Casualties: Freighters hit nearly head-on in Welland Canal accident that goes viral

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COVID clouds job outlook for academy grads

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Navigating the Duwamish • AIS data danger • Tugs in paradise

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ON THE COVER

An operator aboard the Crowley Maritime tugboat *Legacy* turns the Intercon coupler controls while maneuvering the vessel into the notch of barge *750-1*. The articulated tug-barge transports petroleum from the Marathon refinery in Garyville, La., to Port Everglades and Tampa, Fla. Brian Gauvin photo

Signals

Coast Guard warns that inaccurate vessel data can undermine AIS

A spring collision on the Mississippi River that resulted in several fatalities has spurred the U.S. Coast Guard to ramp up efforts to get two points across about automatic identification systems: that it's unsafe to rely solely on the communication tool to know what vessels are nearby, and that improper entry of AIS data can even be deadly.

Toward that end, the Coast Guard is strongly urging vessel owners and operators to make use of a downloadable AIS Encoding Guide that spells out exactly how to properly update information and best use the technology, said Jorge Arroyo, a Coast Guard AIS specialist.

Mariners have an obligation to

Courtesy Ferrer Photography

A towboat guides a pair of barges up the Mississippi River near St. Paul, Minn. In a recent safety alert, the Coast Guard warned operators that failure to enter accurate AIS information about the length of tows can have deadly consequences.

accurately enter static information such as the length, name and other characteristics of their vessels into AIS so that they're transmitting the right information to other vessels, said Caitlyn Stewart, senior director of regulatory affairs for the American Waterways Operators (AWO). And that's not difficult to do.

What can be problematic, Stewart said, is getting dynamic information for each voyage properly entered in a timely way without it being an undue burden. "A lot of towing vessels use AIS systems with pretty rudimentary keypads, so entering data is a time-consuming endeavor," she said. Think flip phone versus smartphone.

"It's not simple to enter data on basic keypads, especially when it has to be updated frequently," Stewart said. "It's a multistep process."

A few years ago, the AWO took Coast Guard representatives to the Houston Ship Channel, one of the busiest waterways in the world, to demonstrate the challenges involved with entering data when loads are frequently changing.

"A lot of our members operate in harbor services where they're making multiple short trips, so for those types of operations, it can become challenging to keep re-entering data," Stewart said, noting that checking displays and radar, using a ship radio to negotiate plans to pass other vessels, and other methods of transmitting dynamic data are necessary, too. Relying on AIS alone is not the answer.

Arroyo concurred and said it's especially important for operators of vessels with frequently changing tow sizes to be up to speed on proper updating methods. "It can be cumbersome if you're moving 100 barges up and down a river," he said, and there are simple codes to enter that alleviate that requirement. An example: Vessels towing ahead or alongside should use Ship Type 57, not 31, within the static fields.

"A lot of our members operate in harbor services where they're making multiple short trips, so for those types of operations, it can become challenging to keep re-entering data."

Caitlyn Stewart, American Waterways Operators

"This particular accident (on the Mississippi) possibly could have been averted had operators used AIS to its full potential," Arroyo said. He added that he could not provide any details about the incident because it is under investigation.

AIS data-entry problems — including not properly updating navigational status — impact vessels traveling on inland waterways far more frequently because, among other reasons, there are far fewer obstacles to confront in open seas. Rivers have bends and frequent changes in depth and currents that can affect course and speed.

The impact of improper AIS data entry is not felt much on the Great Lakes, according to Eric Peace, operations and communications director for the Lake Carriers' Association. Narrower inland waterways where vessel operators "sometimes are not accounting for their full length or don't know what's coming around the corner," and locations where towing vessels may collect additional barges "almost like a train" are the problem areas, he said.

The only reports of AIS problems to the Chamber of Shipping of America, which represents U.S.-based owners and operators of oceangoing vessels, are those being encountered overseas with vessels turning off AIS to avoid potential sanctions violations, said Kathy Metcalf, president and CEO. She noted that "masters under SOLAS can turn AIS off when in high-risk areas — e.g., piracy."

Beyond education efforts and strongly urging review standards, Arroyo reminded mariners of the true purpose of AIS by likening it to a phone's caller ID system: It's meant to offer vessel operators a snapshot look at nearby vessels, not to be a primary navigational tool.

Patricia McCarthy

GAO: Too soon to assess Coast Guard oversight changes after *El Faro*

In the wake of the *El Faro* disaster, a federal review of a U.S. Coast Guard initiative to ensure that domestic vessels meet safety management system (SMS) standards found that it is too early to evaluate the effectiveness of these efforts.

The report by the Government Accountability Office (GAO) noted that actions taken by the Coast Guard since the tragedy have enhanced the service's oversight of recognized organizations (ROs). These are third-party companies that the Coast Guard allows to review an operator's SMS, issue applicable vessel certificates, and perform audits of safety plans aboard each vessel.

The Coast Guard's steps to improve oversight of SMS stem from the incident on Oct. 1, 2015, in which the cargo ship *El Faro* sailed into the heart of Hurricane Joaquin and sank, killing all 33 mariners aboard. Investigators found deficiencies in *El Faro*'s SMS plan, a factor that may have contributed to the sinking. Some in Congress questioned how effective SMS plans are, the ability of the Coast Guard to oversee the third parties conducting SMS audits, and whether the SMS plans meet federal and international standards.

Since the sinking of *El Faro*, the Coast Guard has taken several steps to improve its oversight of recognized organizations and SMS plans. These actions included creating a new Coast Guard group to monitor ROs; developing new SMS guidance and work instructions; increasing direct observation of organizations performing SMS audits; coming up with key performance standards for evaluating ROs; and requesting internal investigations for certain RO deficiencies.

In April 2018, the Coast Guard established guidelines for 21 specific shipboard emergency scenarios and how to address them. However, these guidelines are not a substitute for legal requirements, nor are they Coast Guard regulations, according to the GAO report.

Officials from two ROs said that their auditors "may be limited to issuing an 'observation' to the vessel operator if any potential shipboard emergency listed in Coast Guard guidance is not addressed in SMS plan documents," according to the GAO report. The International Safety Management Code states that an "observation" is not as binding as an SMS "nonconformity," which would require specific action to correct.

However, the GAO noted that

A photo presented by the National Transportation Safety Board in December 2017 shows *El Faro* moored without cargo, with "running rust" visible on its hull plating. NTSB investigators found deficiencies in owner TOTE Maritime's safety management system, and the Coast Guard has since taken steps to improve its SMS oversight. NTSB photo

the 21 shipboard emergencies do not apply to every vessel or in all operating regions, and that more time may be needed for companies to add these contingencies to their SMS plans.

If a specific risk "is not applicable to the company's operations, the company should be prepared to discuss or provide documentation that outlines the reasons for not addressing (it) in their safety management system," said Coast Guard Chief Warrant Officer Kurt Fredrickson.

The Coast Guard has asked ROs to review the 21 emergency procedures and how companies are evaluating risk. "The Coast Guard will evaluate the findings to see what gaps may exist and find the best way to apply new interventions as necessary," Fredrickson said.

For its review, the GAO audited 25 vessels in five categories: general cargo/container; chemical/oil carrier; offshore supply/support; towing/tugboats; and passenger ferries. The agency received 11 SMS plans from the American Bureau of Shipping (ABS) representing 18 vessels, and another plan from DNV GL. From June 2019 to April 2020, the GAO evaluated the plans, attended SMS audits, and conducted interviews with Coast Guard, recognized organizations and operators' personnel.

Each of the 12 SMS plans reviewed by the GAO identified potential shipboard emergencies and response procedures, but they did not address all 21 emergency scenarios included in the Coast Guard's 2018 guidance. In the 12 plans, the number of unique shipboard emergencies addressed ranged from five to 16. Ship routing procedures regarding heavy-weather emergencies — the scenario in the *El Faro* sinking — were only addressed in five of the 12 SMS plans, with one other plan referencing separate heavy-weather guidance.

The Coast Guard is not aware of any plans by the GAO for additional review of SMS and emergency preparedness, Fredrickson said.

David A. Tyler

Pandemic clouds job outlook for new maritime academy grads

Courtesy Texas A&M Maritime Academy

Staff and cadets from Texas A&M Maritime Academy prepare to unload weather buoys before departing Galveston last year for training in the Pacific Ocean. The COVID-19 outbreak has clogged the once-reliable job pipeline from the nation's maritime schools for many recent graduates.

A degree from a maritime academy usually spares one from the pain of checking job websites throughout a day, hoping a suitable position has popped up since they last hit refresh.

Maritime schools have rosy job placement numbers. SUNY Maritime College boasts a near 100 percent placement rate within 90 days of graduation. California State University Maritime Academy and Massachusetts Maritime Academy both launch nearly 90 percent of their grads into jobs within six months, according to audited surveys done within the schools. Employers often scoop up students through internships and job fairs before they even graduate.

But for the class of 2020, already reeling from an upended final semester, COVID-19 has clogged the once-steadfast school-to-job pipeline. Maritime employers are slow to hire as they face operations interruptions, an uncertain economic forecast and the risk of outbreaks on ships. Seafaring natural gas jobs have stalled particularly as demand for petroleum has declined. This has left many recent graduates in the lurch.

Stephanie Robbins, 24, who graduated from Massachusetts Maritime in June, checks LinkedIn every morning. "Everything says three to five years' experience," she said with frustration. "People are not looking for college experience."

Her senior year was sidetracked when, at the start of the coronavirus outbreak in March, the school gave students 24 hours to vacate campus. She completed her degree, a bachelor's in international maritime business, remotely from her family's home in Marshfield, Mass.

Robbins thought she would move to New York City, working behind a desk to coordinate shipping and operations. Her plans have taken a turn. The company where she interned is laying off employees. The spring semester's career fair was moved online and did not net her a job. It's a state of limbo unexpected for maritime grads.

"I was focusing on schoolwork and now I am not doing anything," she said.

To bolster her resume, Robbins is considering taking the customs broker license exam, a government

certification showing a knowledge of international customs. The exam, application and background check will cost $700. Usually, a company would pay that for an employee. The exam is typically given twice a year, but the April test was canceled due to the pandemic. She's waiting for the next exam in October.

"I need to come up with a plan B," Robbins said. "I've worked in a coffee shop. I know I am always welcome back there."

Maryanne Richards, director of career and professional services at Massachusetts Maritime, said the school has held virtual workshops for the new job environment with titles like "Making the Most Out of LinkedIn" and "Virtual Job Interview Etiquette." This year, she said, maritime job searches have required greater effort.

Richards is ultimately hopeful. "A lot of our employers, if they aren't hiring now, will be hiring down the road," she said.

Some lucky students managed to snag jobs before the pandemic reshaped the world. Joe Heath, also a 2020 graduate of Massachusetts Maritime, accepted a job offer from the Military Sealift Command in February. He hoped to be placed on a ship in July or August.

Heath is aware he will be literally navigating a new world, where an increase in coronavirus cases could close a port or strand a ship.

"I don't have any hesitation," he said. "I'm young. I don't have anything holding me back. I want to get student loans paid off as quickly as possible."

Patrick Zimmer, who is a 2020 graduate of Texas A&M Maritime Academy in Galveston and its newly hired director of operations, said that maritime hiring used to be very old school. Recent graduates met employers in person at job fairs and handed them crisp paper resumes.

Students were able to make an impression. "(The employer) would remember, 'Oh, I remember him from Texas A&M; he presented well,'" Zimmer said. "A lot of people are accepting that the traditional way of job hunting will be diminished. They have accepted it will be harder."

Zimmer, who graduated with a master's degree in maritime administration and logistics after stints in the Navy and work in oil fields, said the dicey prognosis for jobs on vessels is one reason he accepted a job at the school. Now he's in the position of advising students and new graduates. Some of them, he said, may have to take deck hand jobs as opposed to jobs on bridges. Others might not be hired for any job until the situation has stabilized.

As for the long term, he is unsure what to tell students, as the future is as murky to him as it is to anyone.

"I don't think things will go back to normal soon," Zimmer said about job searches. "There is hope everything will get to a point where it's manageable."

Nick Keppler

A century in its wake, Jones Act faces new era of challenges

One hundred years after being enacted, the Jones Act is still mired in controversy. Proponents say it protects the U.S. maritime industry from low-priced foreign competition, preserving the merchant marine and domestic shipbuilding for national defense. Detractors say it does neither, and that it leads to higher consumer costs.

