

Casualties: Fatal fire started on California dive boat as crew slept, NTSB says

# PROFESSIONAL MARINER

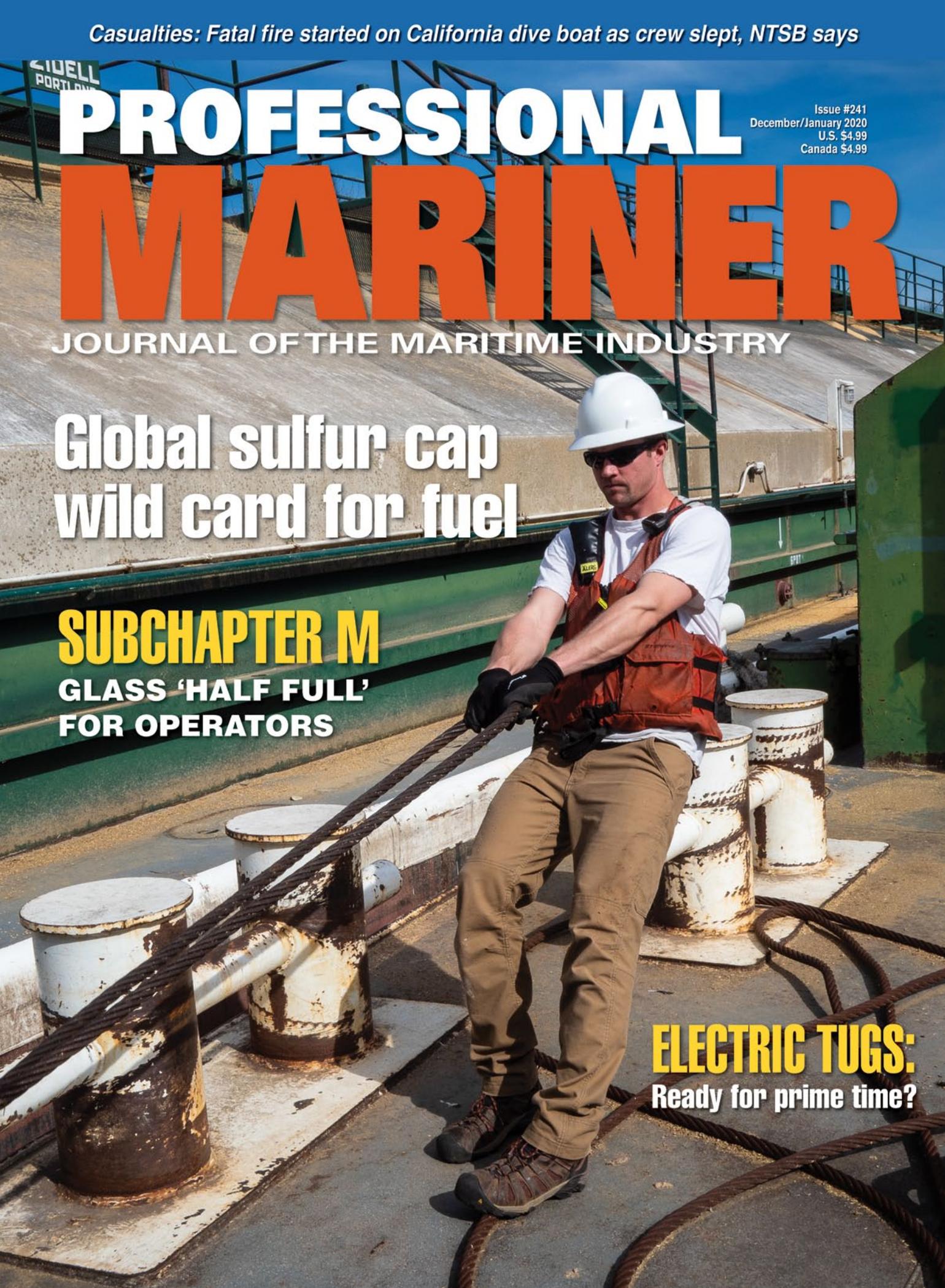
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JOURNAL OF THE MARITIME INDUSTRY

Global sulfur cap  
wild card for fuel

**SUBCHAPTER M**  
GLASS 'HALF FULL'  
FOR OPERATORS

**ELECTRIC TUGS:**  
Ready for prime time?



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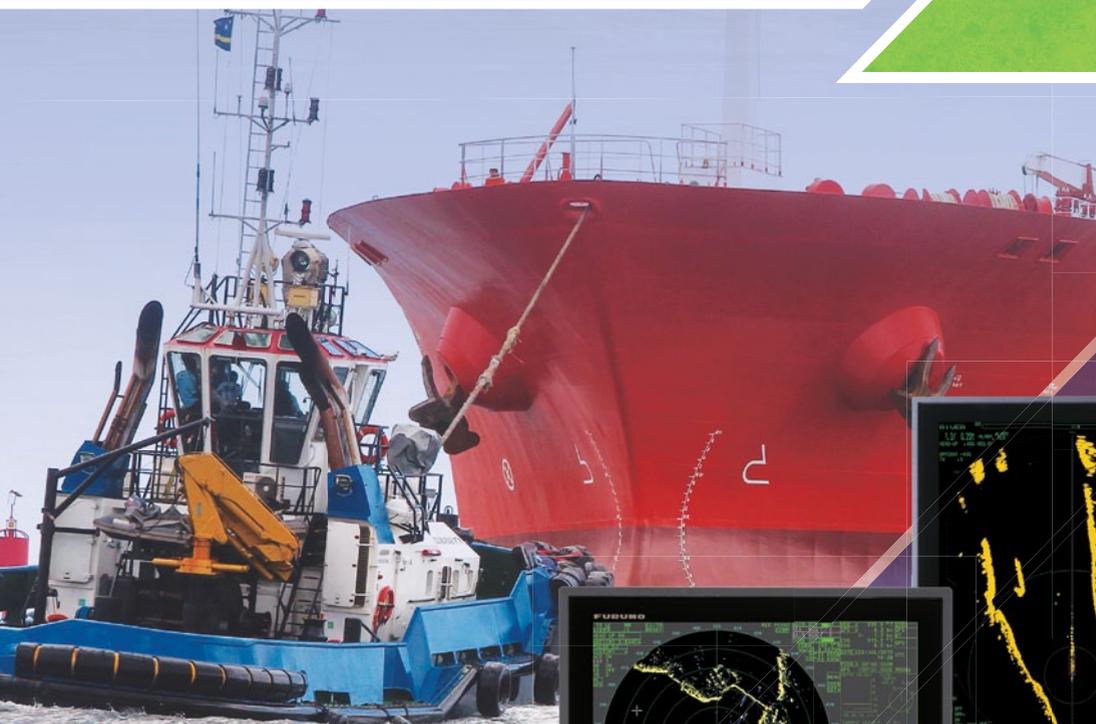
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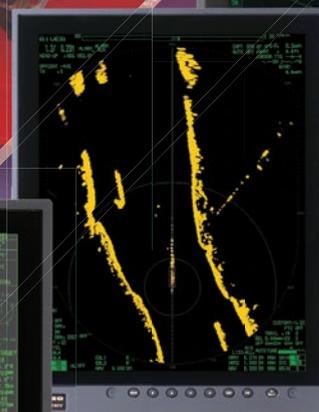
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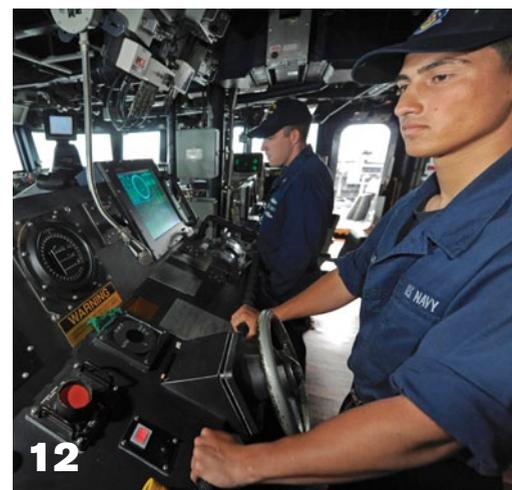
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BY BRIAN GAUVIN

### ON THE COVER

Kevin Maki, a deck hand on the tugboat *Captain Bob*, makes up a four-barge tow on the Columbia River in Vancouver, Wash. The 110-foot tug is the most powerful vessel in the Tidewater Transportation fleet, delivering up to 5,000 horsepower to overcome strong currents and winds that can exceed hurricane force along the waterway. See story, page 26. Photo by Brian Gauvin

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- 26 Wind in the winches:  
Towing up the mighty Columbia

BY BRIAN GAUVIN



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# Signals



Oil refiners have adapted their production processes, with new fuel blends, in advance of IMO 2020. But “pockets of non-availability” are expected for compliant fuel in the short to medium term in some regions of the world, according to Kathy Metcalf, president and CEO of the Chamber of Shipping of America.

Courtesy: Pixabay

## Global sulfur cap brings uncertainty over fuel prices, blending

It has taken decades to build the fuel supply chain for the 50,000-vessel global merchant fleet. The pending 0.5 percent sulfur cap on marine fuel stands to upset this entrenched structure, with price volatility likely as a result.

To comply with a 2016 regulation enacted by the International Maritime Organization (IMO), vessels must either treat their exhaust, use an alternative fuel such as liquefied natural gas (LNG), or begin

using fuel oil containing 0.5 percent sulfur or less by Jan. 1, 2020. Contained in Annex VI to the International Convention for the Prevention of Pollution from Ships (MARPOL), the regulation reduces the sulfur limit from its current level of 3.5 percent. In response, fuel suppliers have adjusted refining processes, while operators are adapting to changes in fuel prices and quality before the cap takes effect.

The sulfur cap forces bluewater

operators in the United States to decide between opting for compliant fuel or burning high-sulfur fuel oil (HSFO) while using a scrubber system that removes sulfur oxide from exhaust, according to Kathy Metcalf, president and CEO of the Chamber of Shipping of America (CSA).

“Either option comes at a cost to a vessel’s budget, although it is predicted that scrubbers would pay for themselves ... no longer than three

years from the initial investment and installation,” she told *Professional Mariner*.

Installing a scrubber can cost anywhere from \$2 million to \$5 million. According to Metcalf, the expected price of compliant fuel could increase next year by at least 30 percent over current HSFO prices.

Vessels sailing within 200 nautical miles of the U.S. and Canadian coasts will continue to comply with the 0.1 percent Emission Control Area (ECA) sulfur limit that has existed since 2015. Given this history, Chamber of Marine Commerce President Bruce Burrows said he does not foresee many compliance issues in Canada next year. While most Canadian operators have decided to burn compliant fuel, he said the scrubber decision largely depends on fuel costs.

“If for some reason fuel costs skyrocket for low-sulfur fuel, then the notion to put scrubbers on (vessels) may be more attractive,” said Burrows, whose organization represents

shipowners and fuel suppliers in Canada and the U.S.

According to Metcalf, the trend in the U.S. fleet is toward scrubbers. Adoption has not happened as quickly as expected, however, as a result of installation issues and environmental concerns related to open-loop scrubbers, which discharge washwater into the sea. Multiple government bodies throughout the world have banned open-loop scrubbers, the most common type of scrubber system, due to their impact on marine environments.

Connecticut and California have banned scrubber discharges in their waters, while Hawaii has enacted standards for washwater. The IMO has agreed to open discussions on harmonizing global rules governing scrubber discharges, and these talks are expected to conclude in 2021.

**Prices are expected to decline for wholesale (W) and retail (R) high-sulfur fuel oil (HSFO) through the end of 2020, according to 20/20 Marine Energy. Increases are forecast for low-sulfur fuel oil (LSFO) and marine gas oil (MGO).**

Metcalf did not have data on scrubber use for the 70 U.S.-flag vessels trading internationally. She said that about 15 percent of the global fleet will be using scrubbers in 2020 and that more U.S. operators are expected to adopt the technology next year.

In the tugboat sector, coastal operators should already be in com-

## Sulfur cap at a glance

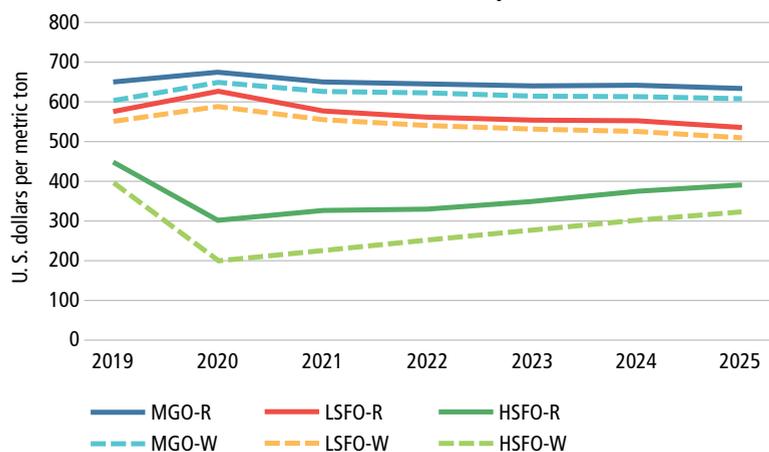
Under the new global limit, all ships will have to use fuel oil on board with a sulfur content of no more than 0.5 percent, against the current limit of 3.5 percent, which has been in effect since Jan. 1, 2012.

The interpretation of “fuel oil used on board” includes use in main and auxiliary engines and boilers. Exemptions are provided for situations involving the safety of the ship or saving life at sea, or if a ship or its equipment is damaged.

The new limit will not change the sulfur limits in Emission Control Areas (ECAs) established by the IMO, which since Jan. 1, 2015, has been 0.1 percent. The ECAs established under MARPOL Annex VI for sulfur are the Baltic Sea area; the North Sea area; the North American area (covering designated coastal areas off the United States and Canada); and the United States Caribbean Sea area (around Puerto Rico and the U.S. Virgin Islands).

*International Maritime Organization*

**Retail and wholesale bunker prices to 2025**



pliance with IMO 2020 without the need for scrubbers. Most operators are already burning low-sulfur fuel oil (LSFO), and the Environmental Protection Agency limits sulfur content for marine diesel to 15 parts per million, said Caitlyn Stewart, regulatory affairs director with the American Waterways Operators.

Indirect impacts of IMO 2020 “could include fuel price fluctuations or changes in demand for fuel bunkering services that some of our member companies provide,” she said.

### Price projections

Despite the move to scrubbers by some larger ships, Adrian Tolson, senior partner at consulting firm 20/20 Marine Energy, said LSFO should comprise the overwhelming majority of the fuel market.

“That means demand goes up for low sulfur and down for high sulfur (fuel), and it should, relatively speak-

“If for some reason fuel costs skyrocket for low-sulfur fuel, then the notion to put scrubbers on (vessels) may be more attractive.”

Bruce Burrows,  
Chamber of Marine Commerce

ing, impact the wholesale prices of those products accordingly,” he said.

The increased demand could push wholesale prices of LSFO from \$550 per metric ton this year to \$590 in 2020, according to predictions 20/20 Marine Energy shared with *Professional Mariner* in September. HSFO is expected to decrease significantly in price, dropping from \$400 to an estimated \$200.

