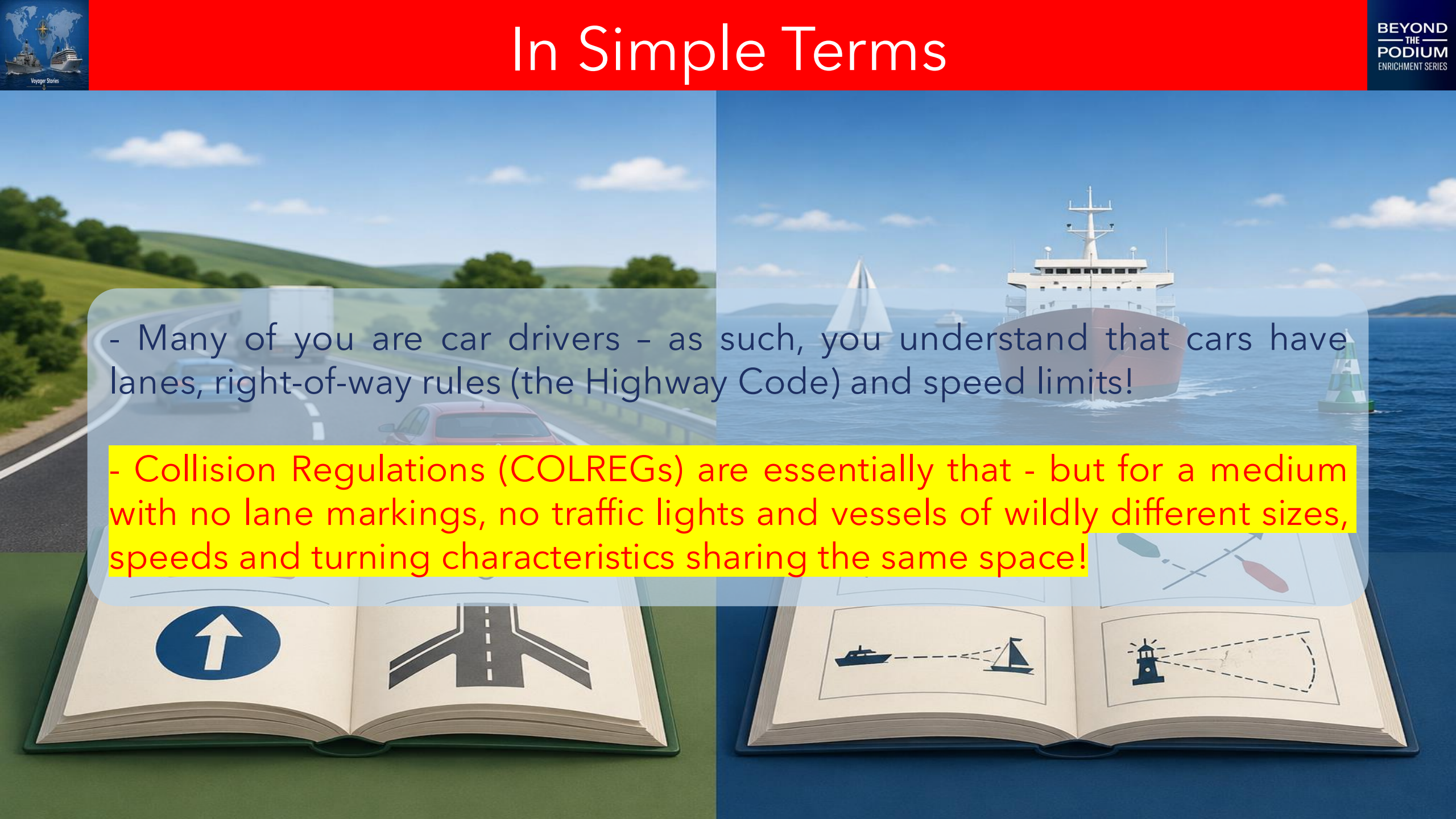
International Regulations for Preventing Collisions at Sea (or COLREGs for short)

The internationally accepted rules governing vessel behavior at sea to prevent collisions, ensuring safe navigation and minimising risks to vessels, crew, and the environment

Success depends on good training, education and experience matched to national and international regulations

A 2023 European Maritime Safety Agency Report found that while modern technology has improved safety, it has added to Bridge Staff burden due to information overload

In Simple Terms



- Many of you are car drivers - as such, you understand that cars have lanes, right-of-way rules (the Highway Code) and speed limits!

- Collision Regulations (COLREGs) are essentially that - but for a medium with no lane markings, no traffic lights and vessels of wildly different sizes, speeds and turning characteristics sharing the same space!



Applicability

Types of Vessel

Rules apply to **all types of vessels** without exception

Waters

Rules apply to vessels on the high seas and all connected waters navigable by seagoing vessels, as well as all vessels on inland waterways

Visibility

Rules also apply in **any condition of visibility**, with specific rules for low visibility situations



Worth Remembering

- A car travelling at 30mph can stop in under 100 metres. A large vessel at 15 knots may need 3-5 miles and close to 15 minutes to stop - and virtually cannot turn faster than that stopping distance allows. This is the fundamental cognitive challenge that makes collision avoidance at sea so demanding, and why the Rules require action early

- Passengers might reasonably assume a big cruise ship is the 'give-way' vessel - after all, it is the most visible, the most powerful. In fact, a small boat or a fishing vessel will often have right of way over our 122,000-tonne cruise ship





Over-riding Responsibilities

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Maintain a Proper Lookout



Use Radar Effectively



Take Early and Decisive Action



Employ All Available Means





A Sharp Bridge Team is Crucial

**Always on Watch
Vigilant
Night and Day**



Someone is always on watch, always scanning.
It speaks to the professionalism of the crew you are living with aboard the
Celebrity Eclipse



Firing Shots to Avoid a Collision is not in the Rules



JUNE 16, 2026

Current News

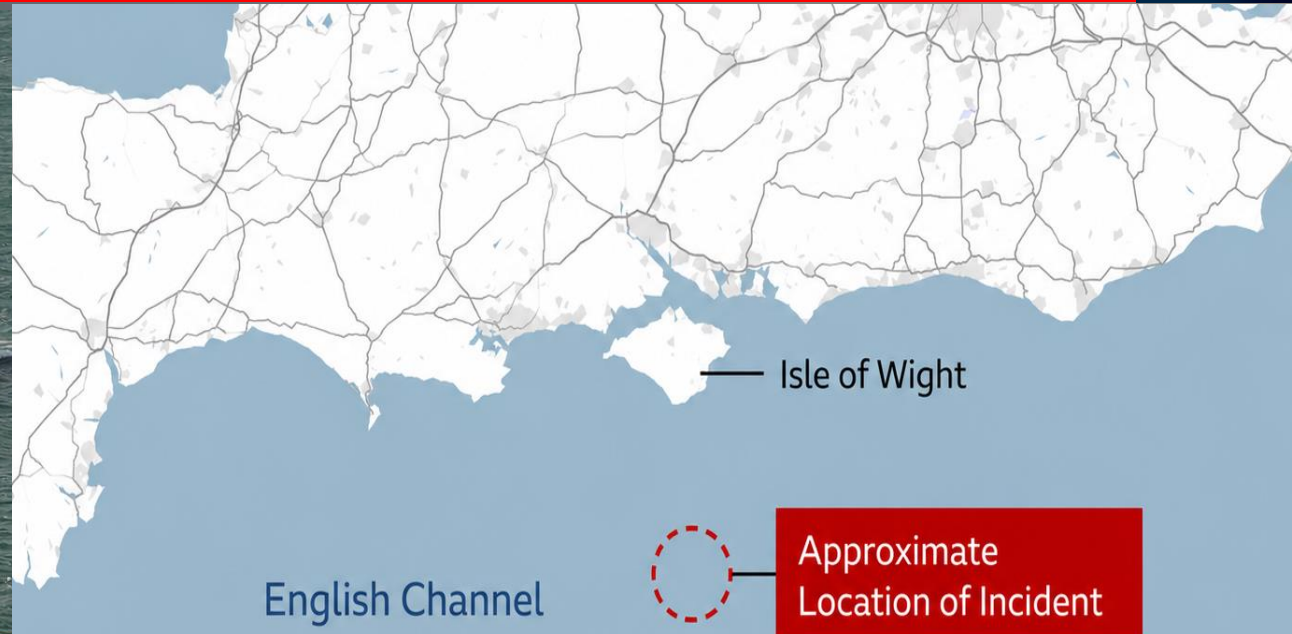
Russian frigate RFS Admiral Grigorovich fires warning shots at a British yacht

A Russian frigate has fired warning shots at a British-flagged civilian yacht in the English Channel, in the most direct military confrontation between Russia and the UK in home waters in recent memory. The incident follows the Royal Navy's seizure of a Russian shadow fleet tanker in the same waters just days earlier.