Officially Section 27 of the Merchant Marine Act of 1920, the Jones Act was named for Sen. Wesley Jones from Washington state. It deals with cabotage, or coastwise trade, requiring that goods transported by water between U.S. ports be carried on vessels that are U.S.-flagged, U.S.-built, and crewed by U.S. citizens or permanent residents. It applies to shipping between ports in the contiguous 48 states and Alaska, Hawaii, Guam and Puerto Rico. Other island territories, such as the U.S. Virgin Islands and American Samoa, are exempt.

The Jones Act grew out of the U.S. experience in World War I. Vessels flagged to foreign nations were pulled out of service, leaving America without enough ships to support domestic trade. The country then embarked on a massive shipbuilding program to support the war effort.

From its inception, the Jones Act was a protectionist measure with the stated goal of providing for national defense and the growth of foreign and domestic commerce to preserve the merchant marine and the nation's shipbuilding industry. According to Mike Roberts, president of the American Maritime Partnership, national security — not competition — is the main reason the Jones Act is still relevant after a century.

"We need Americans who know how to build and operate ships, and that will never change because it provides a host of benefits to this country," he said. "The Jones Act basically says that if you want to do business (here), you have to hire American workers and obey American laws. It's really about sovereignty, and that's one of the most basic concepts of government."

Maritime laws around the world are similar to regulations for aviation and other transportation modes. A recent study found that 91 countries have some form of cabotage law restricting foreign maritime activity in their respective coastal trades.

Roberts said about one-third of the merchant mariners needed in a national defense activation would come from the domestic trades, and shipyards could build vessels as part of the industrial base built into Defense Department planning. From a homeland security perspective, the Jones Act's vessel and crew requirements protect domestic supply chains from foreign vessels and foreign mariners, he said.

Courtesy BriarCraft

***America's Finest*, a factory trawler shown under construction in 2017 at Dakota Creek Industries in Anacortes, Wash., ran afoul of the Jones Act for having too much foreign-fabricated steel in its hull. The vessel was granted a waiver two years later, allowing it to fish in U.S. waters and deliver products to American ports.**

There are provisions in the act that allow for waivers during emergencies when enough U.S.-flagged shipping capacity is not available. One example was when Hurricane Katrina struck the Gulf Coast in 2005, damaging fuel pipelines. Foreign-flagged tankers were allowed to

carry petroleum between U.S. ports to alleviate potential shortages.

"We're very vigilant about making sure that there's a genuine need before a waiver is granted," Roberts said.

One criticism of the act is that it prevents the shipment of liquefied natural gas (LNG) and liquefied petroleum gas (LPG) from ports in the Gulf to the Northeast for heating use. There are no domestic tankers available now for this service. However, if there was a market-based demand, U.S. shipyards could provide the capacity, Roberts said.

The Cato Institute, a libertarian think tank in Washington, D.C., launched a campaign to challenge the Jones Act in 2018. Colin Grabow, a policy analyst at the institute, said that the act had not kept the number of merchant mariners from declining, and it had not supported shipbuilding capacity for non-government vessels.

"We've been doing the same thing for well over 100 years, and I would think at this point that it's time to consider some kind of change," he said.

Grabow acknowledged the Jones Act wouldn't be changing imminently, as congressional support for it remains strong. It has been reported that President Trump is not a fan of the act, but so far the administration has not taken steps toward altering it.

"I'm not under any illusion that that's going to happen anytime soon, but I would like to think that there's room for some common-sense reforms," Grabow said.

Gary Wollenhaupt

Congressional medal to honor sacrifice of WWII merchant mariners

Plans to award a Congressional Gold Medal to the American merchant mariners who sacrificed so much in World War II are moving ahead after President Trump signed an authorization bill.

Following the March signing of the Merchant Mariners of World War II Congressional Gold Medal Act of 2020, the medal is being designed by the U.S. Mint in consultation with the U.S. Maritime Administration (MarAd), the Citizens Coinage Advisory Commission and the U.S. Commission of Fine Arts. Once the design is approved by the secretary of the treasury, the single collective medal will be struck by the mint. Then, the speaker of the House of Representatives will present the medal to a representative of the merchant mariners.

The Congressional Gold Medal is presented to honor those whose dedication, heroism and public service has created a lasting impact on American history.

In the meantime, on Maritime Day on May 22, the U.S. Department of Transportation and MarAd honored the men and women who serve the industry in peace and war, while paying a special tribute to the World War II merchant mariners.

"Congress and President Trump's awarding of the Congressional Gold Medal to World War II merchant mariners is a fitting tribute to those who served with valor and distinction," said Maritime Administrator Mark Buzby. "With the memory of the sacrifices of World War II merchant mariners always with us, we honor their patriotism and service on this and every Maritime Day."

This year marks the 75th anniversary of the Allied victory in World War II. During the war, American merchant mariners sailed seas prowled by enemy submarines and surface warships to maintain the vital supply lines fueling the worldwide effort to defeat the Axis powers.

Bound for the United States after a supply voyage to Murmansk, Russia, a Liberty ship sails through heavy swells in the Arctic Ocean in February 1945. A recruiting poster reflects the need for new volunteers to deliver materiel for the Allied war effort.

Courtesy United Kingdom government/Imperial War Museums

Known as America's "fourth arm of defense," more than 215,000 merchant mariners delivered nearly 270 billion long tons of cargo to the armed forces — an average of 17 million pounds of cargo every hour, according to MarAd. In the process, the merchant marine suffered a higher per-capita casualty rate than any of the U.S. military branches. Nearly 2,000 American cargo vessels were sunk during the war, and more than 9,500 members of the all-volunteer force died.

World War II merchant marine veterans and the organizations that represent them have been lobbying for recognition ever since the fighting stopped. It took decades to

get veterans' benefits for those who served on commercial vessels. The pending honor has been praised by the veterans and their advocates.

John Pitts, president of the nonprofit American Merchant Marine Veterans, said after the bill signing that "our heartfelt thanks are bestowed on all the dedicated members, friends and supporters of the American Merchant Marine Veterans who have worked so diligently, for so many years, to provide long-overdue recognition for the service and sacrifice of the unsung heroes of WWII, the United States merchant mariner. Bravo Zulu!"

Pitts singled out for praise bill sponsors Rep. John Garamendi, D-Calif., and Sen. Lisa Murkowski, R-Alaska, along with the president.

Dru DiMattia, vice president of the veterans group and a member of the MarAd design committee for the medal, said the process will take a year. "There are plans for a big event next year," he said.

The medal issued to honor every American merchant mariner from the war will be displayed at the U.S. Merchant Marine Academy at Kings Point, N.Y. Copies will be available for about $50. Veterans groups are planning to purchase copies for surviving World War II veterans, who now number about 2,000.

According to the Citizens Coinage Advisory Committee, Congressional Gold Medals have been issued since the American Revolution as "the highest civilian honor … (for) national achievement in patriotic, humanitarian and artistic endeavors."

Since 1776, the medal, which initially was bestowed only on military leaders, also has been given to civilians including Winston Churchill, Bob Hope, Robert Frost, Joe Louis and Mother Teresa. •

Bill Bleyer

Towing

Story and photos by Casey Conley

The 5,500-hp *Protector*, left, idles in a turning basin on Seattle's Duwamish Waterway to make room for an outbound container barge. Capt. Doug Wingate, below, a longtime Crowley captain, steers the tugboat *Guard* while assisting the bulk carrier *Forest Trader* as it approaches a series of bridges.

Crowley crews finesse freighter stern-first down narrow Duwamish

Two Crowley Maritime tugboats guided the bulk carrier *Forest Trader* around the final turn in Seattle's Duwamish Waterway, and with that the most difficult part of the job lay behind them. The open waters of Elliott Bay were straight ahead.

"Once you get past the corner of Fisher's Mill, everyone kind of breathes a little easier," said Capt. Doug Wingate, captain of the Crowley tug *Guard*, referring to the former flour mill at the southwest corner of Harbor Island.

For the past hour, the 5,500-hp sister tugs *Guard* and *Protector* had guided *Forest Trader* stern-first down the nar-

row Duwamish. *Guard*, positioned forward of the bow, kept the empty bulker in the center of the channel. *Protector*, working centerline aft, pulled the ship along.

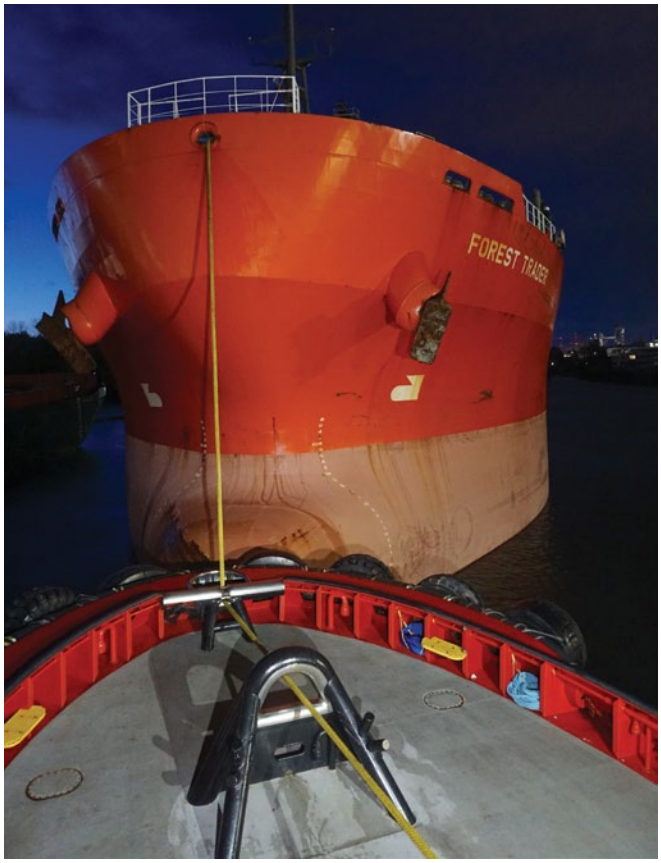
Crowley performs this type of ship-assist work once or twice a month in Seattle, and it requires skill, finesse and constant communication between the pilot and the tug captains. The Duwamish is lined with barges and maritime infrastructure — several marinas extend into the waterway, and there are back-to-back bridges — leaving little room for error.

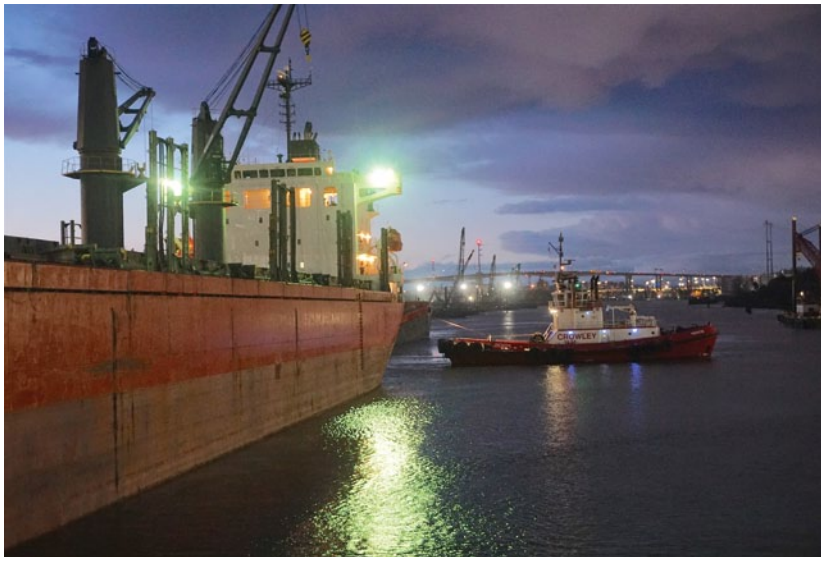
"The main challenge up there is just the space that you have to work in," said Shannon Graham, *Guard*'s chief mate. "You have a couple of choke points. There is the rail bridge and the Spokane Street Bridge that narrows things down. You might have just 15 or 20 feet on either side."

Guard got underway at about 1715 on a drizzly late February afternoon from Crowley's home base at Pier 17. The voyage took place a day before authorities announced the first coronavirus death in a Seattle suburb, signaling the first major outbreak in the United States. Still, by this point pilots and other mariners in major West Coast ports were already taking precautions against the virus.

