Greater Houston Port Bureau

Port Bureau News

Quarter Two / 2023

Also in this Issue: Captain's Corner | Port Watch | Maritime Fuel Market Fraud | Gulf Center Sea Turtle Research at TAMUG | Port Captain Retires | Heavy-Lift Drone Solution for Maritime Delivery | Commerce Clubs |

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About the Cover

In February 2010, CAPT Bill Diehl was part of a U.S. delegation from the Port of Houston Authority and AECOM that traveled to Libya to look at the possibility of doing business with their ports. Photo: CAPT Bill Diehl at Leptis Magnus in Khoms, Libya. Read more about his career on page 16.

The Gulf Center for Sea Turtle Research ("GCSTR") at Texas A&M University at Galveston ("TAMUG") was created to research and expertise in the western Gulf of Mexico and the Texas coast. Through conservation programs, sea turtle rescue and recovery, and a rehabilitation hospital on the TAMUG campus, the GCSTR has been able to rescue hundreds of sea turtles and involve thousands of volunteers as well as students in sea turtle preservation. Read more on page 8.

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Captain's Corner

This is a saying I often said when we were moving in the Coast Guard. The kids thought it was a Coastie saying. When I decided to get out of the Coast Guard and said it, my daughter, Rachel, challenged me by asking, "What does that even mean?" Here is what I told her:

> When I was 2 or 3 my, Dad decided I was old enough to swim. He grabbed me unexpectedly and tossed me in the water. Down I went and up I came — like a bobber. Once I oriented myself, I grabbed the wall, scrabbled out, and immediately reported it to the authorities, Mom. Days later it happened again, but this time he tossed me further out. Up I came again, only to find myself far from the wall. He said, "Swim!" I doggie paddled to the wall and reported it again to the authorities.
>
> You would have thought I would have learned my lesson, but sometime later I let my guard down and he tossed me a third time. Up I came, only this time Dad had jumped into the pool between me and the nearest wall, blocking my return to safety! He began saying, "Swim to the other side." I tried to get by the goalie, but eventually gave up and turned to face death. Somehow, I made it to other side. He followed me across the water and said with a big smile, "I knew you could do it, I'm proud of you—you can swim." He was right. From then on, I could swim!
>
> Years later I had a similar experience with my dad when I arrived at the Coast Guard Academy. I wanted to return to the wall of comfort—home, but the goalie was ready and thwarted my efforts. He would say, "Turn around and put your head down. Get busy—you can do it." After trying to get around the goalie for a year, my parents tossed my brother Bert into the Academy waters with me. Legend has it, he got me to the other side. At graduation Dad had a big smile and similar words, "I knew you could do it. I'm proud of you."

So, I told Rachel, over the years when I face the challenges of change, I say, "Time to jump back into the water" to encourage myself – and then I do it,

When I got out of the Coast Guard, I had no job offers. I told Annette, my wife, that this time I would try floating in the water. It was a little different from my previous, more determined swims. Tom Marian threw me the Port Bureau ring buoy, and off I headed in that direction. Shortly afterward, the Coast Guard called to ask if I would return to help with the response to the big rig explosion off Louisiana. I already missed the Coast Guard—it was the near wall; the Port Bureau was still unknown waters. But my dad's long-ago words popped up immediately and I knew the answer — put my head down and stay busy with the Port Bureau. Exciting new achievements waited in the waters ahead!

Altogether, 40 years in the maritime working waters (with one-third of them in Houston) have flown by. I value the Port Bureau's work and relationships greatly. I also realize time is ticking and while Annette and I have our health, I want to play in the retirement waters (I hear it's actually a hot tub). The beauty is we are staying here, so I can keep up with the relationships.

This is my last Captain's Corner. Sure, I have some trepidation about leaving, but I'm also excited and happy. I'm glad Tom trusted me with the Port Bureau. I'm grateful to the board and our members for their confidence in me and the staff. Like my brother Bert, you got in the waters with us during discouraging times and ensured we got to the other side with encouragement, swimming alongside, and supporting the Port Bureau with the financial ring buoys.

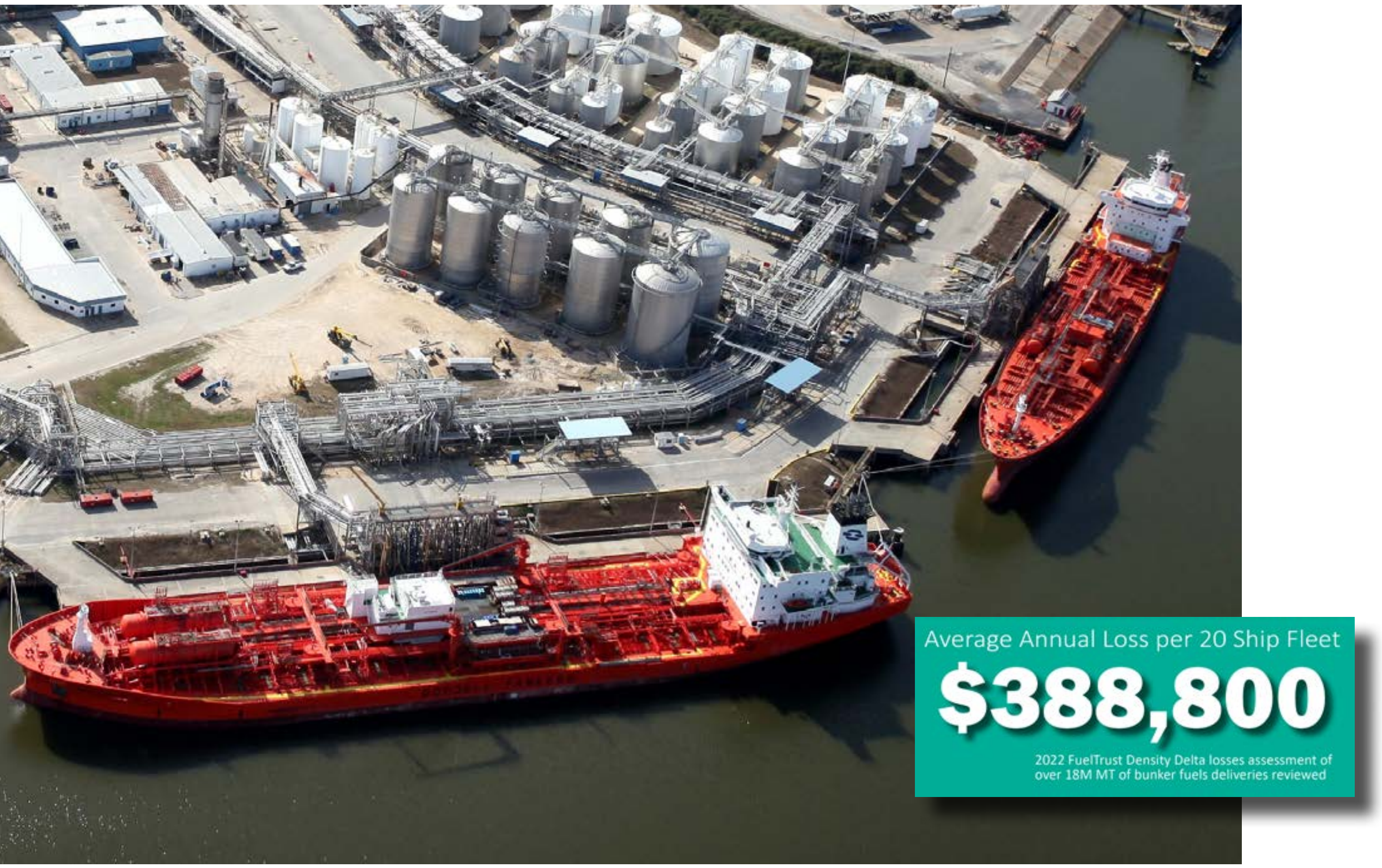
I will miss my beloved coworkers, board, and members and acknowledge a debt of gratitude that I owe you all. But I have great confidence in Captain Eric Carrero and know that you all are going to continue to do great things. I will keep you all in my prayers and heart!

Bill

CAPT Bill Diehl USCG (Ret.), P.E.
GHPB President-RETIRED
as of May 18!

Maritime Fuel Market Fraud Could Be Costing $5 Billion Each Year

Common practices in the $245 billion maritime fuel market ("bunker fuel") could be causing significant financial losses. Trusted technology to enable better transparency could be the means of making transactions more cost-efficient.