The British yacht reported coming into close proximity with RFS Admiral Grigorovich before warning shots were fired at a distance of approximately 500 yards. The incident is understood to have taken place in the sea between the Isle of Wight and Normandy. No injuries or damage were reported, and a seaboot from HMS Tyne visited the yacht to check on its occupants and gather details.

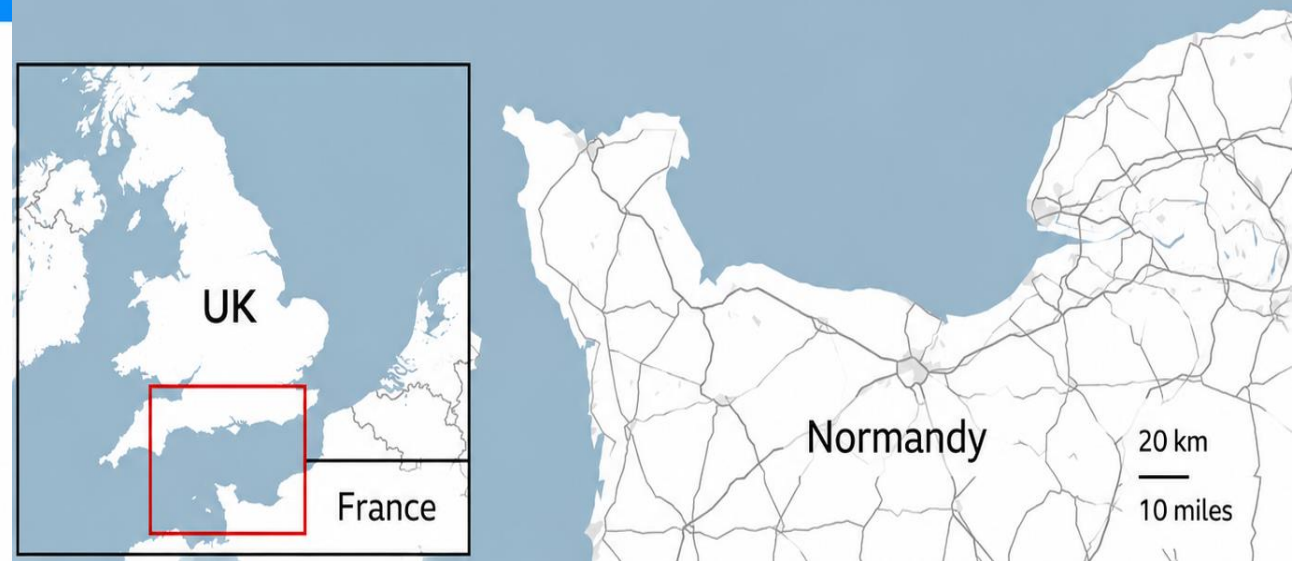
UPDATE: Deborah Haynes of Sky News reports that the Russian frigate appears to be having difficulty controlling its movements. The warship is thought to have sounded an alert to the yacht to avoid a collision, but it didn't change course, so a couple of warning shots were fired, though not directly at the yacht.

The RN says the OPVs HMS Mersey and HMS Tyne were shadowing the frigate west of Brest at the time of the [tanker seizure](#) that took place 25 miles south of the Isle of Wight on Sunday night. They were also close by at the time of the incident involving the yacht today. The ships were monitoring a vessel that has now been a persistent presence in British waters for some weeks. As we have [previously reported](#), she has been escorting shadow fleet vessels but also loitering off the UK coast.



English Channel

Approximate
Location of Incident



UK

France

Normandy

20 km

10 miles



Incidents are Generally Human Failures

The background image shows a large blue and white container ship with many colorful shipping containers on its deck, grounded on a dark, rocky coastline. To the left of the ship is a white lighthouse with a red top. The sky is overcast and grey, and the water is dark with white foam from the waves crashing against the rocks.

Surveys of incidents consistently show that groundings involve failure to follow passage plans, complacency in familiar waters, or pressure to maintain schedule. It connects to broader themes of risk management and institutional culture

Lack of Bridge Concentration and Focus



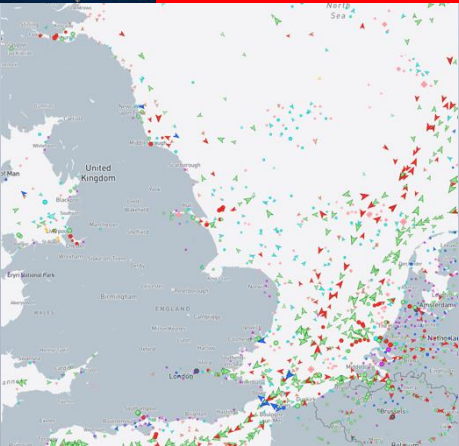
Korean Ferry QUEEN JENUVIA II grounded on 19 November 2025 on approach to Mokpo

Initial Korean Coastguard findings found the Bridge Watchkeeper was distracted by his mobile telephone, left the ship on autopilot and missed a planned wheel over and the fact that the Captain was rarely on the Bridge for the approaches to the narrow waters





Consequences of Serious Failure



Captain guilty of North Sea tanker crash death

David McKenna
East Yorkshire and Lincolnshire

Vladimir Motin was found guilty of gross negligence manslaughter.

The captain of a cargo ship that collided with a tanker in the North Sea has been found guilty of gross negligence manslaughter.

Vladimir Motin was the only person on watch duty on the Solong when it hit US tanker Stena Immaculate off the East Yorkshire coast on 10 March 2025, leaving Mark Angelo Perini, 38, a crew member on the Solong, missing presumed dead.

A trial at the Old Bailey in London heard Motin did not keep a proper lookout and did not use all available means to determine the risk of a collision, or leave enough time to take evasive action.

Motin, 59, from St Petersburg, Russia, is due to be sentenced on Thursday.

SOLONG Container Ship

Details Track Add Photo Add to fleet

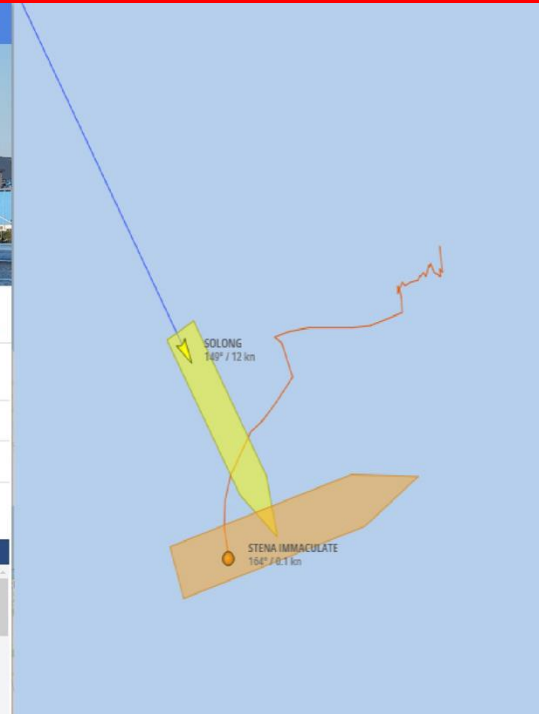
Destination
Rotterdam, Netherlands
ETA: Mar 10, 20:15 (in 6 h)

Speed: 0.0 kn Course: 115° Draught: 6.3 m (max 7.3)

Status: Under way Last report: Mar 10, 2025 10:34 UTC

Last Port
Grangemouth, United Kingdom (UK)
ATD: Mar 09, 20:07 UTC (18 h ago)

PORT CALLS	
Recent Port Calls	ATA (UTC)
Grangemouth	Mar 8, 22:06
Rotterdam Waalhaven	Mar 7, 04:01
Hull	Mar 5, 12:15
Rotterdam Waalhaven	Mar 4, 04:02