Protector and *Guard* were built in the late 1990s at Nichols Brothers Boat Builders based on a design from Guido Perla and Associates of Seattle. The 120-foot tugs are outfitted with two Caterpillar 3606 2,250-hp engines turning Voith Schneider cycloidal propellers. Over the years, Crowley also has operated Protector-class tugs in California's busy ports.

Graham, who has spent 21 years working for Crowley and the past 13 as mate, said the vessels are well-suited for ship assist and escort. Much of Crowley's work in Puget Sound consists of escorting tankers and assisting containerships. The company competes with Foss Maritime for most commercial ship-assist work in the sound.





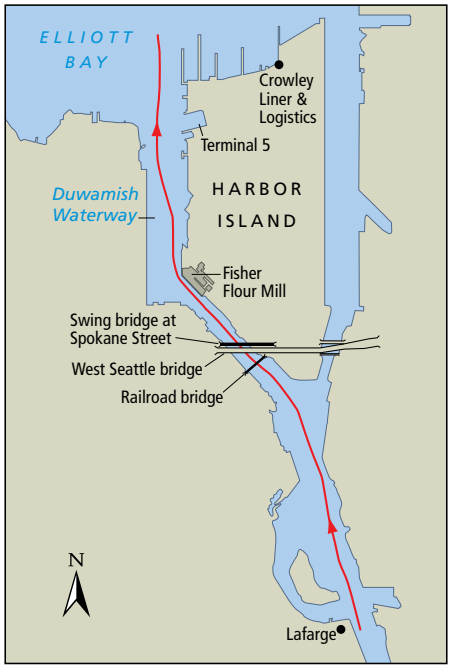
A tight responsive line is deployed by *Guard*, above, to control *Forest Trader*'s bow during the sternward transit out the Duwamish. At left, *Protector* helps pull the bulk carrier away from the Lafarge cement terminal just before sunset.

"(*Guard*) is highly maneuverable, so it is really good for ship assist to get into tight quarters," Graham said. "For turning a ship that's going above 3 knots, you can use the skeg and go indirect, and it lays the boat over and you have the weight of the boat, and the skeg, producing that tonnage."

The trip from Pier 17 to the Duwamish is a short one. Graham steered the vessel around Harbor Island, home to Seattle's main container port and much of its maritime infrastructure. The tug rounded the island's northwest corner, past Vigor's massive shipyard, then slowed as it approached the Spokane Street swing bridge to wait for *Protector* to arrive from Tacoma.

"Anytime you are working together and you have to go through a bridge, you want to go together so they don't have to open twice and stop traffic, especially at 5 o'clock," Graham said.

Before long the Spokane Street Bridge and narrower Duwamish River Bridge, which carries rail traffic, were open. The Western Towboat tugs *Mariner* and *Western Titan*, which were outbound on the Duwamish with the cargo barge *Anchorage Trader*, held up south of the bridges so the Crowley tugs could pass. *Guard* and *Protector* returned the favor soon afterward, moving into a turning basin while the Western tugs chugged toward Elliott Bay with the loaded barge headed to Alaska.



***Forest Trader*'s transit on the Duwamish is depicted by a red trackline from the Lafarge cement terminal. Below, *Guard*'s 9-inch Samson line is stretched before spinning the bulk carrier in Elliott Bay. Downtown Seattle is in the background.**

The 580-foot Panama-flagged *Forest Trader* awaited the Crowley tugs a mile or so upriver at the Lafarge cement terminal. Don Soriano, a Puget Sound pilot already aboard the ship, dropped a bundle of newspapers onto *Guard*'s aft deck as it came alongside. The paper drop is something of a tradition among the region's "old school" pilots, said Wingate, who relieved Graham at 1800. In a bygone era before cellphones and wireless internet, daily

The stern is the working end for Protector-class tugboats *Guard* and *Protector*, which has its line on the stern of *Forest Trader*.

newspapers provided tug crews with a link to the outside world.

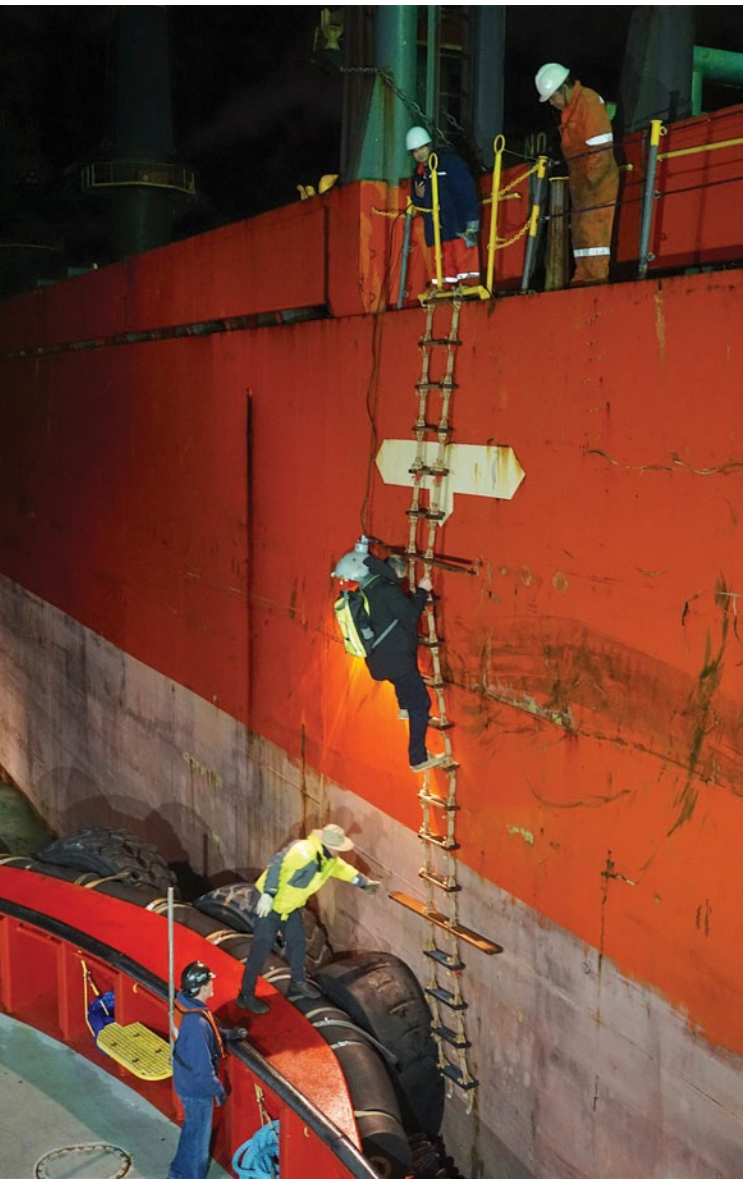
The COVID-19 pandemic has threatened the practice, or at least put it on hiatus, as many crews are declining the newspapers, said Porter Sesnon, Crowley's general manager of ship assist and escort in Seattle.

Protector-class tugboats operate a little differently than modern z-drive tugs. First, the stern is the working end, with the exhaust stacks positioned forward of the pilothouse. The operator drives the vessel standing up, typically facing aft, with one hand on the steering wheel and the other on levers controlling thrust. Graham likened it to driving a forklift.

> On the way back to the dock, vonBrandenfels discussed heightened concerns about coronavirus among some pilots and foreign mariners arriving in U.S. ports.

Guard's chief engineer Randy Walker, a recent transfer from Valdez, Alaska, got a line on *Forest Trader*'s bow while Wingate awaited orders from the bridge. Puget Sound pilots were joined by multiple trainees looking for experience with the sternward transit out the Duwamish.

It was approaching dusk when pilot trainee Capt. Matt Miller ordered *Guard* and *Protector*, positioned with a line on the stern, to back easy off the dock. It didn't take long to bring the empty ship into the channel. "Can I get both boats to stop and stretch?" Miller asked once the bulker was in position.



Puget Sound Pilots President Eric vonBrandenfels, standing on *Guard*'s fendering, assists pilot trainee Capt. Matt Miller down the ladder from *Forest Trader*. *Guard* chief engineer Randy Walker prepares to help both men onto the tug.

Guard took a centerline position in front of the bow, while *Protector* lined up centerline aft. The transit required *Protector* to pull the ship toward Elliott Bay while *Guard* maneuvered the bow to keep it squarely within the channel. Miller alternated between requests for *Protector* to back easy or back one-third for much of the voyage, orders that kept the vessels moving at about 2 knots.

Miller used downtown Seattle's skyline to orient *Guard*'s position. If he wanted the ship to move toward the river's east bank, he'd call "toward town," while a move toward the left bank meant an "away from town" request. Miller confirmed the process before *Forest Trader* got underway.

The Markey winch on *Guard*'s stern kept the 9-inch Samson AmSteel-Blue hawser line tight and responsive while Wingate steered the tug. Depending on the command, Wingate moved constantly from one side of the bulbous bow to the other. The actions kept the bow, and consequently the stern, well inside the channel.

"I like a tight line for the quick reaction," he said as he maneuvered around the bow. "I like to give it a little pull and put a little tonnage on the line. It kind of helps center the bow and holds it in the center of the waterway."

"The line is doing most of the work right now," he added. "If you see the tires (fendering) squish a little bit, that means we are pushing a little."

The vessels slowed as they approached a turning basin alongside Ash Grove Cement, where the Duwamish splits into a "Y." *Protector* slowed to about 1 knot while *Guard* pulled the ship's bow more or less east "toward town." *Forest Trader* would pass through the west side of the split, through a series of bridges barely 500 feet apart.

The 92-year-old Duwamish River Bridge was first. The opening of the steel bascule railroad span is just 150 feet wide. *Forest Trader*, meanwhile, has a 94.5-foot beam. Miller moved to a bridge wing for a better look during the transit. He also relied on *Guard* and *Protector* to check distances from the bridge's protective walls.

The railroad bridge leads right to the Spokane Street Bridge, which carries vehicular traffic toward the port and into neighborhoods in West Seattle. The swing bridge is comparatively roomy with a 250-foot opening. Miller, with help from both tugs, got through both spans without issue.

Protector, helmed by Capt. Dave Williams,

backed easy through the bridges. The former Fisher flour mill was about 1,500 feet ahead. A minute or so later, *Forest Trader* rounded the elbow turn leading to the wider portion of the west waterway. The radio chatter quieted considerably.

"Out here there are not a lot of commands," Wingate said as the vessels passed Vigor's yard.

Wingate is a veteran captain who has spent more than three decades with Crowley. He came aboard *Guard* four years earlier after stints on other tugs, including the z-drive *Tioga* — a vessel he likened to a "hot rod."

"Years ago I would have said, 'I love the way a boat drives.' Now, I like the way you live on a boat, the comfort of a boat. This is a comfortable boat to work on," he said of *Guard*.

AB Benge Deraco, who was off watch down below, finished making the crew dinner as *Forest Trader* continued toward open water. The menu for that evening consisted of Chilean sea bass, sauteed prawns, rice and a garden salad.

Protector pulled *Forest Trader* around Harbor Island into Elliott Bay, then hauled in its line. Wingate stretched *Guard*'s line to about 150 feet and then backed the tug, spinning *Forest Trader* nearly 180 degrees for the northbound transit out of Puget Sound.

Guard stood by for the pilot transfer after *Protector* moved on to its next job. Capt. Eric vonBrandenfels, president of the Puget Sound Pilots, climbed down the ladder first as chief engineer Walker helped him aboard the tug. Miller followed moments later. Another pilot stayed aboard for the bulker's transit to Port Angeles, where the pilot station is located.

On the way back to the dock, vonBrandenfels discussed heightened concerns about coronavirus among some pilots and foreign mariners arriving in U.S. ports. He described steps the pilots were taking to stay safe from a virus that, at that point, was still a mystery.

Little did anyone know, on that late February night, how much the nation, the world and the maritime industry were about to change. •

U.S. Coast Guard photos

Tending the Junipers: Upgrades inject new life into legacy cutters

by Peter Ong

At the U.S. Coast Guard Yard in Curtis Bay, Md., workers have the laborious task of performing 12 months of maintenance on each of the service's legacy 225-foot seagoing buoy tenders at an average cost of roughly $12 million per hull.

All 16 Juniper-class cutters (WLB 201-216) are scheduled to be dry-docked for a service life extension to keep them sailing for another 15 years.

