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# PROCEEDINGS

*of the Marine Safety Council*

## U.S.-Flagged Towing Vessels & Barges

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# Assistant Commandant's Perspective

by Rear Adm. PAUL J. PLUTA

Assistant Commandant for Marine Safety, Security & Environmental Protection

The towing vessel industry has seen marked improvements in its safety record since the Amtrak Sunset Limited accident in 1993. That accident, which resulted in the death of 47 people, was one of the principal catalysts for formation of the Coast Guard-industry partnership and development of new regulations and programs aimed at improving the safety of the industry.

As we show in this issue of *Proceedings*, major changes were effected by the Coast Guard and industry; as a result of those efforts, we have seen notable improvements in the three main safety measurements: numbers of crew fatalities, oil spills, and vessel casualties. The most recent statistics for the period 1994-2000, which were compiled through the partnership of the Coast Guard and American Waterways Operators (AWO), show a downward trend in those three areas in recent years. The industry saw 14 fatalities per 100,000 workers in 2000, down from 23 in 1999 and 1998, and 35 in 1997. Oil spills continued to decrease from a high of 16.9 per million gallons transported in 1996 to 3.5 in 1998, 2.3 in 1999, and 1.9 in 2000. Towboat/tugboat casualties were also down. In 2000 there were 32.2 casualties per one million trip miles compared to 34.6 in 1999, 38.2 in 1998 and 37.7 in 1997.

Though direct correlation is not possible, it is difficult not to attribute these improvements to recent Coast Guard-industry initiatives. The Responsible Carrier Program, initiated by AWO in 1994, has become the most widely recognized safety management system for the U.S. tugboat, towboat and barge industry. The program, which is now a condition of AWO membership, requires members to establish and comply with operating principles, practices, and guidelines. The Coast Guard-AWO partnership has also been actively reaching out to the industry to make crewmembers aware of safe practices. In response to findings that falls overboard from barges and towboats have accounted for the majority of crew deaths during the last 10 years, the partnership developed the S.A.F.E. Decks Campaign to raise safety awareness in the barge and towing industry. Further, the Coast Guard, in partnership with industry, instituted a new system of licensing requirements for towing vessel officers. This initiative was designed to improve the way we qualify and train our mariners.

While these initiatives have gone far to improve the safety of the industry, it does not mean we no longer have any cause for concern. The recent incident in Oklahoma is yet another reminder of our need to continually be mindful of safety. Through the combined efforts of the Coast Guard and maritime community, we can look forward to continued improvement.

A handwritten signature in black ink that reads "Paul Pluta". The signature is written in a cursive, flowing style.

# Champion's Point of View

by Capt. MICHAEL B. KARR  
Chief, U.S. Coast Guard Office of Investigations & Analysis



## Pursuing Towing Vessel Safety Through Casualty Analysis

We have made much headway in improving towing vessel safety for both crew and non-crewmembers, and though there is more work ahead, we have defined a course to help move us forward. One of the best efforts to effect towing vessel safety was the work performed by the Towing Vessel Crew Fatalities Quality Action Team (QAT). This November 1995–July 1996 effort was the first QAT under the then recently formed partnership of the Coast Guard and the American Waterways Operators (AWO). The team looked beyond annual statistics of crewmember deaths for more details that defined each fatality. It concluded that the majority of towing vessel crew fatalities resulted from crewmembers falling overboard during routine operations, with crewmembers under the age of 25 incurring the highest fatality rates. Several factors contributed to these fatalities, including lack of training, skill assessment, communication, safe work practices, supervision and teamwork.<sup>1</sup> The attention this effort focused on the problem resulted in the ongoing AWO S.A.F.E. Decks Campaign (Stay Alert For the Edge—[www.uscg.mil/hq/g-m/moa/docs/falls/safe.htm](http://www.uscg.mil/hq/g-m/moa/docs/falls/safe.htm)), which, I believe, has helped to drive down the annual number of towing vessel fatalities. Though fatalities are down for the period 1994–2000 compared to the earlier period, we can still improve—almost all crew fatalities still result from the crewmember falling into the water.

As we began to analyze what to do about the continuing falls overboard fatalities, the second fatal bridge allision occurred within an eight-month period. The first resulted in the death of eight motorists following the allision of the towboat *Brown Water V* and its tow with the South Padre Island Queen Isabella Bridge on Sept. 15, 2001. The second allision resulted in the death of 14 motorists after the towboat *Robert Y. Love* and its tow struck the Interstate 40 bridge over the Arkansas River on May 26, 2002. Following the second fatal bridge allision, we redirected our evaluation efforts to bridge allisions. We have created a Coast Guard and AWO Bridge Allision Working Group to examine the non-conformities that lead to bridge allisions and particularly to those allisions that result in motorist deaths. Between 1992 and today 72 people in motor vehicles and trains have lost their lives as a result of a bridge allision (New Orleans Claiborne Bridge 1993—1; Amtrak Sunshine Limited 1993—47; New Orleans Claiborne Bridge [Freight Ship] 1996—2; Queen Isabella Bridge—8; I-40 Bridge—14). The working group will evaluate approximately 1,300 bridge allisions that have occurred since 1992. Their effort will include licensed captains and pilots experienced with transiting many of the bridges to help the work group assess what did and what can go wrong when passing through the bridges that have been struck. We plan to finish the report and make recommendations by the end of this year.

And there is still more to pursue to help drive down fatalities. Prior to these two bridge allision accidents, the Coast Guard's Compliance Analysis staff (G-MOA-2) intended to begin the assessment of non-crewmember deaths associated with towing vessels. These cases would most likely involve collisions and lookout issues, such as in the case of the collision of the 42-foot fishing vessel *Linda E*, with the 520-foot ITB *Michigan/Great Lakes* on Dec. 11, 1998 with the loss of the *Linda E* and the three fishermen onboard. The investigation ([www.uscg.mil/d9/wwm/mso/milwaukee/lindae/lindaenra.htm](http://www.uscg.mil/d9/wwm/mso/milwaukee/lindae/lindaenra.htm)) revealed that on a clear day both vessels failed to detect each other. Events such as this reinforce the importance of our continuing efforts to identify the causes of these accidents and appropriate safeguards to effect greater safety in the towing vessel industry.

.....  
<sup>1</sup> The report includes a comprehensive review of previous literature and studies; an analysis of Coast Guard casualty data from 1985-1994; a review of specific cases; and conclusions and recommendations, including a discussion of the role of safety "culture" in the maritime industry. View the report online:  
[www.uscg.mil/hq/g-m/moa/docs/cafata.htm](http://www.uscg.mil/hq/g-m/moa/docs/cafata.htm)

# A Look Back

## at the History of Regulations on Towing Vessels

by KEITH GRANT,

Uninspected Vessel Program Manager, U.S. Coast Guard Domestic Vessel Compliance Division

As a class, towing vessels historically were subject to very minimal requirements. The vessel inspection laws and regulations required a full U.S. Coast Guard inspection with the issuance of a Certificate of Inspection for steam-powered tugs and towboats and any seagoing tug or towing vessel greater than 300 gross tons. All other tug and towing vessels fell under what was known as Subchapter C, uninspected vessels. These regulations were very minimal and were, in essence, the same regulations that applied to yachts. There were other requirements that addressed pollution prevention, but they also were the same as those for other vessels. With a special class of operators license just for towing vessels, licensing was the one area that was different. This was all to change.

Since the late 1980s, the Coast Guard has become more interested in the towing industry due to a perceived high incidence of casualties and high-profile incidents. In particular, the derailment of the Amtrak Sunset Limited passenger train at Big Bayou Canot, Ala., on Sept. 22, 1993, in which 47 people lost their lives, caused the Coast Guard to begin several regulatory initiatives to improve towing vessel safety. These initiatives included:

■ Immediate Reporting of Casualties and Notice of Hazardous Conditions (effective Aug. 3, 1994) improved the speed of reporting and quality and scope of casualty reports that were required to be reported to the Coast Guard.

■ Radar Observer Endorsement for Operators of Uninspected Towing Vessels (effective June 1, 1995) required radar training and periodic refresher training for all operators of towing vessels equipped with radar.

■ Navigation Safety Equipment for Towing Vessels (effective Aug. 2, 1996) upgraded requirements for radar, navigation equipment, and towing equipment for towing vessels.

■ Fire Suppression Devices on Towing Vessels (effective Jan. 19, 2000) implemented measures for the early detection and control of fires on towing vessels. These measures increase the chances of fighting a fire with early warnings and better communications, and controlling the fire with shut-off valves and training and drills.

■ Licensing and Manning for Officers of Towing Vessels (effective Nov. 20, 2000 and May, 21, 2001) established updates to the licensing and training of officers of towing vessels and the qualifications of those officers.

These new regulations now distinguish towing vessels as a distinct class with specific requirements. In fact, there now exists a distinct part within Subchapter C just for towing vessels (46 CFR 27) and specific sections within the Navigation Safety regulations of 33 CFR 164 (164.72 – 164.82). A Masters or Mates license for a towing vessel is now needed; it requires special training and has an experience path similar to that of other licenses.

Further changes may be on the horizon. A recent Supreme Court decision (Chao vs. Mallard Bay) allows Occupational Safety and Health Administration (OSHA) jurisdiction on uninspected vessels in areas where the Coast Guard does not have pre-emptive regulations. Only time will tell what new regulations might be imposed, either by OSHA or the Coast Guard, addressing the workplace on uninspected vessels.

# The Making of a Towing Vessel Rule: Public Opinion Matters

by Lt. Cmdr. LUKE HARDEN<sup>1</sup>  
& TRICIA NARDONE<sup>2</sup>, Editor

## On the first day of my new job

at U.S. Coast Guard Headquarters, I was told I would receive a rulemaking project on towing vessel licensing that was ready to publish. When the project was described, I was simply told that I would need to collect comments and “possibly” revise the rule before it was finalized as a Final Rule. The rule needed revision because industry identified a number of areas in which the rule could be improved.

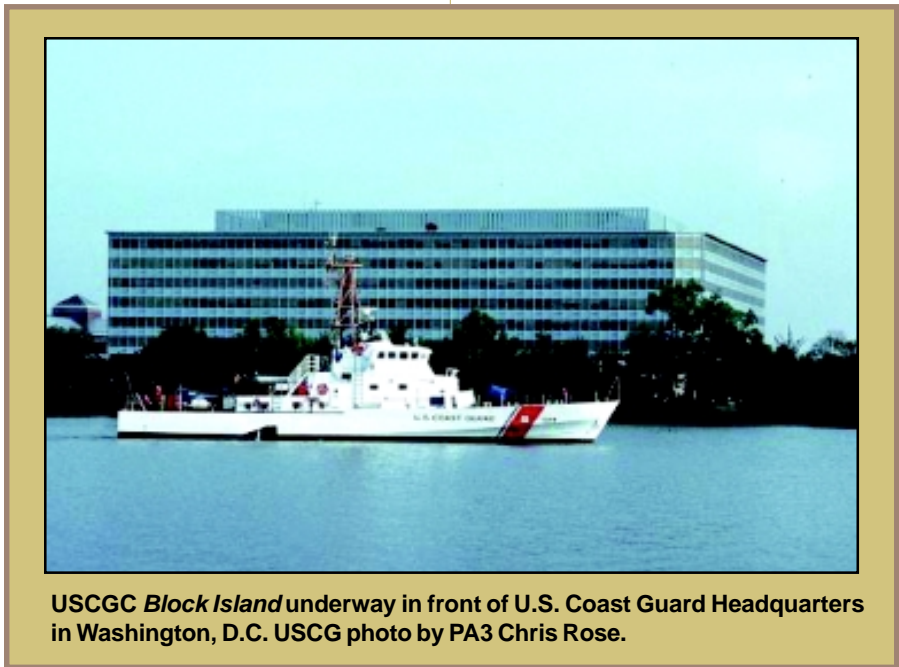
My new job title was Regulatory Project Officer, a person responsible for drafting regulations, or rules, and ensuring they meet the needs of the Coast Guard, industry and public. Having an 11-year background working in ports with substantial towing activity, I thought I was a good fit for the job. I also thought I was being handed an easy oppor-

tunity for a quick success. As in life, tasks that appear easy sometimes turn out to be the most challenging ... and this was one of those times!

How do you make a rule that affects towing? What’s the process? Why does it take so long? Why do we even need rules? Are the towing mariners involved in the process? Why is the end product sometimes vastly different from the

original rule? If rulemaking seems confusing to you, you’re not alone. This article briefly explains how and why rules evolve and why your input is necessary. I will also discuss my experiences with the evolution of Licensing and Manning for Officers of Towing Vessels, a rule I know intimately.

All rules are made through a similar process. The process often starts with public comment, goes through various revision phases, and ends with a promulgated regulation. The rulemaking process comes full circle when public comments initiate changes. Rules ensure minimum compliance of safety; because of evolving changes in the maritime community, such as new types of ships and equipment, and increasingly crowded waterways, rules need to evolve, too.



**USCGC *Block Island* underway in front of U.S. Coast Guard Headquarters in Washington, D.C. USCG photo by PA3 Chris Rose.**

One of the first steps is a Notice of Proposed Rulemaking (NPRM). The NPRM discusses the regulation that the Coast Guard would like to publish and is an open invitation to the public to comment. This is the first of many opportunities that the public has to influence a regulation.

The next step is collecting and reviewing the comments gathered from the NPRM. Comments are reviewed for

<sup>1</sup> Regulatory Project Officer, Coast Guard Office of Operating & Environmental Standards

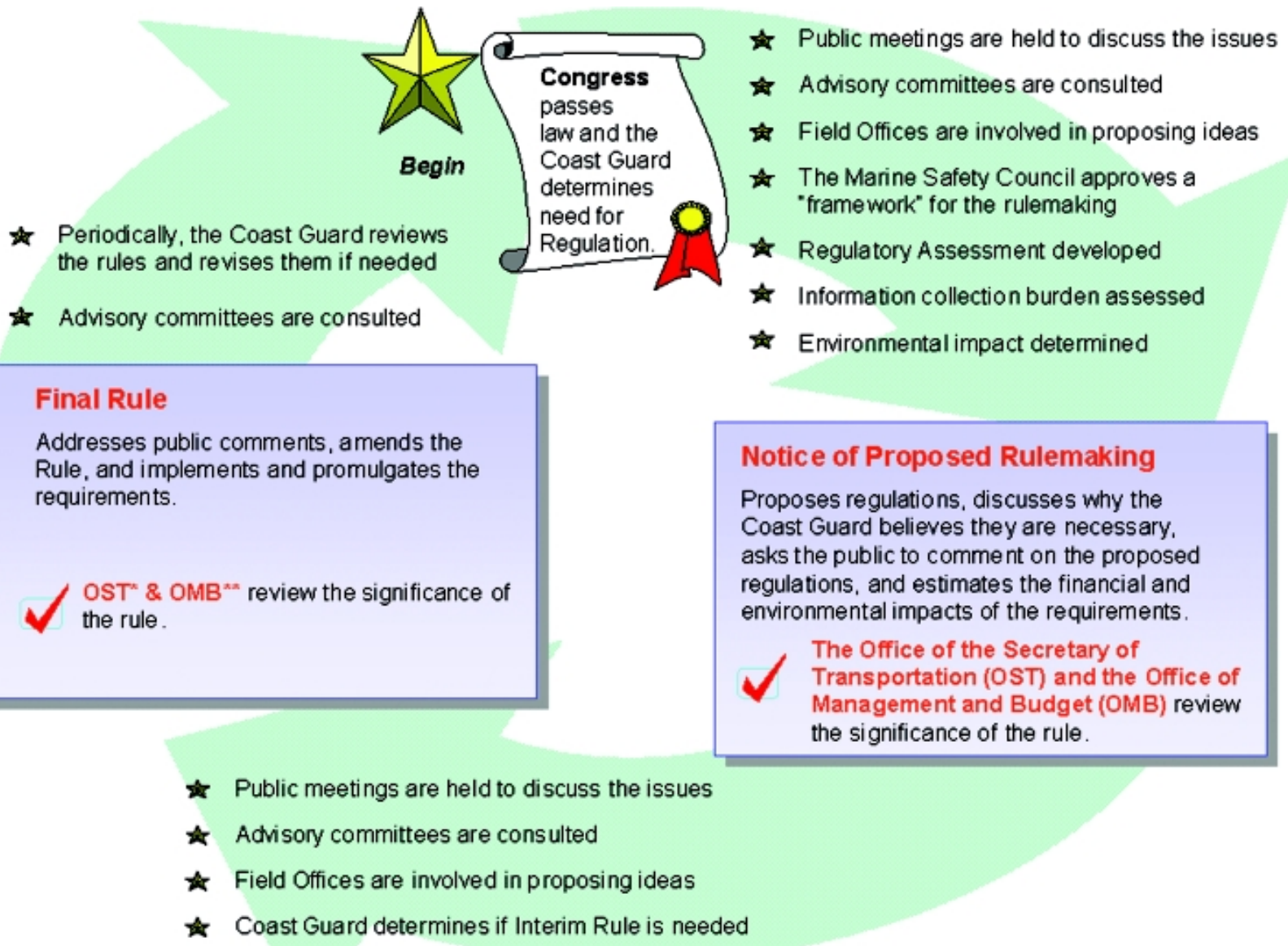
<sup>2</sup> Potomac Management Group, Contractor with the Coast Guard Marine Safety, Security & Environmental Protection Directorate

applicability by all offices that might be affected. On the Licensing and Manning for Officers of Towing Vessels rule, the comments discussed licensing issues, specifically horsepower license limitations for deck officers. In this case, eight different offices reviewed the comments and proposed rules.