STENA IMMACULATE Chemical/Oil Products Tanker

Details Track Add Photo Add to fleet

Destination
Killingholme, United Kingdom (UK)
ETA: Mar 09, 17:30

Speed: 0.0 kn Course: 76.7° Draught: 9.7 m (max 12.9)

Status: At anchor Last report: Mar 10, 2025 14:29 UTC

Last Port
Agio Theodoroi, Greece
ATD: Feb 27, 02:58 UTC (11 d ago)

PORT CALLS	
Recent Port Calls	ATA (UTC)
Agio Theodoroi	Feb 25, 15:41
Corinth Easth Anch.	Feb 21, 12:50
Piraeus Anch.	Feb 15, 18:23
Corinth Easth Anch.	Feb 9, 08:19



Poor Passage Planning





As a Reminder ... The Costa Concordia Incident

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Reckless Manoeuvre

Safety compromised by deviating from planned course for a too-close approach to shore

Loss of Situational Awareness

Failure to monitor navigation systems relative to hazards

Ignoring Alarms

Critical alarms disregarded, silenced or dismissed as false or inaccurate

Delayed Evacuation Order

Evacuation order was delayed even after it was clear the situation was critical

Navigational Errors Leading to Disaster

Failure Can Result in Prison

Jury Finds Ferry Officer Guilty on Lesser Count in Fatal Collision

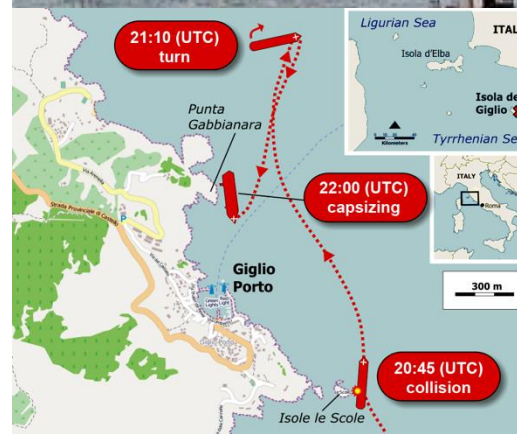
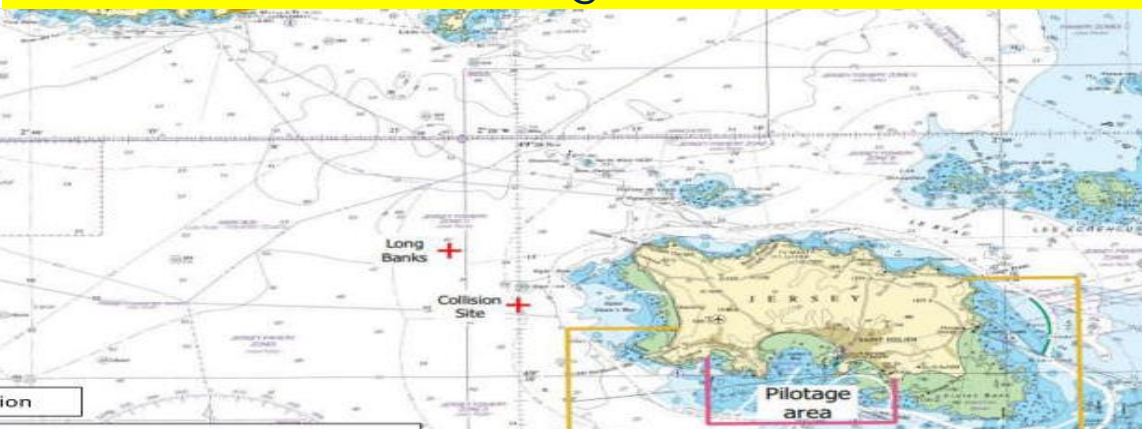
Captain Francesco Schettino was found guilty of manslaughter and other charges, receiving a 16-year prison sentence



Commodore Goodwill ferry collided with the fishing boat in December 2022 (John K. Thorne photo - CC0 1.0)

PUBLISHED SEP 26, 2025 2:43 PM BY THE MARITIME EXECUTIVE

Bridge Watchkeeper jailed on 3 Dec 25 for 18 months for manslaughter of 3 fishermen



Bridge Teams Need to be on the Ball



The Mariner's Safety Toolbox



Global Navigation Satellite System Disruption

Modern ships rely heavily on satellite navigation - but the systems have vulnerabilities

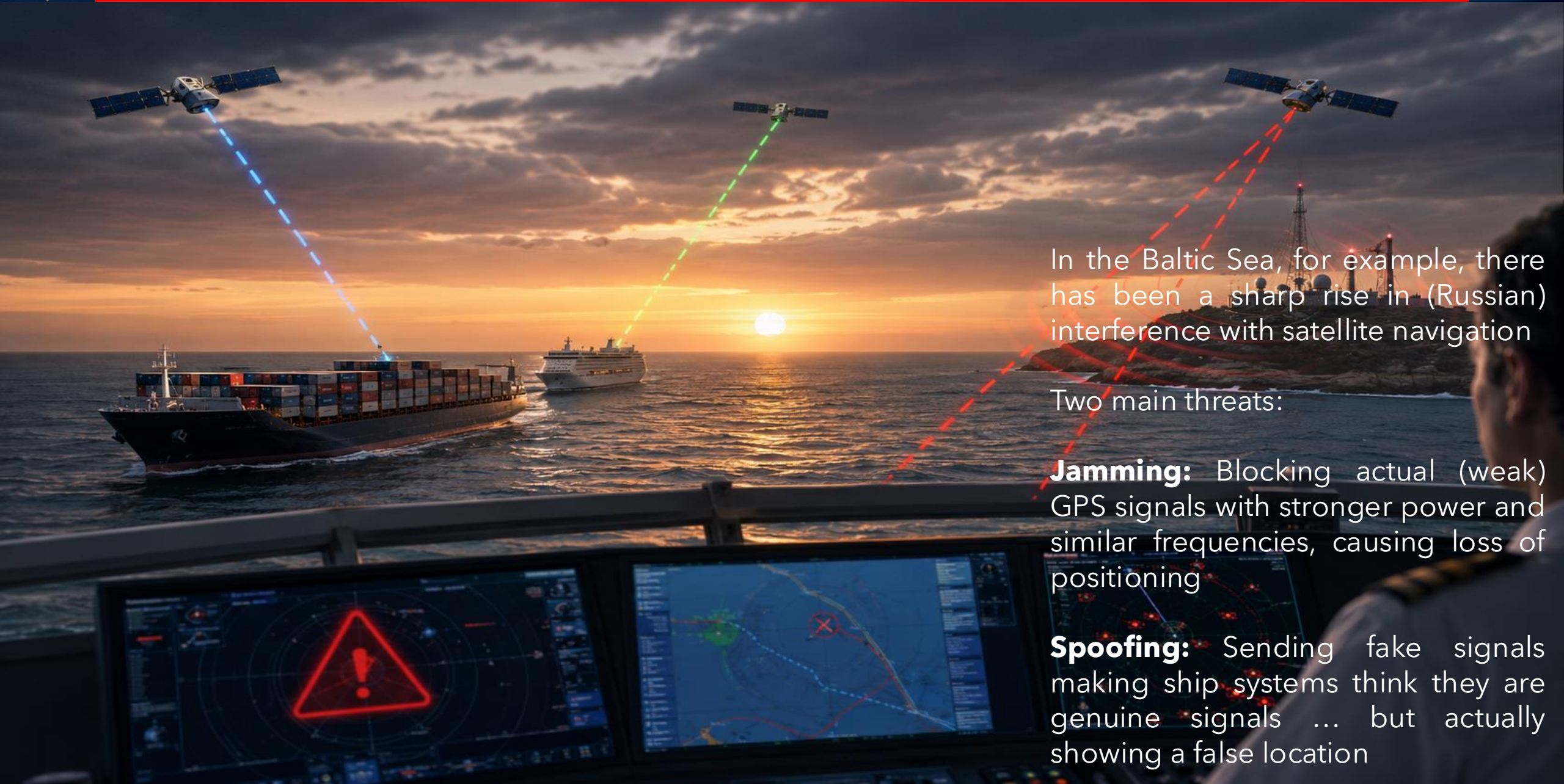
Ships use signals from multiple satellite systems:
GPS (USA), Galileo (Europe), GLONASS (Russia), BeiDou (China)