Fraud in the maritime industry is not new. As far back as 300 BC, when a Greek sea merchant intentionally committed insurance fraud, stories of unethical practices on the high seas have been shared. Today, it can be harder to prove fraud than in the past. However, as evidenced by a large number of fuel contamination incidents and bunker fraud arrests globally, it's still an ongoing issue. While off-spec bunker fuel claims represent only about 3% of total machinery claims, even "on-spec" bunkers have a significant amount of fuel volume or content issues, leading to financial loss or engine issues. Last year alone, over 600 vessels were disabled due to "on-spec" fuels, and the financial losses from under-deliveries or adulteration are estimated in excess of $5 billion globally.

Studies from the Protection and Indemnity (P&I) clubs indicate that 42% of claims are categorized as "machinery", of which 16% are due to main engine damage caused by off-spec bunkers, which cost $545,000 on average to repair.

These machinery claims do not include catastrophic claims due to loss of propulsion, most often tied to fuels or long-term damage from fuels. Such catastrophic claims can be in the millions, to hundreds of millions per incident. The fuel contagion incidents in Asia, the ARA zone, and the Fujairah regions last year are estimated to have cost nearly $50 million in towing fees alone.

FUELTRUST
POWERING BETTER DECISIONS

Assessments by FuelTrust, a Houston-based artificial intelligence startup focused on the energy supply chain, indicated that between 2019 and 2022, over 39% of all bunkers globally had a 2% or greater delta of fuel content and amounts delivered from their delivery paperwork. The most common issue found was water introduction to fuels in the journey from their land-based storage tank to the ship bunker tank. This indication, typically seen as a 0.1% water being increased to 0.29% water – kept under the regulated threshold, but still resulted in average losses of $14,910 per impacted delivery.

Of note, the introduction of electronic mass flow meters has been helpful in reducing "paper fraud" and collusion. The need to go paperless and provide real time transactional reporting is still needed, and the industry is working toward viable solutions toward it. However, as transitional and future-fuels are being introduced into the market, a new wave of potential loss points are arising.

Operating heavy machinery in the middle of the ocean is risky under the most trustworthy conditions. When the potential of contamination, instability of fuels, and fuel incompatible mixtures, whether intentional or not, is introduced, exponential risk is created. The only viable way for the maritime industry to safely embrace new fuels and more efficient fuel supply channels is through shared-party transparency, with decisions backed by data from partners who are empowered to mutually trust each other.

Top Spots for Fraud Opportunities

Fuel Density Inaccuracy

Misstating fuel density at time of delivery is one example of a fraud opportunity. Marine fuel is sold by weight (mass) and delivered by volume. If the density on the Bunker Delivery Note ("BDN") is inaccurate – the volume received reflects a higher quantity than the actual weight delivered – then the short-delivered quantity results in a commercial loss. Studies have shown that 66% of Very-low Sulfur Fuel Oil ("VLSFO") samples analyzed had a lower density declared on the BDN than the actual lab-tested density of the fuel. This is a typical indicator of "short bunkering".

It's important to understand that not all density discrepancies are due to intended fraud. They could result naturally from unintentional contamination that impacts the density. At present, industry lacks the capability to see patterns of contamination and the means to predict the risks associated with density discrepancies.

In an analysis of over 18 million metric tons of bunker fuels in 2022, it was estimated the cost of short bunkering was over $2.95 billion annually, based on roughly 128,000 vessels in the global fleet.

Fuel Trust Analysis: Economic Impact Due to Density Deltas in Blue Water Bunkering Operations
January-December 2022

Bunker stemmed per vessel each month	Avg. 1000 MT
Density of Fuel @ 15C (BDN declared value)	0.9889
Density of Fuel @ 15C (actual tested value)	0.9865
Density Delta @ 15C	0.0024
Short Delivery/month due to Density Delta	2.4 MT/month
Annual Economic Impact per Vessel (USD)	$19,728.

Source: FuelTrust: fuel delivery density report – February 2022

Less easily calculated is the impact of the industry practice of excluding fuel quantity discrepancies of less than 3%. For example, a 3% difference on a single 1000MT fuel delivery, or approximately 30MT, would likely not be disputed, allowing a $15,700 loss to be considered acceptable. This discrepancy is different than the density issue, as it involves volume loss. Assuming a global fleet of 60,000 blue water vessels, estimates indicate over $209 million per month in undisputed losses. This practice means that suppliers could be losing revenues, and/or their customers could be paying for product not received.

Temperature to Volume Relationship

Much like the issues seen with density inaccuracies, another common area for malpractice exists in the temperature to volume relationship. All petroleum products have a high rate of thermal expansion which should be considered when significant quantities are delivered. If a fuel delivery agent understates the temperature during the opening gauge and then overstates the temperature at the closing gauge, a volume discrepancy could easily occur.

Water in Fuel

Water in fuel isn't uncommon from sources such as tank condensation. However, as indicated from real-world analysis, deliberate injection of water impacts the quantity and the quality of the fuel. Unfortunately, the exact proportion of water in the fuel is difficult to determine upon delivery – it's only after settling that a true measurement can be determined.

Costs related to high water content aren't limited to the loss of true fuel but may also include disposal costs of water separated from the fuel by the vessel's oily water separator ("OWS"), a cost which is increasing in ports around the globe.

Bunker Fuels

Bunker fuels are inherently "dirty", even in their most pristine condition. These fuels need distillates and additives ("cutter stocks") to reduce their viscosity enough to function in ship engines. Imagine the thin line between acceptable enhancements that improve their quality, and contaminants that can catastrophically damage a ship's engine.

Everything from used motor oil, restaurant vegetable oil and rubber by-products have been found in "bad bunkers" - none of which should be part of a reliable fuel supply chain. Bluewater ships have been known as the "incinerators of the refining industry," but they should not become literal incinerators that contaminate the global environment as a result of fraudulent acts. As found in incidents that affected the ports of Singapore and Houston in 2022, the disposal of organic chloride oils by an unknown party into a bunker batch resulted in hundreds of disabled ships and a short-stock of replacement engine parts that affected global shipping for months.

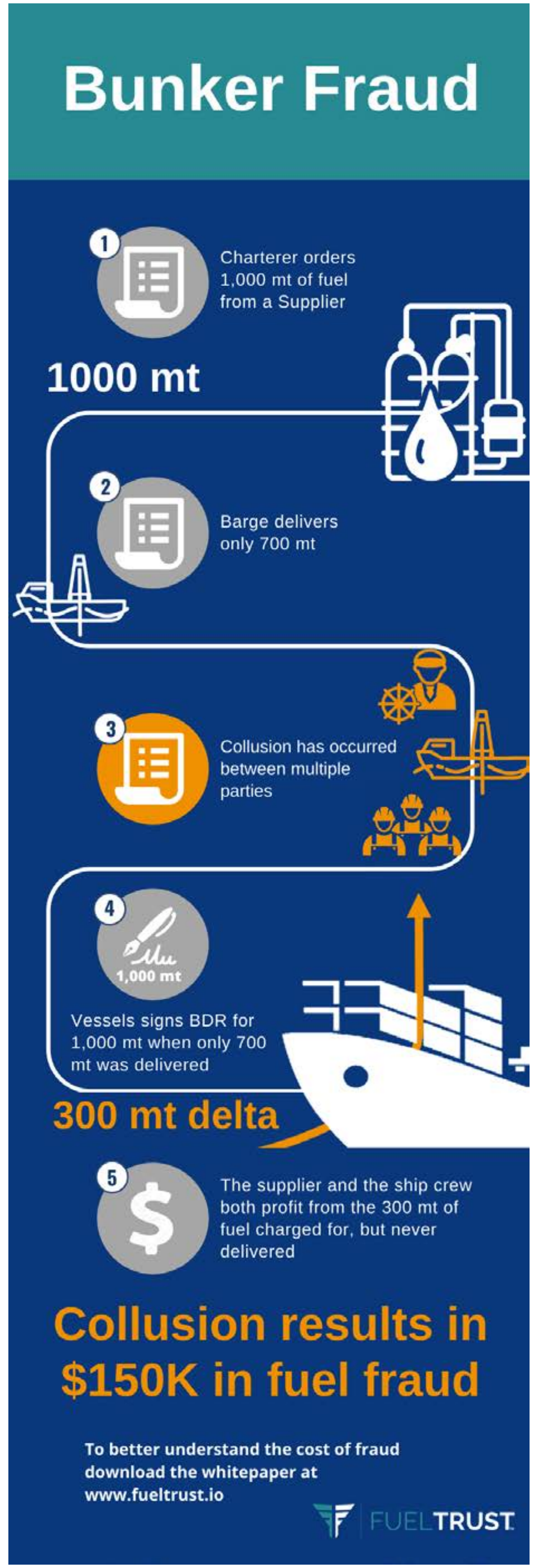
Intentional Collusion

The least technical form of bunker fraud is delivering less fuel than purchased through collusion between the supplier or barge crew and the ship crew. In such a case, the buyer orders 1000MT of fuel but only receives 700MT. The ship crew signs the BDN to reflect the full receipt of 1000MT. The buyer then pays the supplier for a full delivery with the value of the 300MT delta ($165,000 at an average $550/MT) being split between the colluders. The ship crew then covers the shortage by recording greater bunker consumption than what took place over the month of voyages reported.