After reviewing the comments, responses to the comments are developed and the rule is rewritten. My office addressed all comments related to the Licensing and Manning rule. In particular, the licensing versus horsepower comments were extremely helpful in the rule's revision. Comments gave needed insight into industry dilemmas and thus affected the revision; they were the only way of understanding the needs of industry in regards to the rule. This is an example of the importance of public comment during rulemaking.

The particular challenge in the revision of the Licensing and Manning rule was the new requirement to use Plain Language. Plain Language is an initiative of former Vice President Al Gore requiring that all new regulations be written in an easy-to-read and active format and style, as opposed to the more bureaucratic language often used within regulations. It requires the use of questions and answers, tables, graphs, flowcharts and pictures to make regulations more understandable.

Before publication of a rule, the Assistant Commandant for Marine Safety, Security & Environmental Protection signs the rule and it is placed into the Federal Register. Although Licensing and Manning for Officers of Towing Vessels was published a number of times in the Federal Register, public



comment continued to play a part in further revisions. Licensing and Manning was revised and published as an Interim Rule (IR) before it was placed within the Code of Federal Regulations (CFR). Even though it was published in the CFR, there was still fine-tuning of the rule that was necessary. As a result, two additional IRs, also known as Interim Final Rules, were issued. The first IR discussed delaying implementation of these rules, and the second IR discussed revising the rule and policy.

In addition to IRs, a Navigation and Vessel Inspection Circular (NVIC) was developed. NVICs are public documents that further explain rules and provide specific implementation instructions to Coast Guard personnel. This particular NVIC explained changes in licensing structure and provided specific tools for evaluating towing vessel personnel to industry and Coast Guard Regional Examination Centers. The Towing Safety Advisory Committee created a working group to provide advice and feedback on the NVIC. Development of the NVIC would not be complete without industry assistance through the Towing Safety Advisory Committee.

As rules evolve, opportunities for public and industry comment are abundant – so make use of them! Be involved with the rulemaking process by:

- Attending industry meetings. In the case of this rule, five public meetings were hosted in which comments were received.

- Reading what is published. Be informed as to the new requirements that are proposed at the various stages of rulemaking or policy development. Within the preamble to the rules, the Coast Guard explains why it is taking the action it is proposing.

- Writing to the USCG to comment on Advanced Notice of Proposed Rulemakings (ANPRMs) and IRs. We received more than 1,000 comments on the Licensing and Manning rule – and each one was reviewed and considered.

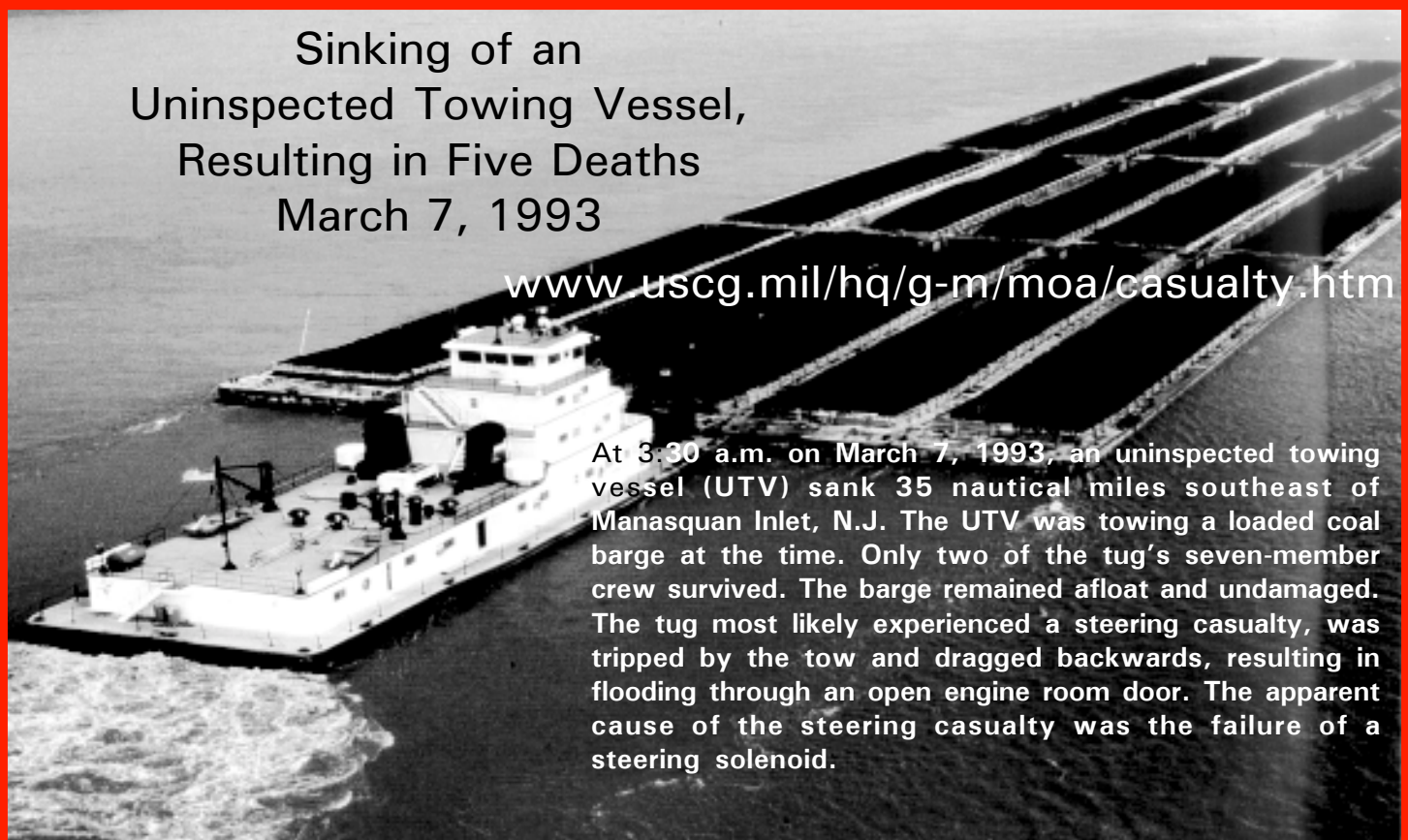
- Attending meetings in which the Coast Guard explains the rule after it is published. In this case 12 opportunities were provided in locations throughout the United States.

- Reading the implementing policy. When NVICs are published, read the implementing policy to ensure that you understand how a rule will affect you.

Rulemaking is a challenging process. It certainly was for me. My “simple” rule has yet to be finished; it is currently in the Final Rule stage being routed around Coast Guard Headquarters for review. I have revised the rule based on the public input I received during the Interim Rule process. It is only with input from members of the towing industry and the public that the Coast Guard is able to make more effective rules for marine safety. Be a part of this expansive but rewarding process. Your voice will be heard!

## Sinking of an Uninspected Towing Vessel, Resulting in Five Deaths March 7, 1993


[www.uscg.mil/hq/g-m/moa/casualty.htm](http://www.uscg.mil/hq/g-m/moa/casualty.htm)



At 3:30 a.m. on March 7, 1993, an uninspected towing vessel (UTV) sank 35 nautical miles southeast of Manasquan Inlet, N.J. The UTV was towing a loaded coal barge at the time. Only two of the tug's seven-member crew survived. The barge remained afloat and undamaged. The tug most likely experienced a steering casualty, was tripped by the tow and dragged backwards, resulting in flooding through an open engine room door. The apparent cause of the steering casualty was the failure of a steering solenoid.

An American Commercial Barge Line LLC tow transporting coal. Photo courtesy American Waterways Operators.





# *Supreme Court Finds Coast Guard has Limited Authority Over Uninspected Vessels*

by GEORGE WELLER,  
U.S. Coast Guard Office of Maritime & International Law

The Supreme Court this year answered the question of which government agency has authority to regulate safety on uninspected vessels. In its January 2002 ruling in *Chao vs. Mallard Bay Drilling, Inc.*, the Supreme Court found that where the Coast Guard has not exercised its statutory authority to regulate working conditions onboard uninspected vessels, that authority resides with the Occupational Safety and Health Administration (OSHA). Conversely, if the Coast Guard has exercised its authority over working conditions on those vessels, OSHA is pre-empted.

On June 16, 1997, a well being worked over by an inland drilling barge operated by Mallard Bay Drilling, Inc., in Little Bayou Pigeon, La., blew out. Mallard Bay evacuated the off-duty crew, but the rest stayed onboard to try to bring the well under control. Before it could be brought under control, gas found its way into compartments on the barge, and exploded, killing four individuals and injuring two others. The Coast Guard investigated the marine casualty, and following guidance in the Marine Safety Manual, forwarded the report of the investigation to OSHA for further action because the Coast Guard determined that it did not have any jurisdiction over the drill barge or its drilling activities, as it was an uninspected vessel.

OSHA took enforcement action under the Occupational Safety and Health Act against Mallard Bay Drilling, Inc., for failure to comply with OSHA marine safety standards by failing to evacuate the personnel onboard, failing to develop and implement emergency response plans, and failing to train the employees in emergency response. Mallard Bay challenged OSHA's jurisdiction in the 5<sup>th</sup> U.S. Circuit Court of Appeals, which has jurisdiction in the states of Texas, Louisiana and Mississippi. The 5<sup>th</sup> Circuit agreed with Mallard Bay's contention that the Coast Guard has exclusive jurisdiction over safety of seamen on vessels on navigable waters, and that, as a result, OSHA was pre-empted from asserting jurisdiction over the drilling barge, notwithstanding that the vessel was not subject to Coast Guard inspection and certification. At the request of the government, the Supreme Court agreed to hear the case because the 5<sup>th</sup> Circuit's holding was contrary to the law applicable in the rest of the country, as announced by the courts of appeals which had considered similar issues, some involving uninspected towing vessels.

The case turned on whether the Coast Guard had statutory authority to regulate, and had in fact regulated the safety aspects of the working conditions of the seamen on the Mallard Bay drilling barge that were pertinent to the blowout, the resulting explosion, fire and deaths onboard. If the Coast Guard had regulated those working conditions, or had articulated a position that such conditions need not be regulated for safety reasons, then OSHA was pre-empted; if the Coast Guard had not regulated (or articulated a position that no such regulation was necessary or desirable), then OSHA was not pre-empted. The government, on behalf of the secretary of labor, joined on the brief by the Coast

Guard and the U.S. Department of Transportation, argued that not only had the Coast Guard not regulated the particular working conditions involved in the explosion, fire and deaths, but the Coast Guard had no statutory authority to regulate those conditions onboard that particular type of uninspected drill barge. In fact, the government argued that the only Coast Guard regulations that applied to the Mallard Bay rig, while it was engaged in the workover operation in the inland waters of Louisiana, were the Coast Guard marine sanitation device regulations.

Various industry groups, including the American Waterways Operators, the Transportation Institute, Associated General Contractors, Dredging Contractors of America and the National Maritime Safety Association, filed “friend of the court” briefs in support of Mallard Bay Drilling, Inc. The Court heard oral argument in the D.C. Circuit Court of Appeals because the Supreme Court was closed due to an anthrax scare, and issued its decision on Jan. 9, 2002.

The Supreme Court reversed the decision of the 5<sup>th</sup> U.S. Circuit Court of Appeals. The Court of Appeals noted that although 14 U.S.C. 2 seemed to grant the Coast Guard broad authority to regulate to achieve safety of seamen on vessels, Congress had enacted an elaborate regime for Coast Guard “inspected” vessels, but had given the agency much less authority over uninspected vessels, including the Mallard Bay inland drill barge involved in the case. The Court noted that the Coast Guard and OSHA had agreed in a 1983 Memorandum of Understanding that the Coast Guard had exclusive jurisdiction over inspected vessels, but this case involved an uninspected vessel. In order to determine whether OSHA was pre-empted onboard an uninspected vessel, the particular working condition involved in the case must be examined. If the Coast Guard had regulated that working condition (risk of explosive gas accumulating in a confined space onboard the vessel), or articulated a formal position that no regulation was necessary or appropriate, OSHA was pre-empted. The Court found no such Coast Guard regulation dealing with that particular risk, and no statement that no regulation was appropriate, and therefore, ruled that OSHA was not pre-empted. In so holding, the Court returned the law in the 5<sup>th</sup> Circuit’s jurisdiction to that of the rest of the country.

There have been many questions about the impact of the Court’s ruling by those involved in the various uninspected vessel communities, including the Passenger Vessel Association, the American Waterways Operators, smaller uninspected towing vessel industry groups, and the Commercial Fishing Vessel Safety Advisory Committee. The Coast Guard does not foresee any change in its regulatory posture as a result of the ruling by the Court of Appeals. Further, it does not anticipate any change in the regulatory posture by OSHA. Rather, the Coast Guard anticipates that the Court of Appeals’ ruling merely restored the two agencies to their respective regulatory jurisdiction and posture in the Gulf Coast states that existed before the 5<sup>th</sup> Circuit’s ruling.

For the future, the Coast Guard expects to work closely with its industry partners, as well as OSHA, to further the goals of maritime safety. The Coast Guard hopes that by working together, the government and industry can bring their collective talents and resources to bear on the problem of how to make the nation’s waterways safer without unduly burdening commerce and the independence of the small operator. Such action may involve revisiting the 1983 Memorandum of Understanding with OSHA to expand its scope to cover uninspected as well as inspected vessels in order to bring more certainty to the regulated public as to which agency—OSHA or the Coast Guard—has primary governmental responsibility for maritime safety on uninspected vessels.

# Uninspected Towing Vessels

## — *A Case Study*

by TIM FARLEY,

U.S. Coast Guard Office of Investigations & Analysis

While uninspected towing vessels (UTVs) are, as their name implies, not formally inspected by the U.S. Coast Guard, the operators of these vessels must have an appropriate Coast Guard license for the type, size and route of the vessel and are bound by many different federal requirements designed to keep the vessel, crew, waterway and environment as safe as possible. Penalties for violating those regulations can range from warnings, simple civil penalties and fines, administrative suspension or revocation of the Coast Guard license, or criminal prosecution. The following case illustrates the responsibilities of a UTV operator and the consequences of failing to comply with the federal requirements.



**PHOTO CREDIT *previous page*: Serving many purposes, buoys often act as channel markers. The individual steering the vessel in this piece kept direction by “keep[ing] to the red side.” Illustration by Jesi Hannold.**

In May 2000, a 95-gross ton, 80-foot uninspected steel-hulled, self-propelled UTV was employed to tow a 289-ton dredge barge and another tug from Chicago, Ill., to Sault Ste. Marie, Mich., typically a three-day voyage. Prior to entering the St. Mary’s River system en route to Sault Ste. Marie, the vessel failed to file the vessel sailing plan to the Coast Guard Vessel Traffic System (VTS) as required by 33 Code of Federal Regulations (CFR), Part 161.19. This requires that, 15 minutes before transiting the prescribed VTS area, the vessel must report to the VTS the vessel’s name, type, position, destination and estimated time of arrival, intended route, time and point of entry and if there is any dangerous cargo onboard the vessel or its tow. In this case, the required sailing plan was ultimately filed with the VTS only after the vessel had been in the prescribed VTS area for about two hours and the vessel had already transited approximately 18 miles of the waterway.