These signals provide precise position, speed, and timing

Most modern phones use multiple signals for accuracy, but many vessels rely on the original civilian GPS signal (L1 C/A). This signal dates back to the early 1990s. It is weaker and easier to interfere with. Newer, more resilient signals are not always used onboard



The Problem



In the Baltic Sea, for example, there has been a sharp rise in (Russian) interference with satellite navigation

Two main threats:

Jamming: Blocking actual (weak) GPS signals with stronger power and similar frequencies, causing loss of positioning

Spoofing: Sending fake signals making ship systems think they are genuine signals ... but actually showing a false location



Why this Disruption Matters for Ship Safety

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Grounding risk rises - ships may appear off course without knowing it



Collision avoidance degrades



Search and rescue slows

Crews must fall back on traditional navigation skills

GNSS Outages Spreading in Baltic Sea Region

Satellite navigation is powerful-but not infallible. At sea, the most important system is still the one on the bridge:

Human Judgement





Vessel Traffic Control - Amsterdam

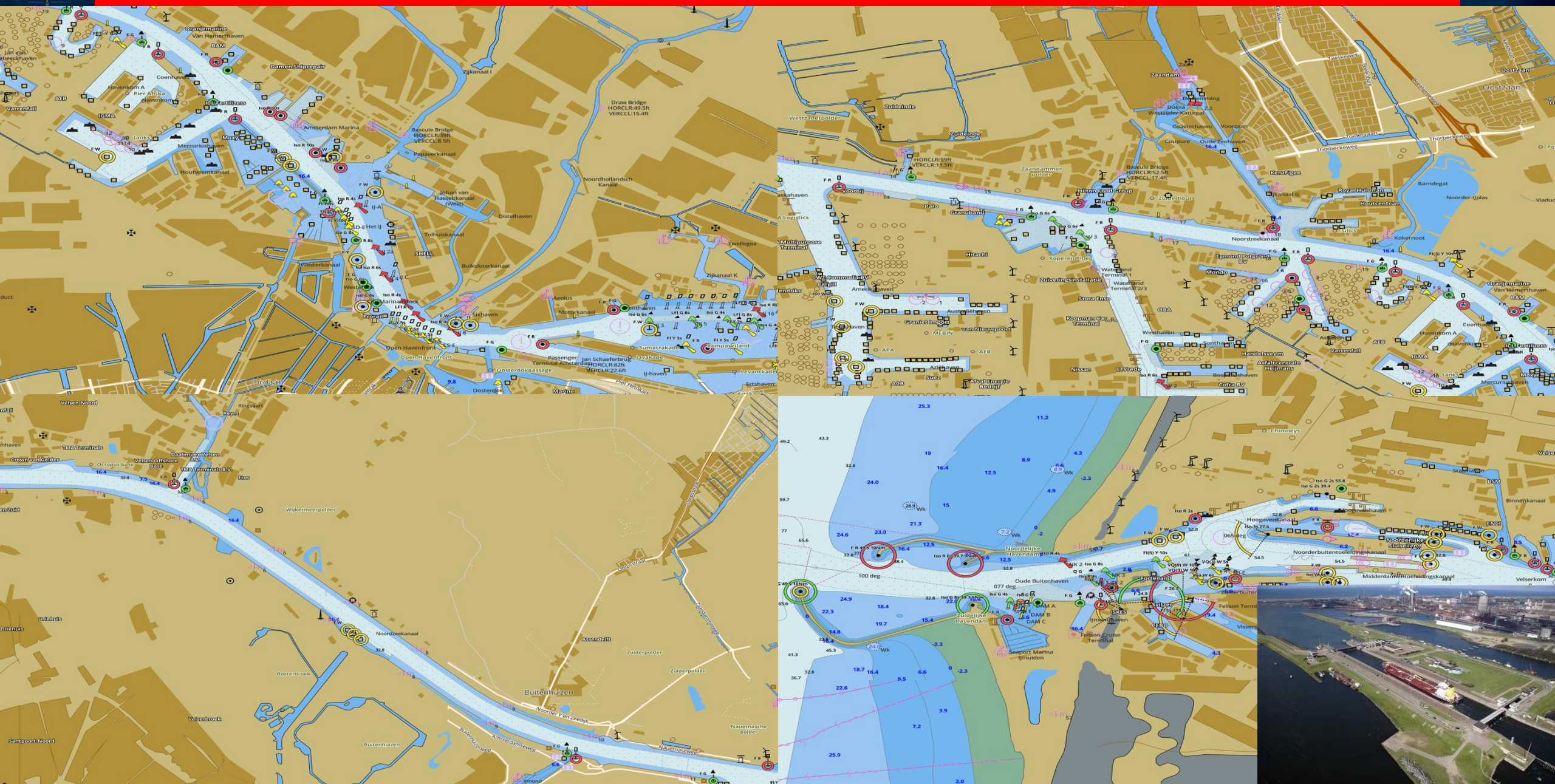


- The Port of Amsterdam Authority (officially Havenbedrijf Amsterdam NV) is the governing body responsible for the safe, swift, and environmentally sustainable management of shipping traffic. It oversees the entire Amsterdam port region, which stands as Europe's fourth largest port
- Operational handling is synchronised via the Central Nautical Management (CNB), representing the municipalities of Amsterdam, Beverwijk, Velsen and Zaanstad



Navigationa Channel - Amsterdam

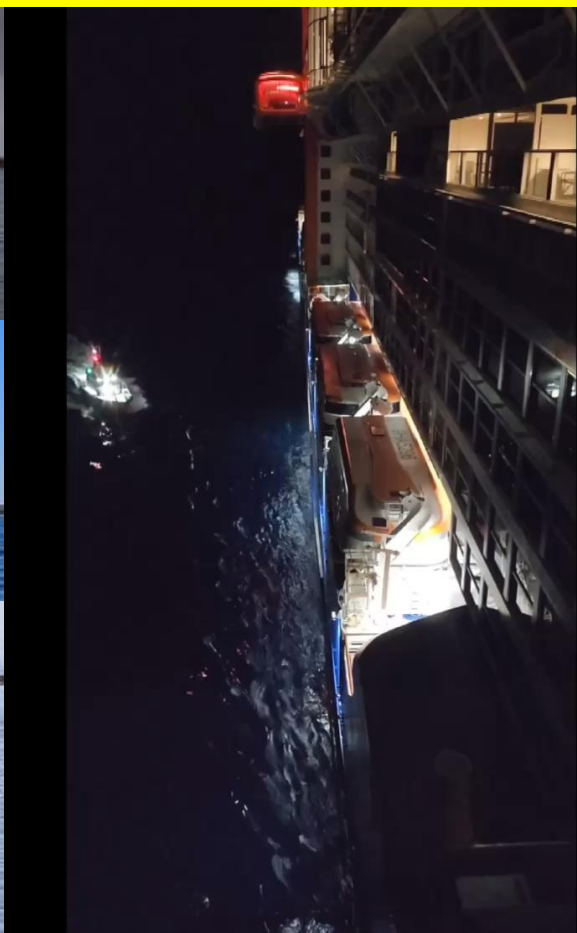
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Pilotage

What Is A Pilot

A harbour pilot is a highly trained mariner who boards ships as they approach or leave a port to guide them safely through local waters. They know every channel, depth, tide, current, shoal, turning point and hazard better than anyone else