Practices like this could involve an owner defrauding a charterer, the ship crew defrauding their owner, a charterer's bunker buyer defrauding the charterer, or some combination of these scenarios. The best way to avoid this type of collusion fraud is to use reputable third-party bunker surveyors, along with regular voyage performance monitoring. Because this requires more expense, new hardware, and work, it's often bypassed by those less than diligent or vigilant. Certain port authorities now regularly impose random surveys, or compulsory surveys on parties with found fraud in the past.

To further complicate fraudulent matters, should an owner have a dispute with a charterer over the fuels provided to the vessel, either in quantity or quality, they have a limited window of time in which they can lodge their protest and several obstacles to overcome to secure resolution.

BIMCO, an international shipping association which sets the basis for most fuel purchase/sale contracts, provides buyer and seller with 14 days to file a quantity claim and 30 days to file a quality claim. The onus of responsible investigation places a tremendous amount of pressure on owners and suppliers that oftentimes may be unachievable under the best of conditions with current technology or manual methods. Even when BIMCO updated their widely accepted Standard Fuel Sulfur Content Clause for Time Charterers in response to the MARPOL air quality regulations which came into effect in May 2019, the time span limits remained. The need for the affected party to produce a responsible set of evidence and investigation in such short order often leads to an "acceptable losses" decision, and therefore no notification to regulators, insurers, or other third parties – washing the losses into an opaque market model, but affecting the bottom line of the supplier, the charterer, and the shippers.



Bunker fuels continue to constitute over 50% of a vessel's operating expense. Fraudulent activities and lax supply chain controls impacting these costs significantly affect the bottom line for vessel owners and charterers. The industry's commonly accepted 3% threshold for fuel loss due to short bunkering or specification deltas has a negative financial impact of over $6.9 billion per year globally.

Creating a Trusted Fuel Ecosystem Through Transparency and Traceability

While fuel supply chain issues remain across the industry, and particularly in maritime fuels, hope is not lost. Fuel suppliers are making efforts to gain visibility to the end-delivery outcomes of their products, and fuel buyers are beginning to leverage advanced technologies to reduce fraud and losses while at the same time decreasing their environmental risk exposures.

FuelTrust has created an AI-based approach to assessing and validating the fuel supply chain, creating a digital DNA of every batch of fuel and its chemical content. Fuel volumes, quality, and emissions potentials are assessed at every step of the delivery chain, including post-combustion. This data, including fraud and risk alerts, are privately shared through its patented blockchain-enabled products.

By "fueling trust" through its secure cross-party platform, FuelTrust provides fuel suppliers, shipowners, charterers, and regulators with the information needed to make better decisions, accurately report emissions, and to reduce potential fuel contamination, collusion, and commercial losses.

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FUELTRUST
POWERING BETTER DECISIONS

Gulf Center for Sea Turtle Research at TAMUG Works to Restore Sea Turtle Populations

Photos courtesy of the Gulf Center for Sea Turtle Research, Department of Marine Biology, TAMUG.

The Gulf Center for Sea Turtle Research ("GCSTR") at Texas A&M University at Galveston ("TAMUG") was created to bring attention to the lack of research infrastructure and expertise in the western Gulf of Mexico and the Texas coast. Through conservation programs such as the Sea Aggie Sea Turtle Patrol, sea turtle rescue and recovery and a rehabilitation hospital on the TAMUG campus, the GCSTR has been able to rescue hundreds of sea turtle's and involve thousands of volunteers as well as students in sea turtle preservation.

Sea Aggie Sea Turtle Patrollers are a dedicated team of TAMUG students and volunteers. They monitor and protect nesting Kemp's ridley sea turtles – as well as other sea turtle species – to assist in the recovery of turtle's population.

The Kemp's ridleyis the most critically endangered species of sea turtles. Making their home in Texas, they return yearly to nest and utilize our bays and estuaries as habitat for foraging. They are also the State Sea Turtle. Researchers at the Gulf Center for Sea Turtle Research ("GCSTR" or the "Center") at TAMUG's research program have learned these sea turtles use all parts of the Galveston Bay Estuary System, sometime traveling as far north as Trinity Bay, west to the Houston Ship Channel, miles into Clear Lake, and travel in and out of Bolivar Roads. Upper Texas Coast sea turtles can be found both in the bays and in nearby coastal environments off beaches.

The GCSTR conservation programs engage thousands of people each year. The Sea Aggie Sea Turtle Patrol program manages over 300 volunteers to monitor the beaches from April through July for nesting sea turtles, so the eggs can be protected and transported to Padre Island National Seashore for safe incubation and release. Since its inception in 2019, the GCSTR has responded to over 500 stranded sea turtles, and the rehabilitation hospital has treated over 275 patients.

In March, the Center hosted their first Nest Fest to help clean the beaches for sea turtle and shorebird nesting season. Planned as an annual event, 312 volunteers showed up and cleaned approximately 2,358 lbs. of trash from the beaches. A busy month, the Center also conducted their Sea Aggie Sea Turtle Patrol nest responder training as well as releasing five sea turtles into the ocean. The turtles had been under their care for several months. Four of them were Kemp's ridley sea turtles that had lost their way and were found cold stunned in Massachusetts. The fifth, a green turtle, was found cold stunned locally at Christmas. The team satellite tagged the green sea turtle to monitor its movement throughout Galveston Bay.

""Now they're going back to the wild and hopefully they'll be participants in the population and do their turtle thing and reproduce," Dr. Christopher Marshall, a professor at the Department of Marine Biology at Texas A&M Galveston, told the Houston Chronicle in their March 23 story on the turtle release.

The GCSTR also seeks to develop positive, beneficial relationships with industry entities. As the sea turtle populations increase, the risk for industry impacts increases. According to the Center, numerous biological opinions have been relying on outdated data, which negatively impacts trade, manufacturing, fisheries as well as sea turtle conservation.

With the research conducted by the GCSTR, improvements can be made to benefit time and money spent on the blue economy. Recent projects like the Coastal Spine have a significant risk to sea turtles -- from both the dune construction and beach renourishment projects to the gate system that will restrict movement through Bolivar Roads. With their studies on sea turtle ecology and movement, the Center provides vital current data that can be used to inform project and wildlife managers to ensure coastal restoration projects are mutually beneficial to marine wildlife like sea turtles and to the coastal community.

To accommodate the Center's growing need for space, Texas A&M University is in the process of fundraising for a new public outreach and education facility and sea turtle hospital that will allow them to become financially independent as well as able to reach a wider audience to educate the public about sea turtles, marine conservation, and resilient and sustainable coastal communities.

As the National Oceanic and Atmospheric Administration ("NOAA") Galveston laboratory is no longer addressing sea turtle research & conservation activities on the upper Texas coast, there is no other entity in the region that can conduct this work. The region needs a sea turtle hospital to replace the NOAA facility as exemplified during the historic turtle stunning event during Winter Storm Uri in 2021. Texas A&M University at Galveston is the most qualified to conduct this work due to the strong history of sea turtle research, its established programs, and the Sea Grant mission that encompasses the Texas A&M University at Galveston campus.

The GCSTR is currently seeking corporate sponsors for the new facility and there are naming opportunities as well. If interested, **please visit https://www.tamug.edu/GulfCenterforSeaTurtleResearch/ for more information or visit https://give.am/TurtleResearch** now to make a donation.

Port Watch

Auld Lang Syne

We two have paddled in the stream,
From morning sun till dine;
But seas between us broad have roared
Since long, long ago.
And there's a hand, my trusty friend!
And give us a hand of yours!
And we'll take a deep draught of good-will
For long, long ago.

A new year, a new quarter, a fresh start. The old has been displaced by the new and what has been matters no more - for the present is here. Scotland's national poet, Robert Burns, treasured the memories of what was in his famous poem Auld Lang Syne. Old Long Since or in the vernacular – Days Gone By – captures the memories of two old friends waxing nostalgically as they quaff a pint or two. They have run from hill to dale and seen many a setting sun whose gloam across the horizon has warmed a long and fruitful friendship. Their shared reminiscences tug the heart strings when one considers that the days ahead are far fewer than those that have flit for the two aged acquaintances.

The fading wakes of ships steaming to and from Texas ports were more numerous as the books closed on the year's first quarter. March, in particular, was a boon to all ports -save Galveston – where all but the state's cruise ship capital posted double-digit gains. An impressive accomplishment that pushed the aggregate deep draft vessel arrival statistics 1% higher than the prior year. Things were not as sanguine for the brownwater community given that 1% fewer tows transited into or across the Houston Ship Channel.