As a result of this incident, an investigation was initiated and the towing vessel was examined, revealing numerous violations of federal regulation, including inadequate vessel manning for the intended voyage, safety equipment deficiencies and navigation safety violations. The investigation also revealed that, during the voyage the licensed operator of the vessel had turned over the navigational watch of the tug and tow to an unlicensed and unqualified individual so that he could sleep.

Because of these violations, the Coast Guard took administrative action against the operator’s Coast Guard license for the following reasons:

- 1.** Violation of a law or regulation and misconduct by failing to ensure the vessel was properly manned as required by Title 46, CFR, Part 15.610 prior to undertaking the voyage from the port of Chicago to the port of Sault Ste. Marie. During this voyage the operator was the only properly licensed operator on the vessel.
- 2.** Misconduct in that during the voyage, the licensed operator of the vessel relinquished the navigational watch and actual direction and navigational control of the vessel to an unlicensed and unqualified individual so that he could get some sleep.
- 3.** Negligently allowing the vessel to be operated without the required equipment such as an emergency position indicating radio beacon (EPIRB), currently corrected navigation charts, navigation publications, lifesaving equipment, anchor ready for letting go, navigation lights, very high frequency (VHF) FM radio and bell. In this regard, the actions of the operator, who was responsible for the material condition of the vessel during the voyage, were not those that a reasonable and prudent person of the same station, under the same circumstances, would have performed.
- 4.** Incompetence regarding a possible physical impairment.

The individual charged by the Coast Guard had been a mariner for more than 50 years. He was licensed as a Master of Near Coastal Motor Vessels of not more than 200-gross tons restricted to uninspected towing vessels for domestic voyages. He was also licensed as an operator of uninspected towing vessels upon the Great Lakes and Inland Waters and had an unlimited Radar Observer endorsement.

Initially the voyage of the UTV and tow took a northern direction from Chicago following the west side of Lake Michigan about three to four miles from shore. The UTV had onboard a new EPIRB, which was not mounted but remained in its original container.

The UTV and tow entered the St. Mary’s River system en route to Sault Ste. Marie during the early hours of the morning. The licensed operator left the pilothouse to sleep and turned over the watch to an unlicensed individual who assumed the piloting of the vessel and its tow. Prior to leaving the bridge, the licensed operator indicated that he instructed his unlicensed relief regarding the proper route to take up-bound in the river in order to avoid down-bound large 1,000-foot ore freighters. The unlicensed individual was told to turn at a specific mid-channel buoy and proceed up the Round Island Course and “keep to the red side” following the red buoys. The unlicensed individual was instructed to go up the starboard side of the channel, which comes on to the Winter Point Ranges. He was also instructed when to make a proper report to the Coast Guard VTS.

Instead of following the piloting directions given by the licensed vessel operator, the unlicensed individual piloted the vessel on the wrong side of the channel, proceeding up the down-bound or port side of the channel. Later, another crewmember awakened the licensed operator and alerted him to a problem with the vessel’s voyage. The licensed operator immediately recognized the error, assumed control of the vessel and turned the vessel and tow around to exit the down-bound channel. He then piloted the vessel and tows up through the correct channel. The Coast Guard VTS was never informed of this error or the tow’s location.

Later, the Coast Guard VTS heard a weak call on the radio stating that it was a tug and barge in tow. The tug switched to a different radio and contact was lost. The VTS watchstander made a call to the tug on VHF Channel 12, to no avail. Shortly thereafter, contact was made with the tug by cellular telephone. The caller was the operator of the UTV reporting that the vessel’s radio was not operating properly. The vessel advised the VTS of its estimated time of arrival to Sault Ste. Marie.

After the vessel arrived at the dock in Sault Ste. Marie, the Coast Guard commenced an inspection of the vessel. This revealed that the UTV did not have the required up-to-date navigation charts, navigation publications such as the Coast Pilot, life preservers for each crewmember, personal flotation devices, lights, or sound signal devices.

During the administrative hearing before the Administrative Law Judge, the licensed operator of the UTV argued that the charge against him for failing to report to the VTS should be dropped because the tug's radiotelephone equipment was inoperative. He felt that the VTS regulations allow for situations like this and state that the master of the vessel shall exercise due diligence to restore the radio to its proper operating condition. The operator indicated that the radio was repaired as soon as possible once the vessel arrived in Sault Ste. Marie.

The Administrative Law Judge responded to the licensed operator's argument that:

*"While all of that is true, it ignores the dictates of the regulation and the facts relevant to the [UTV's] entry into the VTS area of the St. Mary's River.*

*At the outset of this analysis, I must reiterate that I have found that Respondent was operating the [UTV] under the authority of his license and thus I must conclude here that he was for the purposes of this charge the Master of the [UTV] at all relevant times. As the Master he was charged with the duty of compliance with 33 CFR § 161.19.*

*Just after entering the VTS area of the St. Mary's River at 0230 hrs on May 18, 2000 Respondent left the bridge of the [UTV] to sleep. He left in charge, [the unlicensed individual], a man who Respondent knew had no knowledge of the St. Mary's River system. Respondent knew [the unlicensed individual] had never navigated the area before. He knew [the unlicensed individual] lacked sufficient skills plotting a course. Respondent even left instructions with [the unlicensed individual] when to call in to the VTS. Which was not done.*

*A completely unqualified person was piloting the [UTV]. And, Respondent's decision proved potentially fatal by [the unlicensed individual] navigating the down bound channel where the [UTV] could have collided with a 1,000-foot ore freighter in the dark hours of the early morning.*

*Moreover, Respondent knew or should have known (given his many years of experience) the regulation required that within 15 minutes after entering the VTS area a sailing*

*plan was to be called into the VTS. No call was even attempted until about 0411 hrs, more than an hour and half after entering the VTS area.*

*I must conclude that Respondent violated 33 CFR § 161.19 and thus 46 USC §7703(1)(A)."*

The Coast Guard also charged the licensed operator with misconduct for failing to ensure that the UTV was properly manned as required by 46 § CFR 15.610. Additionally, the vessel operator was charged with turning over navigational direction and control of the vessel to an unlicensed and unqualified individual. The Administrative Law Judge considered these two charges as they were essentially the same issue.

The licensed individual did not dispute these charges and the Administrative Law Judge ruled that:

*"I must agree with the IO [Coast Guard Investigating Officer]. Respondent's most serious relinquishment of direction and control of the vessel occurred when it entered the VTS area of the St. Mary's River system. Respondent knowing that [the unlicensed individual] had no knowledge of the area, was not particularly skilled in plotting a course, turned the helm over to [the unlicensed individual] and retired to sleep. This proved seriously mistaken. Again, [the unlicensed individual] went up the wrong channel (up the down-bound channel). Upon discovery and awakening, Respondent had to resume control, reverse the vessel's course, exit the area, and return to the proper channel. I find the specification proven.*

The Coast Guard also charged the licensed operator, as the master of the vessel and the responsible person in charge, with negligently allowing the vessel to be operated without required equipment such as an EPIRB, navigation charts, navigation publications, lifesaving equipment, anchor ready for letting go, navigation lights, VHF FM radio and bell. Allowing the vessel to sail without this navigation and safety equipment is not an action that a reasonable and prudent person of the same station, under the same circumstances, would fail to perform.

The Administrative Law Judge ruled that:

*"The Respondent did not seriously contest this charge, or at least has not filed any closing argument addressing these allegations. In short, Respondent's failure to address or defend these allegations tacitly admit them.*

*The record evidence is quite plain that the [UTV] did not have the proper navigation charts and publications. It did not have various life*

saving equipment, such as personal flotation devices, or sufficient life preservers on board. The EPIRB device was onboard but still in the original container and thus not mounted and ready for deployment in the event of a capsizing of the vessel.

I have found that Respondent was in reality the master of the [UTV]. He was placed on that vessel because the owner of the vessel had confidence in him to see that its voyage and tow to its destination would run smoothly. As the master he is the individual primarily charged with the care and safety of the vessel and crew. Commandant Decision on Appeal (CDOA) 2098 (Cordish)<sup>1</sup>. In order to ensure the proper management and safety of his vessel, and crew, the master must keep himself well informed of any defects in the vessel, which could pose a signifi-

cant hazard to life or property. CDOA 2307 (Gaboury). Absence of proper personal flotation devices, mounted EPIRB when more than four miles off shore as this vessel was at time, poses significant hazards which cannot be overlooked. I find this specification proven.”

With regard to the Coast Guard’s charge that the licensed individual was physically incompetent to serve as a master or operator of a towing vessel, the Administrative Law Judge determined that there was insufficient evidence to conclude physical incompetence and dismissed the charge and specification.

The Administrative Law Judge concluded that all of the charges in the complaint except for the allegation of physical incompetence had been proved. Given the nature and severity of the charges, the Administrative Law Judge suspended the respondent’s license for a minimum of six months.<sup>2</sup>

<sup>1</sup> These and other Commandant Decisions on Appeal can be found on the Internet at [www.uscg.mil/hq/g-cj/appeals/index.htm](http://www.uscg.mil/hq/g-cj/appeals/index.htm)

<sup>2</sup> The vessel’s operating company was assessed multiple civil penalty fines by the Coast Guard for the numerous infractions uncovered during the investigation of this case.

## Other Recent Administrative Cases of Note Involving Towing Vessel Operators

### Summary of Offense

The operator of a towing vessel pushing a loaded cement barge was charged with negligence when he failed to make a proper course change and the vessel proceeded outside the marked navigable channel and allided with a waste water treatment plant’s sea wall.

Operator and captain of a towing vessel was charged with negligently causing the sinking of a barge by proceeding with a voyage under predicted and notified heavy icing conditions. The ice caused significant damage to the barge, leading to its sinking.

Operator of a towing vessel was charged with negligently transiting a drawbridge, striking the bridge fendering system and causing substantial damage. Additionally, he was charged with violation of law or regulation for failing to report the casualty to the Coast Guard. He was also charged with misconduct for operating a vessel without the proper license and failing to disclose on his Coast Guard License application a previous Coast Guard Letter of Warning.

### Sanction

License was suspended for two months.

Both the licenses of the vessel operator and the captain were suspended for two months.

License was revoked.

*Uninspected Towing Vessel Allided with Amtrak  
Over Big Bayou Canot,  
Resulting in 47 Deaths and 6 Injuries  
Sept. 22, 1993*

[www.uscg.mil/hq/g-m/moa/casualty.htm](http://www.uscg.mil/hq/g-m/moa/casualty.htm)

At approximately 2:45 a.m. on Sept. 22, 1993, the operator of an uninspected towing vessel (UTV) pushing barges, became lost in the fog while transiting the Mobile River.

The operator mistakenly turned out of the Mobile River into Big Bayou Canot in the vicinity where the Amtrak bridge crosses over Big Bayou Canot.

The UTV pushing the barges struck the bridge shortly before the train crossed. The bridge was dislodged by the collision, resulting in a 14-inch misalignment of the railbed. The misalignment resulted in the derailment of an Amtrak train that later crossed the bridge.

The derailment resulted in 47 deaths, 6 injuries, and \$20 million in damages.

*Entrak Bridge*

*ies*





*The following article was adapted from a recent speech by Mr. Allegretti on the Responsible Carrier Program—how it works and how it has evolved.*

by TOM ALLEGRETTI,  
President and CEO, American Waterways Operators

## Embarking on a Safety Journey:

# Creation of the Responsible Carrier Program



USCG photo by Jesi Hannold.

AWO's voyage of safety and discovery is like the early voyages of discovery by our ancestors, who were also seeking new worlds and better ways of doing business. Our safety voyage began in 1994, when AWO first recognized the need to improve safety and conceived the idea of an industry-developed safety management program that would set new and higher standards of safety performance. This recognition was the result of two major factors that made the rapid departure on our safety voyage imperative. The first was the development of a strategic plan for our association that called upon AWO to take a lead role in promoting safety in our industry. A second, and far more distressing factor, was a fatal train accident that occurred when a tug strayed off course in the fog and hit a railroad bridge, resulting in the death of 47 people. The recent barge-bridge accident in Oklahoma brought back fresh memories of that fateful incident eight years ago.

## Planning the Voyage

That incident was a little like having our mooring lines cut—we had no choice but to get our safety initiative underway. And, though our lines were cut, we knew the value of a well-conceived voyage plan. To develop that plan, we assembled a group of senior-level executives from AWO member companies who determined that the bar of safety should be raised within the entire industry. In what was widely viewed as a unique and bold move at the time, these member executives concluded that they, as the people who knew their industry best, could develop a world-class safety program designed specifically for the U.S. tugboat, towboat and barge industry. That conviction and far-sighted vision turned out to be well-founded and resulted in the development of the Responsible Carrier Program (RCP), which has become an award-winning, Coast Guard-recognized marine safety and environmental protection program for tugboat companies. The program works by establishing operating principles, practices, and guidelines that meet and often exceed those currently required by U.S. federal law or Coast Guard regulation.

## The First Leg

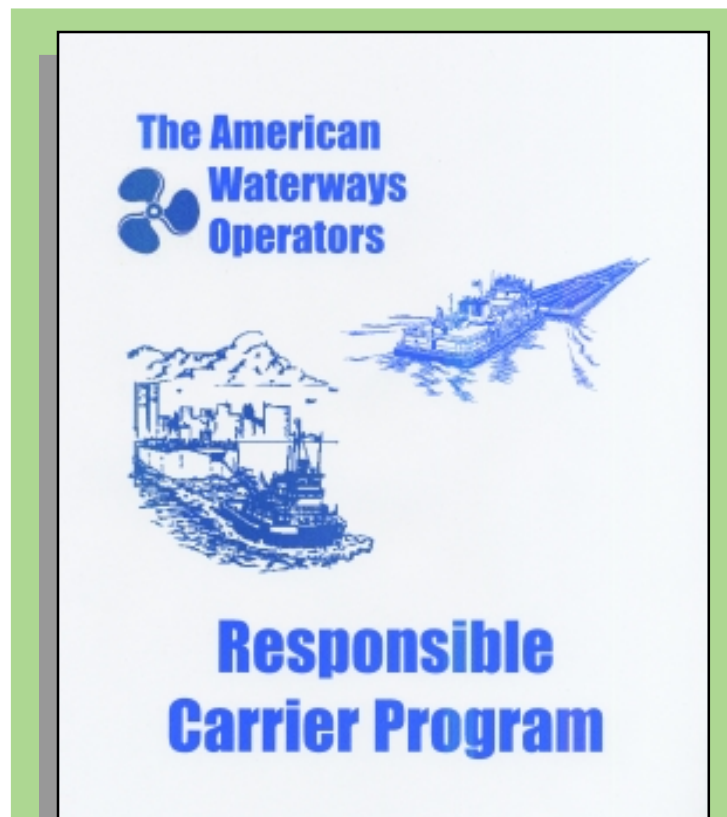
With our voyage plan set, the first leg of our safety journey began. The RCP requires all AWO carrier member companies to first “say what they do,” by establishing operating principles, practices, and guidelines in the three major areas of the program: Management and Administration, Vessel Equipment and Inspection, and Human Factors. Next, they must “do what they say,” by following their own company-developed procedures and guidelines in each of those areas. And finally, the voyage becomes much more challenging

when members must “prove it,” by undergoing a third-party audit by an AWO-certified RCP auditor. Audited compliance with the Responsible Carrier Program became a condition of membership in AWO in April 1998.

## The Second Leg

The second leg of our journey was to establish a means to verify that all AWO carrier members were in compliance with the system uniformly and consistently. Like the RCP, the third-party audit was designed by AWO members themselves. The program requires that all carrier members undergo an audit of their RCP every three years. These audits are carried out by a network of AWO-certified third-party auditors. To become certified, auditors must meet a stringent set of professional requirements, including experience in the marine industry and management and auditing experience. Prospective

auditors must also provide letters of recommendation from two AWO members with a personal knowledge of their professional ability. Additionally, prospective auditors must attend a 12-hour orientation and training session conducted by AWO. Each auditor must renew his or her certification every three years by attending a challenging professional training course, which, in the words of one recent attendee, “is no slam dunk.” (Indeed, some have failed it!) The training is designed to ensure that the auditors’ knowledge of the program remains current and their professional auditing skills are continually improved.



