SEA TIMES

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1,000 Miles Up The Glorious Amazon

I joined my first ship, the *Hubert*, at Bevan's Wharf, Northfleet, on the River Thames, where she was loading a full cargo of cement for Northern Brazil. I arrived aboard resplendent in a brand new uniform and complete with a trunk full of clothes bought with an allowance of about 100 clothing coupons supplied specially for the purpose, and my father's hard earned cash. It was February 1948 and at 17 years and 2 months I was old starting out as an Apprentice with the Booth Line.

We sailed a couple of days later and as I recall the weather was fair considering it was late February. However there was a heavy swell running in the Bay of Biscay which made the ship roll and my stomach turn over but I succeeded in not disgracing myself by being seasick.

Our first port of call was St. Vincent, Cape Verde Islands, for bunkers. We anchored for a few hours whilst an ancient oiler bunkered us with crude. My time was spent on stowaway patrol, looking into lifeboats and lockers.

After leaving St. Vincent we steamed on to Fortaleza in Northeast Brazil, which in those days was only an anchorage port. Wooden barges were towed out to us and discharge took place by union-purchase with as many gangs as could be worked. Unfortunately, as each sling of cement cleared the hatch coamings, the prevailing trade wind blew clouds over our nice clean paintwork.

> *"There were virtually no navigational aids on the river such as leading lights, beacons or buoys...."*

We went on up the coast calling at Tutóia and São Luís before entering the brackish water pouring out of the Amazon, south of the island of Marajó, which lies in the middle of the Amazon delta.

We arrived at the deep-water anchorage in the Pará River for the port of Belém and awaited the "Visit". This was comprised of a tender full of various officials like doctors, customs and immigration officers, agricultural officials, ship's agent and the agent's runner. He was the most important person of all to the crew because he brought on board the mail from home.

After the visit we went alongside the river berth to continue discharging cement, which by this time was starting to come to an end. When the holds became completely empty I was introduced to the doubtful pleasures of bilge diving and hatch cleaning. Sweeping up broken cement bags was a filthy business but having done so we were able to wash down the holds with fresh water from the Amazon via the deck service line. The dirty water was then returned to the river via the bilge pump. Nobody worried about pollution in those days when oil tankers used to go a day's run up the river to the fresh water, and then proceed to wash their tanks out.

We left Belém and proceeded downstream for some miles before turning into the channel leading to the narrows, which in turn lead into the main river. There were virtually no navigational aids on the river such as leasing lights, beacons and buoys, but that did not stop progress at night. A perfect blackout forward of the bridge was essential, the only permitted light being the masthead light. Transit time from Belém to Manaus in a 10-knot ship was approximately 5 days against the current, although it should be noted that the return trip from Manaus to Belém with the current was only about three and a half days.

On arrival at Manaus we tied up to a large floating pontoon firmly moored in deep water some yards off shore. Rat guards on ropes were absolutely essential as the pontoon was infested with enormous water rats. I remember our ship's cat decided to take a walk ashore but scooted back on board after spotting them.

Rat guards on ropes were absolutely essential as the pontoon was infested with enormous water rats....

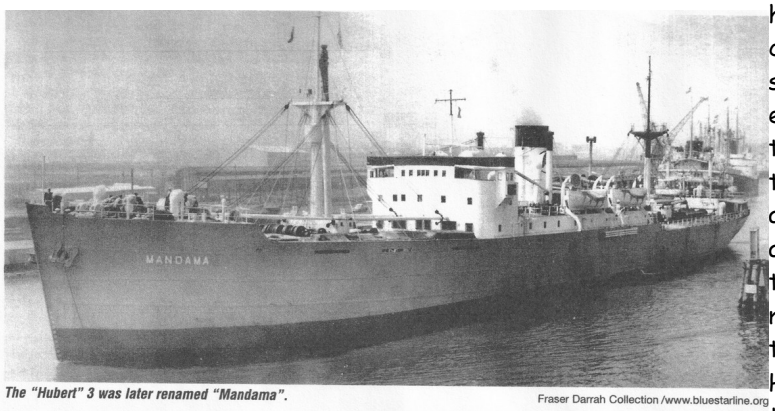
The last of the cement finally discharged we commenced loading some more interesting items, such as carnauba wax, which is used in the manufacture of wax polish, piassava, which is a course palm fibre used for making broom bristles and rose wood oil, used in the manufacture of perfumes.

On completion of loading at Manaus we returned downstream to load a large cargo of timber. Our first port, if you can call it that, was Parintins. Rafts of logs were floated alongside and were loaded straight out of the water into the lower holds. The most notable thing I remember about Parintins was the presence of many bats. Also there were moths with a 9-inch wingspan, which flew under the suspended cargo clusters and the deck lights.

We then moved downriver to Breves, located in the narrows, and the largest log port in the area. There was a substantial saw mill here that turned out bundled sawn timber as well as assembling many logs gathered from the surrounding area. Breves was fairly civilised in that it boasted quite a few timber built houses and a school, as well as a church complete with resident priest. However, life there was of a feudal type in that local labour earned money loading ships and working in the sawmill for which they were paid by the mill owner. They would then spend their money in the general store, which was also owned by the mill owner so that the money came back to him full circle.

Breves was also the base for a Canadian missionary and his wife and helpers. They used to take in and look after orphaned children of the area. Their missionary work took them to many settlements up the back creeks of the river, which they visited by a small launch. Unfortunately the engine would break down occasionally in which circumstance he would come aboard and enlist the services of one of the Engineer Officers to find out what was wrong and get the thing started.

Most of the log ports were located on or near the main shipping channels but there was one, Jaburuzinho, which was up a very narrow channel. The Amazon is still tidal in the narrows and up to about 200 miles from the sea. To go to Jaburuzinho one had to first establish by radio that there was no other ship up that channel as it was not possible for ships to pass. When this was established we proceeded up the channel on the flood tide. On arriving at the settlement we steamed slowly past and dropped the starboard anchor in mid channel. Then with wheel hard-a-starboard and slowly paying out the cable, the ship's bow was put gently into the soft mud bank. Dead slow ahead on the engine assisted the stern to drift upstream, there being just enough room to do so and thus turn the vessel round. Heaving on the anchor brought the bow back into mid-stream and now, stemming the current, we were able to proceed alongside a rather shaky jetty, making fast fore and aft to substantial trees to keep the vessel in position.