Ironically, Galveston, the only port that experienced a monthly wane, is head-and-shoulders above its sister ports on a year-to-date basis at 34%. Cruise ship arrivals have doubled over the prior year and even higher numbers are on the horizon for this vessel category. Nonetheless, the bounty of 2023 is not entirely attributable to RCCL et al with 10% more bulkers; 45% more chemical tankers; 69% more reefer vessels; and 27% more general cargo vessels. Galveston's rebound is keeping her piers full.

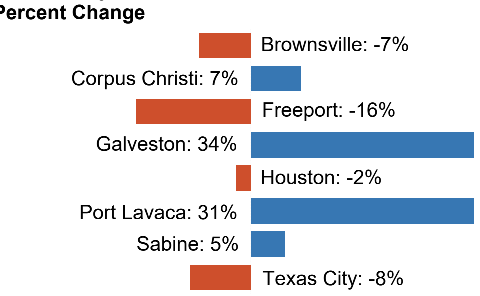
Freeport's March monthly jump was not nearly as robust as Galveston's year-to-date percentages but 31% is still worth crowing about. Unfortunately, despite its first 100+ monthly arrival since June of last year, it still lags last year's haul by 16%. Significant drops in the LPG, car carrier and tanker vessel arrival counts are the primary reason for the lackluster performance during the first quarter of 2023. Brownsville, year-to-date wise, also trails 2022's arrivals by 7%; however, its most recent monthly jump of 25% aided in erasing a few percentage points from last year's deficit.

Retracing one's track line from the terminus of the Texas GICWW, the Port of Corpus Christi is outpacing last year's vessel arrival tally by 7% after March's 15% monthly climb. Tankers are by far the largest composition of the vessels that call upon this burgeoning port. Yet, the 66% year-over-year growth of chemical tankers underscores the port's growing role as a major exporter of petrochemical constituents. Sabine's tanker count pales in comparison to that of Corpus Christi but very few ports in the United States – other than Houston – can match its LPG count. Over the past quarter, 16% more LPG vessels have sailed from this port, compared to last year. Even more impressive is the fact that chemical tanker arrivals leapt 80% on a month-over-month basis; driving the year-to-date numbers up by 23%.

The Port of Texas City has been struggling to regain maritime momentum since COVID took the wind out of its sails. The final month of the year's first quarter saw its highest arrival count since last July, resulting in the highest monthly increase of all Texas ports at 48%. Be that as it may, Texas City is still off by 8% compared to this time last year despite 11% more chemical tanker moorings. Ultimately, 13 more chemical tankers in Q1 cannot offset 22 fewer tanker arrivals.

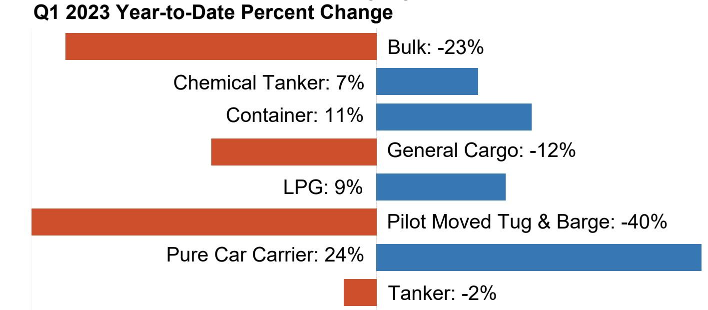
Houston certainly does not lack for chemical and oil tankers which were up for the month by 43% and 44% respectively. While these

Deepdraft Vessel Arrivals by Port
Q1 2023 Year-to-Date Percent Change



Source: Greater Houston Port Bureau Marine Exchange of Texas

Houston Deepdraft Arrivals by Type
Q1 2023 Year-to-Date Percent Change



Source: Greater Houston Port Bureau Marine Exchange of Texas

two vessel categories comprise the lion's share of total vessel activity for the port, Houston requires 2% more arrivals in order to equal last year's numbers. Bulkers have fallen 23% year-to-date; general cargo arrivals are languishing 12% for the year; and ocean-going tows have plummeted by 40%. The gains over the last year in LPG arrivals (9%), container vessels (11%); and chemical tankers (7%) have almost completely offset the declines of the previously-enumerated categories. Indeed, the halcyon days of old, where petrochemical exports dominated the waterfront and the ever-growing population of Harris County stimulated imports via containers, continues unabated.

Houston's dominance as the nation's busiest port complex is a manifestation of the region's economic diversity and vitality. Indeed, it is a legacy owed to the entrepreneurial grit imbued in the untold number of business owners that have sought opportunities, assumed risks, and invested capital to fuel this dynamo of a waterway. Reflecting upon the achievements of those individuals is worthy of a toast of the heartiest of ales or finest of wines.

Yet, we would be remiss if we did not consider those that trumpeted our magnificent port and tirelessly advocated for its infrastructure. Many have done so over the past century but few have done so with such passion. So, it is with a grateful heart that I bid adieu to a raconteur extraordinaire, a selfless leader and priceless friend – Captain Bill Diehl.

Tom Marian
Buffalo Marine Service
buffalomarine.com

Heavy-Lift Drone Solution for Maritime Delivery

In the maritime and offshore, the industry has relied on utility ships for deliveries, but this approach includes high costs, slow delivery times, and safety risks. Delivering provisions to offshore platforms and ships are a critical component of operations. Currently, the industry relies on utility ships to deliver these provisions. Companies are exploring alternative solutions, and heavy-lift drones have emerged as a promising option.

Mule Works
Better working together™

The first challenge is the speed of delivery. Utility ships can take several hours to reach their destination, resulting in delays and disruptions to operations. Additionally, the cost of operating a utility ship can be significant, as fuel, maintenance, and crew expenses add up over time.

The environmental impact of utility ships is also a concern, as they emit greenhouse gases and contribute to community and ocean pollution. Furthermore, safety is another issue with utility ships, as they are vulnerable to harsh weather conditions and accidents, which can put the crew at risk.

These challenges have significant economic implications, as delays and disruptions to operations can lead to financial losses. In addition, the environmental and safety concerns can harm the reputation of the offshore industry, making it more difficult to attract customers and investors.

According to a report by the International Energy Agency, offshore oil and gas production is expected to increase by 30% by 2040, which means that the demand for offshore provisions delivery will also increase. Therefore, a more efficient and sustainable solution is needed to address these challenges.

Heavy-lift drones present a potential solution to the problem of maritime and offshore deliveries. By utilizing unmanned aerial vehicles with the capacity to lift heavy loads, businesses can benefit from faster, safer, and more environmentally friendly deliveries. Heavy-lift drones have advantages against the current approach of using utility ships.

Heavy-Lift Drones: An Overview

Heavy-lift drones are unmanned aerial vehicles ("UAVs") designed to carry heavy payloads over short and long distances. They are equipped with advanced technology, including GPS, sensors, and cameras, which allow them to navigate and operate autonomously. Heavy-lift drones can be used for a variety of applications, including offshore deliveries, construction, and search and rescue missions.

One of the most promising applications of heavy-lift drones is in offshore deliveries. With the ability to carry heavy payloads over distances, heavy-lift drones can replace traditional delivery methods, such as utility ships, and provide faster and more efficient delivery services to offshore industries.

The use of drones for delivery has increased significantly since the Federal Aviation Administration allowed drone delivery in 2019. Over 4,800 drone patents were granted in 2021, indicating a growing interest in drone technology. The Department of Transportation is also focused on innovation and finding new ways to improve transportation, including offshore delivery.

In 2019, the Norwegian energy company Equinor used a heavy-lift drone, the Camcopter S-100 model manufactured by Schiebel, to deliver equipment to its offshore oil platform in the North Sea. The drone was able to transport a payload weighing up to 110 lbs (50 kg) over a distance of 80 kilometers in less than an hour, significantly reducing delivery time and costs.

The impact of heavy-lift drone deliveries in the offshore industry is significant. Heavy-lift drones are a promising solution to the challenges and limitations associated with offshore deliveries. As technology continues to advance, heavy-lift drones will become more sophisticated and capable of carrying even heavier payloads ranging from 300 to 2,000 pounds over longer distances, making them a valuable asset for the offshore industry.

Advantages of Heavy-Lift Drone Delivery

Speed: One of the key advantages of using heavy-lift drones is their speed. Drones can travel at high speeds without the need for a crew, which can significantly reduce delivery times. According to a study by PwC, drone deliveries can be up to six times faster than traditional delivery methods. This speed can be particularly advantageous for offshore deliveries, where time is often of the essence.