While private commercial shipyards fulfill nearly 85 percent of the Coast Guard's planned depot-level maintenance requirements — including dry-dock availability, dockside maintenance and emergency repairs — Curtis Bay has proven to be an ideal facility for conducting life-cycle repairs and upgrades.

Civilian employees remove the propeller shaft of the 225-foot *Hollyhock,* above, during dry-docking at the U.S. Coast Guard's shipyard in Curtis Bay, Md., in 2013. The buoy tender, built in 2003 by Marinette Marine and home-ported in Port Huron, Mich., is one of 16 Juniper-class cutters scheduled for a 15-year service life extension at Curtis Bay, left.

"In particular, the ability to manage configuration control and assess the condition of the entire fleet at an organic Coast Guard facility is invaluable to ensuring continuity in legacy asset sustainment," Coast Guard officials and program managers told *Professional Mariner*.

Curtis Bay's history of success with this type of endeavor includes the 225-foot buoy tender service life extension program (SLEP); the 210-foot medium endurance cutter

midlife maintenance availability project; the 210-foot and 270-foot medium endurance cutter mission effectiveness project (MEP); the 140-foot icebreaking tugboat SLEP; and the 110-foot patrol boat MEP.

"All of these projects demonstrate the Coast Guard yard's ability to efficiently plan and execute major ship overhaul projects," service officials said. "Additionally, Coast Guard Project Resident Office (PRO) Baltimore is located on site (at Curtis Bay) and is able to complete numerous inherently governmental functions."

Juniper-class vessels are responsible for maintaining short- and long-range aids to navigation (ATON) such as fixed structures and buoys. The multi-mission cutters conduct maritime law enforcement, Homeland Security and Department of Defense operations, and provide search-and-rescue assistance should the need arise. These 225-foot seagoing tenders are not to be confused with the 175-foot coastal buoy tenders (WLM) of the Keeper class.

Ships in the Juniper class were launched and commissioned from 1995 to 2004. The first vessel in the series, *Juniper*, is 25 years old, while the average age is about 20 years. The cutters are equipped with two Caterpillar 3608 diesel main engines, a single driveshaft, a controllable-pitch propeller, and bow and stern thrusters. A GPS-linked dynamic positioning system (DPS) allows the vessels to approach, maneuver and automatically maintain position when servicing buoys, and a sharply angled bow allows them to conduct icebreaking operations.

Routine work through the midlife maintenance availability (MMA) process is performed at recurring intervals. Examples include eight- to 12-week drydockings every four years, or eight-week dockside availability two years after a dry-docking. Routine maintenance is considered operational-level work that can be performed by a ship's crew, sometimes with support from maintenance augmentation teams.

Petty Officer 1st Class Rebecca McMillen-Eickhoff, right, a damage-control manager aboard *Hollyhock*, grinds a fitting on the cutter at Curtis Bay in 2013. At left, the Juniper-class *Willow* undergoes maintenance at the yard in 2017 alongside *Sturgeon Bay*, a 140-foot Bay-class cutter.

Juniper class at a glance

- Length: 225 feet
- Beam: 46 feet
- Draft: 13 feet
- Displacement: 2,000 tons full load
- Propulsion: Two Caterpillar 3608 diesel engines, 3,100 hp each
- Speed: 15 knots
- Icebreaking capability: 14 inches of freshwater ice at 3 knots; 36 inches by backing and ramming
- Range: 6,000 nautical miles at 12 knots
- Buoy deck area: 2,875 square feet
- Crew complement: 48
- Builder: Marinette Marine

"A major maintenance program (such as the MMA for the Juniper class) consists of repairs considered depot level beyond the capability of the ship's force and requiring depot maintenance facilities to conduct," Coast Guard officials said. "These include dry-docking, major system upgrades, structural repairs and hull painting. SLEP is intended to extend the expected service life of an asset, while MMA is designed to ensure the asset reaches its intended service life."

Even with the COVID-19 outbreak, the Coast Guard closely monitors progress at Curtis Bay and follows federal guidance and best practices. Juniper-class work involves topside preservation; control, propulsion and alarm systems; buoy crane and deck equipment; HVAC, watermaker and refrigeration systems; renewal and replacement of worn-out steel; new CCTV systems; replacement of boat-launching davits; new buoy deck lighting; stability assessment; and updates to information systems to ensure their reliability and effectiveness against cyber-threats. Buoy ports also are coated with new paint that is more resilient against impacts while conducting ATON operations.

The cutter *Fir*, above, passes Tillamook Rock Light on the Oregon coast. Like its Juniper-class sisters, *Fir* has a dynamic positioning system for safer and more accurate tending of aids to navigation. At right, mariners on the Juniper-class *Oak* place seasonal buoys in Buzzards Bay in March 2017.

"Some areas that are typically associated with a service life extension project that were not upgraded or modernized during (this MMA) include the galley, berthing areas, mess deck and crew's lounges," Coast Guard officials said. Ships in the Juniper class were built after lead and asbestos were known to be hazardous, so the cutters do not require lead or asbestos remediation.

Each cutter has a standard work package of repairs. "Age, operating area and material condition may require some cutters to need additional repairs," Coast Guard officials said. "During the planning process, that standard work package is reviewed and adjusted as necessary to accommodate the needs of the particular cutter. Many of the components being replaced or installed on the buoy tenders are readily available, which is by design as it makes the (WLB) cutters more supportable in the future."

The Coast Guard is continuously adapting to new technology, including robotics and automation. Cutters in the Juniper class reflect the advancements, with dynamic positioning perhaps the most important improvement. "Using this technology, the crews are able to maintain the vessel's position within a 10-meter circle in winds of up to 30 knots and waves of up to 8 feet," service officials said.

As of mid-May, there were no ongoing Coast Guard acquisition initiatives to replace the Juniper-class buoy tenders. Therefore, the service life upgrades should ensure that these 225-foot cutters serve well into the next decade.

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At Work

Another day in paradise for agile island tug

Story and photos by Casey Conley

Capt. Curtis Iaukea steered *Tiger 21* toward Honolulu Harbor on a postcard-perfect Hawaii afternoon. The job awaiting them was straightforward: shifting a Sause Bros. barge a few hundred yards from one berth to another.

The 3,600-hp *Joseph Sause* made up to *Hilo Bay*'s starboard hip before *Tiger 21* arrived. The Sause tug would provide the muscle on the sternward transit. *Tiger 21* would handle the barge's bow on the run between Pier 28 and the fuel terminal at Pier 30.

"My responsibility is to pull the (bow) so we come evenly off the pier," Iaukea explained. "(*Joseph Sause*) can only really control one side. They need me to control the opposite side of the barge."

The 4,400-hp *Tiger 21* is one of more than a dozen Tiger tugs that P&R Water Taxi has built at its shipyard in Kewalo Basin, just west of Waikiki in downtown Honolulu. These nimble tugs, designed by P&R owner Charlie Pires with help from a Hawaiian naval architect, work in all of Hawaii's commercial ports. P&R also has a contract to handle Navy ships in Pearl Harbor.

This was the first time Iaukea had done this particular job since transferring from Pearl Harbor about six months earlier. He conferred with deck hands Micah Kama and Micah Makekau Keaupuni while the tug headed to Honolulu Harbor.

P&R is something of an outlier among ship-assist companies for its willingness to hire inexperienced mariners and provide on-the-job training. Iaukea joined the company almost five years ago after working for a tour boat company. Keaupuni is related to another P&R employee but had no experience when he hired on in 2016.

"They hired me right off Waikiki Beach," Iaukea said. "I didn't get to drive for a few years, but ... they gave me a shot and were willing to teach me."

The company has about 60 mariners working across Hawaii. Nearly half of them joined with no maritime experience, according to Kate Keeler, a company spokeswoman. "I don't know how the rest of the industry does it, but we find great local talent in attitude and aptitude," she said.

Tiger 21 SPECIFICATIONS

Owner/operator: P&R Water Taxi/P&M Marine Services, Honolulu, Hawaii
Designer/builder: P&R Water Taxi and Stoddard Marine Design, Hilo, Hawaii/Kewalo Shipyard
Dimensions: L: 75' B: 33' D: 11.5'
Mission: Ship assist and barge handling
Crew size: Three

PROPULSION
- (2) Caterpillar 3516 Tier 3 engines, 2,200 horsepower each
- (2) ZF Marine Series 7000 z-drives
- (2) John Deere 4045TF 65-kW auxiliary generators
- Bollard pull: 53 tons (estimated)
- Vessel speed: 10 knots

CAPACITIES
- Fuel: 9,000 gallons
- Water: 800 gallons
- Lube oil: 200 gallons

DECK EQUIPMENT
- Shipyard-built custom hydraulic double-drum winches
- Cordage: Cortland Plasma
- Fendering: Custom yard-built package

NAVIGATION/COMMUNICATIONS
- Furuno 1935 X-band radar
- Garmin GPSMAP electronic chart display
- Ritchie Navigation compass
- Em-trak AIS
- (2) Standard Horizon GX6000 radios

Tiger 21, opposite, gets underway from P&R Water Taxi's Honolulu headquarters at Kewalo Basin, not far from the iconic Waikiki Beach.

P&R port Capt. Eric Tang is a prime example. He planned on a career driving buses around Oahu when Pires offered him a job 31 years ago. Keeler, a mariner herself who operated vessels in the Marshall Islands, described Tang as an excellent instructor, a kind man and one of the finest boat operators she's ever met.

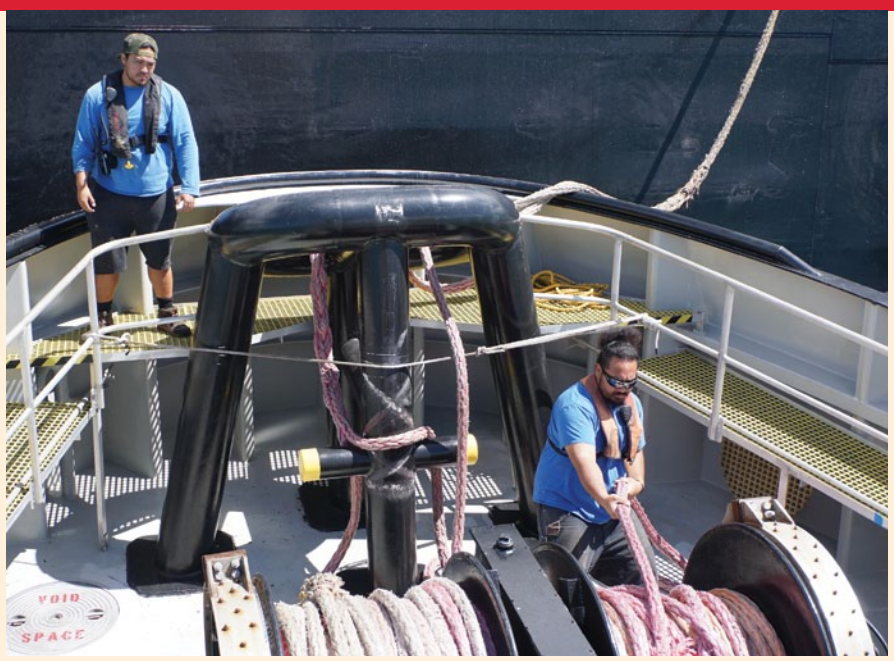
"I believe he has trained every captain currently working at P&R, and he never attended an academy," she said.

After arriving in Honolulu Harbor, Kama and Keaupuni got a line on *Hilo Bay*'s port bow. Responding to instructions from the Sause crew, *Tiger 21* pulled the bow off the wall at Pier 28.

The tow had to clear the Sause tugboat *Mary Catherine* tied up at Pier 29 en route to Pier 30. Lookouts on the barge called out distances as the vessels approached the moored tug.

Iaukea nudged *Hilo Bay*'s bow toward the dock at Pier 30, a few hundred feet aft of *Mary Catherine*. The empty barge moved with little effort. Before long, it was safely in position at the terminal.

On the way back to Kewalo Basin, Iaukea praised the year-old tug's responsiveness and agility, particularly when moving side to side along a ship's hull. He lamented not being able to show off those capabilities handling *Hilo Bay*. That particular job, he said, is about as easy as it gets for P&R crews. •



Above, P&R deck hands Micah Makekau Keaupuni, left, and Micah Kama work together to get a line onto *Hilo Bay*'s port bow. Tiger tugs have a flat deck and a raised platform at the bow to facilitate line handling. Capt. Curtis Iaukea, below, steers *Tiger 21* toward Honolulu Harbor. *Tiger 22* joined the fleet in spring 2020, and two more sister tugs are under construction.