**RCP is an industry-driven safety program for the tugboat and towboat industry. The goals of the program are to ensure a better, safer, and more responsible industry. To learn more about the initiative, visit [www.americanwaterways.com](http://www.americanwaterways.com), and click on Responsible Carrier Program. Image courtesy AWO.**

## Staying on Course

AWO sets the course for both the audit and the RCP, ensuring that they meet the needs of our members and maintain the highest standards of professionalism and credibility. The RCP is reviewed twice a year for content to ensure that it continues to reflect industry best practices. Oversight also includes the monitoring of individual auditor performance and periodic surveys of member and auditor satisfaction with the program. Much of the day-to-day navigation of our safety voyage is the responsibility of the AWO Responsible Carrier Program Accreditation Board. The Accreditation Board is comprised of six AWO members, representing each of the operating sectors of AWO: Coastal, Harbor Services, Inland Dry and Inland Liquid, as well as liquid and dry cargo shipper representatives. The Accreditation Board trains auditors, reviews auditor applications for certification, continually reviews and updates the program, and acts as the initial arbitrator between auditors and AWO members on questions of program content and interpretation.

## How Far Have We Come?

As our voyage continues, AWO is dedicated to continuing to help our members meet and maintain the association's requirement that all carrier members must be operating in audited compliance with the program within two years of joining AWO. Today, 100 percent of our member companies (except for new ones) have undergone an independent third-party audit of their programs. In fact, most are now undergoing their recertification audits. Maintaining 100 percent compliance with the RCP does not come without some pain. In those early voyages of discovery, not every ship that sailed made a successful landfall. We've had the same experience. During 2000, 13 companies had their memberships in AWO terminated when they failed to undergo the required audit or failed to correct nonconformities that would allow them to complete their audits. Additionally, just this year, several AWO auditors had their certification withdrawn when they failed to



**THAT CONVICTION AND FAR-SIGHTED VISION TURNED OUT TO BE WELL-FOUNDED AND RESULTED IN THE DEVELOPMENT OF THE RCP, WHICH HAS BECOME AN AWARD-WINNING, COAST GUARD-RECOGNIZED MARINE SAFETY AND ENVIRONMENTAL PROTECTION PROGRAM FOR TUGBOAT COMPANIES.**

attain a qualifying score in their recertification training. When forced to choose, AWO members have decided to forfeit revenue rather than to compromise on safety.

## What Has Our Voyage Accomplished So Far?

Today, our industry is safer, more responsible, and better regarded by government decision-makers than it was eight years ago. The RCP is widely recognized as the premier safety management program for the U.S. tugboat, towboat and barge industry. The program has gained the support of government leaders, the U.S. Coast Guard, insurance

companies and our customers. For example, Senate Republican Leader Trent Lott told a gathering of AWO members he thought the RCP was "fantastic," and expressed his hope that other sectors of the transportation industry would adopt this type of program. Adm. James M. Loy, USCG (Ret.) echoed this sentiment, writing to me, "The Responsible Carrier Program is an outstanding example of an industry initiative that serves to protect both the safety of your workforce as well as the environment in which you must operate." The program is so well regarded that the National Transportation Safety Board has recommended that all towing companies have an RCP-like safety program in place. This kind of encouragement and support has been critical to our forward momentum.

Having others recognize your efforts also helps you to stay on course. The RCP is the recipient of several awards, including an award for excellence in oil spill preparedness, prevention and response from the Texas General Land Office, as well as the American Society of Association Executives' 1999 Summit Award. The Summit Award is the highest honor in the "Associations Advance America" Awards program, conferred on associations that develop particularly innovative projects to positively impact American society.

Our safety voyage has been demanding, but also rewarding. The challenges most often mentioned by companies in main-

taining this far-reaching program are staff commitment and stretched resources. In fact, for many looking back, the most difficult part of the program was just getting underway. However, AWO members have learned that these obstacles can be overcome with management commitment, staff focus and slow, steady pressure. Several small companies that initially resisted implementing the program have reported that adherence to the RCP has not only improved safety at their companies, but increased efficiency and improved profitability as well. The owner of one small company, after implementing the RCP and undergoing the required third-party audit, said he “walked away from the audit feeling good about our program.” He said that his employees have the same sense of accomplishment and that this has been a motivator to continually improve the operation and maintenance of their fleet. Another member said that while he came into the program with some degree of skepticism, the RCP has helped immeasurably in the way he manages his operations, and has actually brought him more business and increased profitability.



A key question, of course, is the program’s effect on the safety performance of our members’ vessels. We are now working to assess this question statistically. According to U.S. Coast Guard statistics, there has been a 92 percent decline in the volume of oil spilled from tank barges since 1990. Overall vessel casualties are also down a healthy 33 percent since their high in 1998. While we can’t say definitively that this has been the result of AWO’s safety efforts alone, it does indicate that we are on the right course. Measurement, however, remains a challenge for the future. We need to develop ways to quantify the impact of the RCP in reducing oil spills, personnel injuries and vessel casualties. We also would like to be able to gauge the program’s impact on improved fleet operations and other factors that influence a company’s bottom line.

### The Course Ahead

Our voyage has had many successes so far. However, if you ask me if we’ve reached our destination, my answer is no. The Oklahoma accident makes very clear that while we’ve made great strides toward a safer industry, there is more work to be done, and we must sail on. We must consider how to ensure the safety of the entire industry, not just those companies who are members of AWO. We must find effective ways to encourage the safety of our vendors, who are not all AWO members. U.S. antitrust laws prevent us from requiring that our members use only RCP-certified vendors; however, we can and do require our members to consider the safety efforts of potential vendors before engaging their services. The system is not perfect and needs more work. For example, how do we respond when a

member says, “What can we do when a non-RCP operator is the ‘only game in town’?,” or “We don’t have the staff to check on all our vendors?” Our Accreditation Board has begun an examination of the next steps to help AWO navigate these murky waters.

A related challenge centers around the relationship between the RCP and government regulation. Can the RCP alone do the job, both for AWO members and for those companies that are not part of AWO, or do we need to consider some role for additional governmental requirements? Should compliance with a safety management system like the RCP be a regulatory requirement, for that matter? That’s a challenging question, and it’s one that AWO is grappling with right now. A member task force headed by AWO’s Vice Chairman of the Board is developing recommendations to AWO’s Board of Directors on the right next steps for the association on these important questions.

### The Voyage Must and Will Continue

We’ve seen notable success so far on our safety voyage, but it’s not over yet. We are now confronting the issues of finding ways to encourage the safety of the entire industry, not just AWO members; encouraging the safety of our vendors; quantifying the impact of the RCP; and, determining the most effective relationship between the RCP and government regulations.

Over the long haul, the real test of the RCP, or any other safety management system, is whether it continues to live up to its promise of improving industry safety and environmental protection. It must prove to be a day-in, day-out operational standard that the tugboat, towboat and barge industry maintains and lives by—an operational standard that improves performance in measurable ways—fewer spills, fewer accidents, fewer fatalities.

The members of AWO are working hard to meet this challenge. It’s a concerted effort from management and all of the port captains, port engineers, captains, mates, tankermen and deckhands—the people who are actually called upon to do what the program requires. It’s a big job, but it’s a critically important one—one to which the members of AWO are committed.

*The American Waterways Operators (AWO) is the national trade association representing the U.S. tugboat, towboat, and barge industry. Headquartered in the Washington, D.C. area, the association is made up of 375 member companies operating the majority of the towing equipment in the United States. AWO has three primary missions: advocacy, safety and industry image.*



*the* NEW LICENSING PATH

*for* TOWING VESSEL OFFICERS

by Cmdr. DAVID DOLLOFF,  
National Maritime Center

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A towboat with a raised pilot house, like the *Emma M. Roehrig*, above, allows the captain to keep a lookout over a barge when pushing ahead or towing on the hip. USCG photo by Jesi Hannold.

It has been more than a year since new regulations brought significant changes to licensing requirements for towing vessel officers. The new rules, which took effect May 21, 2001, radically changed qualification requirements and created a new licensing structure. These requirements are the result of several years of effort by the U.S. Coast Guard and the towing industry. Extensive partnering efforts resulted in regulations and policy guidance that are easing the transition to the new rules.

In the past, the following licenses authorized service as the “operator” of an uninspected towing vessel:

- Operator Uninspected Towing Vessels (OUTV)
- Master of inspected, self-propelled vessels (within the authorized tonnage)
- Mate or first class pilot of inspected, self-propelled vessels of more than 200 gross register tons (GRT)

As an example, a 100-ton master could serve as captain of a towboat within the tonnage limit of the license, even though he or she may not have had any previous towing vessel experience. An unlimited third mate could also serve as a towing vessel operator without further examination, experience, or license endorsement.

The new system incorporates a progression from deckhand to master combining experience, examination, and assessments. The new license titles are:

- Master of Towing Vessels
- Mate (Pilot) of Towing Vessels
- Apprentice Mate (Steersman) of Towing Vessels
- Limited (Master, Mate (Pilot), Apprentice Mate)

The progression begins with underway experience. Once enough experience has been gained, the candidate either takes a Coast Guard-administered examination or completes an approved course to qualify for a license as Apprentice Mate (Steersman) of Towing Vessels.

The next step is Mate (Pilot) of Towing Vessels. To obtain this license, the officer must obtain additional underway experience and be assessed. A Designated Examiner who observes the performance of tasks or duties common to towing vessels performs the assessment. The tasks and duties are listed on a Towing Officers’ Assessment Record (TOAR). TOARs have been developed for each of the routes for which towing vessel licenses are issued. By “signing off” an element within the TOAR, the Designated Examiner considers the potential officer to be “proficient” at the task. With a completed TOAR and sufficient underway experience, the officer qualifies for an endorsement as Mate (Pilot).

To progress to Master of Towing Vessels, the officer needs only to demonstrate the additional service requirements unless he or she is also seeking an additional route, in which case some additional testing and assessment may be required.

The sea service requirements have also changed. The new requirements are summarized in the table below.

Designated Examiners are generally towing vessel officers who possess recent experience in the tasks being assessed, and have training or experience in conducting assessments. The U.S. Coast Guard National Maritime Center approves Designated Examiners. The Designated Examiner has the important job of ensuring that potential officers are capable of performing critical tasks. This has often been a criticism of the license qualification process—that just gaining experience and taking an examination do not necessarily ensure that a mariner can drive the boat.

## Requirements for Towing Licenses

LICENSE	TOTAL SERVICE	SERVICE	TIME on ROUTE	TOAR or TRAINING PROGRAM REQUIRED	EXAM	DAYS of OBSERVATION for NEW ROUTE
Master of Towing Vessels	48 mos.	18 mos. <sup>1</sup> service as Mate (Pilot)	90 days	No <sup>2</sup>	No <sup>2</sup>	90 days for increase in the scope of the license
Mate (Pilot) of Towing Vessels	30 mos.	12 mos. Service as Apprentice Mate		Yes	No <sup>2</sup>	
Apprentice mate (Steersman)	18 mos.	12 mos. Service on towing vessels		No	Yes	90 days on any route

<sup>1</sup> Up to 180 days of Harbor Assist can be credited  
<sup>2</sup> TOAR and Limited Exam may be required if not previously completed for route

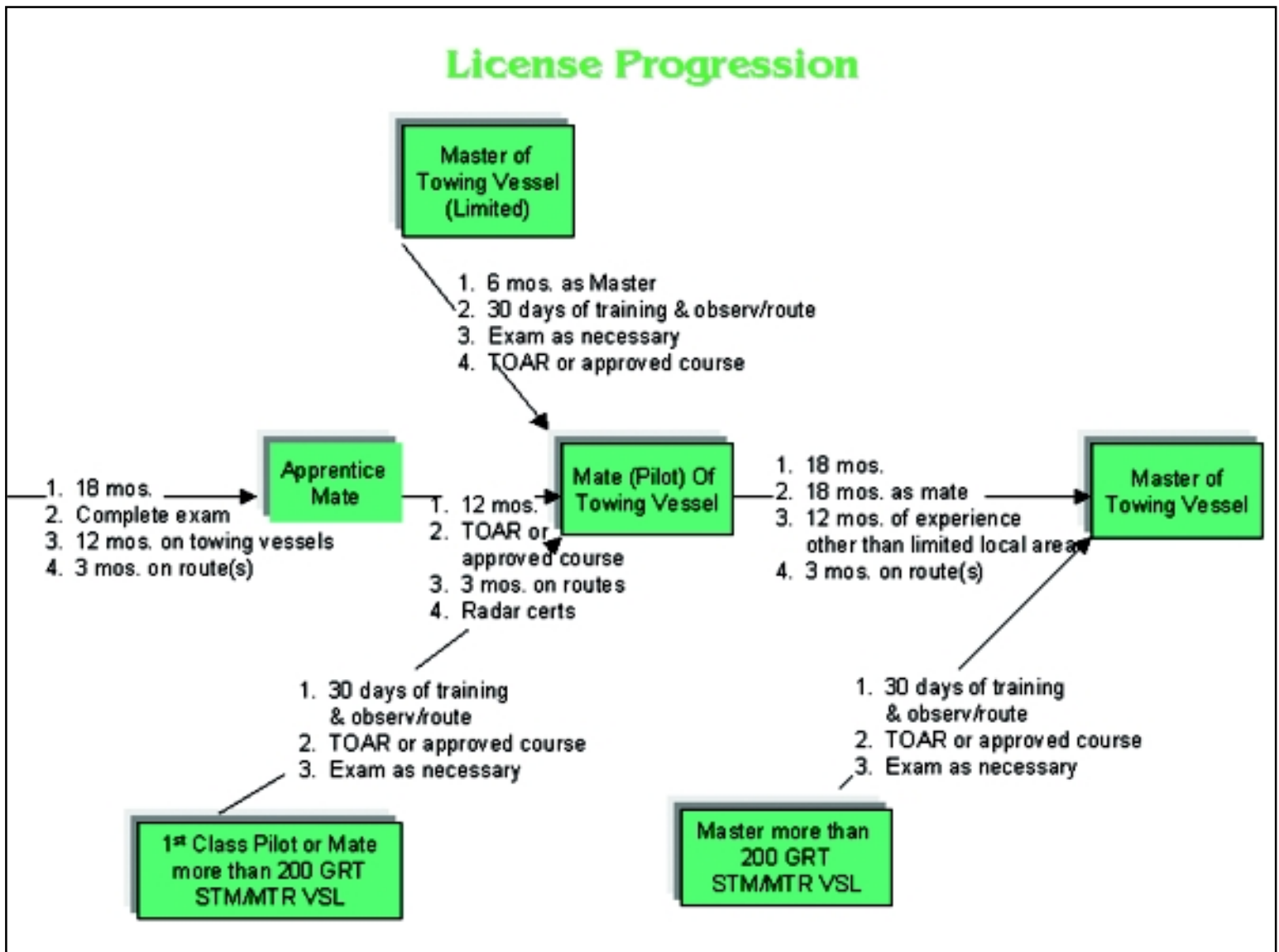
Some changes have been made to the authorized routes endorsed on a license. In the past, licenses were endorsed for Oceans, Near Coastal, Great Lakes-Inland, or Western Rivers. Service was authorized on routes subordinate to the route endorsed. For instance, an Oceans endorsement authorized service on Near Coastal, Great Lakes-Inland, and Western Rivers. Under the new rules, subordinate routes are still authorized except for Western Rivers. To operate upon these waters, the license must be endorsed for Western Rivers.