Cost: Heavy-lift drones can offer significant cost savings compared to traditional utility ships. They have a 50% to 75% lower initial cost than traditional utility ships and can also cut prices by 40% to 60% compared to traditional utility ships. This is due to their ability to operate with minimal human involvement, make multiple deliveries in a single flight, and have lower operating costs. Additionally, drones can be easily transported and deployed, which further reduces logistics costs.

Safety: Heavy-lift drones offer significant safety benefits compared to traditional offshore delivery methods. Crew members working on utility ships are often exposed to hazardous conditions and machinery to transport provisions. This poses a risk to their safety. By using drones, businesses can reduce the risks associated with human error and accidents, leading to a safer working environment for all involved. Drones can operate in difficult terrain and harsh weather conditions, reducing the need for crew members to work in hazardous environments. Additionally, drones can be programmed to avoid obstacles and hazardous areas, minimizing the risk of accidents and collisions.

Environmental impact: Heavy-lift drones can also have a positive impact on the environment. Traditional utility ships can emit harmful pollutants, which can damage the marine ecosystem. Drones, on the other hand, produce much lower emissions and have a much smaller environmental footprint. By adopting heavy-lift drone delivery, businesses can reduce their carbon footprint and help to protect the environment.

Potential market: The potential market for heavy-lift drone delivery in the offshore industry is significant. Offshore deliveries to cargo vessels are a crucial aspect of many shipping agents in this industry. The use of heavy-lift drones could significantly improve their efficiency, safety, and profitability. As such, there is a clear opportunity for shipping agents to gain a competitive advantage by adopting this technology.

Heavy-Lift Drone Usage

Several companies are already using heavy-lift drones, demonstrating the potential of this technology in the industry.

One such company is xFold Kaizen Aerospace, which has developed a range of heavy-lift drones for various applications. Their drones have been tested and are capable of lifting payloads of up to 500 lbs. and can travel up to 40 miles in a single flight. Another company, Dronematics, has developed a heavy-lift drone capable of carrying up to 330 lbs. and has successfully used it for delivery in various locations.

While specific companies may still be in the testing phase, the potential benefits of using heavy-lift drones in offshore operations cannot be ignored.

Market Potential of Heavy-Lift Drones

The shipping industry is experiencing a shift towards automaton, and the use of drones for offshore delivery is becoming increasingly common. The drone market size is forecast to increase by USD 27.78 billion from 2022 to 2027, at a CAGR of 13.58%, according to a recent market study by Technavio, a market research company.

Potential customers for heavy-lift drones in the shipping industry include companies involved in the offshore delivery of goods, such as shipping companies, logistics providers, offshore energy companies and most importantly shipping agents. These companies are looking for ways to increase efficiency and reduce costs in their operations, and heavy-lift drones can provide significant benefits in terms of time and cost savings.

The estimated market size for cargo drones is expected to reach $9.4 billion by 2030, according to market research company Markets and Markets. The growth of the market is attributed to the increasing adoption of drones for offshore delivery and the growing demand for efficient and cost-effective logistics solutions.

Challenges and Obstacles to Adoption

Despite the potential benefits of heavy-lift drones in offshore delivery, there are also potential challenges and obstacles to adoption. Ensuring the safety and reliability of heavy-lift drones is a primary concern. Heavy-lift drones must meet certain safety standards, and redundant systems and sensors must be implemented to ensure safe and reliable delivery.

Another challenge is the regulatory framework for heavy-lift drones in offshore delivery. Regulations are still evolving, and it may take some time for the industry to establish a standardized regulatory framework that ensures the safe and efficient use of heavy-lift drones.

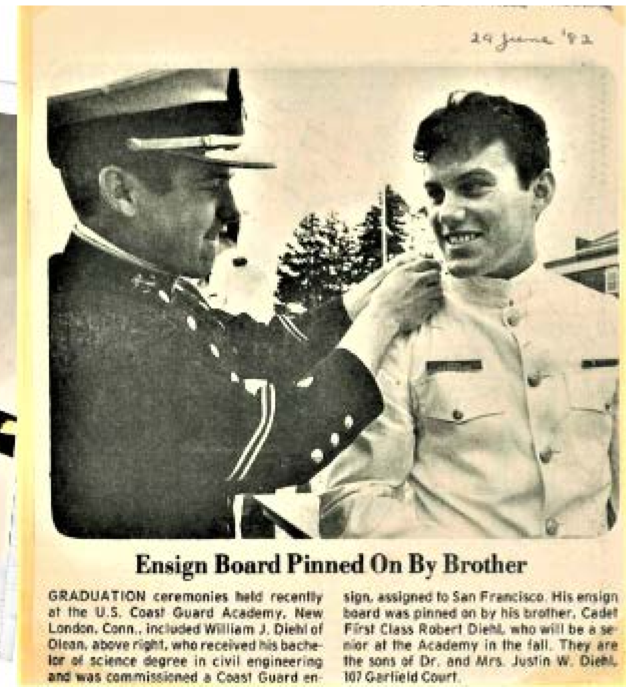
Overall, while challenges remain, the potential benefits of heavy-lift drone delivery for offshore deliveries make it a promising solution for businesses in the industry. The development of new regulations, technology, and safety measures will continue to improve the feasibility and safety of heavy-lift drone delivery.

Promising Solution

Heavy-lift drones present a promising solution to the challenges and limitations associated with offshore deliveries. By utilizing unmanned aerial vehicles with the capacity to lift heavy loads, businesses can benefit from faster, safer, and more environmentally friendly deliveries. The market for heavy-lift drone delivery in the offshore industry is significant and expected to grow in the coming years, driven by the increasing demand for more efficient and sustainable delivery methods. As technology continues to advance and regulations become more supportive, heavy-lift drones will become an increasingly important asset for businesses in the offshore industry and beyond.

CAPT Bill Diehl Carries 'No Excuse, Sir' Attitude into Retirement

CAPT Bill Diehl, retiring president of the Greater Houston Port Bureau, chats about his maritime career and what might be written into his next chapter.



29 June '82

Ensign Board Pinned On By Brother

GRADUATION ceremonies held recently at the U.S. Coast Guard Academy, New London, Conn., included William J. Diehl of Olean, above right, who received his bachelor of science degree in civil engineering and was commissioned a Coast Guard ensign, assigned to San Francisco. His ensign board was pinned on by his brother, Cadet First Class Robert Diehl, who will be a senior at the Academy in the fall. They are the sons of Dr. and Mrs. Justin W. Diehl, 107 Garfield Court.

CAPT Bill Diehl, USCG (Ret.), will close his long chapter as a full-time maritime professional on May 18. He then will focus on finding out if Mondays really can become Fundays – mostly likely on the golf course. He hasn't decided yet, but one thing is certain. He will take the attitude of "No excuse, sir!" into retirement.

For 17 years, Bill has brought this energetic philosophy into his work in Houston's vast port community. It's proved effective because he served as Sector Houston-Galveston with distinction and now leaves the Port Bureau flourishing in membership and thriving in its work with members to collaborate on the initiatives that impact everyone in the port region. Bill also leaves it in skilled hands. The Port Bureau's knowledgeable and experienced staff will be led by Captain Eric Carrero when he takes the helm as president on July 1.

Bill first learned the "No excuse, sir" response in 1978 when he arrived at the Coast Guard Academy fresh out of high school, He was met by second class cadets (his superiors) who rattled him with their taskings and questions. He quickly learned that "I don't know" was never an acceptable answer. Rather, the accepted response was "No excuse, sir or ma'am!" for jobs not completed or unknown answers.

Utter the phrase, and Bill could go on his way by feigning to accept responsibility for his shortcomings. He latched onto it with a kind of youthful audacity and used it frequently. Whether the question was trivial or complex, when he answered "No excuse, sir!" his superiors left him alone and didn't ask the question again. Years later, after he graduated from the University of Michigan, the true meaning of the drilled response came home to him. When it did, it was an eye-opener.

"The captain came in and asked me for my opinion on whether a damaged ship would break in half if they moved it from Alaska to California. I puffed up and gave a lot of reasons why that would be a pure guess. When I was done, the captain turned to the officer next to me and asked the same question. His reply was he was on it. That captain never asked me for my opinion again," recalls Bill.

He realized he had only pointed out the obvious problems and posed no solution for getting the job done – and it had to be done. Suddenly, he understood that "No excuse, sir!" meant that not having a way forward or a suggestion to help was unacceptable. Never being asked for his input again was a consequence rather than the perk he thought it was at the Academy. It was his moment of clarity about his career – and about life.

A year later the scenario replayed itself. Bill flew to Texas to respond to a ship on fire off the coast of Galveston. A different captain entered the room and asked the naval architect next to him if the ship was going to break in half from the firefighting efforts. He replied to the captain that it would be a guess. The captain turned to Bill, and this time he was ready—he said "I'll give it my best shot". The trajectory of Bill's Coast Guard career changed that day—he became a go-to guy for solving problems. He has continued with the "No excuse, sir" mindset to this day.