The "Hubert" 3 was later renamed "Mandama". Fraser Darrah Collection /www.bluestarline.org

Having arrived it was time for "Smoko". I was then to witness an event that I have never forgotten. We were leaning over the ship's rail observing the local scene when there was a noisy disturbance. A rather scrawny cow with a rope round its neck was being dragged and pushed along the path to a wooden structure that had a level floor, no sides but a roof supported by poles. Apparently it normally served as a dance floor for 'Fandango' nights and we watched with interest as we could not understand why they wanted the cow on the dance floor. However, having got it there, the reason soon became apparent. One of the men picked up a large felling axe and with one heavy but perfectly directed blow, smashed it into the cow's skull. Death followed virtually instantaneously and the poor beast was dismembered and carried off for distribution before our very eyes. The pools of blood were washed away with river water and the dance floor was once again ready for the evening's entertainment.

After Jaburuzinho we moved on to Cocal, a small settlement close to the main channel and built entirely on stilts. More rafts of logs were floated alongside, loaded laboriously and bull-wired into position in the holds in an effort to reduce the 'broken stowage'. The most notable thing about Cocal was being bitten to death by minute flying insects, locally called 'Maruim'. Fortunately, insect repellent was available on board which was relatively effective against them.

A similar but equally important settlement located below the narrows was Jarauçu. This was a much more popular call, not because it was really any different from others but it usually heralded the arrival of a tug or riverboat with mail from home on board. There being no sawmill to provide power on the jetty, this was normally provided by the ship's generator. A long electric cable was run ashore and connected to two cargo clusters suspended from makeshift lampposts.

After completing loading of all available logs and sawn timber we returned to Belém to top off with other general cargo and departed for Europe. The stay of ships on the River Amazon could last for several weeks and return from the brown brackish water to clean green salt water was always greeted with great enthusiasm by the ship's company, accompanying as it did, release from the high temperature and humidity of the river. Above all, we were homeward bound.

Most of the cargo we had loaded was for Leixões, the deep-sea port for Oporto in Northern Portugal. However we also frequently had some cargo for Lisbon and one of the really memorable sights of my life at sea is steaming up the River Tagus in the early morning sunshine. In those days the magnificent bridge spanning the river had not been built, but it was still a beautiful sight.

Unfortunately our stay was never more than half a day or so after which we moved on up the coast to Leixões. It usually took two or three days to discharge here and this was where I saw my first forklift truck. It was ideally suited to handling logs and certainly speeded up the process.

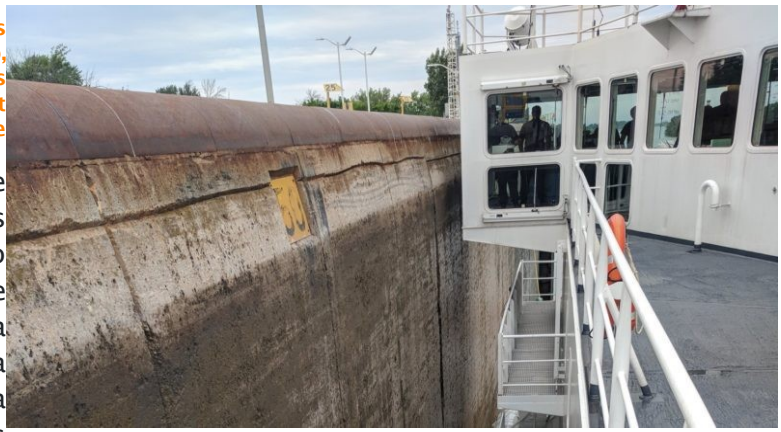
But this was not the main attraction as far as we apprentices were concerned. Here we were usually allowed half a day off to go up to Oporto by tram to do our shopping. It was always an enjoyable day buying British newspapers and magazines, perhaps going in the cinema and usually rounding off the day with a meal at the Missions to Seamen Club, a game of table tennis and a late night tram back to the ship.
Now we were ready for Liverpool. It was only three days to home and everything had to be made spick and span for inspection by the Marine Superintendent when he came aboard at King's No. 2 Dock in Liverpool. With a bit of luck and a good report from the Chief Officer we might get a few days leave before the next trip to Manaus.
F.H. Sergent. Sea Breezes. https://seabreezes.co.im/

Salties And Lakers, Shipping On The Great Lakes: Quite true for the vast and expansive Great Lakes region of North America. The region consists of five lakes, Ontario, Erie, Huron, Michigan and Superior. The Great Lakes comprise one of the largest concentrations of fresh water on Earth. The Great Lakes also boasts a significant volume of shipping from both ocean-going and lake-locked vessels. Great Lakes vessels trading is typically performed by dry bulk vessels that carry a variety of cargoes including ores, limestone, salt, cement, sand, grain, coal, and gypsum. This article provides some insight into commercial shipping on the Great Lakes and some of what one might expect when transiting the area.
There are two main types of vessels engaged in trade on the Great Lakes: Salties and Lakers. Seagoing vessels are commonly referred to as "Salties" and include ocean-going vessels that access the Lakes via the St. Lawrence Seaway. Salties must fall within the maximum dimensions for transiting the locks between the Seaway and Great Lakes. The maximum parameters for a vessel wishing to transit the St. Lawrence Seaway are 222.5m in length, 23.2m beam and 8.1m draft. In fact, an entire class of vessel, Seawaymax, exists based on these dimensions. Whereas Lakers are self-unloading vessels intended for almost exclusively Great Lakes trade and generally never leave the Great Lakes. Lakers are longer and narrower than their sea-going counterparts. However, some companies are now designing their Lakers to be capable of off-lake (blue water) use to increase their marketability.
Most of the Great Lakes are naturally navigable, except for the lock systems that separate the Lakes from the Seaway, and locks at separate several of the Lakes themselves. As Salties head west from Montreal, they encounter a series of locks prior to entering the first if the Lakes – Lake Ontario. From Lake Ontario the vessels transit the Welland Canal, which allows vessels to bypass Niagara Falls between Lake Ontario and Lake Erie. This lock system includes eight successive locks that raise or lower vessels 325.5feet.
Once in Lake Erie, a vessel can pass to Lake Huron and Lake Michigan without encountering any locks. However, Soo Locks, separate Lake Huron from Lake Superior, and produce a 21-foot elevation change of water level. Soo Locks have two parallel locks operating at a time, MacArthur Lock (for smaller vessels) and Poe Lock (for most traffic, including large vessels).
Transiting the Lakes includes special hazards, including ice during the winter months. Vessels on the Great Lakes must be wary of complete icing over in various locations throughout the Lakes, and consolidated pack ice, which is a loose and slushy ice that can freeze together quickly if temperatures drop. Such a freeze could prevent vessels from departing a pier. Any contact with ice can damage a ship's hull, rudder, propeller, or other structure. Moreover, owners should actively monitor ballast tank temperatures as it is possible for them to freeze should the hull's surrounding water be sufficiently cold.
The first ice often starts slowly in November in shallow coves and along the coastline, only to break off to become drift ice. By mid-December ice can be thick enough to halt navigation through the St. Lawrence Seaway. However, inter- and intra-lake shipping continues well into