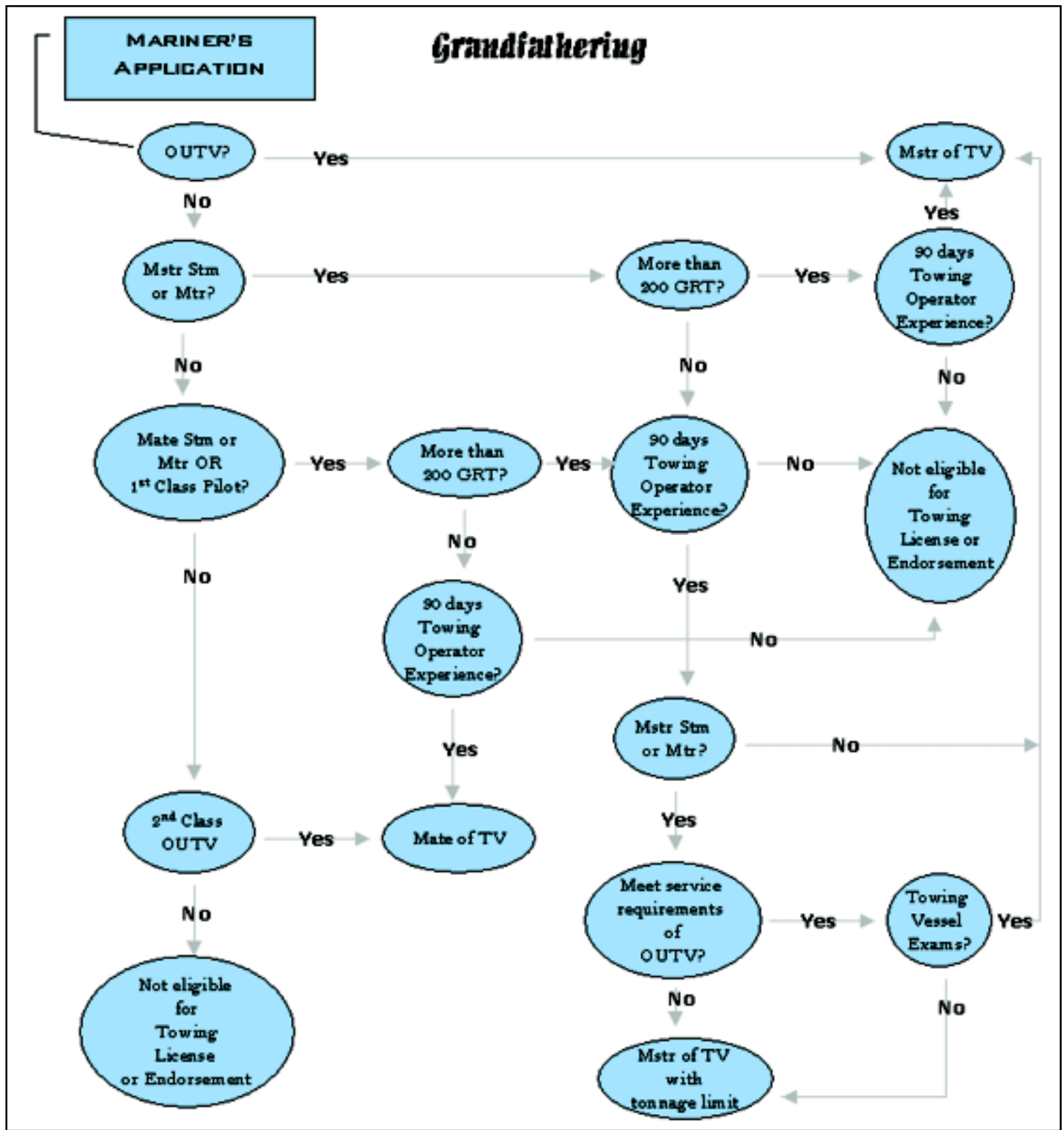
Licenses as Master, Mate (Pilot) and Apprentice Mate will also be issued that are limited to a local geographic area or for special use. These licenses have reduced service and examination requirements.

A towing vessel endorsement is not required in all cases. For instance, a mariner who holds a license as master of inspected, self-propelled vessels with a tonnage limit greater than 200 GRT may serve as master of towing vessels by possessing evidence of 30 days of training and observation on towing vessels and a completed TOAR. By meeting the same

requirements, a mariner who holds a mate's license with a tonnage limit greater than 200 GRT may serve as mate. However, those masters and mates who wish to obtain a towing vessel endorsement need not follow the progression through apprentice mate. The new regulations provide for crossovers with appropriate experience and completion of a TOAR. The license progression and crossovers are illustrated below.

To ease the transition to the new requirements, the rule incorporates grandfathering provisions. For instance, those who began their service or training in the towing industry before the effective date of the rule may qualify under the prior OUTV requirements up to May 21, 2004. Also, holders of an OUTV license will automatically receive the new license upon renewal, and during the grandfathering period those masters and mates with prior towing vessel experience will usually qualify for one of the new endorsements without meeting any additional requirements. If requested, the new endorsement will be placed on the license at time of renewal. Grandfathering is illustrated in the diagram on page 23.





To ease the burden on Regional Examination Centers, we are encouraging that these endorsements be added to licenses at the time of renewal. The transition period continues to May 21, 2006. During the transition, a mix of licenses old and new will be seen onboard towing vessels. Any license issued after the implementation date, however, must comply with the new rules.

The requirements for towing vessel officers are fully covered in Navigation and Vessel Circular (NVIC) 4-01.

Important information on grandfathering, routes, endorsements, limited licenses, and manning are fully explained. The NVIC also includes the various TOARs and sample evaluator checklists. This document can be located at [www.uscg.mil/hq/g-m/nvic/](http://www.uscg.mil/hq/g-m/nvic/). The NVIC is the result of an extensive effort in association with the Towing Safety Advisory Committee (TSAC). TSAC continues to assist the Coast Guard through its efforts to develop assessment criteria as a companion to the TOARs.



# Facts About the American Tugboat, Towboat and Barge Industry



USCG photo by Jesi Hannold.

1. On our nation's inland waterways and coasts, America's tugboat, towboat and barge industry:
  - Transports 20 percent of America's coal—enough to produce 10 percent of all electricity used each year in the United States;
  - Moves 60 percent of U.S. grain exports, helping American farmers compete with foreign producers;
  - Carries most of New England's home heating oil and gasoline.
2. Today's fleet of more than 5,000 modern tugboats and towboats and more than 25,000 barges moves nearly 800 million tons each year of raw materials and finished goods.
3. The industry allows the United States to take advantage of one of its greatest natural resources—the 25,000-mile waterway system—and adds \$5 billion a year to the U.S. economy, carrying 15 percent of the nation's commerce for 2 percent of the nation's freight bill.
4. Waterways transportation is the most economical mode of commercial freight transportation. This is due to the enormous capacity of a barge. For example, a typical inland barge has a capacity 15 times greater than one rail car and 60 times greater than one semi-trailer truck.
5. Waterways transportation is the most environmentally friendly mode of commercial transportation. The greater fuel efficiency of tugboats and towboats results in cleaner air.
6. Waterways transportation contributes to the American quality of life by moving goods off the already-congested roads and rails and away from crowded population centers.
7. The American tugboat, towboat and barge industry is an important element in the nation's intermodal transportation network, and contributes to the American economy, environment, national security and quality of life.

## Safety and Environmental Protection

1. Waterways transportation is the safest mode of commercial freight transportation, with the fewest number of accidents of any mode.
2. The Coast Guard-AWO Safety Partnership, the first industry-Coast Guard partnership of its kind, has launched more than 25 quality action teams that are improving safety and training throughout the industry's operations.
3. AWO has worked closely with the Coast Guard in the Coast Guard-AWO Safety Partnership to achieve a dramatic 82 percent reduction in oil spills just since 1994.

*These facts were compiled by the American Waterways Operators, the national trade association representing the owners and operators of tugboats, towboats and barges serving the waterborne commerce of the United States.*



# Uninspected Towing Vessel and Tank Barge Grounded, Resulting in Major Oil Discharge Jan. 19, 1996

[www.uscg.mil/hq/g-m/moa/casualty.htm](http://www.uscg.mil/hq/g-m/moa/casualty.htm)



At 1:20 p.m. on Jan. 19, 1996, an uninspected towing vessel (UTV) experienced an engine room fire approximately 4 nautical miles south of Point Judith, R.I., while towing a tank barge during a severe winter storm.

The six crewmembers were unable to enter the engine room to fight the fire and abandoned the vessel before being rescued by the U.S. Coast Guard. The tug and barge drifted and eventually grounded on Moonstone Beach, R.I.

The tank barge was holed during the grounding and spilled approximately 828,000 gallons of its cargo of four million gallons of #2 fuel oil.

**PHOTO CREDIT:** The crew of the burning tugboat *Scandia* was rescued by the U.S. Coast Guard moments before its barge spilled more than 800,000 gallons of oil, making this Rhode Island's largest spill ever. USCG photo by PA1 Robert Wyman.

# Towing Vessel/Barge

## Safety Statistics

### Show Improvement

2000

*crew fatalities*

*oil spills*

*vessel casualties*

by DAVID H. DICKEY, U.S. Coast Guard Office of Investigations & Analysis  
and DOUGLAS W. SCHEFFLER, American Waterways Operators

\* See page 40; Summary of Towing Vessel Crew Fatalities 1995-2000.

Whether credit belongs to recent U.S. Coast Guard-in-dustry initiatives or other factors is not yet clear, one thing is certain—the safety measures for the towing vessel industry for the year 2000 show significant improvement when compared to previous years. The safety statistics, compiled as a result of the partnership agreement between the Coast Guard and the American Waterways Operators (AWO), show favorable declines in 2000 in the three areas used to measure safety: crew fatalities, oil spills, and vessel casualties.

All three areas showed marked declines in 2000, and in fact were the lowest numbers since the statistics were compiled beginning in 1994. Fourteen crew fatalities occurred per 100,000 workers in 2000 compared with 23 in 1998 and 1999, and 35 in 1997. Oil spills showed another marked decline to 1.9 gallons spilled per one million moved in 2000, down from 2.3 in 1999 and 3.5 in 1998. The towing vessel industry also

saw the fewest vessel casualties per one million trip miles: 32.3 in 2000 compared with 34.6 in 1999 and 38.2 in 1998.

The statistics presented in this article were derived from a report prepared for the National Quality Steering Committee of the Coast Guard-AWO Safety Partnership. An October 1999 Memorandum of Agreement between the Coast Guard and AWO mandated the submission of an annual safety report to that committee. This was the third report and depicts trends in the areas of towing vessel casualties, oil spills, and crew fatalities for 1994-2000.

The primary sources of data for the reports were the Coast Guard's Marine Safety Management System database and the U.S. Army Corps of Engineers' Waterborne Commerce Statistics Center. The key findings for these three areas are presented on the following pages.

#### Crew Fatalities

Crew fatalities are measured as the deaths from operational causes (deaths from natural causes are excluded) and missing crewmembers per 100,000 workers. The table at the top of page 28 shows the metric and its components for the study period.

It is important to note that the figures reflect fatalities from crewmembers only. The partnership studies other issues as a need arises. For example, in response to the towing vessel-bridge allision that occurred in Oklahoma in May 2002, the partnership assigned a working group to assess non-crewmember fatalities and damages resulting from allisions with bridges. It is expected that a report will be available early next year.

The data for 2000 show record lows for both the count (Total Fatalities) and rate (Fatalities per 100,000 Workers). While the actual number of fatalities is lower (11), the rate of accidents (14) is more significant as it allows for a

*Crew Fatalities, 1994-2000*

Year	Fatalities per 100,000 Workers	Estimated Workers (FTEs)	Deaths	Missing	Total Fatalities	Miss. River System Fatalities	Other Fatalities
1994	23	91,284	20	1	21	10	11
1995	16	81,994	12	1	13	7	6
1996	29	82,793	21	3	24	14	10
1997	35	83,020	26	3	29	16	13
1998	23	84,009	19	0	19	14	5
1999	23	82,314	18	1	19	14	5
2000	14	81,206	10	1	11	8	3

**Oil Spills**

The “normalized” measure or rate for reporting pollution is gallons spilled per million gallons transported by tank barge. The table labelled “Tank Barge Oil Spills, 1994-2000” on page 29 shows this metric and its components for the study period.

The data for 2000 continue the downward trend since 1997. The spillage showed a decrease from 1999 of 25,437 gallons or 16 percent. The amount transported was up slightly, resulting in a new record low in the normalized series of 1.9 gallons spilled per one million transported by tank barge.

The chart “Towing Industry Oil Spills vs. All Sources” on page 29 shows that the percentage of oil spilled from towing industry sources, when compared to all sources, dropped from 19.5 percent in 1999 to 13 percent in 2000. (The tankship *Westchester* grounding and spill accounted for 38 percent of the year 2000 total.) Thus, in terms of both absolute and relative measures, the amount of oil spilled from towing industry sources decreased in 2000.

The results of the last four years indicate that the Oil Pollution Act of 1990, the Responsible Carrier Program, and the introduction of new technologies such as Global Positioning System have caused permanent changes in the industry. While these results are positive, there is no guarantee that they will be sustained in future years. Experience has shown that a single accident can significantly increase the spill volume for any year.

**Vessel Casualties**

The standard measure for vessel casualties is number of towboat and tugboat casualties per one million trip

standard measure between years. In looking at the decline since 1997, an intuitive interpretation is to credit safety programs such as the Responsible Carrier Program that were implemented in that period. Statistical analysis indicates that the 2000 data may be within the lower bounds of expected variability. Hence, the recent years may be similar to 1994-1995, which were followed by the peak years of 1996-1997. More data is needed to determine if the recent years are the start of a downward trend and to ascertain specific causes.

In a further study of crew fatalities, the Coast Guard and AWO looked at fatality figures by vessel type and by waterbody for the period 1995–2000. The tables labelled “Fatalities by Vessel Type, 1995-2000” and “Towing Fatalities, 1995-2000” on this page show fatality figures occurring in all waterbodies that were investigated by Coast Guard personnel.

**Towing Fatalities 1995-2000**

*\* Includes all waterbodies; Non-crew fatalities Excluded*

# each	Waterbody
1	Connecticut River; Delaware Bay; Elizabeth River; Gray’s Harbor; Black Warrior River; Gulf of Mexico 12-200 miles; Gulf Outlet, Mississippi River; Houston Ship Channel; Illinois River; Kanawha River; Lake Michigan; Lynn Canal; Monongahela River; New York Harbor, upper bay; North Atlantic Ocean; North Atlantic Ocean 12-200 miles; North Pacific Ocean; North Pacific Ocean coastal; North Pacific Ocean, near Russia; Pacific Coastal Waters, other; Puget Sound; Rouge River; St. Croix River; St. Mary’s River, Fla.; Tampa Bay; Tombigbee River
2	Atlantic Harbor, other; Bering Sea; Chicago Ship Canal; Cumberland River; Gulf of Mexico coastal; Gulf of Mexico River, other; Missouri River
3	Chesapeake Bay; San Francisco Bay
5	Intercoastal Waterway–Gulf
9	Upper Mississippi River
12	Ohio River
27	Lower Mississippi River
<b>99</b>	<b>Grand Total</b>

**Fatalities by Vessel Type 1995-2000**

*\* Includes all waterbodies; Non-crew fatalities excluded.*

Vessel Type	Total	Percentage
Towboat/Tugboat	66	67
Freight Barge	25	25
Tank Barge	6	6
Barge, Other	2	2
Grand Total	99	100

Year	Gallons Spilled per 1 Million Moved	Gallons Spilled	Millions of Gallons Moved
1994	13.9	955,582	68,541
1995	16.3	1,101,938	67,490
1996	16.9	1,163,258	68,637
1997	2.3	165,649	71,518
1998	3.5	248,089	70,153
1999	2.3	158,977	67,981
2000	1.9	133,540	68,866

Year	Vessel Casualties per 1 Million Trip Miles	Number of Vessel Casualties	Millions of Trip Miles
1994	31	1,503	48,443
1995	38.1	1,989	52,244
1996	40.9	2,107	51,423
1997	37.7	1,922	51,263
1998	38.2	2,014	52,430
1999	34.6	1,798	52,137
2000	32.3	1,702	52,407

miles. The table labelled “Towboat/Tugboat Vessel Casualties, 1994-2000” above shows the time series for 1994-2000 and its components.

The normalized series shows a downward trend from a peak in 1996. Similar tables were generated for the primary incident of each casualty. In 2000, groundings, collisions, allisions, and loss of vessel control accounted for 89.2 percent of these primary incidents. The groundings, collisions, and allisions series all show a downward trend, but the loss of vessel control shows an upward trend.