Tasked with helping shift the barge *Hilo Bay*, the tug *Joseph Sause*, above, backs toward Honolulu Harbor's Pier 30. P&R Water Taxi is based in Kewalo Basin, below, where it builds its Tiger tugboats that work across Hawaii.

Casualties

Bulk carrier damages pier at Soo Locks after losing propulsion

A Great Lakes bulk carrier lost propulsion while approaching the Soo Locks in Sault Ste. Marie, Mich., and struck a pier separating two lock systems.

The incident happened at about 0300 on July 5 as *Atlantic Huron* prepared to enter Poe Lock from the west. The bulker, traveling at almost 7 knots, hit the west center pier separating the north and south canals.

Lt. Dan Peters, lead investigator for Coast Guard Sector Sault Ste. Marie, said *Atlantic Huron*'s crew dropped anchor before the impact. The ship struck the pier at a "glancing angle" rather than head on, he added.

The 736-foot ship "had a momentary loss of propulsion" before striking the wall, Peters said. Specifics about the propulsion failure are subject to an ongoing investigation and could not be released.

The Soo Locks opened in 1855. They are located in the St. Marys River at the northern end of Michigan's Upper Peninsula, at the border with Ontario, Canada. Poe Lock opened in 1969, just north of MacArthur Lock. These two locks are the primary connection between Lake Superior and Lake Huron.

About 4,500 cargo ships transit the Poe and MacArthur locks each year carrying 80 million tons of material, according to the U.S. Army Corps of Engineers, which operates the locks. Another 2,500 recreational and tour boats move through the facility. Nearly 90 percent of the commercial tonnage passes through Poe Lock, said Kevin Sprague, area engineer for the Army Corps.

U.S. Army Corps of Engineers/Pverdonk

A freighter transits west through Poe Lock as another waits behind it. *Atlantic Huron*, shown below on the St. Clair River, struck the west end of the pier separating Poe from Davis Lock (second lock from the top). MacArthur Lock is below Poe.

The Canada-flagged *Atlantic Huron* had departed from Thunder Bay, Ontario, on Lake Superior without cargo. It approached Poe Lock from the west for downbound transit. The ship struck the south face of the west center pier, pushing the concrete pier cap out of position. Mooring bollards installed within the concrete pier also were dislodged.

"It moved about 6 inches, and that is a problem," Sprague said of the concrete pier cap. "When the concrete shifted, it pushed the bollards."

The extent of any damage below the surface was not immediately available. Sprague expected divers to begin their survey in mid-July to determine any issues to the sheet pile face. The total cost of repairs, he said, was not yet known and would depend on what the divers find.

Ship operator Canada Steamship Lines arranged for tugboats to move *Atlantic Huron* out of the canal leading toward the locks. The tugs towed the ship back into Canadian waters. Surveyors also scanned the river bottom to make sure the anchor did not drag any boulders into the 30-foot-deep channel.

"Ship traffic was blocked for several hours, but they were able to move (*Atlantic Huron*) to a different location to enable ships to come through," Peters said.

The 36-year-old self-unloading bulker sustained dents on the port bow where it made contact with the wall. The hull did not breach, and there was no pollution. No one on board was injured.

Canada Steamship Lines declined to comment during the ongoing investigation. As of July 14, AIS data showed the vessel underway from Sault Ste. Marie back to Thunder Bay. It is not clear if the vessel needed immediate repairs.

Casey Conley

Bulkers hit nearly head-on in Welland Canal accident that goes viral

Two bulk carriers preparing to meet in Ontario's Welland Canal collided nearly head-on after one ship crossed into the other's path.

The upbound bulker *Alanis* and downbound bulker *Florence Spirit* collided July 11 at 1555 at canal mile 15 near Port Robinson. Videos of the slow-speed collision shared widely through social media appear to show *Florence Spirit* veering across the waterway into *Alanis*' path. No one on either ship was injured and no pollution was reported from the incident.

Courtesy Alex Stewart/Facebook

A photo taken from a Facebook video shows *Florence Spirit* and *Alanis* colliding in the Welland Canal on July 11. *Florence Spirit* deviated to port before the impact, cutting in front of *Alanis* on the canal's west side.

"*Alanis* maintained her heading and *Florence Spirit* deviated from its path to cross in front of the *Alanis* path," said Jean Aubry-Morin, vice president of external relations for the St. Lawrence Seaway Management Corp., the Canadian agency that manages the binational waterway with the United States.

Transport Canada is overseeing the incident investigation, with assistance from the Transportation Safety Board of Canada (TSB). Transport Canada declined to comment on the possible cause, citing the ongoing investigation.

The 453-foot *Alanis*, operated by dShip Carriers and registered in Antigua and Barbuda, was carrying wind turbine parts bound for Duluth, Minn. McKeil Marine operated the 447-foot Canada-flagged *Florence Spirit*, which was carrying coal bound for Quebec City. Neither company responded to inquiries about the collision.

Video recordings capturing the final moments leading up the crash appear to show *Florence Spirit* turning to port across the Welland Canal. The ship moved from east to west, cutting in front of *Alanis* sailing on the canal's west side. *Florence Spirit*'s starboard bow bulwark made contact with *Alanis*' starboard bow, near its anchor pocket.

Florence Spirit drifted against the western edge of the canal after impact. *Alanis* came to a stop and then appeared to move sternward under its own power.

Key details about the incident were still unknown at press time. For instance, it's not clear if the ships made any meeting arrangements before the collision, or whether either ship had mechanical or steering issues preceding the impact.

Aubry-Morin described typical passages between ships in the area as routine. Skies were overcast but visibility was good. Both vessels also were operating within the canal's prescribed speed limits, he said. Each vessels' speed at impact was not available.

The Welland Canal is almost 27 miles long, with eight locks from end to end. It provides a critical shipping link between Lake Erie and Lake Ontario within the Great Lakes-St. Lawrence Seaway System. There are about 3,000 ship transits a year on the canal, and roughly 20 percent of those cases involve meetings between ships. The canal measures 310 feet across in most places.

"It is a very routine maneuver to meet at that point," Aubry-Morin said. "It is not an area that is unsafe by nature."

Canadian Seaway authorities, he added, have determined the collision was not caused by traffic management procedures. "It is purely a maneuver between two vessels passing each other," he said.

Alanis continued traveling inbound to Wharf 12 in Port Colborne, at the southern end of the canal, for further inspection. *Florence Spirit* backed under its own power to Wharf 10, roughly one nautical mile from where the vessels collided. The incident caused a minor traffic disruption in the canal.

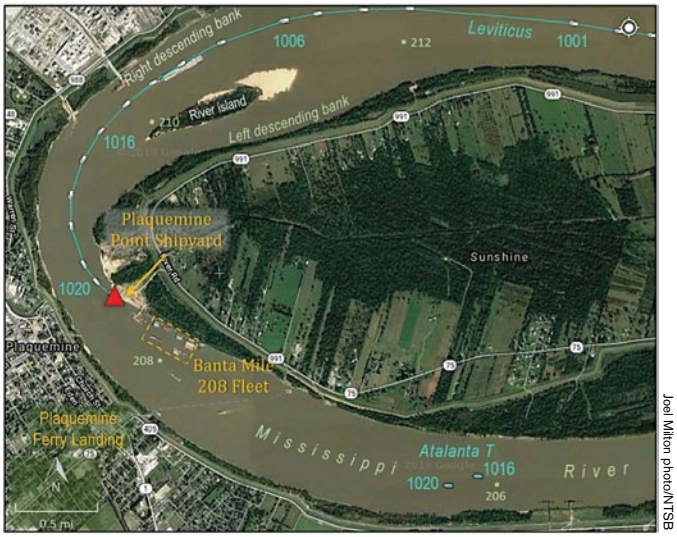
Both ships sustained hull damage at the bow above the waterline, but details and estimated repair costs were not available.

Casey Conley

Apprentice steersman being trained when tow hit moored barges

A towboat pushing six barges down the Lower Mississippi River struck moored barges at a shipyard near Sunshine, La., causing 11 empty shipyard barges to break free. An apprentice steersman had turned over the helm just before impact.

The 147-foot *Leviticus*, with retractable pilothouse lowered, docks with a barge at Louisiana's Southwest Pass. A photo from the NTSB report shows the trackline of the tow in the 20 minutes preceding the accident at Plaquemine Point Shipyard, based on the towboat's AIS data.



Joel Milton photo/NTSB

The incident happened at about 1020 on March 7, 2019, at mile 208.5 as the towboat *Leviticus* prepared to meet an upbound tanker. Chem Carriers' Plaquemine Point Shipyard used the 11 barges for vessel cleaning and repair work. Ten shipyard workers suffered minor injuries.

National Transportation Safety Board (NTSB) investigators said the head of *Leviticus*' tow became mired in an eddy in a challenging bend at Plaquemine Point. The agency said a trainee steering the tow lost control as it approached the shipyard.

The captain's decision to allow the trainee to navigate the challenging section of river while it was in major flood stage was the primary cause of the incident, the NTSB said.

"The captain did not realize the tow was caught in an eddy and headed toward Plaquemine Point Shipyard until less than a minute before the accident," the agency said in its report, noting that by then it was too late to avoid the impact.

The captain, four days into a 28-day rotation, tested positive for marijuana metabolites during a post-accident screening. Vessel owner Kirby Inland Marine immediately fired him and the Coast Guard revoked his license. A Kirby spokesman did not respond to an inquiry about the incident or the NTSB findings.

The 4,600-hp *Leviticus* had a tow loaded with crude oil in a two-wide, three-deep configuration on the morning of the accident. The captain, who the NTSB did not identify, had 25 years of maritime experience. He had trained 10 steersmen for Kirby during the previous seven years. The trainee steersman at the helm during the incident was a 2017 graduate from a maritime academy.

The captain and trainee started their six-hour morning watch at 0500. The river gauge at Baton Rouge, about 20 miles upriver, showed 43.4 feet. The river currents averaged 4.1 mph, with some areas reaching 8.7 mph.

The trainee had the controls when the tow approached a series of sharp bends starting near mile 225. According to the NTSB, the tow became caught in an eddy at Manchac Point, located at mile 215 just upriver from Plaquemine Point, and the captain had to intervene.

Leviticus' captain and its pilot, who had 40 years of experience, were in the wheelhouse as the

tow approached Plaquemine Point. Based on their guidance, the steersman arranged over radio for a starboard-to-starboard meeting with the upbound tanker *Atalanta T*. A pilot from the New Orleans-Baton Rouge Steamship Pilots Association (NOBRA) controlled the ship at the time.

The towboat's captain and pilot warned the steersman about the challenging currents and eddy at Plaquemine Point. They also advised the steersman to avoid those currents by staying closer to the point. The steersman spoke with the NOBRA pilot again over radio to confirm meeting arrangements as he navigated the bend.

Leviticus' pilot noticed the tow sliding into the bend, away from the preferred path closer to the point. The captain issued a series of rudder and throttle orders to get the tow under control ahead of the *Atalanta T* meeting. Aboard the tanker, the NOBRA pilot radioed, "Hey *Leviticus*, let me know when you got your slide in check and I'll come ahead."

The steersman on *Leviticus*, still manning the controls, asked the captain, "What do you want me to do?" The captain replied, "I don't know," and then took the controls from the steersman, the NTSB said.

The trainee told investigators he believed the head of the tow was caught in an eddy as it rounded the bend — details he did not share with the captain or pilot.

Leviticus' port lead barge, *Kirby 27781*, struck a moored barge at an upper section of Plaquemine Point Shipyard at 1020, causing the barge and five others to break free. The *Leviticus* tow then pushed the barges 230 yards downriver to a lower section of the shipyard used for vessel repairs. The tow hit barges at the lower shipyard at 1021 and five more broke away. Two of the barges hit an anchor buoy at the Banta Mile 208 fleet just downriver. The fleet's assist tugs rounded up the drifting barges.

Twenty-seven shipyard workers who were on the barges escaped before impact, but 10 reported injuries requiring first aid, the NTSB said. *Leviticus* did not sound its alarm as it approached the shipyard.

The captain described the trainee as "a natural" who showed real promise, yet he also acknowledged the trainee had difficulty navigating the bend just upriver from Plaquemine Point. The captain felt removing the trainee from the controls after that hang-up might hurt his confidence, the report said. But the captain later told investigators he should have helmed the transit around Plaquemine Point.