January with the help of specialized icebreaking vessels. A few shipping channels remain open all season thanks to icebreakers run by the governments of the United States and Canada. Icebreakers regularly conduct operations to maintain a broken ice track for main shipping routes throughout the Lakes, including the St. Mary's River and the Detroit-St. Clair River System (connecting Lake Erie to Lake Huron). United States Coast Guard icebreakers also maintain a presence at the Straits of Mackinac and their services may be requested through the USCG or via VHF Channel 16. The ice peaks in late February or early March and shipping is back in full swing by mid-April with some ice lasting into May.

The rivers connecting each of the Lakes are susceptible to ice in the Winter months. It can also strand a vessel in the ice or keep vessels from leaving the Great Lakes for months. Conversely, if the ice were thick enough, it could prevent the forward movement of cargo destined for the Great Lakes. Owners should keep apprised of ice movements and forecasts potentially moving cargo under a bill of lading. If such a scenario should arise, other arrangements should be made for the delivery of cargo under the bill of lading. One possibility is to off load cargo at an earlier port in transit to arrange for storage and forwarding once the Spring thaw occurs.

Ice navigation is only one facet that separates commercial shipping on the Great Lakes from seagoing operations. Other operations can prove dangerous for vessels and those that serve on them. For example, Lakers typically perform their own line operations and have self-unloading capabilities.



The U.S. Coast Guard Cutter Mackinaw locks through the Welland Canal in Ontario, Canada, July 14, 2018. The Mackinaw was locking down into Lake Ontario. (U.S. Coast Guard Photo by Petty Officer 2nd Class Joe Coach

While pulling alongside a pier, the Laker will lower several crew members via a bosun's chair onto the pier to complete mooring operations. The bosun's chair could be lowered via a line wrapped around a cleat or using a small boom. While operating a bosun's chair, safety of personnel is always a priority. Equipment failure and improper supervision are leading causes of bodily injury during such operations. At regularly scheduled intervals and prior to any use, all the equipment must be inspected (including the bosun's chair, boom and any PPE) and found to be in good working order. Bodily injury is always an exposure when operating a bosun's chair, with leading causes as equipment failure and/or improper supervision. In an effort to make the lock systems safer, locks now have vacuum pads that extend from the pier and hold the vessel in place, even moving up or down with the vessel as the water level changes.

Lakers are self-unloading vessels, utilizing one of two different systems being either a bucket or gravity fed system. The bucket or cargo scooper consists of an aft-moving scraper that scoops cargo from the hold, feeding it to a longitudinal conveyor. This conveyor transports the cargo to the bucket elevator, where the cargo is then conveyed up to the boom to be discharged to the pier. Whereas the gravity-fed conveyor system consists of hydraulic gates at the bottom of each hold which drops cargo onto two longitudinal conveyor belts. The conveyor brings the cargo aft to a C-Loop elevator. The elevator applies a secondary band on top of the cargo compressing sufficiently to lift it up to the main deck onto a third conveyor or boom. Regardless which system

a Laker uses, the third conveyor, the boom, will be covered to prevent dust or cargo from polluting the surrounding marine environment. Moreover, hold cleaning in the colder winter months could require the use of heating equipment to prevent freezing and ice accumulation.

Finally, weather conditions and wave actions are significant concerns on the Lakes. Weather conditions can change quickly, seemingly without warning, and the shape of the Lakes themselves can produce unpredictable winds. Additionally, unlike an ocean, swells are steep and very close together, which could make a five-metre sea very hazardous for large vessels. Further, the Lakes are susceptible to seiches, which are typically caused when strong winds and rapid changes in atmospheric pressure pile up water on one end of the lake. Seiches can affect drafts in already shallow areas and pose threats to vessels alongside a dock.

The Great Lakes will continue to have strong trade from Salties and Lakers. The Midwestern United States and Canada depend on the Lakes for raw materials and jobs. However, the climate and idiosyncrasies of the Great Lakes highlight the importance of safety and experience for vessel operations in the area. By Kevin Albertson (Thomas Miller) *December 31st 2022*

Kevin Albertson is a maritime attorney and a graduate of New York Maritime College, where he obtained a United States Coast Guard Third Mates' License of Unlimited Tonnage. Prior to joining Thomas Miller in 2019, Kevin worked as an associate attorney at a maritime law firm in New York, working on bodily injury, property damage and cargo claims. He has also worked as a vessel operator for a major commodities firm. Kevin specializes in bodily injury claims and is a member of the US Bodily Injury team.

Learn more about hands-free mooring technology in the GLSP video

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https://gcaptain.com/salties-lakers-shipping-great-lakes/?subscriber=true&goal=0_f50174ef03-3d17530d14-169937937&mc_cid=3d17530d14&mc_eid=35ccf165ad

Also see: https://gcaptain.com/history-of-the-welland-canal-is-it-the-most-important-canal-in-north-america/

Have you had a long day? Perhaps this is the reason.

How the Moon is making days longer on Earth: Billions of years ago the average Earth day lasted less than 13 hours and it is continuing to lengthen. The reason lies in the relationship between the Moon and our oceans.

Throughout human history the Moon has been an inextricable, ghostly presence above the Earth. Its gentle gravitational tug sets the rhythm of the tides, while its pale light **illuminates the nocturnal nuptials** of many species. Entire civilisations have **set their calendars by it as it has waxed and waned**, and some animals – such as **dung beetles** – use sunlight reflecting off the Moon's surface to help them navigate.

More crucially, the Moon may have helped to **create the conditions** that make life on our planet possible, **according to some theories**, and may even have **helped to kickstart life on Earth** in the first place. Its eccentric orbit around our planet is thought to also play a **role in some of the important weather systems** that dominate our lives today.

But the Moon is also slipping from our grasp.