Navigation in Narrow Channels



KEEP TO
STARBOARD SIDE



AVOID ANCHORING



International Organization for Marine Aids to Navigation Regions



What it Looks Like



Region A - Ship Coming Into Harbour



Region B - Ship Coming Into Harbour

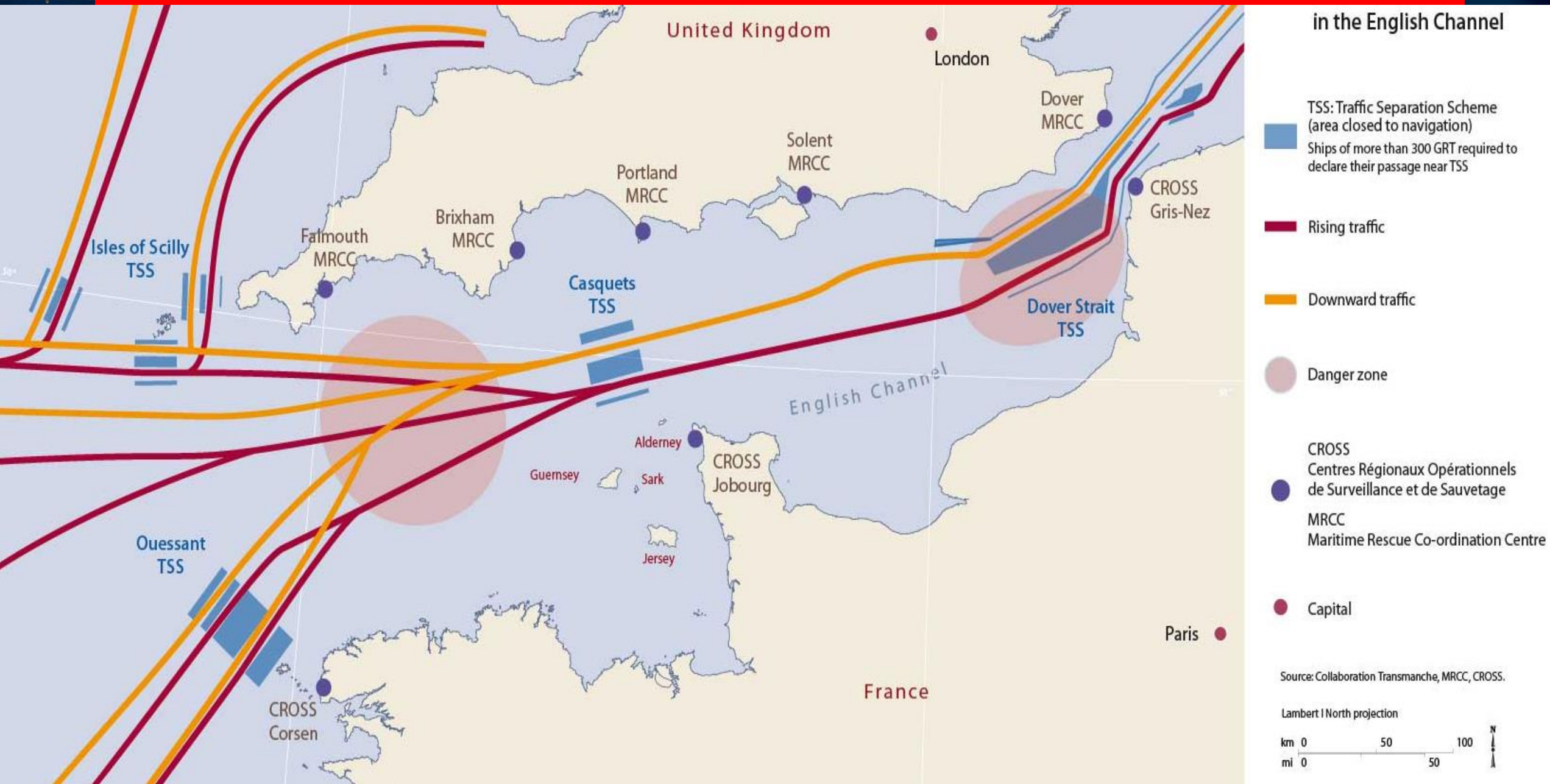


Traffic Separation Schemes - What Are They?





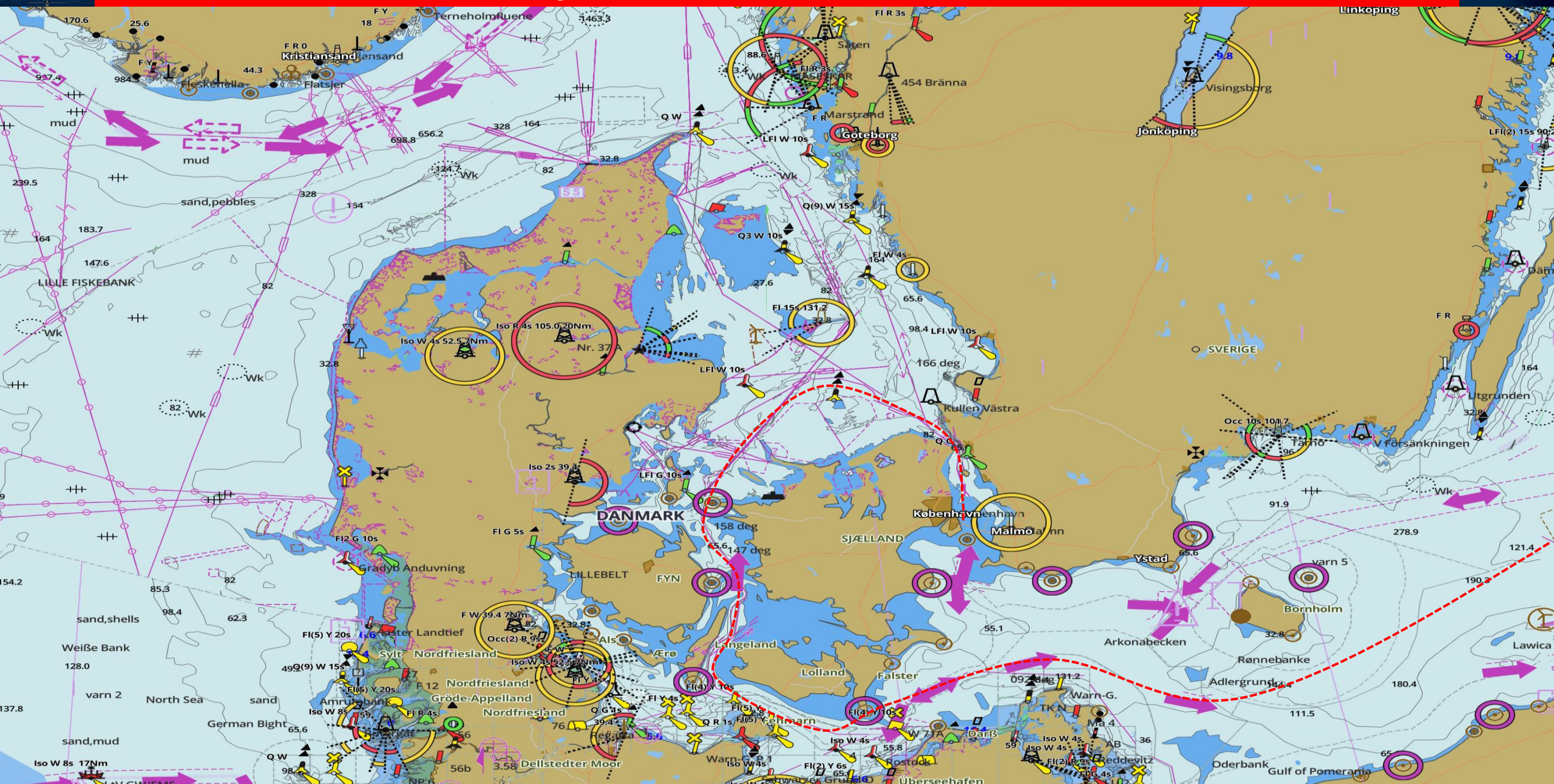
Traffic Separation Schemes - How They Work







Traffic Separation Scheme - Baltic





The Greatest Threat - The Steady Bearing

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Head-On Situation



Day – other vessel ahead or nearly ahead on a reciprocal or nearly reciprocal course