A lot of unknowns exist, making accurate predictions difficult. But Tolson also said operators can expect volatility in the prices of HSFO and LSFO, especially during the first quarter of 2020, until the bunker supply chain becomes more defined.

Before the end of the current year, the number of fuel suppliers dealing in HSFO should gradually decrease, causing prices to rise. However, Tolson added, once demand crashes, the price will trend downward quickly.

“When that day is I have no idea, but that day will come,” he said.

While LSFO should jump in price next year, 20/20 Marine Energy’s projections show the wholesale price decreasing in subsequent years, dipping below \$525 by 2025.

### Ensuring fuel quality

According to Tolson, vessel owners should have no difficulty finding sufficient quantities of HSFO and LSFO at major ports.



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## industry signals

In reference to LSFO, Metcalf said that “pockets of non-availability are expected in the short to medium term” for regions like South America, Africa and some parts of Asia that do not have sufficient refining capacity.

Coast Guard spokeswoman Lt. Amy Midgett said domestic fuel availability issues should be very limited.

For ship operators transiting internationally, “one of the keys to this transition is careful voyage planning that considers bunker availability to the maximum extent,” she said.

Operators have already started to address potential fuel quality issues as refiners begin to use new blends. Metcalf said fuel components may vary from refinery to refinery based on geography.

“The global cap is only focused on sulfur content, and other marine fuel criteria need to be considered as well,” she said.

The International Chamber of Shipping (ICS) recommends that operators consider factors like compatibility and flashpoint to ensure safety and usability.

Compliant fuels with the same sulfur content but bunkered at different locations may not be compatible, according to the ICS. As a result, the organization recommends storing fuel orders in segregated tanks to avoid commingling.

The ICS also advises operators to verify fuel stability and flashpoint before bunkering begins. According to Safety of Life at Sea

(SOLAS) regulations, fuels should have a minimum flashpoint of 60 degrees Celsius.

To avoid violating the sulfur limit, Tolson said that vessel owners who aren't using scrubbers must clean their tanks of residual high-sulfur fuel as soon as possible.

For ships without scrubbers, the carriage of fuel with a sulfur content over 0.5 percent is prohibited after March 1, 2020, under the IMO regulation. Port states will enforce the 2020 sulfur cap, and the U.S. Coast Guard is obligated to do so as a party to MARPOL Annex VI. The current ECA enforcement mechanism will remain unchanged, and the Coast Guard will continue to review bunker delivery notes, check vessel logs and verify fuel changeover procedures, Midgett said.

While ensuring a compliant, competitively priced supply of fuel involves factors beyond operators' control, Tolson said uncertainty can be mitigated through forward contracts. He suggested that shipowners develop a bunker plan and work with fuel suppliers to “lock in” supply and price as much as possible.

“It has to be an adaptable plan because nobody knows what the 2020 market will look like,” Tolson said. “So you really have to adopt some changes as we see different pricing and as we see different supply and demand signals come through.”

*Sam Bojarski*

## EPA plans regulatory relief for certain Tier 4 engines, vessels

**D**espite nine years of advance notice, the Environmental Protection Agency (EPA) is proposing a three-year deadline extension so marine engine manufacturers and boatbuilders can meet Tier 4 emissions standards for vessels with lightweight and high-powered diesel engines.

The Savannah (Ga.) Pilots Association and New England lobstermen are among those who want to build high-speed commercial boats but are hindered by the lack of engines that meet Tier 4 standards and have a suitable power-to-density output. The EPA proposal would allow Tier 3 engines to continue to be installed while manufacturers and boatbuilders develop Tier 4-compliant vessels using diesel engines between 600 kW (804 hp) and 1,400 kW (1,877 hp).

The Tier 3 and Tier 4 marine

The EPA recognized that building Tier 4-compliant vessels with accompanying SCR systems would require design changes to handle the engines' greater size and weight.

diesel standards were adopted in 2008. The Tier 4 phase-in schedule began in 2014 for large workboats with engines at or above 2,000 kW (2,682 hp). Tier 4 standards were applied at the start of 2017 for engines from 1,000 kW to 1,400 kW (1,341 hp to 1,877 hp), and on Oct. 1, 2017, for

engines from 600 kW to 900 kW (804 hp to 1,207 hp).

Since 2017, the Savannah Pilots Association has been trying to build a new version of a 7-year-old pilot boat that is on its second set of engines, said master pilot Robert "Trey" Thompson III, president of the group. The pilots want a boat with twin 1,450-hp diesels to run at 33 to 35 knots to reach inbound vessels 11 miles offshore. A channel-deepening project will extend the run to 17 to 18 miles offshore, nearly doubling the boat's operating time. Two other pilot boats built in 1984 and 1986 also eventually will be replaced.

"We haven't been able to build a boat since Tier 4 requirements came into effect," Thompson said.

Current engines and accompanying Tier 4 equipment such as selective catalytic reduction (SCR)



Courtesy Savannah Pilots Association

The Savannah Pilots Association wants to build a new boat with specifications similar to Georgia, delivered in 2013, but the group's requirements cannot be met with the Tier 4-compliant engines currently on the market.



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systems won't fit into the design's existing spaces. Also, the pilot boat must be less than 65 feet long to comply with regulations to protect right whales.

U.S. Rep. Earl "Buddy" Carter, R-Ga., was among those who pushed for the rule change on behalf of the Savannah pilots.

"The current standards have made it impossible for the bar pilots to purchase any new vessels because there simply is not a single manufacturer that can meet the requirements," Carter said. "The new guidance will give the pilots the ability to purchase new vessels, so they are able to continue to do their important job while ensuring there won't be any disruptions to the shipping traffic or other unnecessary delays at the port."

The Savannah pilots had begun the process to build a new launch, but their builder, Seattle-based Vigor, couldn't find Tier 4-compatible engines that would fit in a vessel less than 65 feet and produce the required horsepower.

In proposing the extension, the EPA recognized that building Tier 4-compliant vessels with accompanying SCR systems would require design changes to handle the engines' greater size and weight. There currently are no certified Tier 4 engines with a power density greater than 35 kW (47 hp) per liter, the agency said.

The EPA heard public comments on the proposal Sept. 20 in Bath, Maine, and the public comment period ended Oct. 21.

*Gary Wollenhaupt*



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## Navy opts for physical throttles on destroyers after fatal collisions

In the wake of high-profile collisions involving U.S. Navy destroyers, including a 2017 incident that killed 10 sailors aboard *USS John S. McCain*, the service is revising bridge training practices and addressing what it sees as an over-reliance on computer touch screens for ship control.

same accidents that befell the Navy.

Douglas Crowder, retired from the Navy and now the president of a consulting firm, served as commander of the 7th Fleet and Navy Destroyer Squadron 24. He said his interpretation of the Navy's findings is that the incidents were

learned by the Navy in the *McCain* incident are applicable to all professional mariners. Similar issues were cited after *Fitzgerald* collided with a Philippine containership off Japan in June 2017, killing seven U.S. sailors.

"The Coast Guard incorporated discussions on the *McCain* and *Fitzgerald* mishaps into its training curriculum, and modified bridge simulator scenarios to (include) environmental and navigational elements similar to those experienced at the time of these unfortunate mishaps," Fredrickson said. "The Coast Guard has and will continue to adapt its navigation practices when warranted by operational lessons learned, in the wake of technological advancements, or when traditional navigation methods are rendered obsolete."

On the civilian side, Margaret Ward, an assistant professor at the California State University Maritime Academy, said merchant mariners typically have logged more sea time than Navy sailors at comparable levels in their careers. Adjusting to a new ship and its systems on the fly is something common to merchant mariners, she said.

"Many mariners may find themselves joining a new ship within hours of it getting underway," she said. "(But) if there is a failure in a system controlled by new technology that a mariner lacks experience in, it can without a doubt lead to a loss of situational awareness or the first step in an error chain, leading to an incident."



Seaman Art Casillas mans the integrated bridge and navigation system on the Arleigh Burke-class destroyer *USS Dewey* during a transit of the Spratly Islands in 2011. The Navy plans to begin installing physical throttle controls on ships in the class in the summer of 2020.

U.S. Navy photo

The investigation into the August 2017 collision and one involving another Arleigh Burke-class destroyer, *USS Fitzgerald*, showed that the touch-screen systems were complex and that sailors had been poorly trained to use them. As a result, the Navy said it plans to begin retrofitting destroyers in the class with traditional mechanical throttles.

The sequence of events has had significant repercussions, as other military branches and even civilian operators may examine their practices and consider whether they might be vulnerable to the

mostly a result of "training issues" and poor decision-making by the commanding officers.

"You need to bring up the best of everything to navigate in one of the busiest shipping areas in the world," Crowder said in reference to *McCain's* collision with a Liberian tanker in the Strait of Malacca. Some of the sailors on *McCain's* bridge had recently transferred from other vessels and had a poor understanding of systems and procedures on the ship, he said.

Chief Warrant Officer Kurt Fredrickson, a spokesman for the U.S. Coast Guard, said the lessons

“Though fire and abandon-ship drills are common to us all, many ships lack frequent, well-rounded training procedures on other emergency scenarios, such as the (actions) a watch stander should take in the event of a steering casualty,” Ward said. “As the use of new technology on board ships becomes increasingly prevalent, it is essential that proper training in its usage comes along with it — especially when that technology governs such essential aspects of a ship’s operation such as steering, propulsion and navigation.”

“I can say one thing for sure,” said Capt. Sam Pecota, director

“A real wheel and throttle have more of a feel of the vessel than just moving a mouse.”

Capt. Sam Pecota,  
director of simulation,  
California Maritime Academy

of simulation at Cal Maritime. “We have a couple of full-mission simulators here, with the option of using tactile hardware controls or

screens, and the computer screens just don’t give you the same kind of input and feel for steering and controlling the vessel. A real wheel and throttle have more of a feel of the vessel than just moving a mouse.”

For either a civilian or military vessel, Crowder said he would have “no problem training a crew to work with touch screens, but there has to be backup if you lose power or the computer gets squirrely.”

“I worry that young officers get mesmerized by systems like GPS, and my warning to them is to look out the damn window once in a while,” he added.

*Alan R. Earls*



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## Waterways need more investment to stay competitive, USDA says

The nation has to invest more heavily in locks, dams and river dredging, and aging waterways infrastructure must be restored to full capacity to allow growth in traffic, the U.S. Department of Agriculture (USDA) said in a recent study, weighing the

waterways containing locks. While barge traffic has expanded, lagging structural work and channel maintenance have caused costly delays.

“Importance of Inland Waterways to U.S. Agriculture,” released in August, relied on modeling to forecast investment impacts. The

(NESP). Getting that program funded has been a WCI priority.

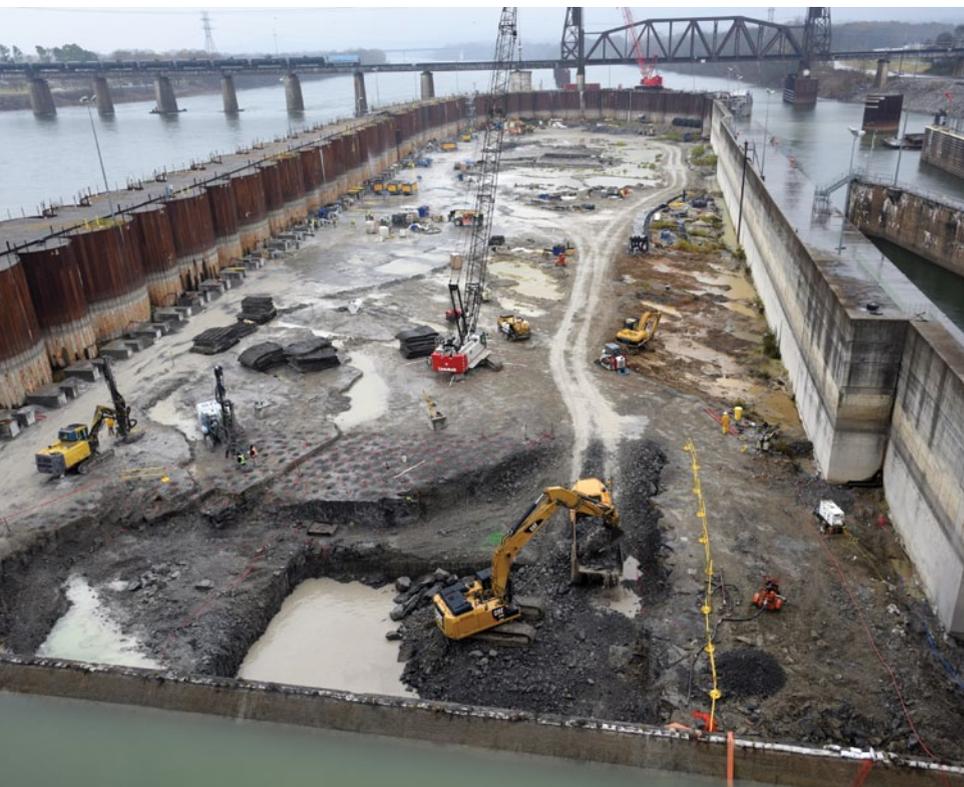
“Expediting the NESP would modernize five locks on the Upper Mississippi River and two on the Illinois Waterway, making them ready for predicted grain shipments,” Toohey said. “It would also improve the health of our marine ecosystems and habitats.”

He cited language for funding pre-construction engineering and design (PED) for the program in a report accompanying the fiscal year 2020 Energy and Water Development (E&WD) bill, passed by the Senate Appropriations Committee on Sept. 12.

“(The U.S. Army Corps of Engineers) shall allocate not less than \$4,500,000 for PED of inland waterway lock and dam navigation and ecosystem restoration projects authorized by Title VIII of the Water Resources Development Act of 2007,” the Senate’s report said.

Toohey said that language must be supported in the House-Senate conference process ahead, and added, “We’re grateful the Senate has taken this first significant step to initiate the project.”

Investing in dredge work in the Lower Mississippi River — from Baton Rouge through New Orleans to Southwest Pass and into the Gulf of Mexico — would boost grain prices paid to growers and bolster land values, the USDA report said. Resulting gains in jobs and gross domestic product should



U.S. Army Corps of Engineers photo

Construction workers excavate in the cofferdam at the Chickamauga Lock Replacement Project on the Tennessee River in December 2017. Delays in structural work and channel maintenance on inland waterways pose a threat to U.S. competitiveness in global agricultural markets, according to the USDA.

benefits to commerce and exports.

Lock and dam performance has declined at recent investment levels. From 2000 to 2017, vessel delays increased on nine major

study compared benefits from varied levels of funding over 10- and 25-year spans.

The USDA’s study highlights how critical inland waterways are to the nation’s prosperity, said Mike Toohey, president of the Waterways Council Inc. (WCI), a Washington-based trade group. And, he added, it makes the case for expediting the Navigation and Ecosystem Sustainability Program

# FLEET OF LOBSTER BOATS POWERED BY CUMMINS X15.



The first vessel powered by Cummins newly-announced X15 marine engine has been launched. It is one of 15 lobster boats being built by Yarmouth Sea Products own shipyard, Bayview Marine. The 44.3' by 30' hull is built for maximum capacity and stability with room for six crew members, 400 lobster or crab traps and 4400 liters of fuel. The Cummins X15 engine which meets EPA Tier 3 and IMO Tier II emission regulations provides 500 horsepower for propulsion. This is one of many marine customers around the world that rely on Cummins power solutions to keep their operation running in a world that's Always On.