With the shipyard on the left bank and *Atalanta T* approaching along the right bank, there was little room for error in the 3- to 6-mph current around Plaquemine Point.

"(The captain) intended the steersman 'to skirt' the edge of the eddy he anticipated just upriver from Plaquemine Point on the left descending bank, with about half of a barge width in the eddy," the report said. "When the captain relieved the steersman at the helm station, however, he realized the head of the tow was not coming out of the eddy. He described the eddy as being lower, farther out from the bank, and stronger than he expected."

Leviticus' eight-person crew was tested for drugs and alcohol at about 1300 on the day of the accident. All tested negative except for the captain, whose drug screening showed 27 nanograms per milliliter of marijuana metabolites (THCA), nearly twice the level allowed.

The NTSB report said inactive metabolites can show up in urine for days or weeks after the last use of the drug. It said the positive test did not necessarily reflect recent marijuana consumption.

Damage to the Plaquemine Point Shipyard barges ranged from a 20-by-12-foot hole to dents in the hulls. In addition, anchors were lost. Total shipyard damage was estimated at $520,000. The yard was closed and reopened five months later after high-water conditions subsided.

The lead barges of the *Leviticus* tow sustained $19,500 in damage that consisted of a small hull penetration, scrapes and damage to a winch. The NTSB said the cargo tanks in the double-hulled barges were not penetrated, and no pollution occurred.

Casey Conley

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Ship's turn off dock, not upriver first, cited in Louisiana bridge strike

Dank Silver loaded clean product at a refinery near Donaldsonville, La., and prepared to sail down the Lower Mississippi River to the Gulf of Mexico. Getting there meant coming off the dock and spinning 180 degrees in the swollen, fast-moving current.

A pilot from the New Orleans-Baton Rouge Steamship Pilots Association (NOBRA) was aboard to guide the 600-foot tanker downriver. He had completed similar jobs from the same refinery dock at least 10 times in his 14-year career, some during high water.

This one didn't go as planned. The ship became caught in the 5- to 6-knot current and struck a support pier for the Sunshine Bridge about a mile downriver from the refinery. The impact occurred at 1322 on June 16, 2019, with total damage to the ship and bridge exceeding $4.5 million. No pollution or injuries were reported.

Investigators from the National Transportation Safety Board (NTSB) suggested the NOBRA pilot never gained full control of *Dank Silver* when starting to head downriver.

"Ultimately, because the pilot decided to turn the ship immediately off the dock rather than heading upriver to turn, he had less distance to gain control of the movement of the ship above the bridge," the NTSB said in its accident report.

The NOBRA pilots declined to comment on the agency's findings.

The Marshall Islands-flagged *Dank Silver* arrived at the Shell Convent refinery (formerly Motiva refinery) on June 13 to load refined products from berth No. 2. The Lower Mississippi was in a period of prolonged high water. The river gauge at Donaldsonville, six miles upriver, measured 31.3 feet — well above the flood stage of 27 feet.

The pilot boarded the ship at 1212 on June 16 and began the standard master-to-pilot exchange. The pilot later told investigators he intended to pass under the 750-foot-wide channel span of the Sunshine Bridge eight-tenths of a mile downriver.

The ship's voyage data recorder (VDR) caught much of the dialogue between the master and pilot. However, investigators could not locate discussion about the intended path under the bridge. The ship's trackline data appeared to confirm the pilot's account, the NTSB said.

Given the high water and fast current, the 6,000-hp conventional tug *Crosby Crusader* and 4,200-

Courtesy Bill Word/Facebook

Dank Silver **plies the Houston Ship Channel in December 2018. At left, a cellphone photo posted on social media shows the tanker striking a support pier on the Sunshine Bridge near Donaldsonville, La., on June 16, 2019.**

hp conventional tug *Ned Ferry* held *Dank Silver* against the terminal during loading. The 5,200-hp z-drive tug *Point Clear* relieved *Crosby Crusader* before departure, taking position at the tanker's port bow. *Ned Ferry* stayed at the port quarter but never got a line onto the ship.

At 1242, before *Dank Silver* got underway, *Point Clear*'s captain asked whether the pilot planned to bring the ship upriver before turning 180 degrees. "Negative," the pilot responded, according to the report. "We'll go right here."

The last lines let go about 30 minutes later, and the pilot issued a series of engine and rudder commands intended to turn the ship around. At 1313, records show the ship turning counterclockwise to port and moving 3.5 knots over ground.

Point Clear remained at the bow to help turn the ship. The tug's 70-ton bollard pull exceeded the 55-ton limit on the ship's bitts and chocks. As such, the tug could back at no more than two-thirds power during the evolution.

Dank Silver gained speed as it moved downriver toward the bridge. The pilot issued a steady stream of engine and rudder orders but soon recognized the ship was caught in the current. The ship sounded its whistle continuously in the minute leading up to impact with the bridge fender at 1322.

The bridge required $3.5 million in repairs, mostly to the fender system, while *Dank Silver* sustained damage to its hull plating and internal framing. The exterior hull breached at one of the ballast tanks. Ship repairs totaled about $1 million.

Investigators highlighted the pilot's decision not to sail upriver before turning around. The NTSB reviewed six recent undocking maneuvers by ships of similar size and draft, from the same berth, in high water conditions. They found in every case that the pilots ordered the ships to head upriver between 0.15 miles and 0.56 miles before starting their rotation.

"All the vessels used three tugs to come off the dock and turn around, and the tugs used in these maneuvers had combined horsepower ranging from 11,020 to 13,200," the NTSB reported. "The two tugs used by *Dank Silver* had a combined horsepower of only 9,400, and one tug was operating at reduced power."

The report said reduced power from *Point Clear* at the bow "reduced the speed that the tanker could be turned, so the near 180-degree turn required to head downriver took longer to complete than if the pilot had used another tug in a different location to provide more force to turn the ship faster."

The 3-year-old *Dank Silver*, operated by Oman Shipping Co., anchored downriver at mile 146.5 after hitting the bridge pier. The vessel underwent temporary repairs at anchor, then continued to Montreal to offload its cargo.

Casey Conley

Barge loses 21 containers during transit to Hilo; 12 not recovered

Twenty-one shipping containers fell overboard from a cargo barge en route to Hilo, Hawaii, and 12 sank and were not recovered.

Crew aboard the 3,900-hp tugboat *Hoku Loa* noticed toppled boxes and missing cargo from the 340-foot barge *Ho'omaka Hou* when the vessels reached Hilo early on June 22.

"There were 49 containers that were affected by the incident. Not all of them went into the water," said Coast Guard spokesman Matthew West in Honolulu, referring to 28 other containers that fell over but remained on the barge.

West said the Coast Guard and National Transportation Safety Board are investigating the incident but have not determined the cause.

Young Brothers, a Hawaii interisland transportation service regulated by the state's Public Utilities Commission, operates both vessels. The company, a Foss Maritime subsidiary based in Honolulu, did not respond to an inquiry about the incident. West said the operator is conducting its own investigation to determine what happened.

Hoku Loa and *Ho'omaka Hou* were underway to Hilo from Young Brothers' Honolulu cargo hub when the containers fell overboard before dawn. Crews reported the missing boxes at about 0430 after mooring in Hilo, the Coast Guard said. Authorities don't know where the 12 missing containers sank.

Courtesy Kaiali'i Kahele/Young Brothers

Toppled containers lean on the deck of the 340-foot *Ho'omaka Hou* in Hilo, Hawaii, on June 22. Twenty-one boxes fell from the barge while it was under tow from Honolulu by the tug *Hoku Loa*, below.

Weather conditions at the time were relatively calm near Hilo. East winds blew at about 12 mph, with isolated showers and 4-foot waves. The 24-hour transit from Honolulu, however, passes through the notoriously difficult Alenuihaha Channel.

West said the Coast Guard investigation will look into conditions en route to determine when the cargo shifted and if any containers fell overboard before the approach to Hilo Harbor.

The Coast Guard conducted an overflight on June 22 and discovered nine boxes drifting near Hilo. Eight were seen floating roughly 8 miles north of the port, while another was spotted inside Hilo Harbor. One of these containers later sank, and another washed up on a nearby beach.

Cates Marine and American Marine, both based in Hawaii, assisted with salvage operations. Cates identified and retrieved the containers, while American Marine lifted them out of the water with a 250-ton crane, according to the Coast Guard.

The service did not identify the cargo inside the 40-foot boxes, but it said none carried hazardous materials. Commercial and recreational traffic was not affected. The Coast Guard broadcast details about the incident and asked mariners to watch out for the missing containers.

Young Brothers carries much of the cargo that moves between Hawaii's islands, including personal property and vehicles, construction materials and equipment, and agricultural products. It serves each island at least once a week, while the ports of Hilo, Kahului and Nawiliwili each have multiple weekly calls from Honolulu. •

Casey Conley

Cordage innovations continue to stretch capability, durability

by Alan R. Earls

Cordage, mainly towing and mooring lines, is being required to do more in a new maritime age as cargo vessels get larger and tugboats get more powerful. In response, manufacturers have continued to innovate.

Global shipping giants Wilhelmsen and Maersk, for example, are adopting a technology called the Snap Back Arrestor (SBA) for mooring lines. Developed by Norway-based Timm Ropes, it includes a special core within the rope that elongates more than the surrounding fibers, acting to absorb and dampen the energy released when lines part under strain.

SBA is significant because mooring is one of the most dan-

Courtesy Cortland

A crewman aboard the tugboat *Henry Foss* takes in a Cortland line after working center lead forward. The company is one of North America's towing and mooring line innovators.

gerous duties for crews and port workers. Snap back accounts for 60 percent of mooring accidents, with one in seven of those incidents resulting in a fatality, according to the UK P&I Club.

Sarah Padilla, technical director at the Cordage Institute in Wayne, Pa., said there are also plenty of other new developments coming from the industry. She cited Dynamica Ropes, the Denmark-based maker of Dyneema, which has worked with partners to develop synthetic-fiber chains for anywhere traditional maritime chains are used. "These chains help with human-factor ergonomics by being lightweight, thereby reducing potential back injuries," Padilla said.

Evolving needs and solutions

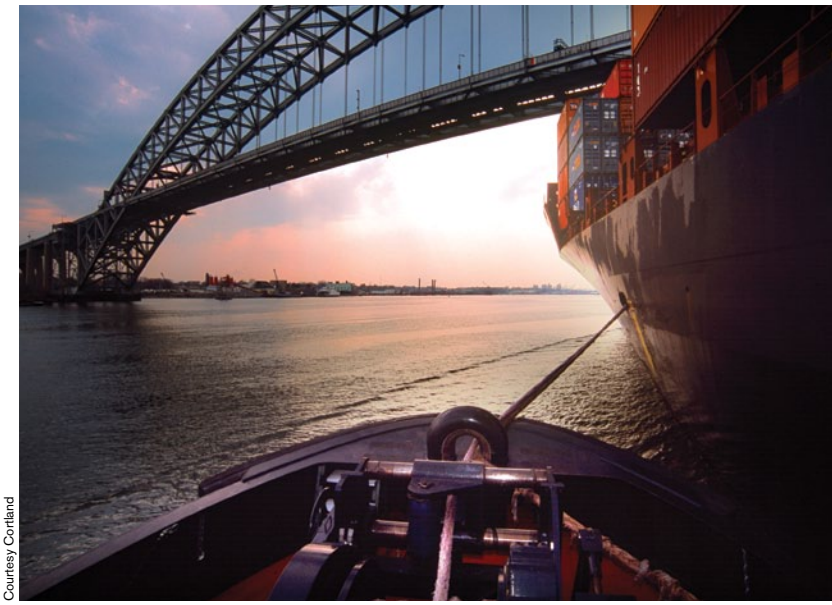
In North America, the cordage market has been dominated by a few large companies, some manufacturing here and others internationally. Among the most noteworthy and innovative players are Cortland (Puget Sound Rope) and Samson Rope in the United States, and Novabraid in Canada.

Michelle Jarvis, commercial marine product manager at Samson Rope, said customers are typically looking for durability, a predictable product lifetime, condition evaluation programs to plan replacement cycles, resilience to extreme loading conditions, reduced risk exposure for crew safety, efficiency on board, and remote support for training and inspections. Developments in the size of vessels and their use patterns have helped shape manufacturer responses to these basic needs.