Night – masthead lights in a line or nearly in a line and/or both sidelights



Take action – alter course to starboard



Crossing Situation

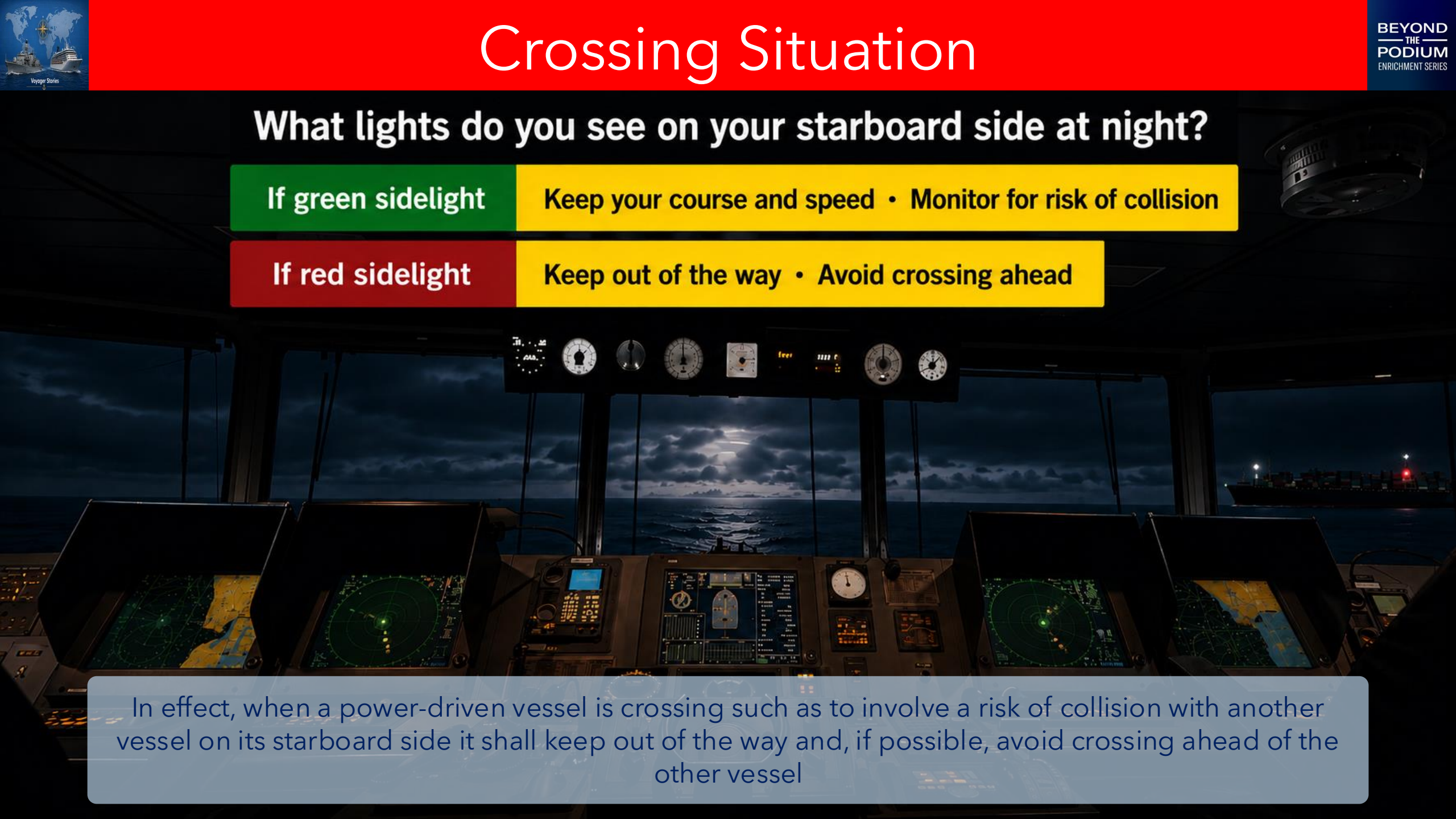
What lights do you see on your starboard side at night?

If green sidelight

Keep your course and speed • Monitor for risk of collision

If red sidelight

Keep out of the way • Avoid crossing ahead



In effect, when a power-driven vessel is crossing such as to involve a risk of collision with another vessel on its starboard side it shall keep out of the way and, if possible, avoid crossing ahead of the other vessel



Crossing Situation - Getting it Wrong



Bulk carrier Polesie (top) and general cargo ship Verity (bottom), the two vessels involved in a fatal October 2023 collision in the German Bight that investigators later concluded was wholly avoidable. UK MAIB Image

Fatal German Bight Ship Collision Was 'Wholly Avoidable,' MAIB Says

Mike Schuler

Total Views: 0

February 12, 2026

More than two years after the cargo ship *Verity* sank following a collision in the German Bight, the UK's Marine Accident Investigation Branch has released its [final report](#)—and its conclusion is stark: the loss of five lives was entirely preventable.

The Isle of Man-registered *Verity* [collided](#) with the Bahamas-flagged bulk carrier *Polesie* in the early hours of October 24, 2023, inside a busy traffic separation scheme about 12 nautical miles southwest of Helgoland. The impact sent *Verity* to the bottom of the North Sea within minutes. Two crew members survived. Five did not.