<b>Classification</b>	Lobster Boat
<b>Hull</b>	44.3' x 30' Downeast Style
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<b>Gears</b>	ZFW350 / 4.962:1 Reduction
<b>Equipment Capacity</b>	400 Lobster / Crab Traps
<b>Fuel Capacity</b>	4400 Liters
<b>Special Equipment</b>	Davco 3000-lb Deck Crane / Lobster Trap Hauler

To learn more about Yarmouth Sea Products' X15-powered lobster boats visit [cummins.tech/yarmouth](http://cummins.tech/yarmouth).



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ALWAYS ON

more than offset project costs, according to the agency.

Increased rainfall in the Midwest in recent years has added to dredging needs, said Sean Duffy, executive director of the Big River Coali-

tion in New Orleans. The group wants more federal funds devoted to maintaining authorized channel dimensions from the Gulf to Baton Rouge. The coalition's "Full Funding Floats All Boats Campaign"

seeks increased channel maintenance in the area of Southwest Pass in Louisiana's Plaquemines Parish.

With recent Mississippi River Basin flooding, more sediment was deposited in Southwest Pass. "This record year has tested dredging abilities," Duffy said. "Navigation

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## USDA report at a glance

According to the USDA, the nation's economy depends on farmers using waterways to maintain a competitive global position. Increased investment in inland waterways would allow for more transport, particularly of farm products, which could grow from 14 percent of the system's volume in 2016 to 25 percent by 2029.

The report includes economic analyses for a dozen states moving the most corn and soybeans by barge: Arkansas, Illinois, Indiana, Iowa, Kentucky, Louisiana, Minnesota, Mississippi, Missouri, Ohio, Tennessee and Wisconsin.

Inland waterways have an advantage in fuel efficiency and greenhouse gas emissions, the USDA said. Inland towing can move 647 ton-miles per gallon, versus 477 ton-miles by rail and 145 ton-miles via trucks. Inland towing's CO<sub>2</sub> emissions are lower than those from rail transit and are only a fraction of those from trucks.

What's more, water transport is safer. "On a million ton-mile basis, there are 21.9 rail fatalities and 79.3 truck fatalities for every one on the water," the USDA said.

For every injury in water transits, 80.9 have occurred by rail and 696.2 via trucks.

*Susan Buchanan*

interests across the nation, along with the U.S. Army Corps' districts, have said we need to fix the Southwest Pass problem."

Duffy sees the E&WD bill passed by Senate Appropriations as very positive. It would allocate \$525 million for a regional dredge demonstration program to show multiyear efficiencies from building deep-draft projects between Louisiana and Florida, including the Mississippi River Ship Channel.

The Army Corps' dredge work is typically planned and funded annually project by project. Under the Senate bill, a multiyear demo program would respond to needs

from storms and address routine yearly dredging.

Duffy said 2019 has been historic. "I never thought we would open the Bonnet Carre Spillway in back-to-back years, much less twice in the same year," he said. The spillway just west of New Orleans allows floodwaters from the Mississippi River to flow into Lake Pontchartrain and then into the Gulf of Mexico.

"In FY 2019, the Corps was appropriated a record of roughly \$245 million for operations and maintenance of the Mississippi River Ship Channel from Baton Rouge to the Gulf," Duffy said.

"But the channel was deficient for over seven months as the Corps had to dredge nearly triple the usual amount of sediment. The Great Flood of 2019 has been one for the books, with a record length of flood stage, record funding and record maintenance dredging."

Strong demand for hopper dredges in recent years has hampered work on Corps projects, including efforts from Baton Rouge to the Gulf. The Big River Coalition wants hopper and cutterhead dredges to be committed and able to start early in new fiscal years.

*Susan Buchanan*



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## World's last sail-driven tanker docked in limbo at Hawaii pier

The last remaining sail-driven oil tanker in the world is docked at a state-owned pier in Honolulu, where it faces an uncertain future.

Plans are in place for the 280-foot *Falls of Clyde* to relocate to Glasgow, Scotland, where it could be refurbished and potentially used as a multipurpose sailing ship. But that effort has largely stalled, in part due to challenges raising the estimated \$1 million needed to haul the ship to Europe.

Meanwhile, the state of Hawaii has impounded the historic vessel and attempted to sell it earlier this year. No “legitimate” bidders emerged, according to the state, leaving the vessel in limbo.

“From our standpoint, we are still hopeful the organization Save *Falls of Clyde* International will finally put together the project to move the ship from Honolulu to Scotland,” said Bruce McEwan, a leader with the local group Friends of Falls of Clyde, which owns the ship.

He described something of a tense relationship with Hawaii officials, who made it clear they want the 141-year-old ship gone from Pier 7, where it has been tied up for many years. The state is concerned the vessel will sink at the dock or in the harbor, where it could hinder shipping and require a costly salvage.

“Honolulu Harbor is the state’s largest harbor and the hub of our hub-and-spoke shipping system,”

said Shelly Kunishige, spokeswoman for the Hawaii Department of Transportation, explaining the potential issues with moving the ship or allowing it to remain at the pier, where it could sink.

*of Clyde* has deteriorated over the years and is no longer seaworthy. Its masts are down, it lacks sails and rigging, and its rudder is gone.

The Friends of Falls of Clyde bought the vessel in 2008 with



*Falls of Clyde, shown berthed in Honolulu Harbor in 2010, continues to deteriorate as supporters try to raise the money necessary to transport the ship to Glasgow, Scotland, where it was built in 1878.*

The iron-hulled, four-masted *Falls of Clyde* was built in 1878 in Glasgow, and many of its early years were spent serving the India trade. Capt. William Matson, the founder of Matson Navigation Co., bought the vessel in 1899, and it remains the oldest surviving vessel of Matson’s fleet.

Eight years later, the vessel was sold again and converted to a tanker with a capacity of about 19,000 barrels. It was later used as a floating fuel depot in Alaska. The vessel was towed to Hawaii in 1963, and five years later it opened as an exhibit of a Hawaiian history museum.

The vessel is included in the National Register of Historic Places and in 1989 was named a National Historic Landmark. *Falls*

the goal of preserving it. In 2016, Hawaii impounded the vessel, leading to the auction earlier this year. One key stipulation for the sale was having a plan and the resources to move the vessel. No bidders met that threshold, Kunishige said.

The state is now allowing the Friends of Falls of Clyde to remove personal effects from the ship. Once that process is complete, Kunishige said the state will continue to look for ways to remove the vessel.

Despite that pressure and a series of setbacks from potential partners in Europe, McEwan is fairly optimistic the vessel has a future. “We just hope,” he said, “that it turns out positive.”

Casey Conley

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# Towing

by Casey Conley

## Subchapter M glass 'half full' amid progress and challenges

In one breath, Tom Allegretti, president and CEO of the American Waterways Operators, describes Subchapter M as “a singular milestone” for an industry striving to improve safety and eliminate spills. In the next, he acknowledges the Coast Guard’s towing vessel inspection standards remain a work in progress, and could stay that way for some time.

“The mission of Subchapter M has yet to be accomplished,” Allegretti said during a conference at the Maritime Institute of Technology and Graduate Studies (MITAGS) campus near Baltimore in late September.

“There is a long road ahead of us to ... bridge the gap between the regulation and the reality of our boats and our barges and our people,” he continued. “Subchapter M will only fulfill its prom-



Coast Guard Cmdr. Andrew Bender, left, answers questions alongside Tom Allegretti of the American Waterways Operators during a Subchapter M conference in late September at MITAGS in Baltimore. Bender emphasized communication and partnership between towing vessel operators and the Coast Guard to smooth the regulatory process.

Courtesy: KRPR Photography Ltd.

ise when we have bridged that gap.”

Allegretti’s mixed assessment seems to ring true throughout the towing sector comprising roughly 5,800 active vessels and hundreds of companies large and small. Enforcement of the new standards remains something of an open question. Meanwhile, operators continue to report inconsistencies

in how the regulations are interpreted by Coast Guard officials in different regions.

Dan Justis, who heads Subchapter M compliance for a large West Coast towing company, said two of its identical SOLAS-rated tugs in different Coast Guard port zones have different manning requirements. Justis said the matter is under appeal, but for

now the company must abide by the decision.

“We have noticed some distinct differences in manning requirements,” he said during the MITAGS conference, adding that the mixed interpretations are “kind of frustrating.”

Subchapter M took effect July 20, 2018, after more than a decade of development and review. As of that date, all tow-

ing vessels must comply with Subchapter M, even if they do not yet have a certificate of inspection (COI).

Coast Guard data suggests the inspection program started a little slower than expected. The service hoped to issue roughly 1,300 COIs in the first year, through July 20, 2019. When that date arrived, 915 vessels had the credential and another 450 were in progress. As of Sept. 25, that figure had grown to 1,165 COIs with another 500 under review.

By July 20, 2020, the regulations require 50 percent of each operator's fleet to have a COI. The rules also mandate that all single-vessel operators have their COIs by that date. That includes companies with a single boat as well as firms that

establish each vessel as a separate entity.

Despite a declining volume of COI applications and relatively thin backlog for single-vessel operators, there is concern not all will be in compliance by July 20, said Cmdr. Andrew Bender with the Coast Guard Towing Vessel National Center of Expertise in Paducah, Ky.

"I like to think it is because we are getting so good at processing COIs ... but it is because boats are not submitting applications," Bender said. "You have to submit applications for us to get the COI processed and out to you."

Bender acknowledged there will be disagreements between vessel operators and Coast Guard personnel over the interpretation of rules. When those situations arise, he urged

operators to file appeals. He also advised them to get to know the local Coast Guard inspection personnel and try to work collaboratively to address any disagreements.

"Communication and partnership. I can't emphasize that enough," Bender told the audience of more than 100 surveyors, auditors and towing industry representatives. "Number one is getting to know the marine inspectors, the chiefs of inspection, and the officer in charge, marine inspection (OCMI) in your port. Understand their expectations and they should understand where you are coming from as well."

Seventy-five percent of COIs have been issued to companies that developed a towing safety management system (TSMS),

then hired a recognized third-party organization (TPO) to conduct the vessel audits and surveys. That figure aligns with industry and Coast Guard expectations for the programs. It also signals progress toward the safety goals

“There is a long road ahead of us to ... bridge the gap between the regulation and the reality of our boats and our barges and our people.”

Tom Allegretti,  
American Waterways  
Operators



**A tow moves through Pickwick Lock on the Tennessee River system. Subchapter M stipulates that 50 percent of each operator's fleet must have a certificate of inspection by July 20, 2020. The COI deadline date also applies to single-vessel operators.**

U.S. Army Corps of Engineers photo

established through Subchapter M, Allegretti said. The remaining 25 percent of vessels are undergoing Coast Guard inspections to earn a COI.

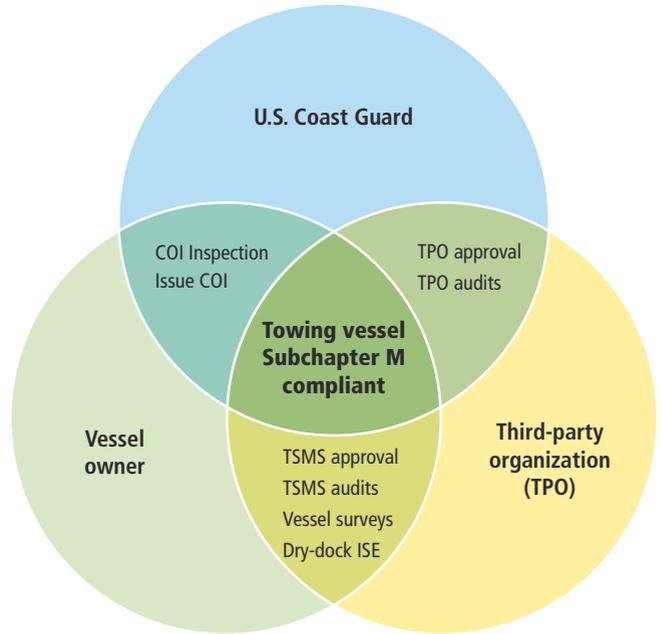
"The TSMS option to us is really a key part of fulfilling the promise of Subchapter M, because it requires a safety management system," he said.

“It is not just a point in time, on a day of a Coast Guard inspection, to show your compliance with regulatory standards. It is a living process that you utilize every single day to evaluate how well you are doing and improve how well you are doing.”

Receiving a COI one day is no guarantee that vessels will meet the letter of the law the next day. During the three months ending Sept. 30, the Coast Guard found 655 deficiencies on towing vessels required to comply with

Subchapter M. Nine vessels were detained, one of them with a COI, Coast Guard data show.

Erik Johnson, national towing vessel coordinator for the Coast Guard’s Office of Commercial Vessel Compliance, cited several recurring themes in the deficiency data. The most common problems were with main engines and auxiliary machinery. Inspectors also noted numerous deficiencies with lifesaving and fire-fighting equipment. Eight of the nine detained ves-



Vessel owners and operators who select the towing safety management system (TSMS) option for Subchapter M compliance must complete management and vessel audits. This is done through a third-party organization or group that can perform the work of a TPO.

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sels also had excessive oily water in their bilges.

One of the detained vessels was a tug on the Gulf of Mexico that lacked a health and safety plan, among other deficiencies. Johnson said the operator had “a general lack of knowledge” of Subchapter M and its requirements, despite more than a decade of industry and Coast Guard outreach.

This particular operator took the appropriate steps to bring the vessel into compliance and later earned a COI, which the

Coast Guard considers a “success story,” Johnson said. Others might not be so responsive.

“Those companies are still out there,” he said. “Not all of them are shady characters. We have to meet them where they’re at, and we have got to get everybody up to speed there. Those that are absolutely unwilling to comply, we have to deal with those guys as well.”

He added that the policy at Coast Guard headquarters is not to randomly target or board tow-

ing vessels to ensure compliance. “That said, if there is a marine incident, a marine casualty, a reported incident or anything like that, we are going to go out there and dig a little bit deeper,” Johnson said.

Allegretti agreed that enforcement is a critical part of Subchapter M, and it should be “proactive and vigorous.” He suggested that the Coast Guard typically knows which vessels or operators might not be in compliance. Dedicating limited resources toward those operators, he said,

will produce the most “safety bang for the buck.”

Looking at the bigger picture, Allegretti is optimistic about the new standards and believes they will yield continued safety improvements for an industry that has seen a marked decline in accidents in recent decades.

“In many ways, the Subchapter M glass is half full,” he said. “What has been accomplished so far is a very good start and a very big deal, but most of the journey is still in front of us.”

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Advanced Manufacturing Center student trains at machinist workstation.

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Rick Schwab,  
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# Delgado ‘Doubles Down’ on Rapid Workforce Development

Two campuses. One mission. Providing fast, flexible, and focused training that matches skill sets needed by industry is how Delgado Community College is responding to the aging workforce and major shortfalls in qualified workers.