As it performs its finely balanced astro-ballet around the Earth – circling but never pirouetting, which is why we **only ever see one side of the Moon** – it is gradually drifting away from our planet in a process known as "lunar recession". By firing lasers off reflectors placed on the **lunar surface by the astronauts of the Apollo missions**, scientists have recently been able to measure with pin-point accuracy just how fast the Moon is retreating.

They have confirmed that the Moon is edging away at a rate of **1.5 inches (3.8cm)**every year. And as it does so, our days are getting ever so slightly longer.

"It's all about tides," says David Waltham, a professor of geophysics at Royal Holloway, University of London, who studies the relationship between the Moon and the Earth. "The tidal drag on the Earth slows its rotation down and the Moon gains that energy as angular momentum."

Essentially, as the Earth rotates, the gravity of the Moon orbiting above tugs on the oceans to create high and low tides. These tides in fact are **a "bulge" of water that extends in an elliptical shape** both towards and away from the gravity of the Moon. But the **Earth spins on its axis much faster than the Moon orbits above**, meaning friction from the ocean basins moving beneath also acts to drag the water along with it. This means the **bulge moves slightly ahead of the Moon in its orbit**, which attempts to pull it backwards. This slowly saps our planet's rotational energy, slowing its spin while the Moon gains energy, causing it to move into a higher orbit.

This incremental braking on our planet's spin means that the length of an average Earth day has increased by about **1.09 milliseconds per century since the late 1600s**, according to the latest analysis. Other estimates put the figure a little higher, at **1.78ms per century** by drawing on more ancient observations of eclipses. While none of this sounds like much, over the course of the Earth's 4.5-billion-year history, it all adds up to a profound change.

The Moon is thought to have formed in the first 50 million years or so after the birth of the Solar System. The most widely accepted theory is that a **collision between the embryonic Earth and another object about the size of Mars**, known as Theia, cleaved off a chunk of material and debris that coalesced into what we now call the Moon. What is clear from geological data preserved in bands of rock on Earth is that the Moon was a lot closer to Earth in the past than it is today.

The Moon currently sits 384,400km (238,855 miles) from us on Earth. But one recent study suggests that around 3.2 billion years ago – just as the **tectonic plates were starting to move around** and **ocean dwelling microorganisms were gobbling up nitrogen** – the Moon was just **270,000km (170,000 miles) from Earth**, or about 70% of its current distance.

"The faster-rotating Earth shortened the length of the day so that [within a 24-hour period] there were two sunrises and two sunsets, not just one each as today," says Tom Eulenfeld, a geophysicist who led the study at Friedrich Schiller University Jena, in Germany. "This may have reduced the temperature difference between day and night, and may have affected the biochemistry of photosynthetic organisms."

What studies like his reveal, however, is that the rate of **lunar recession hasn't been constant either** – it has sped up and slowed down over time. One study by Vanina López de Azarevich, a geologist at the National University of Salta in Argentina, suggests that around 550-625 million years ago, the Moon could have been **retreating as much as 2.8in (7cm) a year**.

"The speed with which the Moon was moving away from Earth definitely changed over time and will do so in the future," says Eulenfeld. For much of its history, however, the Moon has been **moving away at a far slower rate than it is currently**.

In fact, we are currently living in a period when the **rate of recession is unusually high**– the Moon would only have had to recede at its current rate for 1.5 billion years to reach its present position. But the process has been occurring since the Moon formed 4.5 billion years ago, so it was clearly much slower at points in the past.

"The tidal drag right now is **three times bigger than we might expect**," says Waltham. The reason may be due to the size of the Atlantic Ocean. The current configuration of the continents means that the basin of the North Atlantic Ocean happens to have exactly right proportions to generate a resonance effect, so the water it contains sloshes back and forth at a rate close to that of the tides. This means the tides are **larger than they otherwise would be**. As Waltham puts it, think of pushing a child on a swing – they get higher if each push is timed with the existing motion.

"If the North Atlantic was slightly wider or narrower, this wouldn't happen," says Waltham. "The models seem to show that if you go back a few million years, the tidal strength drops right off because the continents were in different positions." But it is likely to continue to change in the future. Modelling predicts a new tidal resonance will appear 150 million years from now, and then will vanish around 250 million years from now as a **new "supercontinent" forms**.

So, could we eventually have a future where the Earth no longer has a Moon? Even at its high current rate of retreat, the Moon is unlikely to ever leave the Earth entirely. The Sun's own calamitous demise will probably intervene long before that happens **in around 5-10 billion years**. Humanity is likely to have been **snuffed out long before then**.

In the shorter term, however, humanity **may itself play a role in lengthening the days a little further** by reducing the amount of water locked up in glaciers and the ice caps due to melting caused by climate change.
"The ice basically suppresses the tides," says Waltham, noting that around 600-900 million years ago, when our planet is thought to have entered a particularly frosty period known as **snowball Earth**, there was a dramatic slowdown in the rate of lunar retreat. The impact is, however, hard to predict, as some of this will be counteracted by rebounding landmasses as the weight of ice sheets is lifted from them, and other complications.
In theory, the next crop of astronauts to fly to the Moon with Nasa's Artemis programme may be able to say they looked back at their home planet from further away than their predecessors on the Apollo programme 60 years ago (although the point they arrive during the Moon's elliptical orbit around the Earth will probably determine this more – the distance between its closest and furthest points varies by **43,000km every 29 days**).
For the rest of us, our lives are far too brief to notice the picoseconds being added to each passing day's length. If you blink, you'll miss it. https://www.bbc.com/future/article/20230303-how-the-moon-is-making-days-longer-on-earth

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All you ever wanted to know about UKC (Under Keel Clearance) ... but were afraid to ask.