For example, Jarvis cited floating storage regasification units (FSRUs) such as *Challenger*, currently the world's largest such vessel, and others that are operating as liquefied natural gas (LNG) vessels while waiting for their permanent mooring. For large FSRUs that are moored for long periods, they need a rope that is designed for optimum durability, with high-tension fatigue resistance, abrasion resistance and ultraviolet resistance such as Samson's EverSteel-X, she said.

Jarvis said Samson is seeing increased demand from operators of smaller vessels who have traditionally used steel wire but are making the switch to high-performance synthetics. In addition, a growing number of operators who were traditionally using commodity ropes (polyester-polypropylene blends) are jumping up to high-performance ropes to improve safety and extend replacement cycles.

For vessels that spend only a few days per month in port, lines are not under continuous tension and do not require the highest degree of tension-fatigue resistance. But they must be durable enough to hold up under the frequent handling required to moor and release a vessel over a long period, Jarvis said.



The tugboat *Gramma Lee T. Moran* works the flank of a containership with a Cortland line. The cordage maker mimics real-world conditions at a 600-ton tensile test bed in Houston. Courtesy Cortland

"What we are noticing more than anything is the need for a range of options to best fit the vessel, the conditions it will experience and the expected lifetime," she said.

A specific recent market driver has been the Oil Companies International Marine Forum (OCIMF) Mooring Equipment Guidelines Fourth Edition 2018 (MEG4). "That has definitely had an impact on the choices in mooring products," Jarvis said.

The changes cover design,

maintenance, user behavior, and products and services needed to support the guidelines. As a result, Samson has made large investments in a wide range of MEG4-certified products and has increased available line sizes and training, as well as service and inspection programs. These programs include fully remote options for training, inspections and consultations, which given current social-distancing needs is very timely, Jarvis said.

In parallel with OCIMF's release of its Static Towing Assembly Guidelines in April, Samson recently completed a successful trial and technical study in a static towing application, and has developed product options and guidance to create optimal synthetic systems to replace steel wire under various conditions, Jarvis said.

At Cortland, founded as Puget Sound Rope in 1979, a similar blend of motivations drives innovation and custom solutions. Engineering manager Thanasis Varnava said that testing is a constant activity at Cortland, not just to come up with new products but also to improve existing ones. For instance, the company's engineering facility in Houston includes a 600-ton tensile test bed. Because it is equipped with 200-horsepower hydraulic pumps, it can go through far more cycles in a given span of time, closely mimicking real-world conditions on the water.

"We can simulate tension-to-tension sequences," along with bending stresses to increase the efficiency of the product, Varnava said. Testing also can help to formulate accurate longevity estimates. "Customers like to get … the full life and then know it is time to take the line out of service before anything is likely to go wrong," he explained.

Ian Watton, technical sales manager for Cortland in Green Bay, Wis., said he makes a point of always getting out on the water with mariners when he is making his sales rounds. "When I am on the boat and they are doing work, I am picking their brains to learn what they like or dislike, and I bring those concerns back to our engineering department," he said.

Recently, a concern was expressed about the need for a "softer" line that would be light, easy to handle, and would provide good grip on bitts. "We got to work right away and went through our toolbox to develop something for that need," Varnava said.

Although generally focusing on smaller-diameter ropes, Nova Scotia-based Novabraid has some penetration in the smaller-craft towing market, said Chuck Gilchrest, marketing and business development manager for the manufacturer's U.S. market. He said towboats use Novabraid's Oletec-12 line, a hollow braided 12-strand rope using 100 percent polyolefin co-polymer fiber.

Gilchrest said the company's ultra-high molecular weight polyethylene (UHMWPE) Spectra fiber, which has very high strength, is much in demand. "In terms of mooring lines, we are also seeing more and more companies switching from nylon, which has been standard, to polyester," he said. Since a mooring

Chafe guards: Protecting the investment

Marine environments are notoriously rough on cordage. That reality has led to the development of a number of specialized products and materials designed to protect cordage against abrasion and other hazards.

Chafe-Pro's flexible epoxy-coated pipe unit for lines was designed for tugs towing astern.

Chuck Gilchrest, marketing and business development manager in the U.S. for Nova Scotia-based Novabraid, said notable innovations in that regard have come from companies such as Chafe-Pro, which his company represents in the Maritimes.

"They have done a great job of addressing those concerns for both the inland and offshore towing market," he said. Chafe-Pro guards can be removed easily and fitted on various parts of the rope to help extend life. "You don't have to sew it in place, which is much easier," he explained.

Chafe-Pro's proprietary nylon weave is positioned on the rope by the manufacturer. Capt. Ed Ratigan, master mariner and director of research and development at Chafe-Pro, said the units also are coated with a two-part epoxy "for extra chafe resistance."

Alan R. Earls

line typically has a good catenary, "stretchiness isn't as required," he explained. Polyester also reduces water absorption and helps alleviate potential reduction in tensile strength.

Future trends

According to Padilla, the Cordage Institute and EuroCord are partnering to promote circular design development, which focuses on lifecycle management for fishing gear in particular before it gets abandoned or lost at sea. "We are also encouraging the collection of larger marine ropes as well, as the size of larger ropes sometimes makes them easier to recycle," she said.

Courtesy NPersha/Adobe Stock

Specialized needs, specialized products. Floating storage regasification units, center, are moored for longer periods and require cordage designed for increased durability and fatigue resistance.

The Cordage Institute is also working on several testing guidelines and standards as a way to improve safety for marine and other industries. Having standardized testing will make it easier for purchasers to compare data, Padilla said. "We just finished an abrasion test guideline," she said, adding that a cyclic bend over sheave (CBOS) guideline and cut test guideline also are in the works. These guidelines aim to educate users on what terminology is associated with each test, and the variables and potential pitfalls to consider when designing tests.

At Samson, Jarvis said the company is looking toward continued enhancement of remote training, inspection and line tracking for both mooring and towing operations. "We continue to look at systems innovations and compatibility beyond individual rope components," she said.

Gilchrest at Novabraid said he doesn't see any major product changes on the horizon, but he did point out a development for commercial fishing that should be helpful for all mariners. "We are starting to offer breakaway lines for commercial fishing, namely lobster and crab pots, to help protect the North Atlantic right whale," a concern that has been affecting commercial marine operations across the board in areas such as the Gulf of St. Lawrence, he said.

"The other thing that is potentially going to affect the market is trade and tariff regulations that may affect the cost of marine cordage," Gilchrest said. "Novabraid is one of the few manufacturers that builds exclusively in North America, but we are still trying to sort out the USMCA agreement (a new trade pact) between the U.S., Canada and Mexico."

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Correspondence

by Are Solum

New Zealand Defense Forces photo

Why do containership stacks collapse, and who is liable when they do?

The collapse of on-deck container stacks represents a grave threat to crew, ship safety and the environment. The shipping community and its insurers have suffered substantial financial losses during recent years as the number of collapse cases resulting in the loss of containers at sea has increased both in terms of frequency and severity.

Causes of collapse

Understanding causation is key in preventing incidents and also determining liability in individual cases.

Containers lean precariously on *M/V Rena* after the boxship grounded on a reef near Tauranga, New Zealand, in 2011 due to navigation errors. Dozens of containers fell into the sea before hundreds of others were salvaged from the wreck. Liability for lost containers often hinges on a determination if cargo was cared for properly while on board, or if there was an error in management of the ship.

Heavy weather has been one of the fundamental challenges for carriers since the dawn of shipping. Advanced technology for voyage planning and weather routing helps the master, but his judgment will be questioned if an incident occurs. Containers, the securing mechanisms and container stacks are exposed to great forces when containerships move in heavy weather. Parametric- and synchronous-roll resonance phenomena have caused several serious accidents involving containerships.

Parametric rolling describes large spontaneous rolling motions occurring in head or stern seas. It involves the dynamics of the length of ship and waves, as well as the vessel's wave encounter period. A vessel's roll angle can increase from comfortable rolling motions to over 30 degrees in only a few cycles, causing excessive acceleration on the container stacks. Synchronous rolling is caused by the ship's rolling period becoming synchronous with the wave period. The waves may then cause resonance, meaning that the ship may lose control over the roll angles as the action of the wave rolls the vessel increasingly over.

Size matters, as bigger vessels move differently in the sea compared with smaller vessels. For example, investigations following the *APL China* incident in 1998 revealed that large boxships with large bow flares are particularly exposed to parametric rolling. Furthermore, the containers on board the largest container vessels are stowed up to 130 feet above the waterline and nearly 200 feet wide across the deck. When ships and container stacks of these dimensions start rolling, you do not have to be a physicist to understand that the stacks will be subject to great forces once the vessel starts to move with the motions of the sea.

When ships and container stacks of these dimensions start rolling, you do not have to be a physicist to understand that the stacks will be subject to great forces.

Ship stowage is an important factor because weight distribution on board also influences the vessel's motions at sea. The metacentric height (GM) is a measurement of the initial static stability of the vessel. It is of the utmost importance to get the GM within the right range before the voyage. This represents challenges in terms of correct cargo planning both ashore and on board. In practice, advanced software will do most of the job, but computer programs depend on correct software development and correct data entered, as well as human interaction and, ultimately, human decisions.

The GM is calculated as the distance between the center of gravity of a ship and its metacenter. The metacentric height influences the natural period of rolling of a hull. A low GM will cause the vessel to roll excessively with movements that are too large. A high GM implies greater initial stability against overturning, but high GM is also associated with shorter periods of roll, which will cause rapid movements and greater forces on the cargo stowage. Hence, the GM has to be correct — not too high, not too low.

Cargo stowage inside containers causes problems, as a container stack is only as strong as its weakest container. If cargo inside one container starts to shift, it may have a domino effect on the stack. We have seen severe cases where one piece of cargo has damaged its container structure, resulting in the collapse of a complete row of containers. Therefore, the container securing manual (CSM) must be followed accurately, and further stowage guidelines should be sought for problematic cargoes. One of the challenges is that container carriers largely depend on shippers, freight forwarders or their subcontractors to pack and secure cargoes adequately. Errors are inevitable.

The container is designed to fit the purpose of containing cargo, but if exposed to extreme weight

pressure from excessive loads, containers may suffer structural failure. Container shells are exposed to wear and tear, rough handling and operations that may weaken their structure. If one container fails, the rest of the stow above and around will follow.

The weight of cargo is declared by the shippers. Misdeclaration of weight is an industry problem and may cause considerable difficulty for cargo stowage planners as they rely on cargo details as declared by the shippers. If numbers are inaccurate, or even deliberately misdeclared, the integrity of container stacks may be jeopardized.

Lashing and securing of thousands of containers in large stacks on board is a major challenge. Failure to do it correctly may have serious consequences. In simple terms, containers on deck are attached to each other with twist locks in the four corners of the container. Further, lashing rods are attached between the container stack and lashing bridges or hatch covers. Each twist lock and lashing rod needs to be in the right place, work correctly, and be able to withstand required forces. Inadequate securing, missing or failing twist locks, and lashings that become loose are probably among the more common causes of containers being lost at sea. Failures in securing have caused severe incidents.

Multiple causes often make cases complex, especially when working with liability. In most cases, there are elements of several of the aforementioned causes that lead lawyers deep into legal considerations about issues such as proximate causes, intervening causes, independent sufficient causes and foreseeability.

Typical legal considerations

Assuming that causation is established, the next step is applying the law to the particular facts. We will now look at some of the reoccurring legal issues for cargo claims and charter party claims, with a focus on seaworthiness.

Lashing and securing of thousands of containers in large stacks on board is a major challenge. Failure to do it correctly may have serious consequences.

Containerized cargo is usually shipped on the container shipping lines' standard terms of carriage, which usually incorporates the Hague-Visby Rules. Whether or not the contractual carrier of cargo is liable for damage or loss of cargo will be determined by whether the carrier is in breach of its duties under the convention, or whether the damage occurred as a result of perils for which the carrier is exempt from liability.

The carrier's fundamental duty: properly care for the cargo

Under the Hague-Visby Rules, the carrier shall "properly and carefully load, handle, stow, carry, keep, care for and discharge the goods carried." This requires the carrier to adopt a solid system to fulfill its obligation throughout the time the cargo is in the carrier's custody. For instance, if lashings of container stacks appear to come loose during the voyage, the carrier is under an obligation to correct the problem and tighten the lashings. This is a contractual obligation, meaning that the contractual carrier is contractually bound even if he is not the actual carrier and in direct control of crew on board. Generally, the carrier is not obliged to improve stowage inside the container. This responsibility will normally lie on the shipper's side.