Whether or not a business can grow and accept a major contract depends upon the ability to recruit or cultivate a competent workforce—deckhands, engineers, and welders alike. As a rapid response, Delgado Community College (DCC) in New Orleans is making a difference now by tailoring educational programs and facilities for the maritime industry that allow workers to ‘learn while they earn.’

Delgado is not your typical community college with two-year programs. With an enrollment exceeded only by Louisiana State University, DCC’s Maritime and Industrial Training Center—already in its fourth decade on the east bank of the river—has been joined by a new 80,000 ft<sup>2</sup> River City Campus on the west bank. With \$27.3 million dollars in funding from federal, state, and private sources, this River City Campus includes a new Advanced Manufacturing Center.

Why such dramatic growth? DCC’s new Chancellor Larissa Littleton-Steib, Ph.D explained, “[What programs we offer are] really based on the need of industry. We have advisory boards that sit on every program to advise us what the workforce needs are so that we are training in real time. Our training is relevant and with the latest technology.”

Chancellor Littleton-Steib refers to the successful use of corporate advisory boards, such as the two that advise MITC—a maritime steering advisory board and an industrial one. At the Advanced Manufacturing Center on the River City campus, the welding, machinist, and diesel engine programs each have their own advisory committees weighing in on the relevance of the program structure.

“I don’t tell them what they want, they tell me what they need,” said Rick Schwab,

executive director of the Maritime and Industrial Training Center since 1998 and now the interim executive director of the Advanced Manufacturing Center. By ‘they,’ Schwab refers not only to the advisory committees, but also the twenty new partners that are working with him as educational programming is expanded on the west bank or River City campus.

Industry advisors have asked for cradle-to-grave training programs that can gain or refresh skills sets for any level of career. “We’re meeting industry’s needs in weeks, not years,” Schwab said. “It’s a laser approach; we listen to what the maritime industry needs and then deliver modular training that is assesses competency and a student’s readiness for work.”

The eastern MITC facility, which opened a new 19,000 ft<sup>2</sup> facility and added 3.3 acres to the original footprint in 2016, offers USCG-approved training in fire fighting, safety, galley cooking, maritime security, and much more. State-of-the-art simulators, operated under the guidance of experienced captains, provide early- and advanced-career mariners with hands-on training needed to achieve licensing. Simulators are tailored to train the gambit from inland and offshore wheelhouse simulation to running a light boat in the IntraCoastal Canal or pushing 30 loaded barges southbound in the Mississippi River with a 6000HP towboat.

The Advanced Manufacturing Center on the west bank campus expands the offerings that support companies serving the maritime industry. It trains everyone from diesel mechanics to machinists, and from carpenters to pipefitters and welders.

With east bank and west bank campuses combined, Delgado Community College is now serving over 8,000 students from just the Maritime and Industrial Training Center and Advanced Manufacturing Center programs. This is a long way from the fifteen-student programs that MARAD ran in the 1970s.

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## Wind in the winches: Towing up the mighty Columbia

Story and photos by Brian Gauvin

*Captain Bob* is one of 16 tugs in the Tidewater Transportation fleet plying the Columbia and Snake rivers.

Power to overcome strong currents and wind is provided by a pair of Caterpillar 3516 main engines delivering 5,000 horsepower.

It was a busy March day aboard Tidewater Transportation's *Captain Bob*, catch-up time due to annual lock closures by the U.S. Army Corps of Engineers on the Columbia and Snake rivers.

The locks, closed one month for maintenance, had reopened two days earlier on the Columbia, and crews were scurrying to make up tows as barge traffic resumed upriver to the Tri-Cities of Richland, Kennewick and Pasco. The Snake River, navigable for commercial cargo to Lewiston, Idaho, opened the following week.

The Tidewater yard sits at

mile marker 102 on the north bank of the Columbia at Vancouver, Wash. For *Captain Bob's* deck crew, it was tough work making up the tow there, schlepping, coiling and cinching up heavy wire cable with hand-operated winches.

Kevin Maki, the deck hand on the after watch, appreciated the help from other deck crews in the fleet to prepare the tow for a midafternoon departure. He remarked that the tow — made up of two empty grain barges at the bow followed by two chip barges, one empty, the other loaded — was an oddball one.

With the tow assembled, the pilot, Phil Morgan, eased *Captain Bob* into the channel and began the push to Pasco, Wash., at mile marker 329. After making the Burlington Northern Railroad Bridge, the steel I-5 span joining Vancouver and Portland, Ore., and the modern concrete I-205 bypass bridge, the tow was clear of the two cities.

The 110-by-34-foot, 5,000-hp *Captain Bob*, the most powerful tug in the Tidewater fleet, is powered by two Caterpillar 3516 mains coupled to Reintjes reduction gears turning 108-by-84-inch, outward-

turning open propellers. That power would be needed to buck the river's strong spring current, which was being fed by freshets of snowmelt. Mount Hood, sparkling white and dead ahead, portended more of the same. Then there was the unrelenting wind, cutting through the mountains and buffeting the tow.

"When the water is running, there is more stress, especially making the locks," Morgan said. "There is so much current coming at you, with a lot of sideways action. If you turn too early at The Dalles, you're on the beach. There's an art to it, and some days are worse than others."

Morgan explained that with one foot of clearance port and starboard in the locks, "you just head for the middle of the lock and get in there, especially at high water. And daylight is your friend."

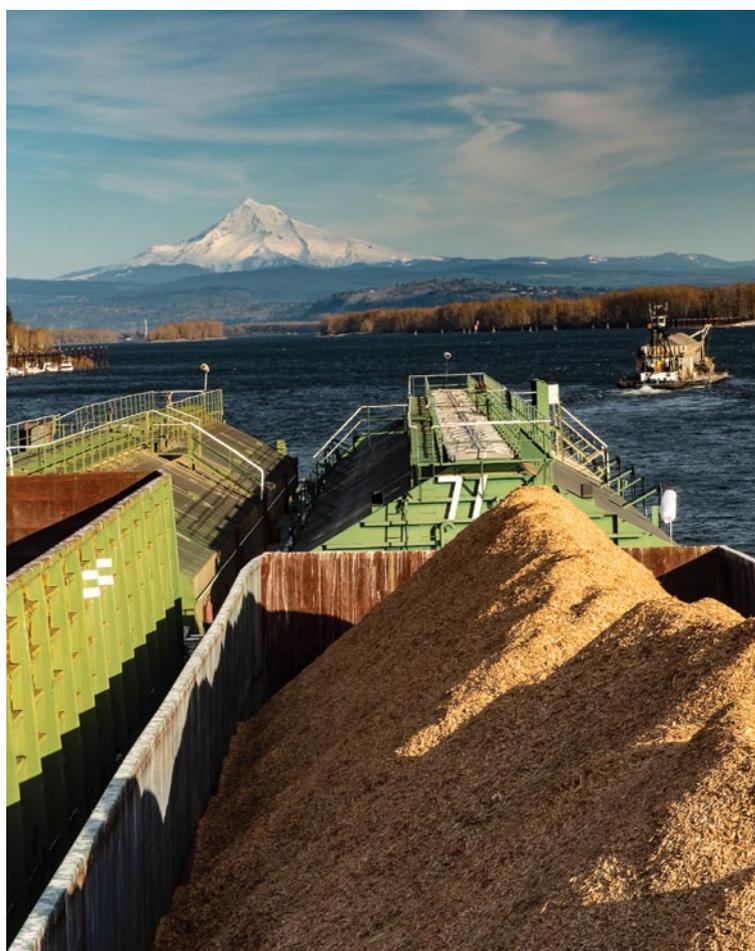
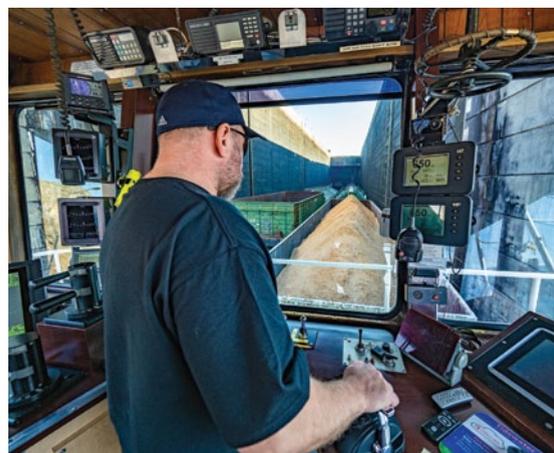
*Captain Bob's* primary navigation tool is radar, but Morgan said AIS is a useful instrument for predicting the estimated time of arrival at bridges and dams. Notifying a bridge operator and lock master well ahead of arrival time is crucial for avoiding delays.

AIS also indicates safe locations in the channel for meeting and passing other tows. Downriver tows, riding with the current, have the right of

**Capt. Mark Cline, below, eases the tug into the lock at the John Day Dam on the Columbia River. Mount Hood, lower left, glows in the setting sun as *Captain Bob* pushes its four-barge tow up the Columbia to Pasco, Wash.**

way. Upriver tows have an easier time adjusting speed accordingly.

At 1800 hours, with Mount Hood aglow in evening light, Capt. Mark Cline arrived on the bridge and took the forward watch. After giving his watch report, Morgan headed for the galley to enjoy sumptuous fillet of beef cooked a per-



"There is so much current coming at you, with a lot of sideways action. If you turn too early at The Dalles, you're on the beach. There's an art to it, and some days are worse than others."

Phil Morgan,  
pilot

fect medium rare by Maki.

At Prindle Dike, Cline recorded the wind at 55 mph, a new high for the trip. Although not a competition, Morgan and Cline like to see which watch logs the highest wind speed on each transit. Cline said that at the Bonneville Dam, the east wind blows strong and often. "The worst wind spot is Cape Horn," he said.

The cape, a massive basalt outcrop on the Washington side of the river at mile marker 132, acts as a bounce board for the unrelenting wind. As *Captain Bob* approached, the wind blew up to 50 mph on the starboard bow, then bounced off the shear cliff face and pushed on the port bow.



“This is a short tow,” Cline said. “Normally our tows are 650 feet long. We like the short tows when the wind is blowing. The extra length makes a big difference when you’re making a turn in the wind. I can put this tow anywhere I want.”

Cline added that the 9-foot open wheels on *Captain Bob*, the largest on any Tidewater boat, are an immense help when turning in the wind.

“This is the best wind boat in the fleet,” he said. “When the water starts running and you come out of the locks, you don’t lose any power with the open wheels. With

nozzles, you’re going to lose some horsepower. There is no advantage for us to have nozzles. And with nozzles you get caught up with debris, especially up the Snake. We get debris piles.”

The past winter was a tough one for much of the United States. The Pacific Northwest, which experienced unusually heavy snowfall and rain, was no exception. The severe conditions, with temperatures locking in at between 17 and 32 degrees, combined with the wind to make a difficult job much harder.

“February is a short month for us because of the lock

“We like the short tows when the wind is blowing. The extra length makes a big difference when you’re making a turn in the wind. I can put this tow anywhere I want.”

Capt. Mark Cline

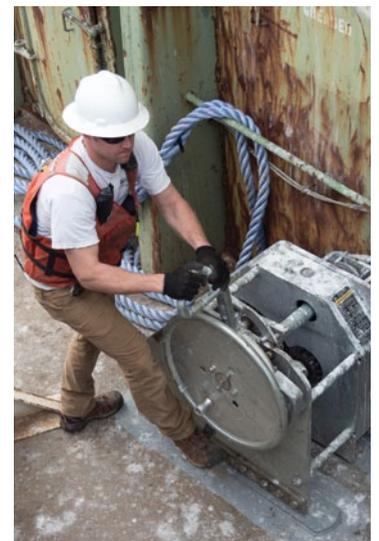
closures,” Cline said. “But we were so burned out with shoveling snow off the tow and spreading rock salt that we all said it was the longest short month we’d ever done. The lines were like two-by-fours when you moved them. Everything took twice as long to do.”

Cline said that on many days, they were running in whiteouts and couldn’t turn on any lights because illuminating the blinding snow caused vertigo.

The Bonneville Dam at mile marker 146.1 was lit up like a small town. As Cline approached the lock, he slowed *Captain Bob* and responded to deck hand Kyle Burkhalter, who was on the bow of the tow with a hand-held radio. Burkhalter called out distances from the bow to the lock opening, and from the beam of the tow to the guide wall jutting out from the lock entrance.

Once in the chamber, the

A Carlisle & Finch searchlight, above left, reaches out from the bow of the tow as *Captain Bob* moves upriver under cover of darkness. Deck hand Kevin Maki, right, uses a hand-operated winch to make up the tow at the Tidewater yard in Vancouver, Wash.



routine was repeated on the approach to the upriver gate. “We know where the stern is, so we know where our bow is in the lock,” Cline said. “Five more feet will put us in the lock.” Maki then tied off the tow.

When the water in the lock equalized with the upriver pool and the gates were opened, Cline eased the tow out, leaned on the throttles and pushed for Hood River, Mosier and The Dalles beyond. Morgan joined the bridge at midnight and he and Maki took the pilot’s watch.

At the 0600 watch



change, Morgan reported that, as usual, the east wind dropped off just below Hood River, and the tow speed rose from 7.4 mph to 8.4 mph. During the night, Morgan recorded 60-mph winds off 13 Mile Point, a record for the trip. On previous transits, Morgan has logged 101-mph winds on the Columbia, and Cline has recorded 102 mph.

**Capt. Mark Cline, right, guides the tow across Lake Celilo as the sun rises. He uses flags on the bow of the tow to help judge distances. Below, the crew in the pilothouse, from left: deck hand Kevin Maki, pilot Phil Morgan, deck hand Kyle Burkhalter, and Cline. “We really mesh together well,” he says.**



At first light, Cline eased the tow along the guide wall at The Dalles Dam and entered the lock. Maki, once again on

the bow with a radio, called out the distances.

“A good deck hand can make an operator look good all the time,” Cline said.

“This crew has worked together for a long time and it goes really smooth.

We really mesh together well. Phil and I spent years on deck, so we make it as easy on the crew as we can because they’re the ones doing the heavy work.”

“Everybody takes care of everyone else,” Morgan said as he headed for the galley. “We run the boat and the deck crew keep it running. And they are really good at it.”

For the most part, Morgan

and Cline run the tug at 44 percent capacity, or 3,000 horsepower. “There’s not much advantage running at 5,000 and burning 10 more gallons per hour when you don’t have to, just to gain a few minutes,” Cline said. “The fuel burn is less, the boat is quieter and it’s better all around at 3,000.”

*Captain Bob* was built in 1974 at Floating Marine Ways in Portland, Ore., with EMD 645 12-cylinder main engines generating 3,000 horsepower. The EMDs were replaced with Caterpillar 3516s during a refit in 2012. At the same time, two Caterpillar C6.6 ACERT gensets were installed with an automatic switch that prompts the second generator to kick in when the other one shuts down.

“I really like the automatic swap-out on the generators,” said Cline, who has experienced a generator failure. “It happened on (the tugboat) *Chief*. We were just enter-

ing the lock chamber with a dead boat.”

The deck hand was on the bow calling out distances. “He said he knew I wouldn’t be turning off the lights, so he recognized that something was wrong and came running back to turn on the other generator and get us back online,” Cline said. “It seemed like an eternity but it was probably only about three minutes. It was a bad feeling all around.”