It is not surprising that Bill came to that important level of clarity. His father was a chemistry professor at St. Bonaventure University who valued learning and problem-solving. He quizzed his nine children daily on a wide variety of topics as a part of their dinner table discussions and read to them from the Great Books. "Dad taught me to find out; not just guess," Bill recalls.

His mother was a highly accomplished registered nurse and instructor whom Bill can't remember ever voicing a complaint. His parents expected each of their children to take classes from the most challenging teachers and learn life sports. By word and deed, they coached each child to get all they could out of every life experience.

Bill graduated from the Coast Guard Academy in 1982 and went on to specialize in the Coast Guard's marine safety field. He served in assignments in Calif., La., Mich., Washington DC, Minn., Hawaii, Panama, and Texas (twice). Along the way, he earned his master's degree in naval architecture, marine engineering, and mechanical engineering from the University of Michigan.

It was in Duluth, Minn., that Bill became a storyteller. There, he applied his "No excuse, sir" approach to learn public speaking. "I was the Captain of the Port and was expected to speak publicly often. I had done little public speaking up to that point and was terrible at it. I went to Toastmasters and learned that I was good at speaking when I wrapped my message around a story. It felt natural and helped me to get my message across in an effective way," he says.

It was a needed skill because he was destined to communicate some significant messages in the years to come. Bill arrived in Houston from an overseas assignment as a diplomatic liaison officer at the Panama Canal in July of 2006 to assume Captain of the Port ("COPT") command. Panama had been an adventure of its own – "No excuse, sir" even if you weren't fluent in the language - but Sector Houston-Galveston was a whole new ball game. The area of responsibility extends from Lake Charles to Freeport and includes seven major ports, not the least of which includes the largest manufacturing complex in the Western Hemisphere.

How to handle this complicated, sprawling industry group? Bill wasn't about to have any excuse and he sought out information. He credits CAPT Frank Paskewich, a friend from New Orleans, for offering some surprisingly sage counsel: Think of it like a gigantic bowl of Jell-O, with industry scattered on top of it.

"Frank told me as COTP, I would periodically have to implement new regulations or change processes due to incidents, which shakes things up. It was important not to shake too hard – or industry (pieces on the top of the bowl) start to bounce around and crash into each other," explains Bill. "He told me this would result in upsetting the community I was serving, and I needed their support to accomplish my job."

The next piece of advice that supported him was from local industry leader, Jim Overman, who told him: "It is not in our interest to watch you fail. The consequences to everyone are just too great." Bill believed Jim and trusted industry would help. It provided a strong foundation for carrying out his mission to work with industry to improve port safety, security, and caring for the environment.

Coming to the Port Bureau in September of 2009, Bill carried his "No excuse, sir" mantra with him as he explored new direction for the Port Bureau.

"We began by marketing an 'Ask the Captain' service," Bill says. "If you had a question—any question, you could call us. We didn't give you any excuse or tell you we didn't know. We called around and researched it until we could give you something you could use."

Companies began to see value in what Bill and the Port Bureau were doing, and it changed the Port Bureau's role in the port. When it came to the Port Bureau's mission, Bill leaned on the lessons learned when serving as COTP: shake gently and get help from industry. He realized anyone working solo on port-wide goals made little progress, but multiple companies "shaking gently" together for needed change offered unlimited potential for success.

This key message resonated in the port community. Bill cultivated an atmosphere that encouraged the needed collaboration and trust among members, sometimes in competition with one another, to push forward to reach port-wide goals.

"I could see the Port Bureau solving problems and was very happy to be a part of something that was catching on and showing benefits. Our goal was for us to meet often and see the sense of community grow," says Bill. As an organization, the Port Bureau has significantly gained in membership, growing from 95 to over 250 companies. It expanded its business information and networking events, hosted port education sessions, like Port 101, and furthered advocacy for dredging, Project 11, and coastal protection. We've also promoted port call digitization objectives through the Port Bureau's PilotTracker real-time vessel tracking and Synchronizer programs.

With the Port Bureau's future looking bright, Bill decided it was time for him to look to his own future. He enjoys and admires the Port Bureau staff and the work we do together, but decided his "grandpa duties" were calling and he wanted time to try new things.

"My dad's approach to retirement is a roadmap for me," says Bill. "He focused on keeping disciplined in mind, body, and spirit. I want to improve my golf game and work on my Spanish and faith. We will be staying in Texas, but we plan to travel, I really enjoy having adventures with others."

His first stop? Croatia. Bill and his wife, Annette, will join a lively group of 20 this summer for a cruise down the coast of Croatia. But it won't be lazing on the beautiful beaches for these visitors. Each day will see them biking to onshore sites to explore the country's superb landscape and rich history.

After that? His daughter's family will be returning to Texas to live in the Austin area. This makes the grandkids a short hop away, and there are plenty of adventures to be had with them. Perhaps he'll read the Great Books to them in Spanish. All in all, we are certain of this: whether retirement finds him on the golf course, puzzling the grandkids, or trekking to parts unknown, Bill will have "No excuse, sir" for not making the most of it.

WOMEN IN MARITIME HAPPY HOUR Cruising on the Houston Ship Channel

The Greater Houston Port Bureau's Women in Maritime Happy Hour on the Kirby's *Observer* Boat took place on April 3 with a 100+ professional women attending.

Port Bureau board member and chair of the outreach committee, Sharon Beemer, Vopak, was the master of ceremony for the event and program.

VP-Project Management Office for Kirby Corporation, Taylor Dickerson, provided insight on working in the brownwater industry. Dickerson started her career in the maritime industry in 2008 with Kirby and served in many roles within logistics, sales, operations, maintenance, safety, finance, and most recently special projects. Today, she is responsible for managing the portfolio of executive level projects in environmental sustainability, technology advancement and innovation, mergers and acquisitions, corporate strategy, process improvement and efficiency, analytics, and more. She is also serves on three separate board of directors as: president of Texas Waterway Operators Association, the next president for Women in Maritime Operations Association ("WIMOs"), and vice president of Hiro Health Corporation.

Stephanie Cavaliere, Kirby Port Captain gave the safety instructions as well talking about her career in the maritime. After graduation in 2011, she joined Kirby Inland Marine as a MOTV in their steersman program and gained experience transiting the Mississippi River and the Intracoastal canal. She worked as a pilot and was promoted to relief captain after obtaining her Masters of Towing Vessels Upon Great Lakes, Inland Waters, and Western Rivers. Today her shoreside role as port captain is to manage a fleet of 12 vessels, oversee budgets, safety and compliance initiatives, crewing, and training, while maintaining important customer relationships and serving as vessel liaison for multiple customer contracts.

CDR Corrina Ott, U.S. Coast Guard ("USCG") Sector Houston-Galveston currently serves as the Chief of Prevention, Marine Transportation System at Sector Houston-Galveston. She discussed the Houston Ship Channel navigation and regulations. Ott oversees waterway management that includes Aids to Navigation, the Vessel Traffic Service, and waterfront facility inspections. A native Texan, she enlisted in the Coast Guard in 1997. She received her commission in 2004 and her assignments included the CGC Buttonwood out of San Francisco, California; Marine Safety Office Boston, Sector Detroit, USCG Personnel Support Command, Marine Safety Unit Texas City.

The event concluded with a thank you to CAPT Bill Diehl, president of the Port Bureau and Commander Jason Smith, U.S. Coast Guard Sector Houston-Galveston, for their support for the Women in Maritime. They both will be retiring from their roles in the next few months.

Thank you to our sponsors, Kirby Observer crew, and drawing sponsors: Haugen Consultants (1-day demurrage seminar), Houston Maritime Center (1 annual membership), and Riverside Seafood & Grill (gift card). Events like this are only possible with the support from our members to help educate and support diversity in maritime and logistics industry today and for our future generations. For information about sponsorship for Women in Maritime Happy Hour, please email alavorgna@txgulf.org.

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CAPT Jason Smith to Retire from Coast Guard on June 9

On June 12, 2020, CAPT Jason Smith assumed the duties of Commander, U.S. Coast Guard ("USCG" or "Coast Guard") Sector Houston-Galveston. On June 9, 2023, CAPT Smith will retire from the Coast Guard handing command over to CAPT Keith Donohue, current Deputy Sector Commander of Sector Houston-Galveston.