When cargo is shipped in apparent good order and condition but is discharged damaged, the carrier bears the burden of proving either that the damage occurred without fault, or that it was caused by an "excepted peril" within the Hague-Visby Rules.

Error in management of the ship

The Hague-Visby Rules state that "neither the carrier nor the ship shall be responsible for loss or damage arising out of … act, neglect or default of the master, mariner, pilot or the servants of the carrier in the navigation or in the management of the ship."

It might be possible for carriers to rely on negligent navigation as an excepted peril if it can be proven that there was, for example, a lack of good seamanship in deciding to sail in severe weather conditions. Also, failure to take the action necessary to prevent excessive rolling may be considered failure to properly navigate and therefore exempt the carrier from liability.

"Management of the ship" does not include management related to the cargo under English law. This principle was set out in the Gosse Millerd case (*Gosse Millerd v. Canadian Government Merchant Marine, 1927*): "If the cause of the damage is solely, or even primarily, a neglect to take reasonable care of the cargo, the ship is liable; but if the cause of the damage is a neglect to take reasonable care of the ship, or some part of it, as distinct from the cargo, the ship is relieved from liability." This means that if a container stack collapse is solely caused by error in cargo stowage, there is no exemption from liability for the carrier based on the Hague-Visby Rules.

Perils of the sea

The Hague-Visby Rules state, "Neither the carrier nor the ship shall be responsible for loss or damage arising out of … perils, dangers and accidents of the sea or other navigable waters." In *Scrutton on Charterparties and Bills of Lading, 20th Edition*, Justice Thomas Edward Scrutton defined such perils to include those "peculiar to the sea or to a ship at sea, which could not be foreseen and guarded against by the shipowner or his servants as necessary or probable incidents of the adventure." Hence, the starting point under English law is that such a peril must be "of the sea" in the sense that the loss must be attributed to natural causes.

The criteria "could not be foreseen" means that the peril must be beyond what is reasonably foreseeable and could be avoided by the carrier. This has naturally made the "perils of the sea" defense increasingly more difficult for carriers as technology has developed. For general weather conditions throughout the voyage, carriers usually will be expected to have the necessary equipment to avoid the peril. However, the defense remains possible. For example, unusually high or challenging waves may be considered unforeseeable and exempt the carrier from liability.

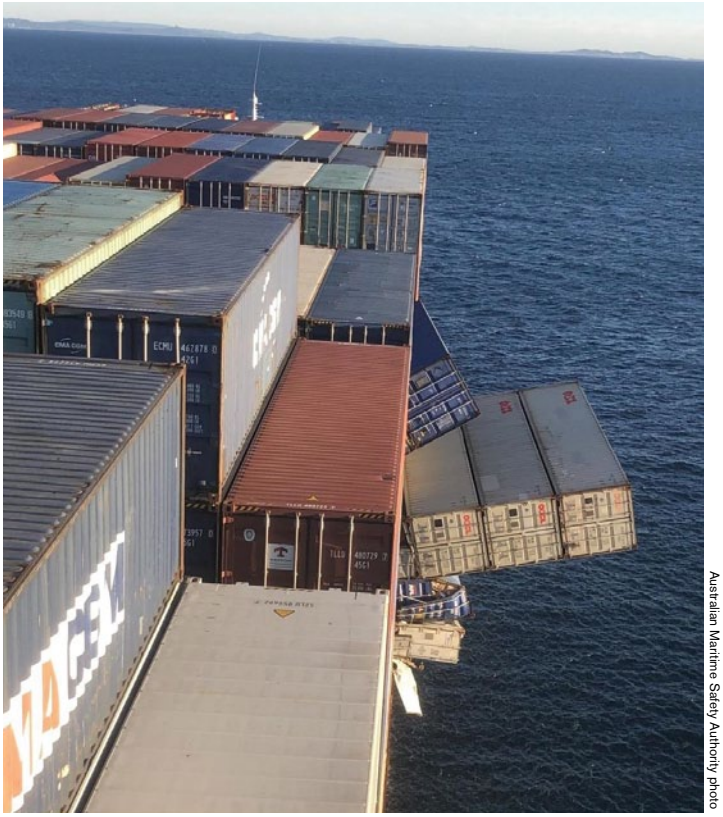
Experts have debated whether parametric rolling or resonance, which can occur in even moderate weather conditions, is foreseeable. The legal landscape is yet to be completely clarified.

No fault or privity of the carrier

The Hague-Visby Rules exempt the carrier from liability for damage occurring "without the actual fault or privity of the carrier, or without the actual fault or neglect of the agents or servants of the carrier." This is usually referred to as the "catch-all exception" and, crucially, carriers can rely on this exception if they are able to prove that there was no fault on their

Australian Maritime Safety Authority photo

APL England **lost about 50 containers overboard and nearly 80 others were damaged after the ship experienced a temporary loss of propulsion in heavy seas off Sydney, Australia, on May 24. The Australian Maritime Safety Authority detained the ship, and the captain was charged with offenses related to pollution and damage to the environment.**



Containers dangle from *APL England* in May after the boxship was able to restore propulsion and head for the Port of Brisbane, Australia. Cargo on the largest containerships can be stowed up to 130 feet above the waterline and nearly 200 feet wide on the deck.

Australian Maritime Safety Authority photo

part. In container-stack collapse cases, the carrier may typically argue there is no fault on their part if the fundamental duties to care for the cargo are fulfilled, and thereby refute liability under the contract of carriage. The "non-fault" exception is extended to fault by the carriers' servants.

Charter party claims and seaworthiness

Ultimate liability for damages arising out of a container-stack collapse case often will end up as a discussion regarding seaworthiness between contractual carriers of cargo and the actual carrier (the shipowner) under charter party contracts.

The classic definition of seaworthiness is that "the ship must have the degree of fitness which an ordinary careful owner would require his vessel to have at the commencement of her voyage, having regard to all the probable circumstances of it." A question that often arises in container-stack collapse cases is to what extent the ship and equipment was sound and correctly applied upon departure, and whether it was fit to withstand the ordinary perils of the sea. Hence, seaworthiness will be considered in context with what the owner could reasonably foresee in terms of occurring sea perils.

For instance, inadequacies with regard to the vessel's lashing and securing equipment in a stack collapse case could be enough to render the vessel unseaworthy. Furthermore, if there is an excessive top-heavy stow on departure that compromises the stability of the container stack itself, the vessel arguably may be in unseaworthy condition due to the error in stowage.

In addition to cargo claims and the legal implications under bills of lading, liability for environmental damage has been high on the agenda in connection with severe incidents in recent years. When containers and cargo drift in the ocean or end up on shorelines, authorities usually will turn to the "waste producer," which is generally considered to be the shipowner or operator of the vessel. The waste should be, and will be, removed. The ultimate liability for the costs and losses often will end up in dispute under charter parties.

To conclude, the law often applied in stack collapse cases is over 100 years old and made to fit, sometimes uncomfortably, with modern ships and technologies. Regrettably, container-stack collapse cases have serious consequences involving monetary losses, ship safety and environmental impact. We fear carriers, insurers, lawyers, judges and arbitrators will continue to be challenged by the complexity of stack collapse cases for years to come. •

Are Solum is a senior claims executive and lawyer for Gard (www.gard.no), a protection and indemnity (P&I) insurer based in Arendal, Norway.

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work tour on a chemical tanker, I saw firsthand how active-listening techniques can be used successfully aboard a ship.

I had just come up to the bridge to relieve the third mate for my 1200-to-1600 watch. We had a pilot on board as the ship turned at Alcatraz Island en route to San Francisco's Anchorage Nine. The captain, who was moody and difficult to work with, paced back and forth and scowled. As we passed under the Bay Bridge near Rincon Park, he stopped his pacing in midstride and in a low, difficult-to-hear voice mumbled something about the other ships in the anchorage. The pilot turned to look at the captain and asked, "What was that you said about the ships in the anchorage, captain?" The lookout, the helmsman and I watched to see how the captain was going to react, bracing for another one of his blowups.

After getting no response to his question, the pilot calmly stated, "I heard you say something about the ships in the anchorage, captain, but didn't hear the rest. Could you please repeat what you said?" With an exasperated expression, the skipper replied, "Keep at least a quarter mile away from all ships in the anchorage." The pilot then said, "I understand you want us to keep a quarter mile away from all ships in the anchorage, and I will make sure we do that." He adjusted our heading accordingly, and we proceeded in as the skipper wanted without the expected flare-up, dropping the hook a half-hour later.

I knew how hard it was to get along with the captain, and I was impressed by the nonconfrontational way the pilot handled the situation. He verified that what he thought he'd heard and understood was indeed what the captain wanted. Then he responded accordingly, and was thus able to avoid the rant we all anticipated.

Although a few professional classes, such as bridge resource management, highlight the importance of effective listening and communication at sea, none that I know of directly address how to improve listening skills for mariners. The bottom line is you're going to have to do the work yourself if you want to become a better listener. For an in-depth treatment of active listening, I recommend Gordon's *Leader Effectiveness Training*, and clinical psychologist Michael Nichols' *The Lost Art of Listening*. Another option is to take one of the myriad of online and in-person seminars aimed at improving listening skills.

Upon reflection, I can't imagine that any mariner hasn't seen a difficult situation on board that could have been avoided if those involved had been better listeners. Likewise, while off the vessel, being a more adept listener can help with navigating the conflicts that arise in your personal life. Make no mistake, however: It takes hard work and consistent effort to improve your listening skills, but I can say from experience that it's definitely worth it.

Till next time, I wish you all smooth sailin.'

Kelly Sweeney holds a license of master (oceans, any gross tons), and has held a master of towing vessels license (oceans) as well. He sails on a variety of commercial vessels and lives on an island near Seattle. You can contact him at captsweeney@professionalmariner.com.

A Mariner's Notebook

by Capt. Kelly Sweeney

Sharpen your listening skills to avoid conflict and danger at sea

I had joined the 890-foot crude oil tanker at Swan Island, Ore., the week before, and since coming aboard had been busy as the ship neared the end of its scheduled yard period. It had been a very long day, with lots of going in and out of cargo tanks, and I was on deck heading back to the house to clean up for supper. I was walking by the No. 3 starboard tank as the chief mate climbed out, when he called me over and said, "I need you to work overtime tonight, stenciling around the pump room. Get with the boatswain for what needs doing."

At 1800, I went out on deck and asked the boatswain about the pump room stencils. He looked at me oddly for a moment, then said, "You mean forepeak, not pump room." I responded, "No, the mate told me the pump room." The boatswain replied, "I have two ABs who'll be stenciling back there tonight. The mate wanted you to do the forepeak." Unconvinced, I went inside and called the mate to verify. When asked whether it was the pump room or forepeak area I was supposed to stencil, he replied irritatedly, "I said forepeak, not pump room. Now quit wasting my time, and get out there and do the work — we need it finished before tomorrow."

Thinking about what had transpired, it was perplexing to me why I had heard "pump room" when he'd said "forepeak." It was probably because, after a hard day, I was too tired to focus on what he was saying. Whatever the reason, it was obvious that I did not listen carefully, misheard the mate's instructions and never verified what he wanted — irritating him and causing myself some grief as a result.

Miscommunication on a commercial vessel can be troublesome. During mooring and unmooring, cargo operations and on the bridge underway, it could mean the difference between safety and disaster — and even life and death. That's why it is a maritime custom in those circumstances for all orders given to be repeated back. For example, a watch officer on the bridge who gives an able seaman at the wheel the helm order of "hard left rudder" should expect a reply of "Roger, hard left rudder" before any rudder change is made.

According to experts, there are a number of types of listening. "Reflective listening" is when something such as a helm order is repeated back by the listener to the speaker. Another category is known as "active listening" — made famous by world-renowned clinical psychologist Thomas Gordon. I first heard about active listening from my wife, a junior high school mathematics teacher, who'd learned about it in Gordon's book, *Teacher Effectiveness Training*.

Active listening was developed to enhance interpersonal communication, and minimize the conflict and problems that can arise from misunderstandings and mishearing. In order to get a complete idea of what the speaker is trying to say, it requires the listener to not only hear all that is being said, but to be aware of nonverbal clues such as the tone of voice and body language — as well as techniques to check for understanding. The goal of active listening is to enable the listener to fully comprehend and remember what was said, and to respond so that the speaker knows he or she was heard correctly. During a 75-day

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