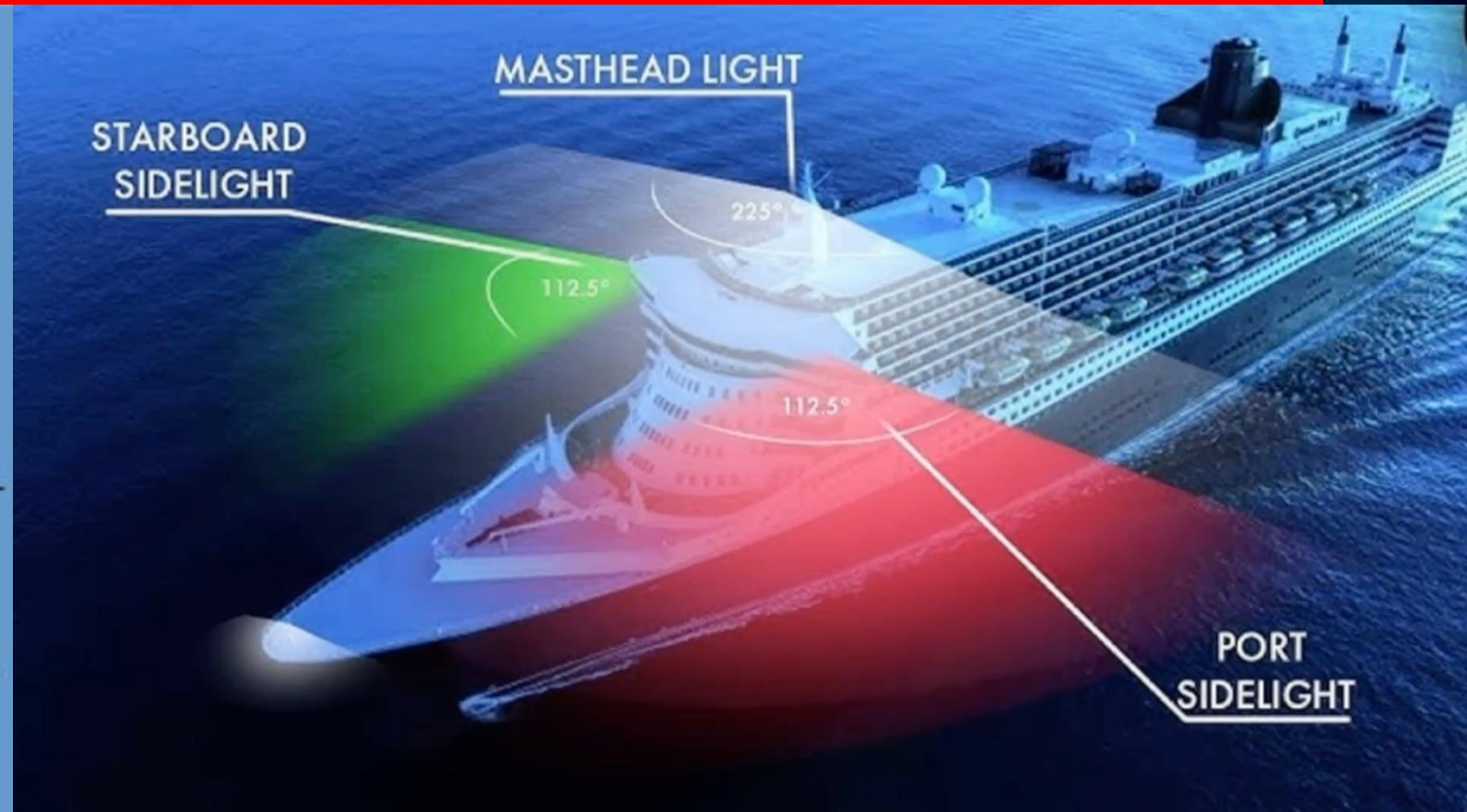
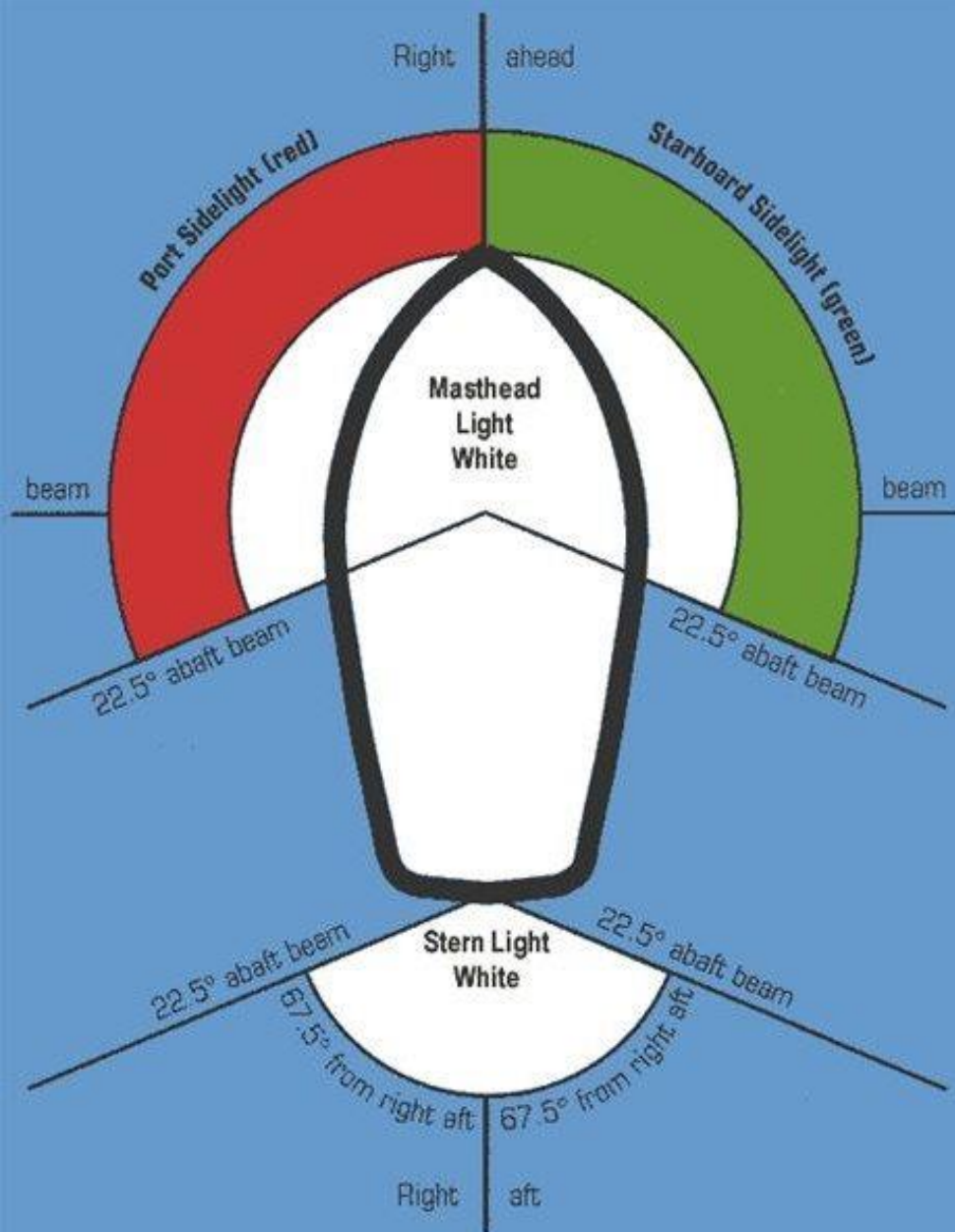
"This accident was wholly avoidable," said [MAIB](#) Chief Inspector Andrew Moll. "Neither vessel applied the collision regulations diligently, and both accepted passing at close range when there was no need to do so."

A Failure to Act—Until It Was Too Late

The investigation found that both vessels were on a clear crossing course with ample sea room. Under the International Regulations for Preventing Collisions at Sea, *Verity* was the give-way vessel and required to take early and decisive action to keep clear. It did not.



Navigational Lights



- A ship's lights will depend upon whether she is power driven and her length
- Crucial at night to understand perspective and take avoiding action as necessary
- In the case of **Celebrity Eclipse**, because she is over 50 metres in length she will have 2 white masthead lights, a green starboard steaming light, a red port steaming light and a white stern light

Navigation Lights - Silver Nova





Masthead Lights - Celebrity Eclipse

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A Shape/Light Sequence for Every Eventuality

Rule 25

Sailing vessels



If not showing navigation lights, hand held torch shown in time to prevent collision.

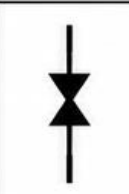


If not showing navigation lights, hand held torch shown in time to prevent collision.



Rule 26

Fishing Vessels
Trawling
(also see Annex II)



Rule 26

Fishing Vessels
Other than
Trawling
(also see Annex II)



Fishing vessels with non-trawling gear extended more than 150m net underway



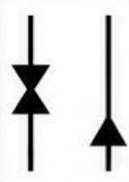
Fishing vessels with non-trawling gear extended more than 150m underway



Fishing vessels with non-trawling gear extended more than 150m net underway

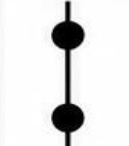


Fishing vessels with non-trawling gear extended more than 150m underway



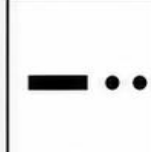
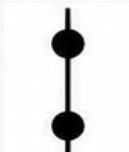
Rule 27