Above The Dalles, Cline slowed the tow to a crawl, then stopped it and waited for a freight train to cross the Oregon Trunk Rail Bridge. Lake Celilo was a sheet of glass reflecting a glorious sunrise

when the bridge was raised, and Cline got the tow back underway.

At 0838, Cline made the Biggs Rapids Bridge spanning the river between Biggs Junction, Ore., and Maryhill, Wash. The Maryhill Museum of Art, the creation of the Quaker Sam Hill, stands grand on a shelf below a ridge lined with wind turbines.

Sam Hill was a substantial contributor to the Northwest’s economic and cultural development in the early 20th century. Among his many projects and enterprises are the Peace Arch on the border with British Columbia at Blaine, Wash., and the original Columbia River Highway, the oldest scenic highway in the U.S.

On the approach to the John Day Dam at mile marker 215.5, Cline explained that he uses the flags at the bow of the tow to help judge distances. “When a flag touches whatever (object), it’s about a half-mile away,” he said. “It helps a lot. All the little tricks help you do your job easier and better.”

The gain in elevation at John Day Dam is 103 feet, raising the tow onto Lake Umatilla. Bonneville rises 64.1 feet and The Dalles 82.4. Up ahead, at mile marker 292.5, the McNary Dam lifts the tow another 75 feet onto Lake Wallula and, from there, a smooth sail to Pasco. •

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# At Work

## New SIT towboat bewitches with hull 'voodoo,' z-drives

Story and photos by Brian Gauvin

**F**irst light was breaking as Capt. Bob Asher maneuvered *Karl E. Johnson* across the Mississippi River to the Southern Illinois Transfer (SIT) fleet at Ste. Genevieve, Mo.

Asher nudged the bow up to the stern of a four-barge tow loaded with scrubber stone destined for the power plant in Lively Grove, Ill. With the towboat faced up, deck hands Jason McConnell and Zack Dill hoisted lock lines over their shoulders and headed for the



bow of the tow to prepare for the Jerry F. Costello Lock, six miles downriver, at the mouth of the Kaskaskia River.

Just above the Kaskaskia, Asher turned the tow and backed down with the current. "When I get abreast of the mouth I'll just twist the tow in there," he said. "If we don't do it this way, we'd have a whole different story. The current would put us on the point below the mouth."

Arriving at the mouth, Asher

applied power and rudder and, taking advantage of the current, turned the tow into the river. He pushed the throttles forward and entered the Kaskaskia.

On the approach to the lock, McConnell was on the bow of the tow, calling out distance and width to Asher at the helm. Once locked through, it was smooth sailing to Baldwin, Ill., beyond which the river narrowed and silted, causing the z-drives to churn mud. Asher backed off the throttles to ease the strain on the tow, slugging through the thick water.

*Karl E. Johnson*, powered by two Cummins QSK19 main engines shafted to Veth azimuthing stern drives, was designed and built by SIT and its Barbour JB Shipyard, incorporating Kenny Barbour's double-chine hull design.

"We call it Barbour hull voodoo," said Kurt Johnson, president



*Karl E. Johnson*, above, the latest addition to the Southern Illinois Transfer fleet, displays its handling prowess on the Kaskaskia River. The towboat has a Kenny Barbour double-chine hull and Veth z-drives. "I can't begin to tell you how well this boat handles," says Capt. Bob Asher, left, guiding a four-barge tow down the Mississippi River.



Deck hands Zack Dill and Jason McConnell, right, set a three-part scissor breast wire to cinch up the tow. At left, McConnell monitors one of the Veth z-drive units in the engine room. Twin Cummins QSK19 mains provide 1,500 horsepower.



and part owner of SIT. He is also the brother of the boat's namesake. "The engineers can't explain why it pushes so well, but it does. What our people tell us is that our 1,500-hp boat handles and pushes like an 1,800-hp boat."

Voodoo or not, *Karl E. Johnson* negotiated the mud with ease to the Kaskaskia Regional Port District 1 dock at mile marker 24.5.

The towboat is the third from the Barbour JB Shipyard with a double-chine Barbour hull. The yard sold the first boat to another operator, but the 68-foot *Kaskaskia Warrior* — completed in early

2019 — joined the SIT fleet. It now totals nine towboats working on the Mississippi and Kaskaskia rivers.

In addition to the Barbour hull, *Karl E. Johnson* has another feature that distinguishes it on U.S. inland waterways: Veth z-drive propulsion, the first installation of such a system on a new Midwest towboat.

"I can't begin to tell you how well this boat handles," said Asher, still negotiating the z-drive learning curve. "When I get my handling up to par, it will be even better." ●

### **Karl E. Johnson** SPECIFICATIONS

Owner/operator: Southern Illinois Transfer, Sparta, Ill.  
 Designer/builder: Southern Illinois Transfer/Barbour JB Shipyard, Baldwin, Ill., with engineering by Sterling Marine, Fairhope, Ala.  
 Dimensions: L: 68' B: 28' D: 9'6"  
 Crew size: Three

#### PROPULSION

- (2) Cummins QSK19 750-hp main engines
- (2) Veth VZ-700 azimuthing stern drives
- (2) Kubota 40-kW auxiliary generators
- Christie & Grey isolation mounts
- Vessel speed: 12 knots

#### DECK EQUIPMENT

- (2) Wintech 40-ton deck winches
- One-inch face wires
- M&M Bumper Service fendering

#### NAVIGATION GEAR

- Furuno electronics suite

The boat's hull form allows it to push a four-barge tow about 50 percent faster using one-third less fuel than other SIT vessels, according to Kurt Johnson, company president. At right, *Karl E. Johnson* heads up the Kaskaskia River with a cargo of scrubber stone.



# Casualties

## NTSB: Fatal fire started on California dive boat as crew slept

Shortly after 0300 on Sept. 2, a crewmember aboard the dive vessel *Conception* awoke to an unusual sound. He left his bunk on the ship's upper level and saw the galley, on the main deck below, engulfed in flames.

The fire intensified as five crew searched for a way into the burning compartment, below which 34 people were trapped in a bunkroom on the lower deck. Smoke, heat and flames made those efforts impossible, the crew told National Transportation Safety Board (NTSB) investigators.

The five surviving crew ultimately abandoned the ship, which was anchored just off the north side of California's Santa Cruz Island. The vessel later burned to the waterline.



Santa Barbara Sheriff's Office photo

Thirty-four people died, 33 of whom were guests on a diving excursion in the Channel Islands. One victim was a crewmember sleeping in the passenger bunkroom.

In the days that followed the

The dive boat *Conception* burns off the coast of California's Santa Cruz Island on Sept. 2. Thirty-three passengers and one crewmember died in the early morning fire, all of them trapped in the bunkroom below the main deck. The boat later sank.



NTSB investigator Jennifer Homendy and Coast Guard Capt. Jason Neubauer tour the lower berthing area of *Vision*, a sister vessel to *Conception*, on Sept. 4 in Santa Barbara Harbor. Access to the galley above is via a narrow ladderwell and an emergency escape hatch.

NTSB photo

incident, officials from vessel owner Truth Aquatics and the surviving crew gave detailed interviews to the NTSB. The agency used these details to produce a preliminary report that does not include the probable cause. Jennifer Homendy, an NTSB board member, said that likely won't be available for more than a year.

"I am 100 percent confident our investigators will determine the cause of this fire, why it occurred, how it occurred, and what is needed to

A close-up photograph of a middle-aged man with a grey beard and mustache, wearing a white hard hat with a headlamp, safety glasses, and a high-visibility yellow safety vest over a blue shirt. He is looking slightly to the right with a focused expression. The background is a blurred industrial setting with metal structures.

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prevent it from happening again,” she said.

Homendy noted the agency won't wait until the final report to suggest possible regulatory changes to safeguard against a similar tragedy. “If we find, as we have many times,

any gaps in safety regulations, we issue recommendations to strengthen them,” she said.

The Coast Guard, which has regulatory and enforcement authority over passenger vessels like *Conception*, has launched a Marine Board of

Investigation into the incident separate from the NTSB inquiry. It also will release its own report on the case.

The 75-foot *Conception* was on the last day of a three-day diving excursion on the morning of the fire. The ship anchored in Platts Harbor on the north side of Santa Cruz Island less than 100 feet from shore. The NTSB said all six crewmembers were sleeping when the fire started, contrary to Coast Guard regulations.

Through its preliminary report and a series of media briefings, the NTSB has offered a glimpse of what happened based on crew accounts. Homendy said the investigation will



*Conception* is shown moored in Santa Barbara with the two other boats in the Truth Aquatics fleet, *Vision* and *Truth*, in a photo from the company's website.

Courtesy/Truth Aquatics

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work to confirm those details, which she described as harrowing.

Five crew were asleep in bunkrooms on the uppermost sundeck, which also contained the wheelhouse, when the fire was discovered. The crewman who awoke to the noise and noticed the flames also roused crew asleep nearby. They quickly realized the interior of the vessel was inaccessible.

“Unable to use the aft ladder, which was on fire, the crewmembers jumped down to the main deck ... and tried to access the salon and galley compartment,” the NTSB said in its preliminary report issued Sept. 12. The report notes that one crewmember broke his leg jumping to the main deck.

The galley, the report continued, “was fully engulfed by fire at the aft end and by thick smoke in the forward end, through a forward window. Unable to open the window and overwhelmed by smoke, the crew jumped overboard.”

Two crewmembers and the captain, identified in media reports as Jerry Boylan, swam to *Conception's* stern and reboarded the vessel. They opened a hatch to the engine room and saw no evidence of fire. Flames blocked access to the salon through the aft doors, so the three launched a skiff and retrieved two crew still in the water. They then motored to another vessel, *Grape Escape*, which was anchored nearby. Two crewmembers returned to *Conception* in search of survivors in the water but found none, the report said.

At some point after the crew awoke, an unidentified crewmem-

ber aboard *Conception* made a frantic mayday call to the Coast Guard over VHF Channel 16. The caller attempted to provide location, the number of people on board and other details during the garbled

transmission. The radio went quiet soon after the caller said, “I can’t breathe.”

*Conception* continued burning for several hours and later sank in about 60 feet of water. The wreckage was



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inverted on the seafloor. Homendy made it clear that investigators wanted the vessel raised intact, and salvage crews successfully lifted the hull in one piece on Sept. 12.

Authorities have not discussed possible causes of the fire, but some key details have emerged as a result of the investigation thus far. For instance, Homendy said the crewman who first awoke to the fire reported he did not hear a smoke detector sounding anywhere on the vessel. According to the NTSB, there were two “locally sounding” smoke detectors overhead in the lower bunkroom.

*Conception* was not required under

existing codes to have a hard-wired fire detection system, NTSB officials said, and it lacked sprinklers, which also were not required. It passed its most recent Coast Guard inspection in February. Initial NTSB interviews revealed no mechanical or electrical issues with the boat before the fire.

On Sept. 4, Homendy and other NTSB investigators toured another Truth Aquatics vessel, *Vision*, that has a nearly identical layout to *Conception*. An NTSB video shows investigators descending from the salon/galley on the main deck to the bunkroom on a narrow stairway forward on the starboard side. The cramped compartment has space

for 46 people in single and double bunks stacked two and three high, with a narrow path separating rows of berths.

The escape hatch on *Vision* is located along the centerline and opens to the aft portion of the galley. Footage appears to show the hatch accessible from one or more bunks. According to the Los Angeles Times, Homendy expressed concern about the accessibility of the hatch. *Vision* is 5 feet longer than *Conception* but has a similar layout.

*Conception's* galley was equipped in typical fashion, with electric appliances and electrical systems to support that equipment. Homendy

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noted the possibility that photography equipment and personal electronics were charging in the vessel's outlets.

"We are not ruling out any possible ignition sources. We are focused on everything, including the electrical system and wiring," she told reporters during a media briefing.

The wooden-hulled *Conception* entered service in 1981. It was powered by twin 550-hp Detroit Diesel engines and had at least one 55-kW genset. It could hold up to 1,600 gallons of fuel, although it is not clear how much fuel was aboard on the morning of the fire.

Truth Aquatics of Santa Barbara,

Recent cases involving fatalities aboard a Missouri duck boat and a Maine fishing vessel hold clues for determining liability in the *Conception* fire, says retired Coast Guard Capt. Andrew Norris. See Correspondence on page 58.

Calif., has offered overnight diving excursions since its founding in 1974. Current owner Glen Fritzler has declined to comment specifically on the accident, noting the ongoing federal investigations. However, in a prepared statement he said that he and the company were "utterly crushed (and) devastated" by the incident, and they are committed to getting answers.

"Our lives have been irreversibly changed by this tragedy and the sorrow it has caused," said the statement on the company's website. "The families and friends of the victims and survivors are now, and forever, in our thoughts and prayers."

Court documents show Truth Aquatics and the Fritzler family took steps in the days after the fire to limit the company's liability and financial damages. A Sept. 5 filing in U.S. District Court in Los Angeles asks for "exoneration from or limitation of liability" from the incident. The filing describes the vessel as "seaworthy" and "tight, staunch and strong."

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*Punitive Damages for Unseaworthiness*" which discussed and analyzed the recent *Batterton* Supreme Court decision.

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**W**hen Mr. Crew started as an attorney, he worked for one of the premier maritime law firms in Texas, representing a “who’s who” of maritime shipping companies, from cruise lines to the largest Jones Act tanker operators.

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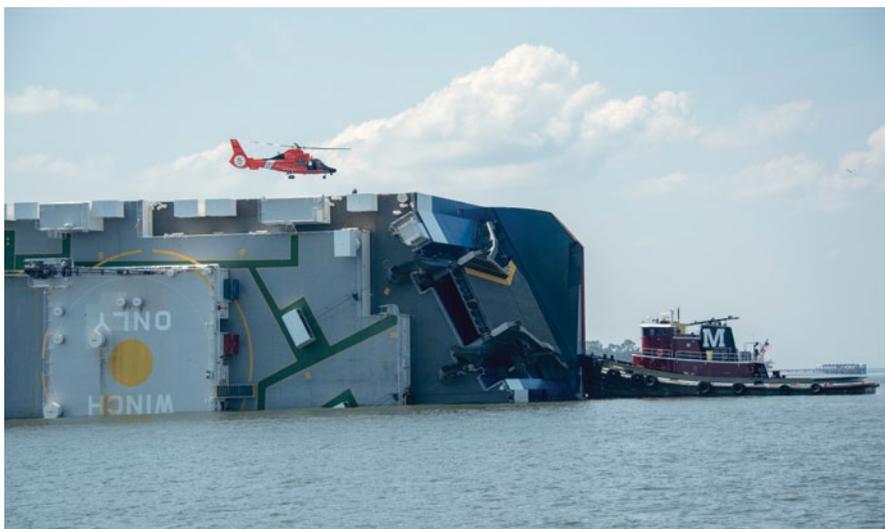
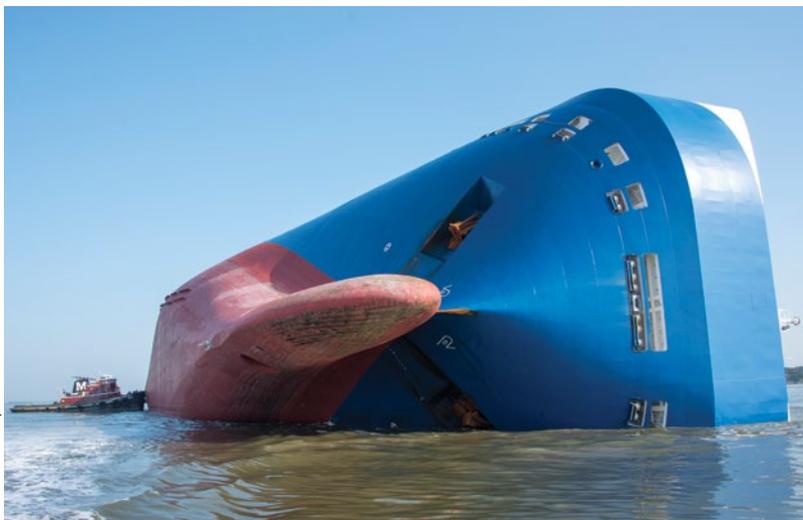
## Twenty-four rescued after vehicle carrier capsizes off Georgia coast

**G**olden Ray left the Port of Brunswick, Ga., early on Sept. 8 with thousands of vehicles packed into its hull. Its journey came to an abrupt end after the ship developed a port-side list and ultimately rolled over in St. Simons Sound within sight of the open ocean.