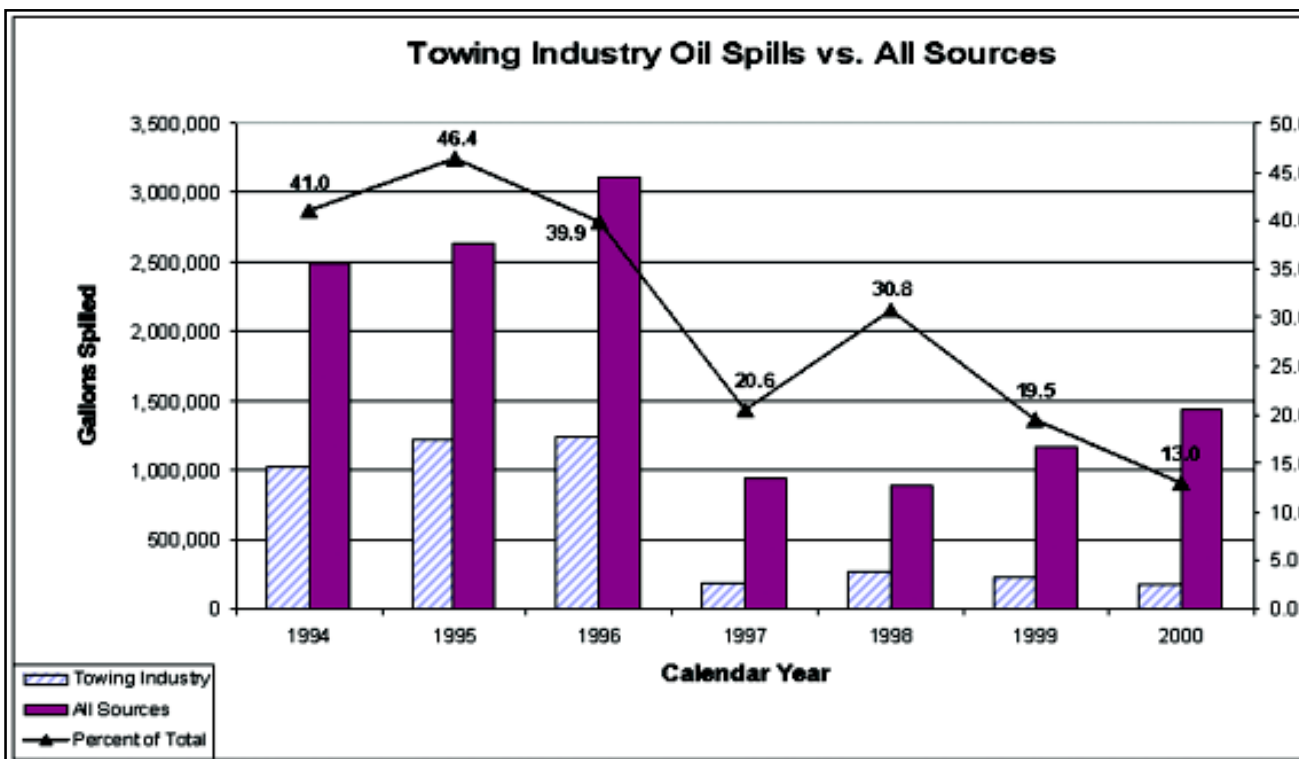
This suggests that a possible line of investigation is to combine the groundings, allisions, and collisions into a human factors group and study them separately. Although the downward trend in the human factors group correlates well with increased training activity in recent years, we would like to investigate the data to see if there are any other patterns that are hidden by the aggregate data.

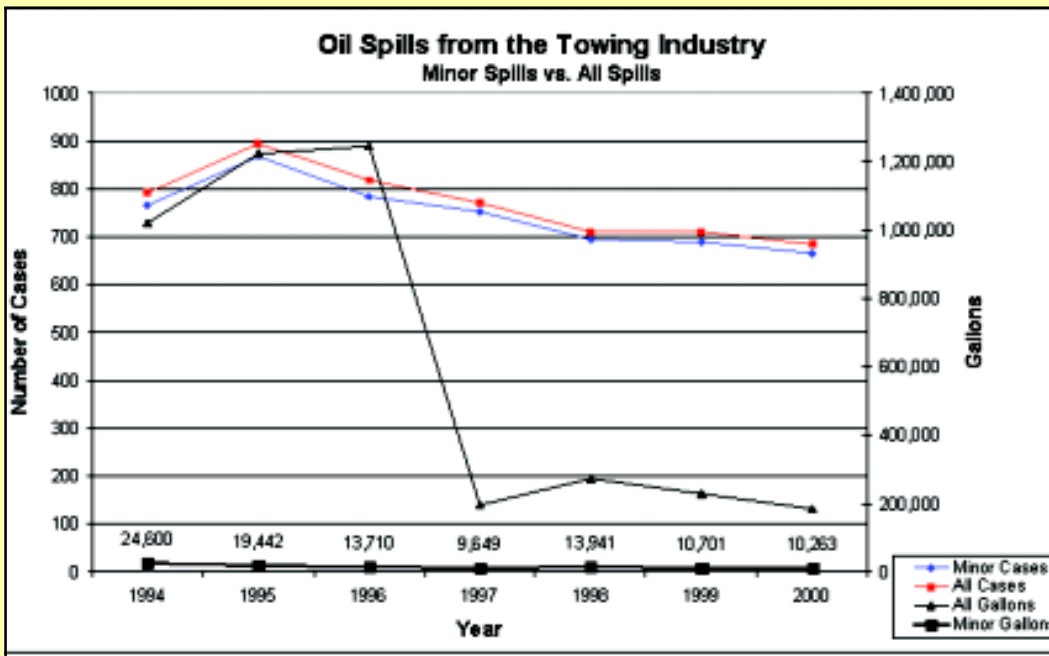
**Conclusion**

All three normalized series show favorable declines for 2000. However,

analysis of the data suggests that additional research is needed to interpret the crew fatalities and vessel casualty data. The three series featured in this article track the issues of concern to the Coast Guard-AWO partnership since its inception in the mid-1990s. Through national and regional Quality Action Teams and Working Groups, the partnership has tackled other safety issues. The Bridge Allisions Working Group is a current example. In the future, the partnership will continue to update and analyze the three standard safety series and investigate other issues as needed.

To obtain a copy of the complete report prepared for the National Quality Steering Committee of the Coast Guard-AWO Safety Partnership, contact either David Dickey at [ddickey@comdt.uscg.mil](mailto:ddickey@comdt.uscg.mil), or Douglas Scheffler at [dscheffler@vesselalliance.com](mailto:dscheffler@vesselalliance.com).





As part of its review, the Coast Guard-AWO partnership reviewed minor oil spills, which are defined as those of 1,000 gallons or less. Comparing minor spills to all spills from the towing industry, they found that nearly all spills are minor in size. As shown in the chart to the left, 96.9 percent of all incidents from 1994–2000 were in the minor category. Conversely, minor spills contribute virtually none of the volume—only 2.3 percent for the same period. This inverse relationship between spill counts and volume is common in the Coast Guard’s spill data, overall. In other words, a small number of incidents account for most of the volume spilled.



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# Coast Guard-AWO Safety Partnership: Effecting Change through Cooperation

A Kirby Corporation-  
owned towboat  
pushing ahead. Photo  
courtesy AWO.

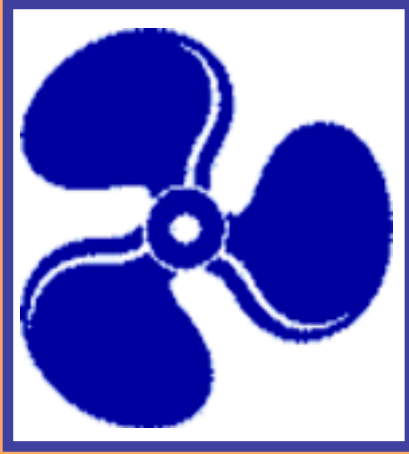
by JENNIFER CARPENTER,  
American Waterways Operators Senior Vice President, Government Affairs and Policy Analysis

The safety partnership of the U.S. Coast Guard and American Waterways Operators (AWO), established in 1995, was the first of its kind to bring together Coast Guard and industry leaders to improve marine safety and environmental protection through cooperative, non-regulatory initiatives. In 2001, the partnership welcomed its new co-chair, Rear Adm. Paul Pluta, Coast Guard Assistant Commandant for Marine Safety, Security & Environmental Protection, and sought to build on its five-year track record of success. (For a history of the partnership, see *Proceedings*, Volume 58, Number 3, page 6.)

To date, the partnership's Crew Alertness Dialogue Group has overseen the development and distribution of more than 40,000 "Stay Alert for Safety!" brochures, which provide safe working tips for barge and towing vessel crewmembers. The Dialogue Group continues to serve as the focal point for Coast Guard-industry cooperation on crew alertness, laying the groundwork for continued educational efforts when new Coast Guard-industry research on alertness management is completed this year.

Making decisions about safety priorities based on statistics and analysis is a hallmark of the partnership, and in 2001 the partnership received the results of a cooperative Coast Guard-AWO initiative to track industry safety performance in the areas of crew fatalities, oil spills and vessel accidents. (See related story, page 27.) The partnership will use this new data as part of a strategic planning process aimed at identifying the most important areas of focus for future Coast Guard-industry cooperation for continued improvements in marine safety and environmental protection.





# **American Waterways Operators**

## **Safety Publications**

The following items can be ordered by visiting AWO's Web site at  
[www.americanwaterways.com](http://www.americanwaterways.com)  
or by calling AWO at (703) 841-9300.



### **401 AWO Responsible Carrier Program**

Details of the industry's premier safety program are set forth in this important publication. Includes an explanation of the Responsible Carrier Program's (RCP) three sections, including Management and Administration, Equipment and Inspection (both inland and coastal versions) and Human Factors. (2002/ 48 pgs.)

### **402 LIFELINES Recreational Boating Safety Brochure**

Charts a steady course for recreational boaters to share waters safely with commercial vessels. Printed by a grant from the U.S. Coast Guard, this brochure is used in boating safety classes across the country. LIFELINES offers vital safety information for the leisure boater, wind surfer, or water skier. (2002)

### **403 ZERO Incidents Brochure**

A quick reference of the tugboat, towboat and barge industry's commitment to the environment – because one pollution incident is too many. This pamphlet, designed for employees, fits easily into pay envelopes. *AWO Members only.*

### **404 MARPOL Compliance Placards**

Offers operators a convenient, effective, and low-cost way to comply with the Coast Guard requirement that all U.S. vessels 26 feet or more in length display informational placards containing pollution prevention information and procedures for proper disposal of waste. AWO's placards are printed on self-adhesive, weather-resistant vinyl, and contain a positive environmental message as well as the information required by law. (1998) *AWO members: \$1 each; nonmembers: \$5 each.*

### **405 Stay Alert For Safety**

Designed to increase crewmember awareness of the importance of alertness to working safely on tugboats, towboats and barges. This brochure offers common sense tips to help crewmembers manage their time before, during and after watch to promote alertness, good health, and personal and vessel safety. Accompanying lesson plan available, see item 417. (2000)

#### **406 AWO Safety Calendars**

Help ensure that towing industry-specific safety messages are displayed aboard your company's vessels or in your company's offices year-round. Employees will see a new safety message each month. (Updated annually) *AWO members: \$11; nonmembers: \$18.*

#### **407 S.A.F.E. Decks Brochure**

Stay Alert For the Edge. A brochure developed to alert deckhands and others to the dangers of falling overboard. Designed to fit into pay envelopes. This award-winning program is part of the AWO-Coast Guard Safety Partnership and the Coast Guard's Prevention Through People initiative. (1997)

#### **408 Downstreaming – Better Safe Than Sorry (Brochure)**

Towing companies involved in fleeting, shifting, or terminal operations are already familiar with downstreaming maneuvers, but a recent Coast Guard-AWO study highlighted the dangers of downstreaming under the wrong conditions. This brochure highlights the dos and don'ts of downstreaming. Accompanying video available, see item 603. (1999) *AWO members: \$1 each; nonmembers: \$5 each.*

#### **409 Responsible Carrier Program Brochure**

This brochure briefly highlights the development of the industry's premier safety program, compares its requirements to the International Safety Management (ISM) code, and contains favorable quotes about the program. Ideal handout for government decision-makers, customers and vessel crews. (1998) *No charge for 25 or less. 50 cents each for 26 or more.*

#### **410 Responsible Carrier Program Audit Checklist (Management, Inland and Coastal)**

To be used in preparation for a Responsible Carrier Program (RCP) internal or external audit, these three checklists contain all the requirements of the RCP in a helpful spreadsheet format. (2001) *Management: 22 pgs.; Coastal: 15 pgs.; Inland: 13 pgs. AWO members only.*

#### **411 REACH for Safety in Confined Spaces**

Developed in collaboration with AWO, the National Fire Protection Association and the National Safety Council, this tri-fold, color brochure is aimed at vessel crewmembers. The importance of recognizing confined space hazards and ways to minimize the dangers associated with them are highlighted. Accompanying lesson plan available, see item 418. (2001)

#### **412 REACH for Hot Work Safety**

Developed in collaboration with AWO, the National Fire Protection Association and the National Safety Council, this tri-fold, color brochure is aimed at vessel crewmembers. The brochure explains the "fire triangle" and contains steps crewmembers can take to reduce the risk of hot work accidents while on the job. Accompanying lesson plan available, see item 419. (2001)

#### **413 Report on Rigging Safety**

Produced by the AWO Interregion Safety Committee, this report includes industry benchmarks for rigging equipment and strategies for reducing the weight of rigging. (1999/ 12 pgs.) *AWO members only.*

#### **414 Report on Back Safety and Hose Handling**

Produced by the AWO Interregion Safety Committee, this report includes areas of concern, potential solutions, and recommendations to reduce back injuries and improve safety. Also includes a drawing of a "clamp on" davit that can assist personnel to position hoses. (1999/ 12 pgs.) *AWO members only.*

#### **415 Fall Overboard Prevention Best Practices**

Collected by the Interregion Safety Committee, this is a list of best practices that companies have found effective in reducing falls overboard, a leading cause of fatalities on the inland river system. (2001/ 4 pgs.)

#### **416 Facilitator's Guide**

This two-page guide was developed for vessel masters and other personnel who lead safety meetings. It includes tips for presenting lesson plans, involving crewmembers and demonstrating points to illustrate the safety topic being presented. (2001/2 pgs.)

#### **417 Crew Alertness Lesson Plan**

This AWO Safety Committee project highlights the importance of diet, exercise and sleep habits to staying alert. Accompanying brochure available, see item 405. (2001/ 9 pgs.)

#### **418 Confined Space Safety Lesson Plan**

Developed by the AWO Safety Committees, this lesson plan emphasizes the risks of entering confined spaces and ways to reduce those risks. Accompanying brochure available, see item 411. (2002/ 9 pgs.)

#### **419 Hot Work Safety Lesson Plan**

This valuable lesson plan illustrates the components of the "fire triangle" and ways to reduce the risk of hot work accidents while on the job. Accompanying brochure available, see item 412. (2002/ 8 pgs.)

#### **420 Emergency Preparedness and Vessel Security Lesson Plan**

This helpful tool introduces a company's policies on security precautions such as personnel security, vessel response plans and the identification of hazards. (2001/ 7 pgs.)

#### **603 Downstreaming – Better Safe Than Sorry (Video)**

Towing companies involved in fleeting, shifting, or terminal operations are already familiar with downstreaming maneuvers, but a Coast Guard-AWO study highlighted the dangers of downstreaming under the wrong conditions. This video highlights the dos and don'ts of downstreaming. Accompanying brochure available, see item 408. (8 minutes/ 1999) AWO members: \$8.95; nonmembers: \$12.95. Shipping charges apply.

#### **605 Fast Response – A Boatcrew's Guide to Oil Spills**

Produced by American Electric Power's River Transportation Division, this video guides mariners on how to properly deal with oil spills. (18 minutes/ 1996) Shipping charges apply.

#### **606 Confined Space Entry**

Produced in conjunction with the Shipbuilders Council of America, this video covers some of the more common hazards associated with confined space entry and provides the information needed to prevent accidents and injuries. (11 minutes/ 1994) \$75. Shipping charges apply.