The first aspect to consider is the static Under Keel Clearance – that is, how much water is left between the bottom of the ship and the seabed. This is calculated as the available water depth, including tide, minus the draught of the ship (see Figure 1 below). If the ship was drifting along the waterway with no vertical movement, this would be its minimum clearance from the seabed.
Calculating the static UKC requires detailed knowledge of: -

- Chart datum depths through the waterway
- Tide height at each time and location through the waterway
- Ship forward and aft draughts on entering the waterway

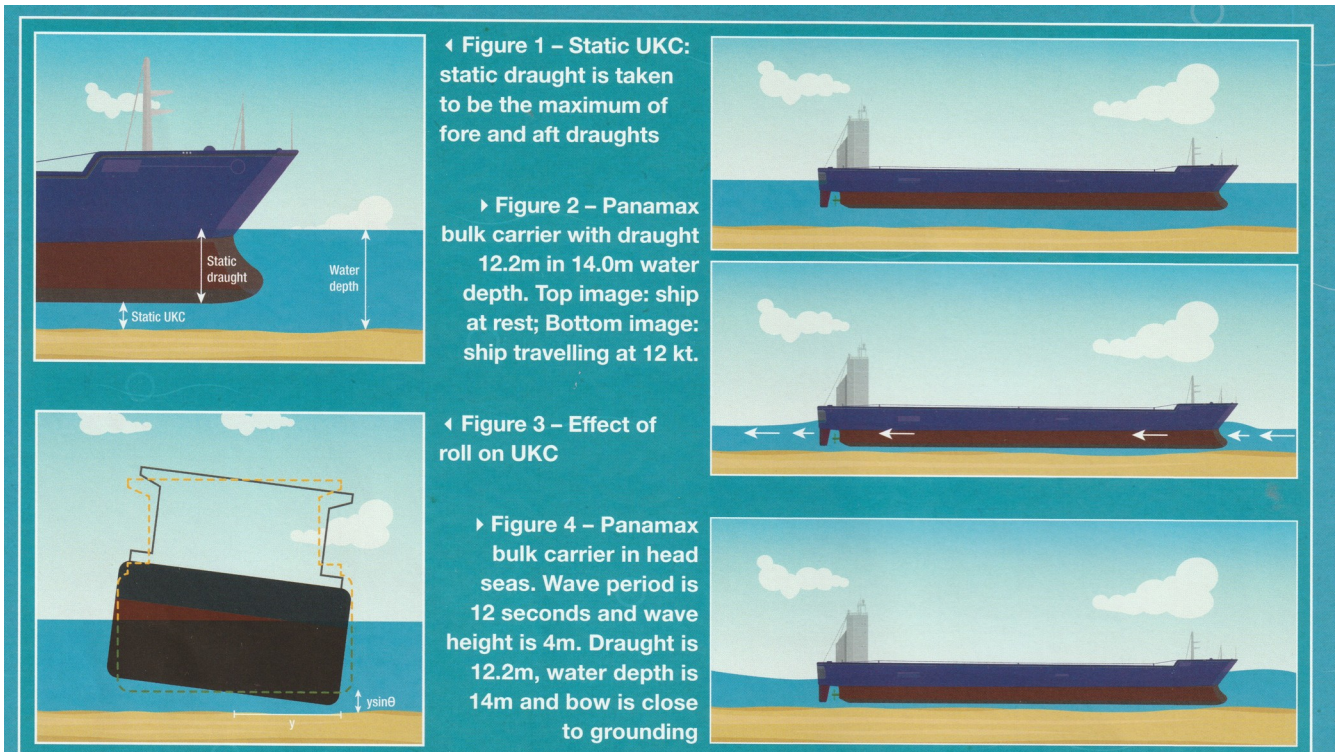

Figure 1 – Static UKC: static draught is taken to be the maximum of fore and aft draughts

Figure 2 – Panamax bulk carrier with draught 12.2m in 14.0m water depth. Top image: ship at rest; Bottom image: ship travelling at 12 kt.

Figure 3 – Effect of roll on UKC

Figure 4 – Panamax bulk carrier in head seas. Wave period is 12 seconds and wave height is 4m. Draught is 12.2m, water depth is 14m and bow is close to grounding

However, grounding risk is not just about the water depth and the ship draught. The ship also has its own vertical motions, which need to be taken into account. Squat, wave-induced motions and heel each cause parts of the ship to move closer to the seabed. All this means that it is possible

for ships to run aground even when the water depth is larger than the draught (positive static UKC). To avoid this, navigators need to allow for vertical motions of the ship and combine them into the overall UKC management plan.

Understanding squat: Squat is the downward vertical movement and change in trim caused by a ship's own wave pattern. The wave pattern changes according to the speed of the ship.

The easiest way to understand squat is to imagine the ship is in a fixed position and that the water is streaming past it at a steady speed. This is how ship models are tested. The Bernoulli equation tells us that when the flow speed is high, the pressure is low and vice versa. In shallow water, the presence of the ship and seabed accelerates the flow, decreasing the pressure on the ship and pulling it downwards.

Figure 2, above, shows the local flow velocities and free surface height around a Panamax bulk carrier travelling at12 knots in shallow water. At the bow, there is a stagnation zone with low flow speeds and high pressure. This high pressure translates into an elevated free surface. At the forward and aft shoulders, the water is accelerated, causing low pressure and lowered free surface. Overall, the presence of the ship causes a generally accelerated flow and lowered free surface. The ship then sinks downwards. It will also change its trim depending on the relative magnitude of the wave troughs at the forward and aft shoulders. Vessels with large hull curvature at the forward shoulders will have very low pressure there, and a resulting bow-down trim.

For bulk carriers and tankers, the greatest squat will tend to be at the bow, while for LNG carriers and container ships it may either at the bow or the stern. Either way, be aware that the propeller may be vulnerable.

Dredged channels, and especially canals, create a blockage effect that increases the flow velocities and pressure changes around the hull. In dredged channels, squat will be 5–10%larger than the standard formula. In canals, it will be approximately double the formula, depending on how confined the canal is.

Roll with it: In long period swells, grounding can occur even with large static UKC values. The important motion components are roll, heave and pitch, each of which produce vertical motions of the ship.

Once you know the angle of roll and the distance from the ship's centreline to the turn of the bilge, or the tip of the bilge keel (labelled as 'y' in the diagram in Figure 3 above), a simple trigonometrical calculation allows you to work out the increase in depth, and therefore the decreased UKC.

This method may also be used in wind heel, which is primarily important for car carriers, container ships and LNG carriers. It may also be used for heel due to turning, which is primarily important for container ships. There are standard methods for predicting heel angle due to wind or turning.

In order to predict which wave conditions are likely to produce large rolling, it is helpful to know the ship's natural roll period this is the period that a ship would roll at, if pulled over to one side and then released. Large roll angles occur when the wave period is close to the ship's natural roll period.

Heave and pitch: Waves in ship navigation channels, particularly head seas or following seas, produce pitching motion that can make the bow or stern vulnerable to grounding. The ship's centre of gravity moves up and down, which is the heave motion. Depending on the phasing between heave and pitch, the bow or stern may have larger vertical movement.