Nineteen crew and a Brunswick bar pilot escaped the 656-foot ship within hours after it capsized at about 0200 on Sept. 8. Coast Guard air and boat crews coordi-

The vehicle carrier *Golden Ray* lies on its side in St. Simons Sound on Sept. 9 after capsizing early the previous day. Twenty mariners on board were rescued within hours of the rollover, but four others were trapped below the cargo decks.

U.S. Coast Guard photos



A Coast Guard MH-65 Dolphin helicopter, left, lands on the side of the capsized ship to drop off supplies for rescuers. Below, one of the four crewmembers trapped aboard *Golden Ray* is greeted by Coast Guard personnel and other rescuers after emerging from the ship.



nated the rescue of the 20 mariners during the overnight hours.

Four engineering crew remained trapped belowdecks for another day and a half, spurring a massive response involving the Coast Guard, salvage experts from Donjon-SMIT, and other partners. The team located the men through hull taps and later opened a hole for them to escape.

Coast Guard Capt. John Reed said the crew who were trapped

faced extraordinary conditions, including darkness, extreme heat and lack of food and water. Several were splashed with lubricants during the ordeal.

“Their condition is relatively good for having spent 34 or 35 hours in the conditions they were in,” Reed told reporters just after the first three men were freed. All four of the mariners, believed to be South Korean, received medical treatment at nearby facilities.

The Coast Guard Unified Command reported sheening and oil in nearby marshes in the weeks that followed the incident. The product likely came from “sporadic discharges” from the ship as

it lay on its port side. As lightering efforts continued in mid-October, the Unified Command announced that *Golden Ray* would be disassembled in St. Simons Sound, not refloated, because experts had

determined it was not possible to safely right the ship “in a fully intact condition.”

The Marshall Islands-flagged ship departed Brunswick after both discharging and loading vehi-

cles. It had roughly 4,200 vehicles aboard when it left port. The ship prepared to make a starboard turn around Jekyll Island when a stability issue developed, causing a heavy port-side list. The Coast Guard and National Transportation Safety Board (NTSB) are investigating and the cause has not been determined. Another ship was inbound at the time *Golden Ray* capsized.

Capt. Jonathan Tennant, the pilot conning *Golden Ray* when it rolled over, earned praise from the Georgia Ports Authority for his role in intentionally grounding the ship just outside the navigation channel. The move reportedly minimized impacts to the Port of Brunswick.

The Brunswick Bar Pilots Association declined to comment on the incident, citing the ongoing inquiry and the group’s role assisting investigators. Capt. John Cameron, who served as a spokesman for the Brunswick pilots after the incident, said the group is confident the investigation “will show that the pilot’s actions contributed to the best possible outcome.”

“In particular, we’re quite proud of the pilot’s actions to direct tugs and coordinate the immediate rescue while perched on the gyro with a hand-held radio and flashlight,” Cameron said.

Coast Guard boat and helicopter crews were joined in the response by vessels from the South Carolina Department of Natural Resources and Glynn County, Ga.



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Tugboats from Moran Towing participated in the initial crew rescue that occurred before dawn on Sept. 8. Reed described the effort as “very difficult.”

The rescue “all came together to get 20 people off in the first couple hours, and that was no easy feat in the middle of the night on a vessel laying on its side,” he told NBC News.

Coast Guard crews soon learned the four unaccounted mariners were still on *Golden Ray*, although it was not known where. Boat crews spent hours on Sept. 8 circling the ship and hitting its hull with a sledgehammer to try and make contact with the men inside, said Coast Guard Petty Officer 1st Class Luke Clayton of Sector Jacksonville.

The tapping process was challenging, he said, because *Golden Ray* was constantly creaking and cargo was shifting in the hull. On the morning of Sept. 9, “it was still dark, and they were banging on the hull and they were able to get confirmation that someone was banging on the inside,” Clayton said. “That is how they narrowed down their location.”

Three of the four crew were in a dry compartment in the engine room, while the fourth was trapped behind glass on another level in an engineering control space. Donjon-SMIT crews opened a 2-by-3-foot hole in the hull, allowing rescue teams to pass food and water to the three crew nearby. They were freed at about

1500 on Sept. 9, tired but not seriously injured.

Donjon-SMIT personnel entered *Golden Ray* and located the 23rd and final crewmember. They guided him to safety at

about 1730 that night after cutting through a glass partition, Clayton said.

The response shifted to pollution control and salvage after the rescue phase ended. Donjon-



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SMIT divers plugged vents in the ship, and other response personnel laid thousands of feet of containment boom to minimize impacts from leaking fuel. The Unified Command has not yet estimated how much fuel and lubricant oil escaped the ship.

Lightering began in late September and continued into mid-October, when the Unified Command announced that more than 250,000 gallons had been removed from fuel tanks. More than 400 people and 70 vessels were involved in pollution control efforts.

With the investigation still underway, it remains too soon to

draw any comparisons between *Golden Ray's* capsizing and others involving vehicle carriers. However, the Marine Accident Investigation Branch (MAIB) in the United Kingdom released a report in early 2016 highlighting industrywide stability issues aboard vehicle carriers.

The report, spurred by the capsizing of *Hoegh Osaka* off the Isle of Wight in January 2015, found the ship rolled to starboard after leaving port with inadequate stability. The ship's upper decks were loaded with vehicles, while lower decks were "lightly loaded." The ship also did not take on addi-

tional ballast before leaving port in Southampton.

"A key finding of the MAIB investigation is that no departure stability calculation had been carried out on completion of cargo operations and before *Hoegh Osaka* sailed," the agency said in its report. "Witness and anecdotal evidence suggests that this practice extends to the car-carrier sector in general."

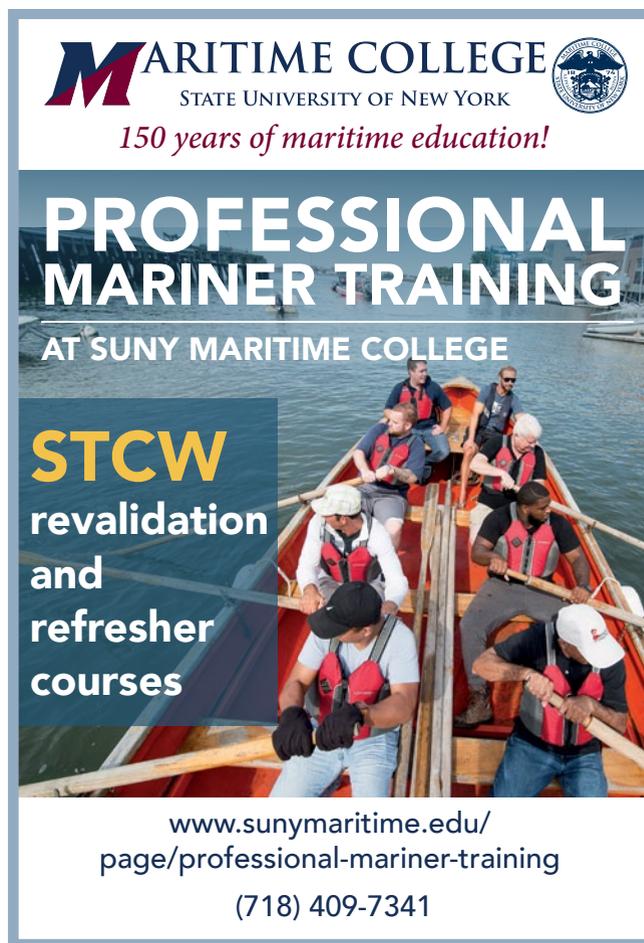
*Golden Ray*, built less than two years before it capsized, can carry about 6,930 cars. It was sailing at less than two-thirds capacity when the incident occurred.

Casey Conley



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## Capsizing of Fraser River tug highlights risk of girding

**G**eorge H. Ledcor was towing a loaded gravel barge up the Fraser River as the vessels approached a bend near Richmond, British Columbia. The tug turned to port, but the barge continued on a straight heading.

The captain ordered the assist tug pushing the barge's stern to back off, then applied full throttle and full starboard rudder as the barge began to pass the tug's starboard side. Barge *Evco 55* soon overtook *George H. Ledcor* on its starboard side, however, and the towline began exerting a broadside force on the tug. Attempts to release the tow weren't successful, and the tug capsized at about 2210 on Aug. 13, 2018.

"Within seconds, the tug's deck edge and bulwarks were submerged, creating a dragging force that heeled the tug further to starboard," the Transportation Safety Board (TSB) of Canada said in its report issued in October. "The tug rapidly capsized."

All four crew escaped the vessel, including the mate and a deck hand sleeping below deck. They

were picked up by the assist tug *Westview Chinook* and a nearby good Samaritan vessel, *River Rebel*. One of the two deck hands suffered a serious hand injury, and an unknown amount of diesel reached the waterway. *George H. Ledcor* was declared a total loss.

The TSB identified several issues during its investigation, including a persistent girding threat among Canadian tug operators. From 1991 to 2018, the TSB recorded 38 incidents of girding that resulted in 30 capsizings and five fatalities, the report said.

The twin-screw, 770-hp *George H. Ledcor* left Sechelt, British Columbia, at about 1645 on Aug. 13, 2018, after *Evco 55* loaded 4,621 metric tons of gravel. The destination was a gravel depot at Mitchell Island. The towline was connected

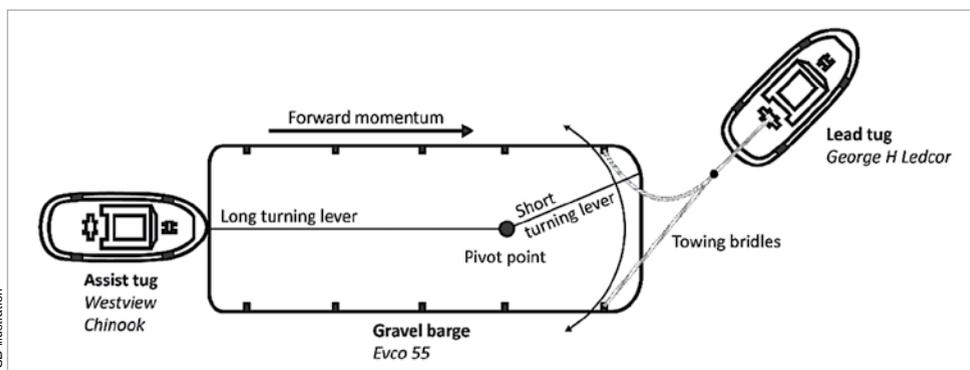


Courtesy Ledcor Group

*George H. Ledcor* passes Bowen Island near Vancouver, British Columbia, with a barge in tow in January 2017. The tugboat rapidly capsized when the barge *Evco 55* overtook it during a girding incident last year on the Fraser River.

to *Evco 55* via a Y-bridle secured to the barge's port and starboard sides. The 950-hp *Westview Chinook* assisted the tow by pushing on the barge's stern.

*George H. Ledcor's* captain shortened the towline to roughly 50 feet as the vessels approached the north arm of the Fraser River, just south of Vancouver. The vessels navigated through two bends and were approaching a third when the cap-



TSB illustration

The assist tug *Westview Chinook* was only pushing *Evco 55*, not guiding it, when the girding incident occurred. The TSB said *Westview Chinook* applied a longer turning lever and had more influence on the direction and momentum of the barge, in a straight line, than *George H. Ledcor*. "As a result, the lead tug, with its shorter turning lever, was unable to turn the barge," the agency said.

tain sensed the barge was not turning to port as expected.

*Evco 55* “continued on a straight course and began to overtake the tug, at which point the short towline, which was not secured by a hold-down gear, began to exert a broadside force on the tug, placing it in a girded position,” the TSB said.

The report added that the captain did not have time for corrective action before the tug started to roll. The captain and the deck hand on duty also lacked time to activate the general alarm, make a distress call or put on life jackets.

The agency suggested the towing arrangement hindered *George H. Ledcor’s* ability to turn the barge; the shortened towline meant the tug exerted less turning force. Conversely, the report said, the assist tug was better suited to maneuver the barge given its longer turning lever.

Both the captain and deck hand attempted to release the winch brake in the moments before the tug cap-

sized. The captain could not reach the wheelhouse abort button due to the tug’s starboard heel, and the deck hand reportedly pressed a button on the aft controls that did not release the winch. Post-incident analysis showed the winch abort system was not activated.

The report does not say if the deck hand pressed the correct button. However, the TSB noted that the abort buttons were in different parts of the control panels across all three conning stations. Ledcor has since standardized the placement of the abort mechanisms on its tugs.

*George H. Ledcor’s* captain earned his master’s license eight years before the incident. During the intervening period, he did not receive training or guidance from Ledcor on avoiding or responding to girding situations. According to investigators, the company considered girding and ways to respond to it common knowledge.

“When the barge began to overtake *George H. Ledcor*, the master

attempted to use steering and propulsion to reposition (the tug) in front of the barge,” the report said. “However, a number of factors acting on the vessel’s stability increased the vessel’s heel: thrust from the course alteration, flow of the river against the hull, and continued broadside force of the towline.”

The TSB said training on girding avoidance and response is key to ensuring that crews are prepared when these situations arise. To that end, Ledcor has taken steps to highlight this issue among its maritime workforce. These include adding girding avoidance to its safety management system and holding crew meetings on the topic. Ledcor also instituted a two-day training session on girding that includes time in a simulator for its mates and captains.

Ledcor, a diversified construction company based in Vancouver, did not respond to an inquiry about the TSB findings.

*Casey Conley*



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## Barge tow destroys riverside yacht club near Cincinnati

**A** barge tow slammed into an Ohio River yacht club near Cincinnati in a predawn accident, destroying the facility and damaging moored recreational vessels.

The 4,900-hp towboat *Dale Artigue* was heading upriver with 15 loaded barges when the lead barge in the starboard string hit the Ludlow Bromley Yacht Club (LBYC). The venue is located on the Kentucky side of the river at mile marker 473.9 outside the navigation channel. The incident happened at about 0600 on Oct. 2.