#### **607 An Introduction to the AWO Responsible Carrier Program Video**

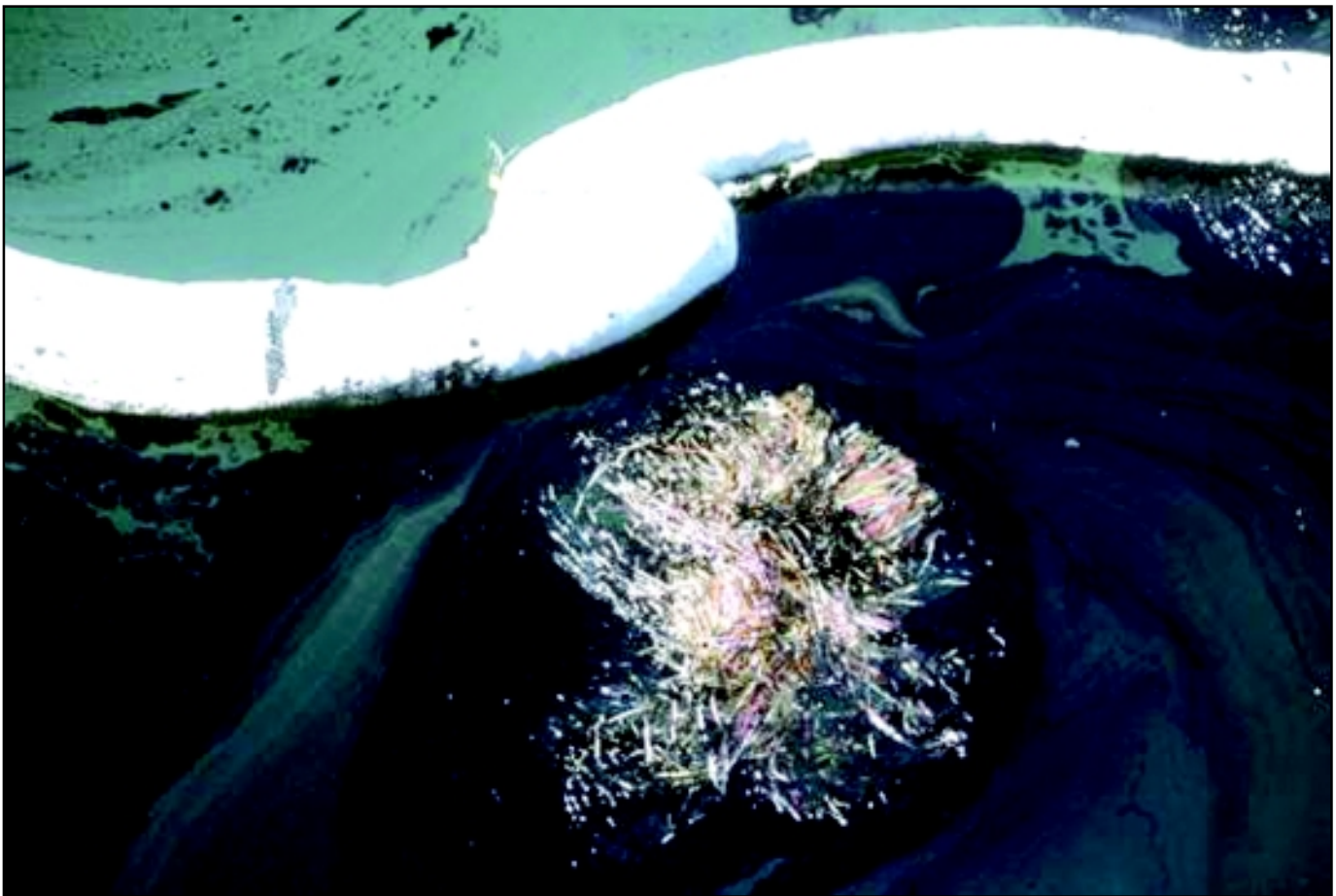
Targeted at vessel crews, this video explains the industry's premier safety program in straightforward language. Also useful for educating government decision-makers, customers and the general public. (10 minutes/ 1997) AWO members: \$10; nonmembers: \$20.



Recent Towing Spills  
Point to  
as Cause



by BILLABERNATHY,  
U.S. Coast Guard Human Element & Ship Design Division



Oil, debris and an oil absorbent boom in an oil spill. USCG photo.

The U.S. Coast Guard's Office of Investigations & Analysis reviewed the casualty data for all oil spills of 10 gallons or more originating from a towing vessel or a barge for the period 1994 to 2000. Of the 155 cases reviewed, 58, or 37 percent, were results of overflows, overfills, or transfers.

All incident briefs from those 58 cases pointed to human and organizational factors (HOF) as the cause.

## The Good News

During the past few years, statistics indicate that the towing industry has reduced both the total number of oil spills and the ratio of spills to moves. The total number of spills from 1994 to 2000 decreased 82 percent, from a high in 1996 of 1,245,393 gallons spilled from barges to the low of 185,511 gallons in the year 2000. Using transportation statistics from the Army Corps of Engineers' annual publication, *Waterborne Commerce of the United States* as denominator data, the number of gallons spilled per gallon moved in the 1990s went from a high of 16.9 gallons spilled per million gallons transported to a low of 2.3 gallons spilled per million gallons transported.

Although there are not enough statistics to identify a trend, a variety of factors may have contributed to the recent change in spill volumes. It is possible that implementing the Oil Pollution Act of 1990 and/or the Responsible Carrier Program have prevented even more spills. Other possible factors that may account for the decrease in spills include improved operational practices and increased percentage of double-hulled vessels to decrease the severity of each spill's effects.

### Where There is Room for Improvement

While there is reason to celebrate the decrease in the amount of oil spilled, statistics note room for improvement in four areas:

#### *The amount of oil spilled.*

Although there has been a reduction of oil spilled, there remains 2.3 gallons [of oil] spilled per million gallons transported — not just a drop in the bucket!

#### *The number of oil spills.*

Although the spill amounts have decreased, the incidents of spills remain high. In other words, the number of gallons of oil spilled has decreased, but the number of oil spill cases reported stayed elevated.

#### *The significance of "minor."*

From 1994 to 2000, 96.7 percent of all incidents were in the minor category. If the spills are considered "minor," why

do we need to address them? "Minor" does not mean insignificant or unimportant; rather, spills less than 1,000 gallons are categorized as "minor." What's more significant about those "minor" spills is the exorbitant amount of resources and money they use.

#### *The type of spill incidents.*

While spill incidents of all types (minor, medium, and major) generally declined on tank barges, spills on towing vessels and tugboats more than doubled from the years 1997 to 1998 to the years 1999 to 2000.

Addressing  
human and  
organizational  
factors  
(HOF)  
could have  
prevented  
more than  
30 %  
of the  
documented  
spills.

### Looking Deeper for the Hidden Causes

All 58 cases related to overflows, overfills, and transfers involved a human or organizational factor. Human and organizational factors focus on how people and organizations influence system performance. The system elements within the marine industry include people, technology, organizational management, and the external environment.

Some examples of reasons for oil spills include the following:

- Failure to fully close or open valves.

"The tankerman did not check all valves before beginning transfer"; "Failure of the engineer to properly align valves prior to a transfer"; "Valve on the tank barge was left open."

- Excessive transfer rates.

"The tug's personnel failed to slow the rate of the transfer when they were getting close to capacity."

- **Improper crew relief.**

“Tankerman went in to use the restroom without notifying anyone”; “Tankerman left a tank barge to speak to a co-worker”; “Tankerman walked away to assist in moving another barge, leaving the transfer area unattended.”

- **Ignored procedures.**

“By not connecting the transfer hose to the proper fill port; The hose was connected to the overboard discharge port instead of the lube oil fill tank”; “Investigators found that an unauthorized transfer from a towboat was being conducted, improper transfer procedures were being used, and improper personnel were in charge.”

- **Failure in training/ labeling.**

“The engineer was unfamiliar with the vessel and fuel transfer procedures were not posted or available.”

The bottom line: Addressing HOF could have prevented more than 30 percent of the documented spills.

## Finding Solutions

One way to combat accidents related to HOF is through lessons learned. By asking questions and encouraging personnel to share their experiences regarding those accidents, mishaps can be prevented by engaging in seven tangible practices that are the essence of the Coast Guard’s Prevention Through

People philosophy:

- Keep mindset on prevention
- Identify non-regulatory solutions to common problems
- Communicate by engaging others
- Understand others’ motivation for doing a job properly
- Share best procedure practices
- Educate the mariner



**Failure to fully close or open valves provides many examples of reasons for oil spills. USCG photo by Jesi Hannold.**

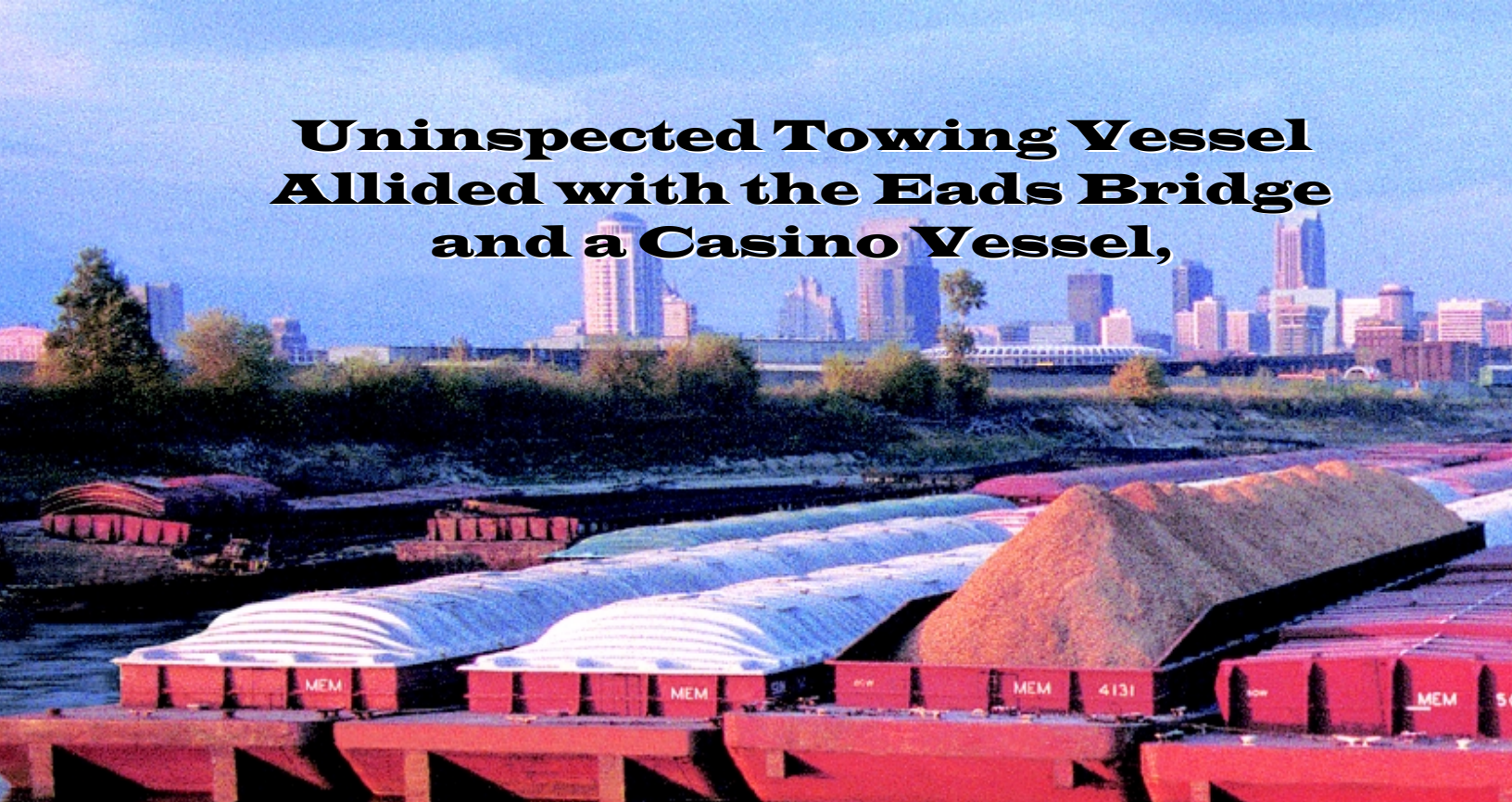
- Demonstrate benefits, such as saved time and money

Even for minor spills, the cost associated with fines, time, and resources—such as clean-up efforts, insurance hikes, personnel and paperwork increases—are steep. Plus, there is a dip into revenue. Keeping companies and crews focused on preventing oil spills can lead to better statistics and raise the maritime industry’s level of environmental protection in the most cost-effective way possible. For the industry today, and for the industry in the future, prevention through HOF will benefit everyone.



**U.S. Coast Guard members place oil-absorbent materials during an oil spill in the San Francisco Bay. USCG photo by PA1 Adam Wine.**

# **Uninspected Towing Vessel Allided with the Eads Bridge and a Casino Vessel,**



On the evening of April 4, 1998, several barges being pushed upriver broke loose from the uninspected towing vessel (UTV) in the vicinity of the Eads Highway Bridge, which connects Illinois with Missouri in St. Louis Harbor at Upper Mississippi River Mile 180. High river conditions had been observed at the St. Louis river level gauge for several days, significantly increasing the hazard to vessels navigating through St. Louis Harbor, which is characterized by four bridges concentrated within a narrow 1.2-mile navigable channel. Captain of the Port St. Louis high-water navigation horsepower and transit restrictions were in effect. The UTV was a 154-foot-long, 1,099-gross ton vessel classified for service as a towboat. The vessel was diesel-propelled with free stream twin propellers (not shrouded) rated to generate 5,600 horsepower. The towing vessel maneuvered with the aid of dual steering rudders and a flanking rudder for downbound transits.

After successfully clearing the MacArthur and Poplar Street bridges, the UTV's licensed pilot maintained full-ahead propulsion, proceeded north, and positioned his 1,100-foot-long tow for passage beneath the Eads and Martin Luther King Jr. bridges. The river stage at the time was approximately 31.5 feet (1.5 feet over the identified St. Louis flood stage). The operator was licensed to serve as "Operator of Uninspected Towing Vessels upon Great Lakes and Inland." He had more than 38 years experience in the industry, and had operated the UTV for more than four years. He had been on watch, serving as pilot of the UTV for about two and one-half hours during the transit of St. Louis Harbor on April 4, 1998.

As the tow's lead barges passed successfully beneath the Eads Bridge, the pilot began steering to port to ensure that the UTV would complete the Eads Bridge passage with her pilothouse positioned directly beneath the centerline of the span. This maneuver was also necessary to properly align the tow for passage beneath the Martin Luther King Jr. Bridge and continue the upbound transit.