Heave and pitch motions in shallow water are quite different from those in deep water. Waves of the same period are shorter and travel more slowly in shallow water than in deep water. The ship's motions are also damped more by the presence of the seabed. All of this means that ship motions tend to be smaller in shallow water than in deep water.
Figure 4, above, shows a Panamax bulk carrier of 180m in length heading into these waves. The ship is long enough that the aft half of the ship may be mostly in a wave crest, while the forward half of the ship is mostly in a wave trough. The result is a bow-down pitch angle, which can lead to grounding.

UKC management in practice: For ships transiting port approach channels: -

- Masters must be satisfied that there is sufficient UKC according to their ship-specific calculations.
- Ports must be satisfied that there is sufficient UKC according to their port-specific calculations.

In practice, the port-specific calculations tend to govern the transits, as these should include detailed modelling of the local conditions. However, Masters' knowledge of the behaviour of their own ships and their UKC judgement are an important part of the decision-making process. The good judgement of the Master is especially important in 'unusual' environmental conditions.
It is also useful for the crew to have a squat table readily available on the bridge. This squat table should be ship-specific, as, for example, wide-beam ships squat more than narrow beam ships.
UKC management techniques for ports typically fall into three categories: -

Fixed minimum static UKC: This method is ideal for port approach channels that are protected from ocean swells, and where simplicity is required. For example, the high-volume port of Kwai Chung in Hong Kong uses a fixed minimum static UKC of 15% of the draught (HKPA 2012).

UKC tables: For ports where metocean* conditions (especially swell) are variable, but simplicity is important, paper and spreadsheet UKC tables may be used. These give the required static UKC for each ship class as a function of the most important input variables (typically swell height and period).

UKC software: UKC software allows more inputs and more specific UKC modelling. It includes allowances for squat, heel and wave-induced motion, and facilitates the inbuilt inclusion of tide and swell predictions and real-time measurements. The increased usage of UKC software internationally should help improve safety and efficiency of ships in navigation channels.

* "Metocean" refers to the combined effect of the meteorology and oceanography. As such, the metocean condition refers to a number of meteorological and oceanographic conditions.

Dr. Tim Gourlay. The Navigator – February 2021.

This is an edited extract from *Navigation Accidents & Their Causes* © The Nautical Institute

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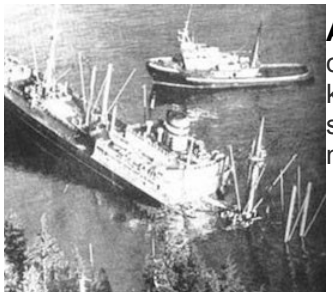
Disaster Avoided: Oil Removed From 1960s Shipwreck but Threat from Other Historical Wrecks Persists



A hazardous coastline: The region stretching from Cape Scott Provincial Park on Vancouver Island in the north down to Tillamook Bay on the Oregon coast is known as the Graveyard of the Pacific for a reason. From the era of sails and sextants to the present day, this region has been a challenge for mariners to navigate due to the unpredictable weather and rocky, convoluted coastline. First

Nations have been journeying up and down this same coast since time immemorial, fishing and harvesting the rich bounty from coastal areas, and trading with other Nations.
The experience of the Captain of the *Schiedyk* (*pronounced shkee-dike)* proved how quickly things can go wrong. The freighter set sail on January 3, 1968, from Gold River, British Columbia, a community tucked in a fjord on the west coast of Vancouver Island, carrying a cargo of grain and wood pulp. Unable to make a critical turn due to a rudder failure, the *Schiedyk* struck a submerged reef off Bligh Island in Zuciarte Channel. The crew of 34 were successfully rescued, but after a few hours the *Schiedyk* slipped beneath the waves to rest on the reef.

Read the full story from Clear Seas at: -

https://clearseas.org/en/blog/disaster-avoided-oil-removed-from-1960s-shipwreck-but-threat-from-other-historical-wrecks-persists/

Pacific Pilotage Authority. New CEO – Ms. Julie Gascon.

Julie's dedicated career in the public service began as a proud graduate of the Canadian Coast Guard College. She holds a Bachelor's degree in Business Administration from the University of Montreal, and a Bachelor's degree of Technology in Nautical Sciences from the University College of Cape Breton.
Julie spent most of her seafaring career sailing on Canadian Coast Guard ships starting on the West Coast fleet in 1998 including time spent on the worldwide fleet on very large crude carriers and large passenger vessels to complete her Master Mariner certification. She is returning to the Pacific with years of experience in the maritime field – here are highlights of her career path:

• From 2005 to 2015 she worked as a regulator taking on increased responsibilities from Senior Marine Safety Inspector up to the Executive Director, Domestic Vessels and Regulatory Oversight with Transport Canada.

• From 2015 to June 2020, Ms. Gascon was appointed to both regional and national roles at the Canadian Coast Guard, as Assistant Commissioner Central and Arctic Region leading the operational and tactical delivery of Coast Guard programs and services covering the Canadian Great Lakes, central Canada including Quebec and the Canadian Arctic and as Director General, Operations where she provided functional direction for the operational policy frameworks and associated programs and services from coast to coast to coast.

• Ms. Gascon returned to Transport Canada in July 2020 as the Director General, Marine Safety and Security, where she was responsible to develop, coordinate, and enforce national safety, security and environmental protection legislation, policies, standards and regulatory controls governing Canada's marine transportation systems and services including the administration of the new *Pilotage Act*.

On behalf of the Board for the Pacific Pilotage Authority, we are excited about our new CEO and we look forward to continuing to deliver a safe, reliable and efficient marine pilotage and related services in the coastal waters of British Columbia and the Fraser River.
https://www.ppa.gc.ca/standard/pilotage/2022-10/Welcome%20Message%20-%20Chief%20Executive%20Officer.pdf

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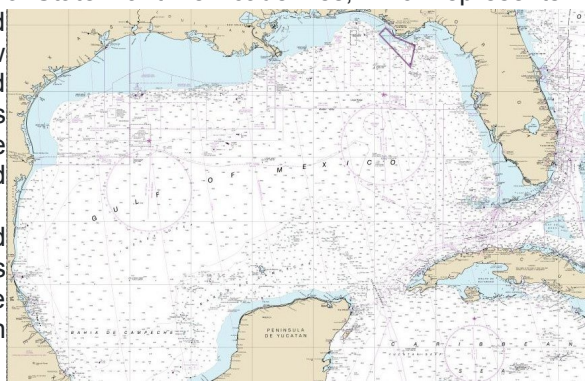
3rd Mate Exam Pass Rates Plummet: The Consortium of State Maritime Academies, which represents the nation's six state maritime academies, has asked Commandant of the US Coast Guard Linda Fagan to review the current Chart Plot module of the U.S. Coast Guard Third Mate exams. The request comes after the majority of Cadets taking the exam failed a test required for them to become Merchant Marine officers. The Consortium also questioned the need for a paper exams during the age of digital charts.
Approximately 70% of the nation's unlimited tonnage/horsepower merchant marine officers are graduates of state maritime academies. Earning their merchant marine officer's license is a requirement for graduation, as stated in



federal law. The Chart Plot module is one of seven within the Third Mate exam cycle, which maritime students prepare for throughout their four-year education.