“The collision took large portions of the floating dock, and multiple boats dragged off with the barges into the middle of the channel,” Coast Guard Lt. Jim Brendel said in a phone interview. “There was debris in front (of the barge string), there were

boats and docks attached to the port side, and there was part of the restaurant attached to the starboard side.”

The Coast Guard closed the river for nearly 36 hours to allow for removal of damaged powerboats and portions of the yacht club from the navigation channel. The waterway reopened at about 1900 on Oct. 3.

Coast Guard officials are still trying to determine the cause of the incident. Brendel, stationed with Marine Safety Detachment Cincinnati, said the service is investigating “what happened, why it happened and what we can potentially do to prevent it from happening in the future.”

*Dale Artigue*, operated by Florida Marine Transporters (FMT), was pushing 14 barges loaded with sand, gravel and

stone, and a single barge carrying styrene. The styrene barge was positioned toward the back of the tow. None of the barges grounded or broke away after the impact.

“They seemed to kind of ricochet off (the yacht club) and push back out into the channel,” Brendel said, adding that it was not known where the lead starboard barge first made contact with the riverside facility.

The yacht club in Ludlow, Ky., often has guests staying overnight on their yachts during the summer boating season. Fortunately, Brendel said, there were no injuries and none of the recreational vessels sank. None of the barges were damaged.

FMT, the responsible party, coordinated the incident cleanup and response. Brendel said debris



**A 15-barge tow struck the Ludlow Bromley Yacht Club in Ludlow, Ky., on Oct. 2, knocking portions of the facility into the Ohio River. The waterway was closed for nearly 36 hours as debris and damaged vessels were removed from the navigation channel.**

Courtesy: Albert Casareo/Twitter

cleanup along the shore continued a week afterward. No pollution was reported.

Ludlow Bromley Yacht Club was a popular venue for boaters as well as a destination for dining, cocktails and entertainment during the warmer months. Owners Steve and Andrea Gott described the incident as a “tragic loss” for themselves, their staff and visitors.

“LBYC has been our paradise sanctuary for 23 great seasons, and we are so sad to watch it be destroyed in five minutes,” the couple wrote shortly after the accident in a Facebook post

“There was debris in front (of the barge string), there were boats and docks attached to the port side, and there was part of the restaurant attached to the starboard side.”

Coast Guard Lt. Jim Brendel

that suggested the venue could reopen.

“While the future for LBYC remains unclear and there are a lot of challenges to face, all I can say is thanks from the bottom of our hearts,” the post said, adding, “I will be back.”

Capt. Norm Antrainer of Mandeville, La.-based FMT said the company is still performing its investigation into the incident and has not yet determined the cause. The 120-foot *Dale Artigue*, built by the former Horizon Shipbuilding, was not damaged.

Casey Conley

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# Crane collapses after faulty weight assessment, injuring three

The crane barge *Atlantic Giant II* was rigged and ready to lift an estimated 350-ton counterweight from a salvaged derrick barge in Brownsville, Texas. But when the time came, the weight wouldn't budge.

It remained in place with the crane set for 500 tons of tension, and again at 550 tons. After a consultation, crane owner South Coast Maritime Corp. agreed to set the crane for 700 tons of tension, its maximum working weight. While the lift was underway, at about 2030 on Aug. 9, 2018, the boom collapsed, injuring three people. Property damage was \$6.4 million.

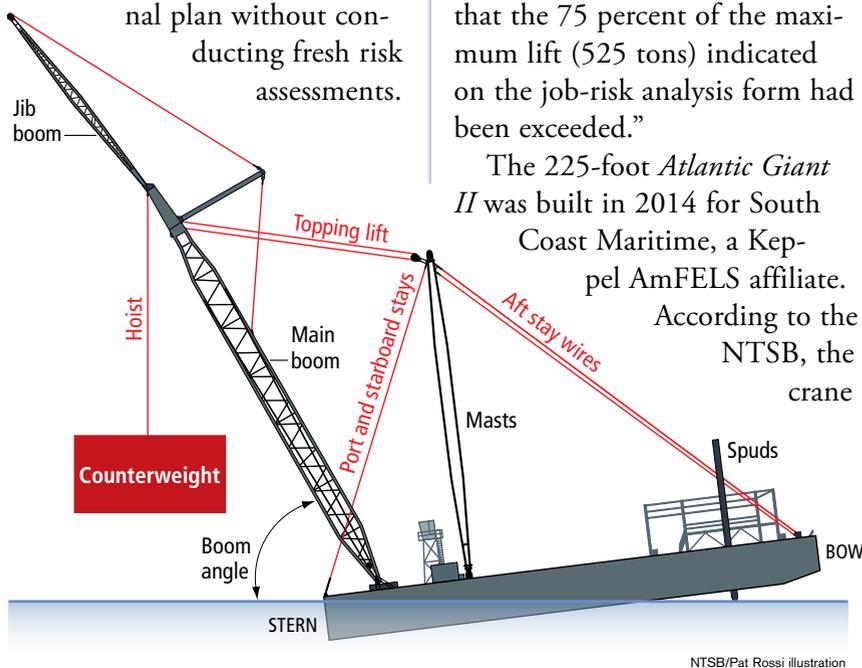
The probable cause of the boom failure, according to the National Transportation Safety Board (NTSB) was the decision to go ahead with several lifts that day that exceeded the original plan without conducting fresh risk assessments.

"There were numerous opportunities for employees to stop the work," the NTSB said in its report. "The deviation from the planned 350 tons communicated by the client was not immediately investigated to determine the source of the discrepancy. Fur-

thermore, there was no discussion that the 75 percent of the maximum lift (525 tons) indicated on the job-risk analysis form had been exceeded."

was mounted on a pedestal on the main deck, 25 feet forward from the transom. It had a 245-foot main boom and a 100-foot jib. Its safe working load with the boom between 66 and 75 degrees was 700 tons.

*Atlantic Giant II's* main boom lies crumpled in the Brownsville Ship Channel after collapsing on Aug. 9, 2018. The crane was lifting a 671-ton counterweight from the salvaged derrick barge *TOPS DB1* that initially was estimated at 350 tons.



thermore, there was no discussion that the 75 percent of the maximum lift (525 tons) indicated on the job-risk analysis form had been exceeded."

The 225-foot *Atlantic Giant II* was built in 2014 for South Coast Maritime, a Kerpel AmFELS affiliate. According to the NTSB, the crane contract to help disassemble the derrick barge *TOPS DB1*, which sank 30 miles offshore in the Gulf of Mexico in October 2017. Resolve Marine raised the barge less than a year later, performing what was reportedly the heaviest salvage lift ever in the Americas. The barge was being taken apart at SteelCoast's facility on the Brownsville Ship Channel.

*Atlantic Giant II* was slated to perform a series of lifts on Aug. 9 to remove heavy components

An NTSB diagram of *Atlantic Giant II* shows the barge's position and boom angle relative to sea level as the crane hoisted the counterweight from *TOPS DB1* (illustration not drawn to scale).

from the derrick barge. Crews involved with the job held a meeting that morning to go over the lift plan, emergency procedures and other key details. They also completed a job-risk analysis form, making it clear the crane would not lift anything exceeding 525 tons, or 75 percent of its maximum capabilities.

The first lift of the day got off to an inauspicious start. An A-frame aboard *TOPS DBI* weighed 53 tons, nearly double the 30 tons that crews expected. That afternoon, after a pre-lift meeting, crews rigged *DBI*'s estimated 350-ton counterweight for removal. Crane tension levels continued to climb to 550 tons as subsequent attempts to lift the weight weren't successful.

Another discussion ensued, and SteelCoast officials argued that stopping the job with the load already cut from the derrick barge would be problematic, the NTSB said. South Coast Maritime's president then instructed the crane operator to increase tension to 700 tons. *Atlantic Giant II* was repositioned and made ready for

the lift, which this time succeeded if only briefly. The counterweight, authorities later learned, weighed 671 tons.

"Two tugboats were used to rotate and move *Atlantic Giant II* and the counterweight toward the dock," the NTSB said, adding that the barge's two forward spuds were raised to allow for this movement. "However, at about 2030, shortly after the starboard spud was raised, the barge heeled to starboard and the crane's boom collapsed. The port stay failed first, dropping the load into the channel."

The crane operator on *Atlantic Giant II* fell to the deck, injuring his back and shoulder, and a mechanic on the barge fractured an ankle. A deck hand on one of the assist tugs also suffered a leg injury.

Keppel AmFELS conducted its own investigation of the incident and found that "wind, wave action and drifting action" affected the crane after *Atlantic Giant II* retracted its spuds. The NTSB determined that these factors "resulted in the suspended

counterweight shifting to starboard, thereby sidelading the crane boom. Because the suspended load was not centered below the boom, the crane collapsed to the starboard side of the barge."

NTSB investigators also learned *Atlantic Giant II* was trimmed up to 7 degrees at the stern at the time of the final lift, raising the bow out of the water. That trim created a situation where the 671-ton counterweight exceeded the crane's abilities at that boom angle. Tugboat captains reported the barge's bow coming out of the water, but the lift continued anyway. The NTSB noted that load ratings presume the crane is "perfectly level in all directions."

South Coast Maritime responded to the incident by creating new internal guidelines that demand additional weight and structural details from clients before performing heavy lifts. Attempts to reach the company and SteelCoast were not successful.

Casey Conley

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Courtesy Damen Group

# All-electric tugs and pilot boats: Are they ready for prime time?

by David Tyler

**T**here are electric ferries and tour boats, along with proposals for fully electric containerships, bunker tankers and barges. But how will all-electric vessels measure up to the extreme power demands of harbor tugs, or the distance and speed requirements of pilot boats?

Two companies have taken on these challenges. In July, the Ports of Auckland in New Zealand ordered the world's first full-size, fully electric ship-handling tug from Damen Shipyards of the Netherlands. The acquisition of the RSD-E Tug 2513 will help Auckland toward its goal of becoming emissions-free by 2040. And the naval architecture firm Robert Allan Ltd. of Vancouver, British Columbia, unveiled plans

for an all-electric pilot boat in 2018.

Both companies are using existing designs and boats, reconfiguring them for all-electric propulsion. Damen's all-electric tug is based on an RSD (reversed stern drive) model that is fuel-efficient and meets International Maritime Organization (IMO) Tier III standards.

"Functionally, the requirements and capabilities of the tugs is the same," said Viktoria Adzhygyrei, spokeswoman for Damen. Robert Allan is basing its all-electric aluminum pilot boat on its steel-hulled RALLY 1600.

Auckland began looking for an electric tug three years ago. "When we first looked into buying in 2016, there was nothing on

the market," said Allan D'Souza, the ports' general manager for marine, engineering and wharf operations. Auckland then went to Damen for the project based on the ports' satisfaction with the ASD Tug 2411.

"We looked at the request and saw it was technically possible," said Marc Baken, a design and proposal engineer at Damen. "The next step was to consider the feasibility of full electrical operation from a business perspective."

Damen used data from Auck-

**The Ports of Auckland has ordered a full-size, all-electric tugboat from Damen Shipyards based on the builder's RSD Tug 2513, shown above assisting the LPG tanker PGC Strident Force. Damen says the electric tug will be able to generate a 70-tonne bollard pull, which is comparable to the diesel-powered version.**

land's operations of the ASD Tug 2411 to work out the battery requirements for the RSD-E Tug 2513, which will measure 81 by 43 feet. After a collaborative process, the order for the electric tug was announced, with delivery expected by 2021.

The most impressive feature of the RSD-E is that it will generate a 70-tonne bollard pull, according to Damen. For safety reasons, the tug will have two 1,000-kW generator sets to provide enough power for it to operate at 40 tonnes bollard pull in the event of an electrical system failure, or if the vessel needs to operate beyond

its battery capacity. The tug will be able to switch to the backup power in a matter of seconds, Adzhygryei said.

The RSD-E will have two strings of batteries so that if one string fails, the other takes over. Damen would not say who will build the batteries, or what type they will be.

An electric tug's ability to generate a 70-tonne bollard pull has been met with some skepticism in the maritime world. "For how long is my question," said Nick Sorber, regional representative for the International Organization of Masters, Mates & Pilots (MM&P)

in Portland, Ore. "Is it five seconds? Is it 20 minutes?"

Providing that much bollard pull is the real test of the batteries. "You have to have that much electrical power in the batteries to provide that power," said Jonathan Parrott, senior naval architect at Seattle-based Jensen Maritime Consultants. "It can only provide it for a certain period of time, and then the batteries drain out. The more power you pull out, the shorter duration time you have."

The RSD-E will be able to generate 70 tonnes of bollard pull for 30 minutes, said Matt Ball, spokesman for the Ports of Auck-

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Courtesy: Robert Allan Ltd.

The RALLY 1600-E, designed by Robert Allan Ltd., has Danfoss permanent magnet motors and a 72-module battery system capable of providing 815 kW. Top speed is 20 knots and the range is five nautical miles, according to RAL.

land. “We rarely operate the tug at a 70-tonne bollard pull and if we do, it will be for very short bursts unless we are doing something outside our normal operating mode.”

The RSD-E will be able to complete three operations without recharging, Adzhygyrei said, and it will take two hours to fully recharge. The 1.5-MW charging station is based on technology already being used in the auto industry, with four cables on the vessel connecting to the station.

In 2018, Robert Allan Ltd. tackled the challenge of creating an all-electric pilot boat. Using the same hull form and general layout as the RALLY 1600, the company took out the diesel equipment and replaced it with electric propulsion and battery equipment, and switched to an aluminum hull. The boat is 52 feet long and has a 16-foot beam.

“Once we dispensed with the diesel engines, gensets and diesel fuel, we were left with enough space and weight-carrying capac-

ity to integrate the new powering and energy storage systems,” wrote Robin Stapleton, an electromechanical engineer and project manager at Robert Allan, in *The Journal of Ocean Technology*.

The RALLY 1600-E is designed with Danfoss permanent magnet motors rated at 500 kW at 2,800 rpm. Standard ZF or Twin Disc 3:1 reduction gears connect to open fixed-pitch propellers. The battery system is composed of 72 modules from Spear Power Systems providing 815 kW of



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energy. The battery system is designed for maritime use and is liquid cooled.

At 20 knots, the boat has a range of five nautical miles from its berth to a ship and back. "This seems low, but actually covers a significant portion of pilotage operations," Stapleton said. With a high-capacity charging station, the tug could be fully recharged in less than an hour.

But many pilots say that five nautical miles, even one way, is a short range. "Just on the river, we can go more than five miles," Sorber said, referring to the Columbia River in Oregon. "And that's not going against the ebb tide or something that's going to strain the batteries more. Five miles is not much."

Sorber doubted that the Columbia River Bar Pilots would want to use an electric pilot boat. However, the Columbia Bar is one of the most demanding pilot runs in the country.

"They're not going to want to go out over the bar on something electric and wonder if they're

going to make it back," he said. "I know I wouldn't."

Stapleton acknowledged that a negative for all-electric boats is cost. Robert Allan estimates that the RALLY 1600-E could cost \$1 million more (Canadian) than the steel, diesel-powered version. He pointed out that government programs to reduce emissions could help reduce the price tag.