During CAPT Smith's three years in Houston, he managed a $12.5 million annual budget and led 1,562 active duty, civilian, and reserve personnel across Sector Houston-Galveston's area of responsibility which stretches from the east bank of the Colorado River in Southwest Texas to 60 miles east of Lake Charles, La., and 200 miles offshore. In this position, he serves as Captain of the Port of Houston, Officer-in-Charge of Marine Inspection, Federal Maritime Security Coordinator, and Federal On Scene Coordinator, responsible for all Coast Guard missions including maritime safety and security, environmental protection, search and rescue, waterways management, and contingency planning operations for the nation's busiest navigable waterways. Under the Sector umbrella are 14 outlying units, including three Marine Safety Units, five Multi-Mission Small Boat Stations, two Aids to Navigations Teams, and four Cutters.

This area of responsibility is strategic and a vital part of the nation's economics, encompassing six of the nation's largest ports including Houston (largest port with 275 million tons/year), Beaumont (4th single largest), Lake Charles (12th), Texas City (15th), Freeport (16th), Port Arthur (17th), and Galveston as well as 247 miles of Gulf Intracoastal Waterways. These ports and waterways account for 25% of the total U.S. maritime tonnage and contribute over $1 trillion to nation's economy. Included in these ports are the nation's top three largest refineries, the 4th busiest cruise ship port, 57% of the nations' strategic petroleum reserves, and a 56 square nautical mile National Marine Sanctuary.

CAPT Smith's first exposure to the USCG was through his father, who served in the USCG for a short time. His father always spoke highly of the memories, missions, and friendships he built while in the USCG. Originally from the Boston, Mass. area, CAPT Smith went to Maine Maritime Academy ("MMA") where he joined the USCG as a reservist to gain a better understanding of the USCG's missions. He graduated from MMA with a bachelor's in maritime transportation and unlimited 3rd mates license. After a short time at sea, he transitioned his reserve enlistment into an active duty commission and never looked back.

Photo: Cadet Smith at the Maine Martitime Academy in his senior year.

CAPT Smith credits his success to taking opportunities and recognizing the importance of hard work, things he learned from his father who was a self-employed caterer for most of his career. Another individual that influenced CAPT Smith was John Dwyer, a civilian inspector who instilled in him the importance of marine safety. Other influential leaders CAPT Smith looked up to throughout his career include RDML John Nadeau, RDML John Mauger, CAPT John Healey, and CAPT John O'Connor, or he just likes the name John!

CAPT Smith recalls many memories throughout his career which included tours on the East, West, and Gulf Coasts plus overseas in Europe. Early on, while serving independent duty in North Bend Ore., CAPT Smith remembers responding to what turned out to be Oregon's largest man-made natural disaster, the *New Carissa* grounding and subsequent 70,000-gallon oil spill. As the incident management team was forming to over 500 personnel, CAPT Smith was tasked to monitor salvage options and remained onboard the dead ship for four days. He left only after he identified major transverse cracking, which eventually split the hull into two, creating even more challenges and extending the incident response to almost a year.

Photo: CAPT Smith in North Bend, Ore., in 1999 on the New Carissa gounding.

CAPT Smith also recalls running operations for the maritime response to the Boston Marathon Bombing and being part of the only increase in MARSEC level by an operational unit to prevent attacks on the waterways and simultaneously cutting off potential escape routes to the bombers. CAPT Smith later co-authored "Teachable Moments: Ready for Disaster" that was built on best practices and lessons learned from responding to incidents and natural disasters. Other response work during his Coast Guard career included Hurricanes Harvey, Laura and Delta as well as response to the Bouchard Barge 225 explosion.

Excitement and success did not always come from responses. CAPT Smith gained experience and formed partnerships working overseas as a lead delegate for the International Maritime Organization and here in Texas initiating multiple national level events focused on the liquified gas industry, including the now annual Liquified Gas Senior Executive Forum.

Collaboration and partnering with the federal, state, and local agencies as well as private industry and the community was a goal for CAPT Smith as Commander, Sector Houston-Galveston. His accomplishments include formalizing marine inspection and investigation support for Texas Parks & Wildlife following the *Lake Conroe Queen* capsize, creating a Joint Operations and Intelligence Communication Center allowing for daily communication and analysis with the Department of Homeland Security interagency partners, improving Certificate of Compliance efficiency, remaining transparent and accessible with monthly industry roundtable discussions, and maximizing information sharing to ensure a safe and successful Project 11 dredging. CAPT Smith has also been a strong supporter of seafarers' wellness initiatives through the Houston International Seafarers' Center and embedded the USCG into the seven regional maritime high schools through the Port Houston Partnership in Maritime Education program.

Photo: CAPT Smith, student, and Jennifer Carpenter, president of AWO, attending 2022 Women in Maritime Happy Hour.

In addition, CAPT Smith was appointed to the board of the Houston Clean City Commission by the Houston City Council in 2017. His focus has been on combining the efforts of the Coast Guard and the Clean City Commission (in association with Keep Houston Beautiful) to help identify ways to reduce litter and improve recycling to save our seas.

Having been in the USCG for over 30 years, the advice CAPT Smith would give to the next generation would be to take opportunities early and often as you may never get a second chance. "Don't put barriers up that prevent you from attaining your goals. Have confidence you can achieve anything you put your mind to," he says.

After retiring, CAPT Smith plans to stay in Houston, working in the maritime community. His wife and son have lived in Houston since 2014.

Photo: CAPT Smith with his son, Jack.

Texas A&M at Galveston Receives New Training Ship *TS Kennedy*

TS Kennedy photos courtesy of the Texas A & M University Galveston Campus

Texas A&M University at Galveston has received a new training ship, the *TS Kennedy*, a 540-foot vessel that will enhance year-round training for Texas A&M Maritime Academy cadets in ship navigation and marine engineering systems, maintenance, safety and security.

"We have dreamed of having this capacity for over a decade and are extremely grateful to the Department of Transportation, MARAD, university administration and elected officials for helping us get here," said Col. Michael E. Fossum, vice president of Texas A&M University, chief operating officer of the Galveston Campus and superintendent of the Texas A&M Maritime Academy. "A large training ship that accommodates our entire maritime academy will allow us to meet industry demand for highly skilled mariners and maritime professionals and support the blue economy on the Gulf Coast."

State maritime academy training ships are federally owned vessels operated by the six state maritime academies to serve cadet-training purposes. Successful legislative efforts in Washington, D.C. secured the transfer of the *TS Kennedy* from Massachusetts Maritime Academy this year and a new, state-of-the-art National Security Multi-Mission Vessel, *NSMV Lone Star State*, in 2025. These ships have 12 times the capacity of the Maritime Academy's former training ship, the *TS General Rudder.* While ship-sharing agreements with other state maritime academies have been in place for several years, the campus has not been assigned a training ship that would fully accommodate mariner training needs for the past 18 years.

The larger *TS Kennedy* expands the Texas A&M Maritime Academy's ability to provide highly trained and professional U.S. Coast Guard-licensed deck and engine officers to serve on oceangoing and inland waterway vessels and commission officers to the Navy. With the nation's workforce of skilled mariners aging and retiring, educating and training merchant mariners is critical to meeting the needs of citizens.

"Over 90 percent of everything you eat, wear or use travels through our nation's ports and inland waterways," explained Fossum. "Our programs educate and train the next generation of mariners and maritime professionals to ensure our state and nation's economic prosperity and security remains strong."

Each summer, cadets embark on a summer sea term onboard the ship to receive at-sea training that often takes them to international locations. During the two-month term, cadets live, learn and work as a crew while also attending classes onboard. To share the importance of the maritime industry, the Galveston Campus also hosts events in most ports with their 'Taste of Texas' series featuring ship tours, games, music and other festivities. This year, cadets will sail from Galveston to Curacao, Georgia, Puerto Rico and Louisiana before returning to campus in August.