Historically, Cadets have passed the Chart Plot module at an acceptable rate and served the U.S. Merchant Marine with a high level of competency. However, following the introduction of new exams in 2021, passing rates have dropped dramatically. Recent results from five state maritime academies show passing rates as low as 0% at Maine Maritime Academy and only 19% at California State University Maritime Academy.

This trend is especially troubling in the context of the current mariner shortage.

In response to the initial decline in passing rates, the academies requested a review of the exams in March 2022, leading to revisions in the past two months. However, the Consortium claims problems within the module persist.

While the Consortium does not have access to the actual exam questions, reports from Cadets and other students indicate that recent changes in the structure and wording of the questions have made the exams more difficult, resulting in lower passing rates. The new exams seem to differ significantly from those administered as recently as 2018.

The Consortium is also concerned about the growing emphasis on the Chart Plot module, as many Cadets will sail on vessels without paper charts, and newer ships are required to be fitted with the Electronic Chart Display and Information System (ECDIS).

One notable structural change in the exams is the linkage between multiple questions, making a correct answer to one question dependent on having answered a previous question correctly. The Consortium does not believe this approach is necessary or fair.

Lawyers representing the academies requested that the exam be modified to address these issues, specifically suggesting that questions should not be linked, should assess a singular task, and should have standardized wording across all chart plots.

The Consortium has urged for the immediate formation of a new review team to address the problems within the chart plot exam module. **April 3rd 2023**

https://gcaptain.com/3rd-mate-exam-pass-rates-plummet/?subscriber=true&goal=0_f50174ef03-9de7300e44-169937937&mc_cid=9de7300e44&mc_eid=35ccf165ad

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NYK Upgrades Its Fleet With Orca AI Technology: **"Orca AI",** developer of a unique automated situational awareness platform, has partnered with Nippon Yusen Kabushiki Kaisha (NYK) Group, a leading Japanese shipping and logistics company, to enhance its fleet's safety.

Today, following more than two years of collaboration, the NYK Group confirmed it will install the Orca AI platform across the NYK fleet, which includes bulk carriers, tankers and containerships. This deal further strengthens the relationship between NYK Group and Orca AI.

As one of the world's leading shipping and transport companies, finding a safety system that could enable and empower NYK's crews to make better real-time decisions while navigating congested oceans was the aim, **according to Captain Jun Nakamura, Manager of the autonomous ship team at NYK Group**. The company also wanted to develop its understanding of navigational challenges facing the fleet and how they were being managed.

"Orca AI demonstrated that the safety of shipping operations can be improved by automating the task of target detection in low visibility in congested waters," Capt. Nakamura said. "The platform serves as an automated lookout and recognizes dangerous targets and other vessels that may be overlooked by the human eye, reducing the probability of incidents at sea."

Mr. Yarden Gross, CEO and Co-founder of Orca AI, added: "We are excited to partner with tech leaders such as NYK, deepening our collaboration with the company and supporting its ongoing aim to be a central player in the shipping industry's digital revolution."

The partnership began in August 2020 when NYK and MTI Co., Ltd, installed a trial version of Orca AI's platform on a ship operated by the NYK Group. Since then, the NYK Group and Orca have also completed a successful autonomous voyage trial in congested waters near Japan's east coast through the 'Designing the Future of Full Autonomous Ships ' (DFFAS) consortium, which includes 30 Japanese firms.

The NYK trial – known as the MEGURI2040 Project and supported by the Nippon Foundation – was carried out on *Suzaku*, a 749 gross tonne autonomous containership fitted with Orca's artificial intelligence and

deep-learning technology. Traveling from Tokyo Bay to the port of Tsumatsusaka in the Ise Bay, the vessel achieved 40 hours of navigation with complete autonomy for about 98% of the voyage.
The vessel automatically carried out 107 collision avoidance maneuvers and avoided up to 500 ships using Orca's safety navigation system. The platform provided real-time detection, tracking, and range estimation through 18 cameras with panoramic views operating 24/7 in any conditions.
Orca AI's technology has already captured more than 10 million nautical miles of visual data and its team continues to innovate and develop the platform, including incorporating regulatory compliance such as CII into its interface. **April 20th 2023**
https://allaboutshipping.co.uk/2023/04/21/nyk-upgrades-its-fleet-with-orca-ai-technology/

Presentations: Society Book Awards & Bursary Certificates

Camosun

Demi Leuchter

Recipient of a Fall 2022 Bursary

Presentation by Captain Ivan Oxford

Numa Dorling

Recipient of Book Award

BCIT

Tomas Hudsky

Marine Engineering Cadet

with BCIT Foundation 2022 Bursary.

Presentation by Captain Joachim Reuther.

Kara Perehudoff

Nautical Science Cadet

with BCIT Foundation Bursary.

Presenters: -

Captain Joachim Reuther & Stan Bowles.

Tyus Barfoot

Nautical Science Cadet

Recipient of Book Award.

Wyatt Sawchuk

Marine Engineering Cadet

Recipient of Book Award

Letter to the Editor **Re: Four Years Apprenticeship.** By Roger Jones.

Greetings David, I was very interested in your November Seatimes with the above story. A friend and colleague of mine, Cameron Smith, aided each other studying at pre school and after completing school, we went our ways. He was accepted as an apprentice by Hogarth's of Glasgow, my last comment being,"are you planning not to eat for 4 years". I joined Donaldsons of Glasgow and 2 years later on a vessel called the *Moveria* berthed in Avonmouth, a Hogarth vessel, *Baron Dunmore*, berthed astern of us and Cameron Smith was on her. We all went ashore that evening for a few pints of cider and he invited us back to his ship for supper; well, he located a blackened bridie in the bain marie and was about share it when the Third Mate appeared and took half of it. The four of us could barely understand the performance and I invited Cameron back to our ship for some real food. Donaldsons were a hard company but they did feed well and our pantry always had at least three cold meats, plenty of jam, butter and bread (good after you de-cockroached it).