Vessels
not under
command



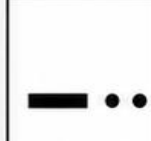
Rule 27

Vessels not
under comm'd
making way
through water



Rule 27

Power-Driven
Vessels
restricted in
ability to
manoeuvre





A Shape/Light Sequence for Every Eventuality

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Rule 28

Vessels
constrained
by draft



Rule 29

Pilot Vessels
on
Pilot Duty



Under way



At anchor



Under way



Under way



At anchor



At anchor



Rule 30

Vessels
at anchor



Vessels over 50m
may also show deck lights



Vessels less than 50m



Vessels over 50m
may also show deck lights



Vessels less than 50m



Bell & gong
signals as per
rule 35(b) or 36
on approach of
another vessel

Rule 30

Vessels
aground



Vessels over 50m

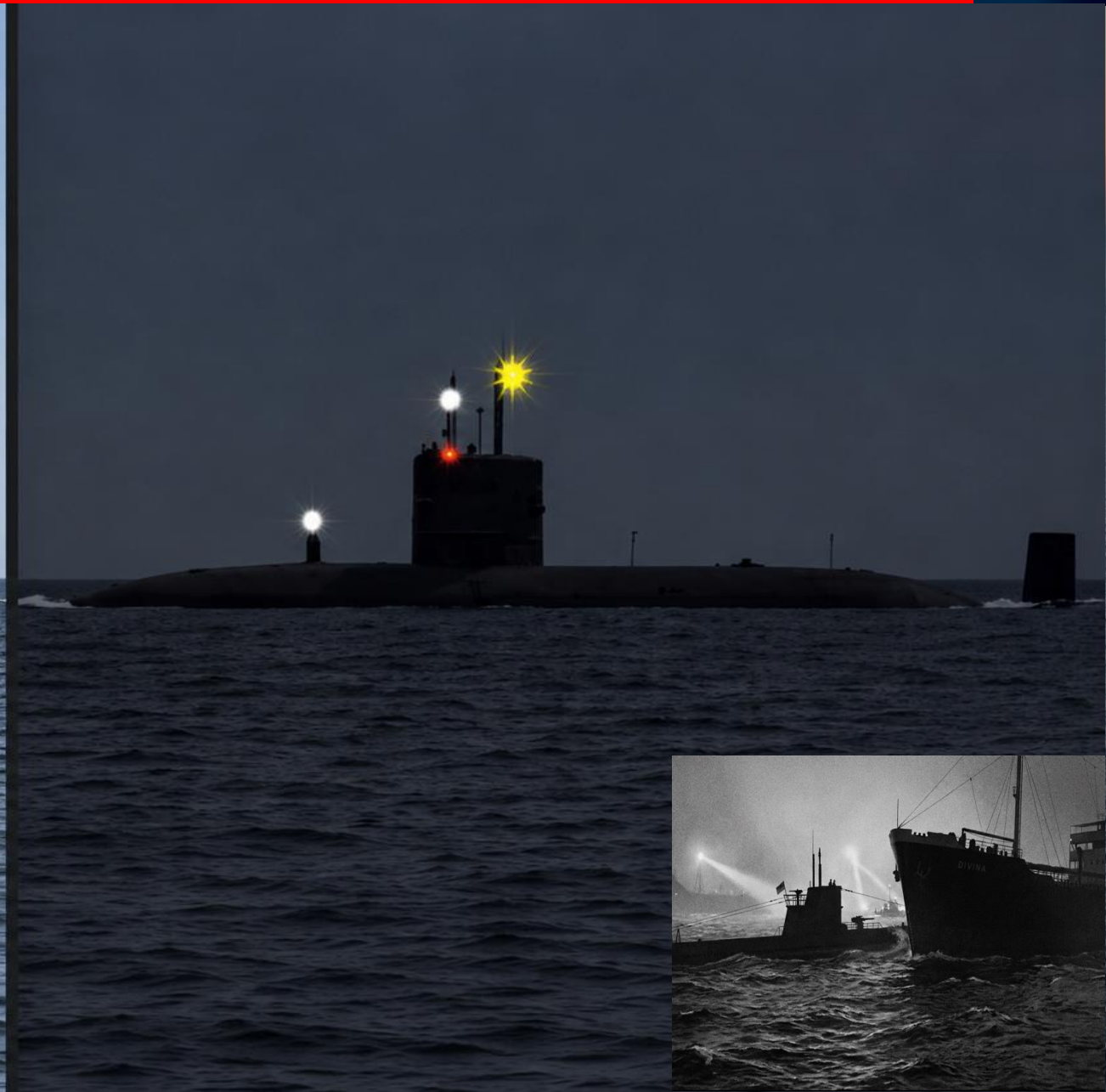


Vessels over 50m



Bell & gong
signals as per
rule 35(b)

... Even for a Submarine





Sound Signals You Might Hear

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INTERNATIONAL

PART D — SOUND AND LIGHT SIGNALS



Rule 34 — Maneuvering and Warning Signals

(a) When vessels are in sight of one another, a power-driven vessel underway, when maneuvering as authorized or required by these Rules, shall indicate that maneuver by the following signals on her whistle:

One Short Blast

I am altering my course to starboard

Two Short Blasts

I am altering my course to port

Three Short Blasts

I am operating astern propulsion

Five Short Blasts

I am unsure of your intentions

In Summary



Universal Regulatory Framework

The International Regulations for Preventing Collisions at Sea provide internationally accepted rules that minimise risks to crews, ships and the environment



The Human Element

Success ultimately relies on the training, education and experience of deck officers



Layered Traffic Management

Safety is reinforced through Vessel Traffic Services (VTS), local pilots and Traffic Separation Schemes (TSS) that organise flow in densely travelled areas



Standardised Communication

Universal systems like IALA buoyage and standardised vessel lights/signals help mariners communicate clearly



Operational Discipline

Strict adherence to 'Right of Way' principles in channels and using proper signals to avoid collisions

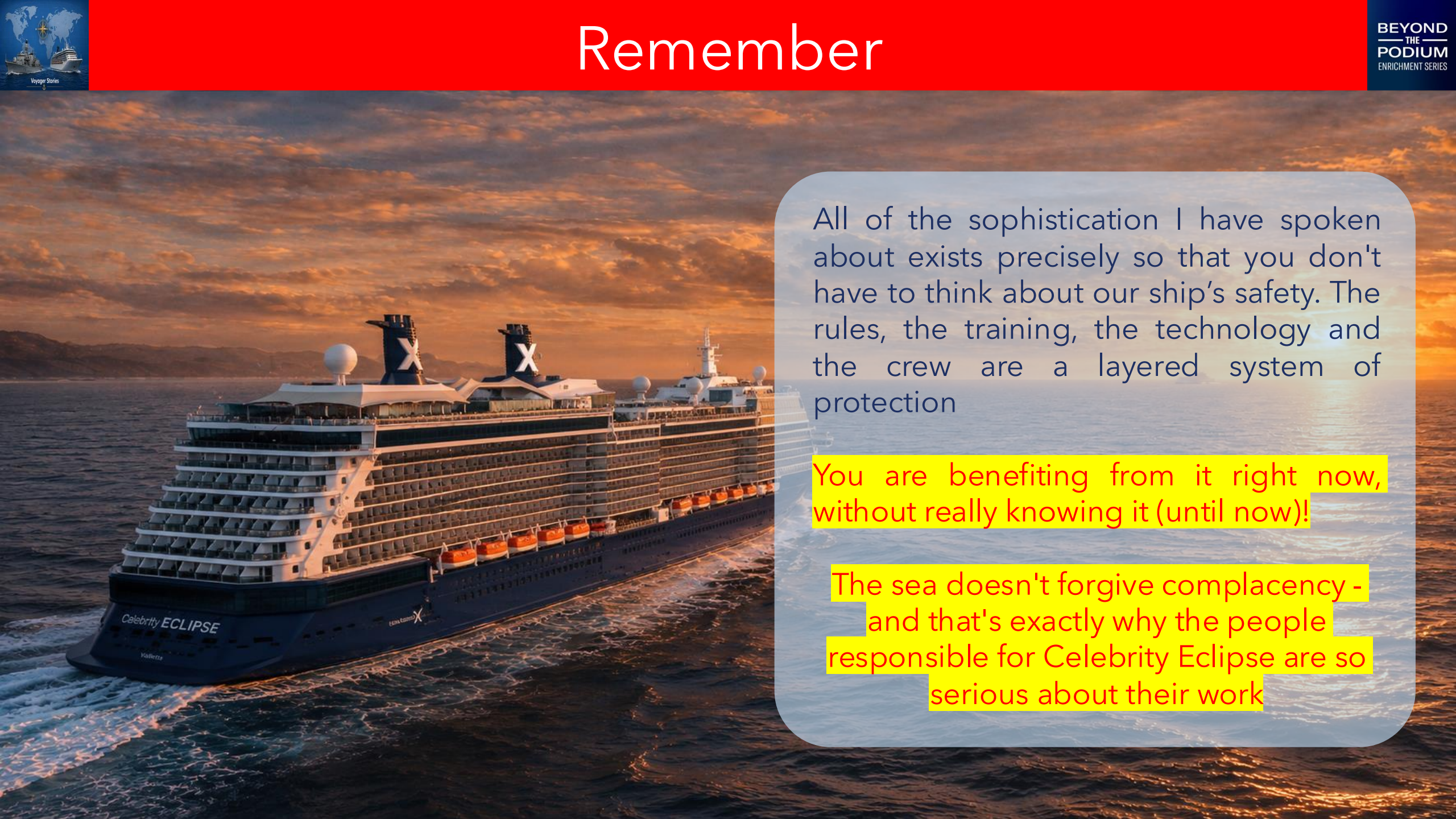


Accountability and Consequences

Ignoring maritime safety rules is illegal and can lead to severe consequences



Remember

A large cruise ship, the Celebrity Eclipse, is shown from a side-on perspective, sailing on the ocean. The ship is white with a dark blue hull and features the 'X' logo on its funnels. The name 'Celebrity ECLIPSE' is visible on the bow. The ship is moving towards the right, leaving a white wake in the dark blue water. The sky is filled with orange and yellow clouds, suggesting a sunset or sunrise. The overall scene is dramatic and emphasizes the scale and technology of the vessel.

All of the sophistication I have spoken about exists precisely so that you don't have to think about our ship's safety. The rules, the training, the technology and the crew are a layered system of protection

You are benefiting from it right now, without really knowing it (until now)!

The sea doesn't forgive complacency - and that's exactly why the people responsible for Celebrity Eclipse are so serious about their work



Thank You

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