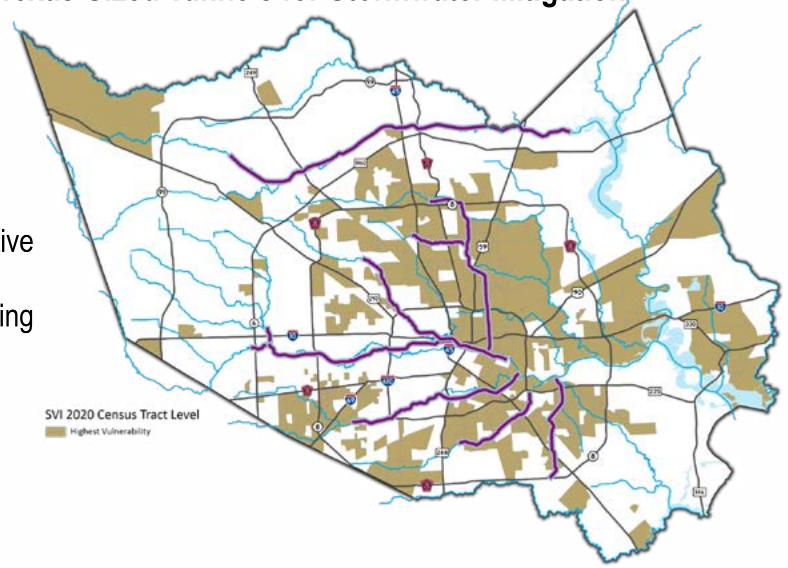
To attend summer sea term events, learn more about the Texas A&M Maritime Academy and follow cadets on their sea term journey, visit the Texas A&M website at: https://www.tamug.edu/corps/

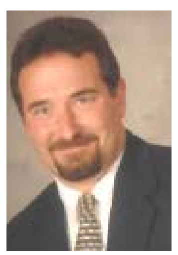
February Commerce Club Featuring Scott, Interim Deputy Director of Engineering & Construction, Harris County Flood Control District

Harris County Flood Control District Explores Texas-Sized Tunnels for Stormwater Mitigation

Potential Tunnel System

- Where tunnels would likely be most effective and beneficial
- 80,000-120,000 future instances of flooding avoided.
- Est. Cost $30 Billion





In the wake of Hurricane Harvey, Harris County officials challenged the Flood Control District ("the District") to develop new flood risk reduction tools. Since then, the District has actively explored the potential of utilizing a network of huge, Texas-sized stormwater tunnels as an effective solution to mitigating storm waters in Harris County. The District's interim deputy director of engineering & construction, Scott Elmer, presented "What We Know, and Where We Are Going" based on the project's feasibility study at the February Commerce Club.

"We cannot estimate the value [of our project] to quality of life in Harris County," said Elmer in opening his presentation.

What We Know

The second phase of the feasibility study results released last June shows that a potential tunnel system, if added to the existing bayou channels and detention basin network, could be a highly effective option for reducing flooding. The potential eight tunnel locations, known as alignments, identified in the feasibility study represent the foundation of a Harris County tunnel system that could potentially reduce flooding in and around areas designated as damage centers. A damage center is a concentrated area that has and will continue to flood repeatedly, with water in homes and businesses.

Phase 1 of the study confirmed it is potentially possible to construct tunnels in many areas of Harris County. In Phase 2, potential individual tunnel locations, considering various elements such as elevation, community impacts and availability of vacant land for traditional projects were identified. Potential benefits to be gained when tunnel alignments work synergistically with each other rather than independent alignments were also identified. Using a tunnel system in conjunction with the existing drainage system can provide significantly more benefits by allowing the different alignments to reduce the flood risk across multiple watersheds.

Phase 2 also found that tunnels would require the acquisition of much less property, as compared to traditional flood risk reduction projects. Also, because the majority of tunnel construction would happen deep underground, a tunnel may have a flexible alignment that is not tied as closely to a bayou or creek. For example, a tunnel could potentially provide benefits to flood damage centers in more than one watershed. Tunnels are being considered as an addition to – not a replacement for – the county's existing stormwater management network of bayous, channels, and stormwater detention basins. The Phase 2 report recommends eight tunnel alignments in the following watersheds: Brays, Buffalo, Clear/Berry/Vince, Greens/Halls/Hunting, Halls/Hunting, Little Cypress/Cypress, Sims, and White Oak.

Tunnels are projected to be 30-45 feet in diameter and 9-25 miles in length and be placed 80 to 100 feet underground. The tunnel system utilizes gravity and the capacity to carry exponentially more water than a storm sewer. As a channel fills during heavy rain, water drains into the tunnel inlets. There are several inlets projected for each tunnel. The water then moves downstream to a strategically placed outlet.

In Texas, there are stormwater tunnel systems utilized in San Antonio and in Austin. The Harris County project would be bigger than either of these. The cost for the tunnel system is $30 billion.

Where We are Headed

The additional analysis that will occur in Phase 3 of the feasibility study would quantify the countywide economic benefits of adding a tunnel system to Harris County's current stormwater management network, identify how to integrate such a system into the existing network, identify funding strategies, further investigate and refine potential tunnel alignments, and continue to gather public input.

Elmer stressed the importance of input from community and industry to the District. "We take communication seriously," said Elmer. "We want to hear from everyone."

March Commerce Club Featuring COL Michael E. Fossum, Vice President of Texas A&M University, COO of the Galveston Campus, and Superintendent of Texas A&M Maritime Academy

Partnering with Industry for the Future Workforce

"After my introduction, your main question has to be, what is an old Air Force colonel doing running a boat school," said COL Miachel Fossum as he began his presentation at the Port Bureau's March Commerce Club luncheon. Fossum, a former astronaut and veteran of three space flights, is vice president of Texas A&M University, chief operating officer of the Galveston Campus, and superintendent of Texas A&M Maritime Academy.

"First of all, we're much more than a boat school, and I'll be talking about that more shortly. I was fortunate to serve our nation for 36 years as an Air Force officer and test pilot and as a NASA astronaut. I raced forward in full afterburner with a clear mission, a vision of success, and a relentless passion to achieve it," explained Fossum. "I now have directed my passions to fulfill a new mission."

As a Texas A&M alum, Fossum credits the university as the launchpad to his career. He is excited to now be serving as part of the university system in Galveston, dedicated to transforming lives and leading discovery through research and innovation.

"Everything we do is really about feeding the blue economy - the education and training and research and scholarship. In the blue economy, we're seeing that the marine industry really emerges from relative obscurity to become one of the vanguards of change," said Fossum.

The Blue Economy is the interplay between economic, social, political, and ecological sustainability of the ocean and surrounding ecosystems. Fossum explained that at Texas A&M University at Galveston ("TAMUG"), they seek to address this from a holistic perspective. Their focus is on expanding the areas they serve: education and training, renewable energy, fisheries, maritime transportation, coastal tourism and health, and climate change.

In education and training, TAMUG is "doubling down" on the importance of degree programs to the meet needs the of future workforce. For renewal energy, their Power at Sea includes green shipping, marine aquaculture, seawater mining, wind farms, etc. The fisheries program now includes stock assessment and sustainable natural resources.

Maritime Transportation has broadened to encompass the cybersecurity of ports and vessels, piracy, law at sea, and their maritime academy. Coastal community risk analysis, reduction, perception, and education are now a part of coastal tourism and health. Climate Change includes shifts in ecologically and economically important species as well as the protection and conservation of endangered species.

"Most Texans don't even think of us as a maritime state or have no idea of its importance. In this room, we all know it's absolutely essential for our economic success and prosperity … [It is] also absolutely essential to our national security," Fossum said, considering possible impact to the future workforce.

"This is a big deal that we're able to meet these needs for you, for our state, for our nation, with these advanced degrees and in the sciences and engineering . . . The fact that we're on the water, all of our students get out on vessels as part of their education during their time here . . . it enriches their education and give them an opportunity to bring a different perspective to their future employer."

Fossum also stressed the importance of Texas A&M's core values of excellence, integrity, leadership, loyalty, respect, and selfless service. "Our students internalize these values throughout their four years, developing the rock-solid moral values that you need to help you lead your companies."

An important event to the Maritime Academy is the anticipated arrival of the TS Kennedy, a former commercial freighter, and a current training vessel of the United States Maritime Service. Deck and engine license cadet candidates must accrue time at sea before they graduate, and the time is earned during summer sea term journeys.

TAMUG and the Maritime Academy's success can be illustrated by their statistics. For example, 87% of ocean engineering graduates are employed, with salaries ranging from $75,000 to $90,000. 80% of coastal environmental science are employed or in graduate school. About 50% of marine transportation students are employed. While this number may seem low, it is based on the time of a student's graduation and many students have not yet passed their Coast Guard license exams. Once that is done, the numbers are nearer 100% in the current environment.

"Our students are ready from day one. That's what Aggies are known for! Anything done in the marine environment is more difficult operationally, logistically, and administratively. Our graduates are comfortable with these tough environments because they've had a hands-on education," concluded Fossum.

FUTURE EVENTS: txgulf.org/events

- **May 4:** M/V Sam Houston Boat Tour with the Greater Houston Coffee Association.
- **May 18:** Commerce Club luncheon featuring CAPT Bill Diehl as he retires from the Port Bureau! Note, this event will sell out soon, so register now!
- **June 8:** Commerce Club luncheon featuring Ricky Wells, General Manager, Port Terminal Railroad Association.
- **August 26:** 94th Annual Maritime Dinner honoring David Grzebinski, President & CEO, Kirby Corporation! Thank you to Title Sponsor Kirby Corporation and Queen of the Fleet Sponsors Callan Marine, Enterprise Products Partners, Kinder Morgan, Port Houston, and Shell (US) Trading Company.
- **November 6:** 15th Annual Captain's Cup Golf Tournament. Advanced registration open to past Premier Sponsors Executive Partners. Wait list sign-up available.

NEWS: txgulf.org/news

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