Cameron could not believe his eyes and started to eat. I have never seen someone eat so much. Eventually he finished and staggered back to his ship, vowing to return. We never saw him again until he was with me at the Tech preparing for 2nd Mate.

Some of ROGER'S observations were also very interesting: I presented myself on starting to the Chief Officer of Donaldsons last coal fired vessel. Have you a boiler suit? Yes sir. Put it on we are bunkering. 4 hours later I was as black as the coal.

Apprentice accommodation on the *Moveria*, one 4 berth cabin, all bunks athwartship, 4 small wardrobes, one 4 drawer cabinet. Starboard side accommodation deck, outer door, 1 cold tap basin, which could supply any of the following: very cold water, salt water, lubricating oil and fuel oil diesel. Messroom and toilet on deck below. In bad weather it took three of us to hold the weather door open, for the watchkeeper to get out. The tales of the *Moveria* are many.

Kindest regards, Guy (Captain Gavin Dennison – Tauranga, New Zealand)

(If there are any words you don't know – Google them. I did. David)

Great Lakes Labour: Filipino Mariners Can Now Sail On Canadian Merchant Ships.

In a move to tackle an acute mariner shortage accentuated by the rapid retirement of boomers, Canada has signed an unprecedented agreement with the Philippines, allowing Filipino merchant mariners to serve on Canadian-flagged vessels. This marks a significant shift in international labour arrangements, opening new doors for the robust Filipino seafarer population, but causing worry among Canadian Merchant Mariners that wages could fall.

"Various sectors and government departments have expressed to Transport Canada the urgent necessity of sourcing qualified sailors to take on numerous roles, both on ships and ashore, to bolster maritime operations," relayed Hicham Ayoun, a spokesperson for Transport Canada, in a recent statement sent to the CBC.

Signed on March 29, the mutual agreement between the nations acknowledges the competency certificates of Filipino sailors, also referred to as the Standard for Training, Certification, and Watchkeeping for Seafarers (STCW). This effectively enables Filipino mariners to secure work on Canadian-flagged vessels with a work visa, obviating the need to first obtain permanent residency status.

Bruce Burrows, CEO of the Chamber of Marine Commerce, which primarily represents shipping interests in the Great Lakes and St. Lawrence Seaway, shed light on the need for this initiative. "We've been seeking assistance from Transport Canada to facilitate the immigration of more foreign workers to man our vessels, including officers and regular sailors, as we face a severe personnel deficit in Canada's maritime industry," he said.

Burrows anticipates the arrival of Filipino sailors later this year, a development he argues will benefit both ship owners and the wider North American supply chain, especially in the Great Lakes region.

Details of this agreement were unveiled earlier this month in a Transport Canada ship safety bulletin. Although the Canadian Merchant Service Guild, which represents a majority of ships' officers and pilots in the Canadian maritime industry, did not respond to CBC's requests for comment, Canadian mariners gCaptain talked to are worried this will further depress wages and make the industry less attractive for Canadian youth.

Canada has already established comparable reciprocal agreements with several nations, including Australia, France, Norway, Ukraine, Georgia, and the United Kingdom. There are also reports suggesting that the Canadian Coast Guard is contemplating the inclusion of other foreign sailors. However, this agreement with the Philippines stands out due to the country's significant position in the global maritime industry – it boasts the largest population of merchant sailors worldwide. As China's merchant navy expands, many Filipino sailors are finding their employment opportunities shrinking. This is further exacerbated by increased pressures from China – such as tightened travel restrictions and national restrictions in Chinese-owned ports – as it vies to become the leading seafaring nation globally.

This decision may also invite broader security considerations. As the United States and Canada strive to bolster their relations with the Philippines amidst escalating tensions with China, this move gains further significance. Filipino merchant mariners, numbering in the hundreds of thousands, serve on ships belonging to nearly every nation, operating

in almost all major ports and shipyards globally. These mariners undergo rigorous training, and all officers are proficient in English. Such characteristics have led some Pentagon insiders, in conversations with gCaptain, to propose that this body of mariners could constitute the world's most substantial, yet untapped, intelligence network.
However, it remains ambiguous whether this initiative has the backing of Canadian military leaders. While it might provide a solution to the pressing mariner deficit, there is a flip side. A reduced pool of homegrown merchant mariners implies fewer Canadian citizens can be called upon in a conflict scenario. Furthermore, this proposal does not suggest other potential strategies, such as increased investments in regional merchant marine academies and trade schools, that could foster domestic talent in the maritime industry.
One facet that remains unquestioned is the proficiency of Filipino merchant mariners, who are widely recognized for their extensive training and solid reputation within the industry. Bruce Burrows underscored that Canada would not have forged this agreement if there were any doubts concerning the competency of these sailors. He asserted, "Our ship owners, operating on a global scale, are well-acquainted with numerous Filipino mariners. Their demonstrated competence is widely acknowledged, and we are enthusiastic about welcoming new Filipino applicants to our ranks."
by John Konrad (gCaptain) **May 13, 2023**
https://gcaptain.com/great-lakes-labor-filipino-mariners-can-now-sail-on-canadian-merchant-ships/?subscriber=true&goal=0_f50174ef03-1c2a8883fa-169937937&mc_cid=1c2a8883fa&mc_eid=35ccf165ad

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Nautical Slang in Common Usage

Fits the bill: A Bill of Lading was signed by the Ship's Master acknowledging receipt of specified goods and the promise to deliver them to their destination in the same condition. Upon delivery, the goods were checked against the bill to see if all was in order. **If so, they fit the bill.**

Aloof: Now means to stand apart or be indifferent, but it came from the Old Dutch word "loef", which meant "windward" and was used to describe a ship within a fleet that sailed higher to the wind and was thus drawn apart from the rest of the fleet.

Your Society.

Do you wish to make a financial contribution to the Society? Is it time for you to renew your membership? The Annual Membership Fee remains at $40.00 but any amount that you can donate will be greatly appreciated.

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Nautical Professional Education Society of Canada,
3648 Glenview Crescent, North Vancouver, B.C. V7R 3E8

Thank you.

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Articles or comments for inclusion in future editions of Seatimes can be sent to me at whitknit@telus.net
David Whitaker FNI

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