In the case of the RSD-E Tug 2513, the Ports of Auckland is paying the entire cost, with no grants or subsidies. The electric tug will cost twice that of a diesel, the operator said, including the cost of the charging infrastructure. But Auckland also projects a \$12 million savings in operating costs over the 25-year lifetime of the tug.

In addition to cost, there are concerns for operators about venturing into unproven technology in the tug and pilot boat sectors. "It would be really scary for a business owner to say, 'Here's \$20 million, let me know if it works,'" Sorber said about the prospect of ordering electric tugs.

Steve Shaver, president of Shaver Transportation in Portland, Ore., said the company looked into buying a hybrid tug three or four years ago. "We were going to be one of the potential leaders in the industry, and I got a little concerned about getting ahead of ourselves," he said.

Shaver said the company does embrace new technology, calling its Tier 4 newbuild *Samantha S.* "probably the most sophisticated tug in the country right now." But the concept of an all-electric boat is different.

"To get into a whole different area that we haven't dealt with before is a little daunting at this time until it's more of a proven commodity," he said.

Using the new technology also carries an operating risk. "When you're a pilot on these tugs, there's a lot of liability out there," Sorber said. "If you get yourself in a position where you need the horsepower and you don't have it, who's going to be pointing the finger about that (after an) incident?"



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# Correspondence

by Andrew Norris

## Recent cases hold clues for determining liability in *Conception* fire

The *Conception* dive boat fire on Sept. 2 that resulted in the deaths of all 33 passengers and one crewmember could expose the vessel's captain — and the corporate officials

Calif., on the last day of a three-day diving trip to the Channel Islands when the fire broke out at 0314. At the time, five crewmembers were asleep in berths behind the wheelhouse on the

a half-circle ladderwell in the starboard forward end of the vessel. The only other means of egress from the lower berthing area was via an escape hatch at the after end of the compartment,

alerted the other crew behind the wheelhouse and as they awoke, the captain radioed a distress message to the Coast Guard. The crewmembers attempted to access the salon and passengers below. Unable to use the aft ladder, which was on fire, the crewmembers jumped down to the main deck (one crewmember broke his leg in the process) and tried to access the salon and galley compartment through a forward window. Unable to open the window and overwhelmed by smoke, the crew jumped overboard.

Two crewmembers and the captain swam to the stern and reboarded the vessel. Access to the salon through the aft doors was blocked by fire, so they launched a small skiff and picked up the remaining two crewmembers in the water. They transferred to a recreational vessel anchored nearby, where

whose actions or inactions contributed to the deaths — to serious criminal liability under the Seaman's Manslaughter Statute.

According to a preliminary report by the National Transportation Safety Board (NTSB), the vessel was anchored in Platts Harbor off Santa Cruz Island,

three-decked vessel's upper "sun deck" level, while the passengers and the crewmember who died were asleep in the lower-level berthing area. Between these two levels was the main deck, which housed a galley and salon. Communication between the lower berthing area and the salon was by means of

which also opened to the salon.

According to the NTSB report, a crewmember sleeping in the wheelhouse berths was awakened by a noise and got up to investigate. He saw a fire at the aft end of the sun deck rising from the salon compartment below. The crewmember



Salvors raise Stretch Duck 7 from Table Rock Lake near Branson, Mo., on July 23, 2018. The vessel sank four days earlier during a storm, killing 16 passengers and one crewmember. The captain has been charged with 17 counts of seaman's manslaughter.

NTSB photo

the captain continued to radio for help. Two crewmembers returned to *Conception* to search for survivors around the burning hull.

The NTSB's finding that all six crewmembers were asleep is ominous. In other words, no crewmember was serving as a roving patrol, despite a requirement in both Coast Guard regulations and the vessel's certificate of inspection (COI) that one be designated and serving in that capacity. All small passenger vessels like *Conception* that are regulated under Subchapter T are subject to the requirement that "(the) owner, charterer, master or managing operator of a vessel carrying overnight passengers shall have a suitable number of watchmen patrol throughout the vessel during the nighttime, whether or not the vessel is underway, to guard against and give alarm in case of a fire." The requirement in the COI states that "(a) member of the vessel's crew shall be designated by the master as a roving patrol at all times, whether or not the vessel is underway, when

the passengers' bunks are occupied."

This failure potentially subjects the captain, crew and all members of the operating company's hierarchy to criminal liability under 18 U.S. Code 1115 ("Misconduct or neglect of ship officers"), commonly referred to as the Seaman's Manslaughter Statute. That statute provides as follows:

"Every captain, engineer, pilot or other person employed on any steamboat or vessel, by whose misconduct, negligence or inattention to his duties on such vessel the life of any person is destroyed, and every owner, charterer, inspector or other public officer, through whose fraud, neglect, connivance, misconduct or violation of law the life of any person is destroyed, shall be fined under this title or imprisoned not more than 10 years, or both.

"When the owner or charterer of any steamboat or vessel is a corporation, any executive officer of such corporation, for the time being actually charged with the control and management of the operation,

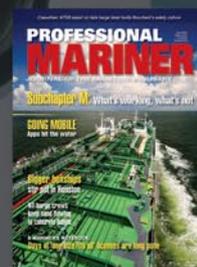


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equipment or navigation of such steamboat or vessel, who has knowingly and willfully caused or allowed such fraud, neglect, connivance, misconduct or violation of law, by which the life of any person is destroyed, shall be fined under this title or imprisoned not more than 10 years, or both.”

As can be seen, the essence of a seaman’s manslaughter prosecution is a maritime-related death that is the product of, among other things, negligence. Through case law interpreting this statute, whose provenance extends back to the first half of the 19th century, we know that it applies only to commercial operations; that ordinary negligence (failure to exercise the degree of care required of a reasonably prudent mariner) will suffice for a conviction; and that the negligent act must have had some causal relationship to the fatality. Due to the unique responsibility or fiduciary duty owed by those who are culpable to those who are killed, the penalty for this felony offense is stiff: up to 10 years in prison and a

\$250,000 fine for each count.

Recent federal seaman’s manslaughter prosecutions are instructive in suggesting who might face prosecution in the *Conception* case, the theories of prosecution, and the sentences that might result.

No crew-member on *Conception* was serving as a roving patrol, despite a requirement in both Coast Guard regulations and the vessel’s COI that one be designated and serving in that capacity.

In February, Christopher Hutchinson, the captain of a lobster boat that capsized off the coast of Maine in a predicted storm, killing two crewmembers, was sentenced to four years in prison and three years of supervised release in U.S. District Court

in Portland, Maine. Hutchinson smoked marijuana and drank alcohol before getting the vessel underway, and ingested oxycodone while at sea. Neither of the crewmembers, whose bodies were never found, was wearing personal flotation devices or survival suits. In pronouncing the sentence, the judge noted that Hutchinson was the captain of the boat and was responsible for the safety of his crew, but rather than living up to his responsibility, he engaged in risky, reckless behavior that cost the lives of two young men.

Also instructive are the indictments handed down in the summer of 2019 in relation to the sinking of the duck boat *Stretch Duck 7* on July 19, 2018, in a severe thunderstorm on Table Rock Lake, Mo., which caused the deaths of 16 passengers and a company employee. The captain, Kenneth McKee, has been charged with 17 seaman’s manslaughter counts for, among other things, allegedly failing to properly assess incoming weather prior to entering the vessel on the water, failing to direct the passengers to

don life vests, and failing to prepare to abandon ship when there was an unacceptable loss of freeboard on the vessel.

Interestingly, the operations director and manager on duty at the time of the accident, Charles Baltzell, who was not aboard *Stretch Duck 7*, was added to each of these 17 felony counts as an aider and abettor of misconduct and neglect by a vessel captain. Baltzell allegedly contributed to the deaths by directing the captain to enter the vessel on the water when there was severe weather and lightning in the area, and by failing to communicate to the captain the nature of the severe weather prior to its arrival. In addition, the operating company’s general manager, Curtis Lanham, faces 17 felony counts under 18 U.S. Code 1115 for alleged executive deficiencies that include neglecting to establish and enforce policies and procedures related to the monitoring of weather in association with the management and operation of daily duck boat tours; creating a work atmosphere on *Stretch Duck 7* and other duck

boats where the concern for profit overshadowed the concern for safety; and failing to adequately supervise the management, operation and conduct of the tour of *Stretch Duck 7* on the day of the accident.

The upshot of this recent activity as it relates to the *Conception* crew and company employees is several-fold. First off, it illustrates that this is an active area of the law, capturing the full attention of

federal prosecutors in cases involving maritime deaths. Secondly, penalties can be, and have been, quite severe; those found to have negligently contributed to 34 deaths in this case face up to 340 years in prison and an \$8.5 million fine. And lastly, beyond the obvious lead culprit — the captain who allegedly failed to ensure there was a roving patrol at the time of the casualty — it's a sure bet that prosecutors

will minutely scrutinize the circumstances that led to the fire raging undetected long enough for both escape routes to be rendered unusable. The goal will be to discover whether anyone in the corporate hierarchy “knowingly and willfully caused or allowed ... fraud, neglect, connivance, misconduct or violation of law, by which the life of any person (was) destroyed.” If such complicity is discovered, it is virtu-

ally certain that the implicated individuals also will be facing 34 seaman's manslaughter counts. •

*Andrew Norris, a retired Coast Guard captain, is a maritime legal and regulatory consultant and president of Tradewind Maritime Services Inc. He can be reached by email at [anorris@tradewindmaritimeservices.com](mailto:anorris@tradewindmaritimeservices.com) or by phone at (401) 871-7482.*



The Oregon Board of Maritime Pilots is seeking qualified applicants for the Columbia River Bar pilotage ground. Applicants must have a least one year sea time as Master on commercial ships over 5,000 GT to apply and two years' sea time to be accepted. The Board will be accepting applications through November 30, 2019. Application and information material are available at this link: <https://www.oregon.gov/puc/bmp/Pages/Forms.aspx>

Contact:

Susan Johnson, Administrator  
Oregon Board of Maritime Pilots  
800 NE Oregon St., Suite 507  
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that they had a union contract guaranteeing them “holiday pay.”

The scene vanished, and in the blink of an eye I found myself in my bunk again. Thinking about what I'd been shown so far, I was convinced that I had been acting immaturely since joining my ship. Compared to those two old-timers on the steam schooner, I had it easy. My thoughts were interrupted by the appearance of a third spirit, a woman dressed in a captain's uniform, complete with epaulets with four stripes. She motioned me up and said, “Let's be on our way.” We found ourselves off of an area that looked like the Middle East, coming up on the stern of a cargo ship registered in Vanuatu. It was filled with U.S. military jeeps, rations, medical supplies and ammunition. Sensing my thoughts, the spirit said, “In the future, there is basically no U.S. merchant marine anymore. The laws that protected you were overturned by your enemies.”

On the bridge of the ship, devoid of Christmas decorations due to the international crew, I watched as the Eastern European captain talked with someone on the satellite phone. After hanging up, he gave the helms-

man an order to “bring the rudder over starboard 20 degrees and come to a reciprocal course. The company agrees that we do not need to put our ship at risk by taking her into a war zone for the U.S. military.” Handing a piece of paper to the Filipino second mate, he said, “Lay

I resolved to stop complaining about being at sea during Christmas, and to always appreciate the many hardships and sacrifices others had endured on behalf of the U.S. merchant marine, our country, and mariners such as myself.

out the courses to this port, Ramon. We'll dump the cargo there.”

Shocked at what I was seeing, I asked the spirit if this future scene was set in stone, or if it could be avoided. She answered, “It all depends on you mariners. Only by your actions can the course of the future be changed.” I then found

myself back in my bed on board, just as there was a knock on the door for my 0320 wake-up call. Bounding out of bed, I realized that I had a new perspective. I resolved to stop complaining about being at sea during Christmas, and to always appreciate the many hardships and sacrifices others had endured on behalf of the U.S. merchant marine, our country and mariners such as myself. For the rest of my life, I would do all I could to stop the forces aligned against the U.S. merchant marine, and to prevent the subterfuge employed by our foes to try and destroy the Jones Act and other laws enacted to help ensure our country's maritime and economic security. I've thanked Neptune many times for his intervention, and have been true to my word ever since — and will continue to be so until my dying breath.

Till next time, I wish you all happy holidays and 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 [captswweeney@professionalmariner.com](mailto:captswweeney@professionalmariner.com).*

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# A Mariner's Notebook

by Capt. Kelly Sweeney

## A Christmas sea story: Lessons from the past, present and future

I was a senior at the California Maritime Academy and one of only 10 cadets in my class who were chosen to go on a commercial ship for their senior cruise. The week before Christmas, the company's Seattle office called to let me know that I'd be joining the



ship there on Christmas Eve. My holiday spirit dropped like a lead balloon. That would mean missing all sorts of highly anticipated activities, including Christmas dinner at home, a New Year's Eve party at a high school buddy's house, and a long-planned family trip to visit my cousin in Idaho. Once on board I sulked for days, complaining to anyone willing to listen to my plight.

One evening, in my stateroom after watch, I was reading Tom Robbins' book *Even Cowgirls Get*

*the Blues*. Just before turning off my reading light, I nearly jumped out of my skin. The figure of a man had appeared a few feet in front of me. He had short hair and wore a khaki shirt and trousers, and something about him seemed almost ethereal. He said, "Cadet Sweeney, your complaints have been heard by Neptune, the king of the oceans. At his request, three spirits will visit you, their purpose to show you a past, present and future mariner's Christmas at sea." Figuring that my mind was playing tricks on me because I was tired, I shut off the light and fell asleep.

Awakened by a young guy dressed in old-time sailor's garb, complete with wide-brimmed hat and V-neck long-sleeve shirt, he said, "I'm the spirit of past Christmases at sea — follow me." I found myself in the messroom of an old steam schooner, where there were two mariners finishing their Christmas dinner

of pickled salmon and beans. One of the men, tall and thin with some missing front teeth and a long scar on his forehead, said, "Andy Furuset's doing great things, John. He got them senators to outlaw us sailors getting thrown in the hoosegow for quitting, and if it weren't for him the bucko mates would still be beating yah deck types with belaying pins." The other guy nodded, rubbing his wrist with a gnarled hand that was missing the ends of two middle fingers, remembering all too well the broken bones received from a cudgeling he got as a young mariner on a schooner barque. He replied, "All true, Bill, and I've heard the latest is that he's getting La Follette to push for a law making it illegal for companies to short us on food, give us damp ratty staterooms and chisel us out of our pay. God bless him."

I found myself back in my room, the spirit of past Christmases at sea gone. A few seconds later,

a man dressed in coveralls appeared and said, "I'm the spirit of Christmas at sea in the present. Let's go." To my great surprise, we were immediately transported to the ship I was sailing on at that time, but back to Christmas Day. Like watching a movie I was in, I saw myself sullenly getting out of bed on Christmas morning in my nice warm stateroom, complete with an attached head and full-size bed — unappreciative of the personal flashlight the skipper had given each of the crew as a present. The steward department had made a Christmas feast complete with turkey, ham, shrimp cocktail, all the fixings, plus apple and pumpkin pie. I sat alone at a table, eating that fantastic meal and looking glum. The first engineer and third engineer were at the table next to mine, enjoying all of that good food with gusto and having a discussion about how great Christmas at sea was now

*continued on page 63*

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