As the operator attempted to maneuver the UTV for a centerspan towboat passage, she lost most of her 3-knot forward momentum. Cross currents in the vicinity of the Eads Bridge (flowing predominately from the Missouri side to the Illinois side of the river) applied unanticipated forces on the tow's port side, probably increasing the rate of turn beyond that



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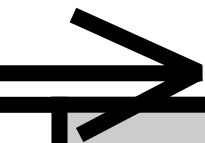
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# Summary of Towing Vessel Crew Fatalities 1995-2000



Case	Year	Vessel	Service	Waterbody
MC95003953	1995	<i>Mary Claire</i>	Towboat/Tugboat	Kanawha River
MC95012692	1995	<i>Lucille II</i>	Towboat/Tugboat	Cumberland River
MC95012866	1995	<i>St. Marys Cement II</i>	Tank Barge	Rouge River
MC95013147	1995	<i>Fairweather</i>	Freight Barge	Bering Sea
MC95014821	1995	<i>Booster 48</i>	Freight Barge	Atlantic Harbor NOS
MC95017484	1995	<i>CC 75</i>	Freight Barge	Upper Mississippi River
MC95017703	1995	<i>Steven F. O'Hara</i>	Towboat/Tugboat	New York Harbor, Upper Bay
MC95018350	1995	<i>Carole Brent</i>	Towboat/Tugboat	Lower Mississippi River
MC95018731	1995	<i>Tongass</i>	Towboat/Tugboat	Lynn Canal
MC95019577	1995	<i>RF 825</i>	Freight Barge	Upper Mississippi River
MC95019994	1995	<i>Linda</i>	Towboat/Tugboat	Missouri River
MC95020056	1995	<i>Jackie B. Eymard</i>	Towboat/Tugboat	Lower Mississippi River
MC96004014	1996	<i>Tana Lynn</i>	Towboat/Tugboat	Lower Mississippi River
MC96004511	1996	<i>Anita Domino</i>	Towboat/Tugboat	Lower Mississippi River
MC96005539	1996	<i>Scarlet Gem</i>	Towboat/Tugboat	Lower Mississippi River
MC96009149	1996	<i>Harriet Ann</i>	Towboat/Tugboat	Lower Mississippi River
MC96009383	1996	<i>MM 7</i>	Tank Barge	Lower Mississippi River
MC96009688	1996	<i>Barge ZB303</i>	Freight Barge	Not Specified, Foreign
MC96011584	1996	<i>Florida Seahorse</i>	Towboat/Tugboat	Intercoastal Waterway—Gulf
MC96013296	1996	<i>Explorer II</i>	Towboat/Tugboat	Intercoastal Waterway—Gulf
MC96014042	1996	<i>W.B. Wood</i>	Freight Barge	Lower Mississippi River
MC96014882	1996	<i>OR 1166</i>	Freight Barge	Ohio River
MC96015602	1996	<i>CM6</i>	Freight Barge	Gulf of Mexico, Coastal
MC96016821	1996	<i>Donna Lee II</i>	Freight Barge	Monongahela River
MC96017601	1996	<i>PTC 194</i>	Freight Barge	Black Warrior River
MC96017931	1996	<i>S 13</i>	Tank Barge	Lower Mississippi River
MC96018094	1996	<i>Irene Lauritzen</i>	Towboat/Tugboat	San Francisco Bay
MC96018645	1996	<i>Ruth Marie</i>	Towboat/Tugboat	North Atlantic Ocean, 12-200MI
MC97001618	1996	<i>Cindy L. Erickson</i>	Towboat/Tugboat	Illinois River
MC97003324	1997	<i>Thunder</i>	Towboat/Tugboat	North Atlantic Ocean



Position	Accident Type	Resulting Injury	Activity
Deck Crew	Fall into water	Drowning	Line Handling
Deck Crew	Fall into water	Multiple	Walking on stern of tow vessel
Deck Crew	Fall into water	Drowning	Making rounds on deck
Deck Crew	Workplace, Other	Crushed	Picking up lashing gear on deck
Deck Crew	Fall into water	Drowning	Painting
Deck Crew	Fall into water	Crushed	Fall from deck of barge
Deck Crew	Fall into water	Drowning	Fell off underway vessel
Deck Crew	Fall into water	Drowning	Walking to towboat for flashlights
Master	Fall into water	Hypothermia	Vessel operator
Deck Crew	Fall into water	Multiple	Relaying distances; Line handling
Deck Crew	Fall into water	Drowning	Boarding M/V <i>Linda</i> from small aluminum craft (WKGJO781L990)
Deck Crew	Fall into water	Drowning	Working as deckhand, no witness to accident
Deck Crew	Workplace, Other	Crushed	Reaching from tug to barge to place marker light
Deck Crew	Fall into water	Drowning	Just finished attaching the facing wire to a barge
Deck Crew	Fall into water	Drowning	Preparing to tie a head wire
Eng. Officer	Fall into water	Drowning	On deck of vessel for break
Deck Crew	Fall into water	Drowning	Placing facing wires on tow
Employee	Fall, same level	Drowning	Securing pipe equipment
Eng. Officer	Caught in lines	Cut	Standing on aft deck
Deck Crew	Fall into water	Drowning	
Deck Crew	Fall into water	Drowning	Unknown at time of accident, no witness
Deck Crew	Fall into water	Drowning	Finishing installation of navigational lights on head of tow
Employee	Workplace, Other	Crushed	Moving valves
Deck Crew	Fall into water	Fracture	Line handling
Employee	Fall into water	Drowning	Deck operations, pumping water from barge
Deck Crew	Fall into water	Drowning	Line handling
Deck Crew	Fall into water	Drowning	
Deck Crew	Fall into water	Fracture	Servicing the lights on a partially submerged dredge pipeline
Deck Crew	Fall into water	Drowning	Working cable on barge and fell into water
Deck Crew	Fall into water	Drowning	Working on deck equipment

Summary of Towing Vessel Crew Fatalities 1995-2000 cont. ...

Case	Year	Vessel	Service	Waterbody
MC97003817	1997	<i>Pat McBride</i>	Towboat/Tugboat	Ohio River
MC97005678	1997	<i>Ace G</i>	Towboat/Tugboat	Lower Mississippi River
MC97005976	1997	<i>RW-430B</i>	Freight Barge	Ohio River
MC97006769	1997	<i>Suzanne McAllister</i>	Towboat/Tugboat	Elizabeth River
MC97006857	1997	<i>Dutch</i>	Towboat/Tugboat	Ohio River
MC97007885	1997	<i>Barge Bell 157</i>	Freight Barge	San Francisco Bay
MC97007885	1997	<i>Barge Bell 157</i>	Freight Barge	San Francisco Bay
MC97009096	1997	<i>Marie-M</i>	Towboat/Tugboat	Gray's Harbor
MC97009224	1997	Crane Barge <i>Bucyrus</i>	Barge, Other	Connecticut River
MC97009442	1997	<i>LL 21</i>	Freight Barge	Upper Mississippi River
MC97009442	1997	<i>LL 21</i>	Freight Barge	Upper Mississippi River
MC97009442	1997	<i>LL 21</i>	Freight Barge	Upper Mississippi River
MC97010935	1997	<i>Rosedale</i>	Towboat/Tugboat	Lower Mississippi River
MC97011391	1997	<i>RW 822B</i>	Freight Barge	Upper Mississippi River
MC97011477	1997	<i>Gail S</i>	Towboat/Tugboat	Bering Sea
MC97012072	1997	<i>PB 1691</i>	Freight Barge	Lower Mississippi River
MC97012371	1997	<i>Vicksburg</i>	Towboat/Tugboat	Missouri River
MC97013693	1997	<i>James R. Hines</i>	Towboat/Tugboat	Lower Mississippi River
MC97014176	1997	<i>M-6625</i>	Freight Barge	Lower Mississippi River
MC97016213	1997	<i>Ted B</i>	Towboat/Tugboat	Gulf of Mexico River NOS
MC97017243	1997	<i>Martin Expolrer</i>	Towboat/Tugboat	Gulf of Mexico, 12-200 miles
MC98000189	1997	<i>Cape Charles</i>	Towboat/Tugboat	Chesapeake Bay
MC98001349	1997	<i>Rig14</i>	Barge, Other	Gulf Outlet—Mississippi River
MC98001134	1998	<i>SCNO 8148</i>	Freight Barge	Ohio River
MC98001459	1998	<i>Margaret O</i>	Towboat/Tugboat	Ohio River
MC98002931	1998	<i>Triple M</i>	Towboat/Tugboat	Upper Mississippi River
MC98003036	1998	<i>SER 211</i>	Freight Barge	Lower Mississippi River
MC98004937	1998	<i>River Wolverine</i>	Towboat/Tugboat	Ohio River
MC98005672	1998	<i>DXE 3057T</i>	Tank Barge	Houston Ship Channel
MC98008331	1998	<i>Hampton Roads</i>	Towboat/Tugboat	Chesapeake Bay

Position	Accident Type	Resulting Injury	Activity
Deck Crew	Fall into water	Drowning	
Deck Crew	Line handling	Crushed	Placing mooring line on barge <i>Cave/</i>
Deck Crew	Fall into water	Drowning	Walking on barge deck
Engine Crew	Workplace, other	Fracture	Securing fallen fender
Deck Crew	Fall into water	Missing	Presumed rigging nav. lights; last seen on deck at last light
Employee	Casualty:capsizing	Drowning	Working inside machinery space on barge
Deck Crew	Casualty:capsizing	Drowning	Working inside machinery space on barge
Deck Crew	Casualty:capsizing	Drowning	Preparing/eating lunch
Employee	Fall into water	Drowning	Standing
NEC	Casualty:firewks exp.	Drowning	Launching fireworks
NEC	Casualty:firewks exp.	Multiple	Launching fireworks
NEC	Casualty:firewks exp.	Drowning	Launching fireworks
Deck Crew	Fall into water	Drowning	
Deck Crew	Fall into water	Drowning	Making preparations to drop tow off at loading dock
Deck Crew	Casualty:capsizing	Drowning	Abandoned vessel
Deck Crew	Fall into water	Drowning	Building a tow of barges
Master	Fall into water	Drowning	Assisting in mooring small work boat
Deck Crew	Fall into water	Crushed	Making up tow of two barges
Employee	Fall into water	Drowning	Taking barge soundings
Deck Crew	Workplace, other	Crushed	Unfacing tow boat from barge
Deck Crew	Fall into water	Drowning	
Deck Crew	Line handling	Multiple	Casting off lines on dredge barge <i>Super Scoop</i>
Platform Work	Workplace, other	Crushed	Securing mooring line at cleat
Deck Crew	Fall into water	Drowning	SNM fell into Ohio River from a barge
Eng. Officer	Fall into water	Drowning	Presumed walking about aft deck area of vessel
Deck Crew	Fall into water	Drowning	Boarding vessel from work flat
Deck Officer	Fall into water	Drowning	Walking on deck of grain/freight barge
Deck Crew	Fall into water	Drowning	Preparing to moor barges in fleeting area.
Tankerman	Fall into water	Drowning	Loading product
Deck Crew	Confined space entry	Asphyxiation	Attempting to rescue fallen crewmember

Summary of Towing Vessel Crew Fatalities 1995-2000, cont. ...

Case	Year	Vessel	Service	Waterbody
MC98008567	1998	<i>White Wing</i>	Towboat/Tugboat	Lower Mississippi River
MC98010005	1998	<i>Lily M. Friedman</i>	Towboat/Tugboat	Lower Mississippi River
MC98010569	1998	<i>Mac</i>	Freight Barge	North Pacific Ocean–Coastal
MC98012144	1998	<i>VL 81441</i>	Freight Barge	Lower Mississippi River
MC98013257	1998	<i>Jim Pierce</i>	Towboat/Tugboat	Gulf of Mexico River NOS
MC98014351	1998	<i>T 3091</i>	Freight Barge	Lower Mississippi River
MC98015717	1998	<i>Donald C. Hannah</i>	Towboat/Tugboat	Lake Michigan
MC98016333	1998	<i>Rusty Flowers</i>	Towboat/Tugboat	Chicago Ship Canal
MC98017067	1998	<i>Albert Cenac</i>	Towboat/Tugboat	Atlantic Harbor NOS
MC98017094	1998	<i>New York</i>	Towboat/Tugboat	St. Croix River
MC99000452	1998	<i>American Heritage</i>	Towboat/Tugboat	Lower Mississippi River
MC00000354	1999	<i>Juneau</i>	Freight Barge	Puget Sound
MC00001817	1999	<i>B No. 95</i>	Tank Barge	Delaware Bay
MC99000237	1999	<i>Lady Cindy</i>	Towboat/Tugboat	Gulf of Mexico–Coastal
MC99002501	1999	<i>Jane A. Mulzer</i>	Towboat/Tugboat	Ohio River
MC99004727	1999	<i>Girlie Knight</i>	Towboat/Tugboat	Ohio River
MC99005835	1999	<i>Kentucky</i>	Towboat/Tugboat	Intercoastal Waterway–Gulf
MC99006125	1999	<i>Bouchard Girls</i>	Towboat/Tugboat	Tampa Bay
MC99007055	1999	<i>Woody Dumas</i>	Towboat/Tugboat	Lower Mississippi River
MC99007276	1999	<i>Ralph E. Bouchard</i>	Towboat/Tugboat	Pacific Coastal Waters NOS
MC99007339	1999	<i>Katie-Chase</i>	Towboat/Tugboat	Intercoastal Waterway–Gulf
MC99008134	1999	<i>Brown 820</i>	Tank Barge	Intercoastal Waterway–Gulf
MC99008136	1999	<i>Sue Chappell</i>	Towboat/Tugboat	Tombigbee River
MC99009215	1999	<i>Woody Dumas</i>	Towboat/Tugboat	Lower Mississippi River
MC99010985	1999	<i>Jonathan B.</i>	Towboat/Tugboat	Upper Mississippi River
MC99013264	1999	<i>Bree Tessa</i>	Towboat/Tugboat	North Pacific Ocean
MC99014147	1999	<i>Cavalier State</i>	Towboat/Tugboat	St. Marys River (Fla.)
MC99014161	1999	<i>Steven Joseph</i>	Towboat/Tugboat	Lower Mississippi River
MC99015711	1999	<i>M/V Elizabeth Marie</i>	Towboat/Tugboat	Ohio River
MC99015968	1999	<i>David K. Wilson</i>	Towboat/Tugboat	Cumberland River

Position	Accident Type	Resulting Injury	Activity
Deck Crew	Fall into water	Drowning	Crew change
Deck Crew	Fall into water	Drowning	Handling barge make up cables; misjudged relative position, fell
Master	Fall into water	Drowning	Nook was on deck walking along rail on port side
Deck Crew	Fall into water	Crushed	Walking on deck of barge
Deck Crew	Fall into water	Drowning	Housekeeping chores aboard towboat
Employee	Fall into tank/hold	Multiple	Assist in handling barge covers
Deck Crew	Fall into water	Drowning	Boarding vessel
Deck Crew	Fall into tank/hold	Multiple	Walking on top of hatch covers on barge
Deck Crew	Caught in lines	Crushed	
Deck Crew	Line handling	Fracture	Line handling during mooring evolution
Master	Fall into water	Unknown	
Deck Officer	Fall into water	Crushed	Mate from control tug, in charge of docking barge
Master	Casualty:explosion, fire	BURN	Resting in cabin of <i>Barge B95</i>
Master	Casualty:capsizing	Drowning	Operator of vessel when it capsized
Deck Crew	Fall into water	Unknown	Conducting housekeeping duties onboard M/V <i>Jane A. Mulzer</i>
Deck Crew	Fall into water	Drowning	See MCNS
Deck Crew	Casualty:capsizing	Drowning	SNM was sleeping when vessel was struck, capsized. Mr. Vega
Deck Crew	Line handling	Crushed	Line handling
Deck Crew	Fall into water	Drowning	Moving between underway towboat and moored barges
Deck Officer	Line handling	Multiple	Observing port tow wire being reeled on to towing winch drum
Deck Crew	Fall into water	Drowning	Either on dingy or getting off dock
Deck Crew	Fall into water	Drowning	SNM was walking along the edge of the barge to fill bucket with water
Deck Crew	Fall into water	Drowning	Cleaning exterior of tug
Deck Crew	Fall into water	Drowning	Securing barges in fleeting area
Deck Crew	Fall into water	Drowning	Working on securing fleet barges
Deck Crew	Workplace, other	Crushed	Working as a deck hand on a crane barge
Master	Casualty:capsizing	Drowning	Acting as Master of UTV <i>Cavalier State</i> , which tripped and sank
Deck Crew	Fall into water	Drowning	Assembling tow
Deck Officer	Fall into water	Drowning	Off watch; unknown
Deck Crew	Fall into water	Drowning	Fell overboard while inspecting barge, counting rigging while underway

## Summary of Towing Vessel Crew Fatalities 1995-2000, cont. ...

Case	Year	Vessel	Service	Waterbody
MC00000324	2000	<i>Delmar Jaeger</i>	Towboat/Tugboat	Upper Mississippi River
MC00004476	2000	<i>C.I.S. 4</i>	Towboat/Tugboat	Ohio River
MC00006418	2000	<i>Bill Rodgers</i>	Towboat/Tugboat	Lower Mississippi River
MC00008231	2000	<i>RH Huffman</i>	Towboat/Tugboat	Lower Mississippi River
MC00009980	2000	<i>Timmy</i>	Towboat/Tugboat	Ohio River
MC00013640	2000	<i>City of Vicksburg</i>	Towboat/Tugboat	Lower Mississippi River
MC00016373	2000	<i>Kent Island</i>	Towboat/Tugboat	Chesapeake Bay
MC01003495	2000	<i>George W. Lenzie</i>	Towboat/Tugboat	Chicago Ship Canal
MC01004666	2000	<i>Delos Case</i>	Towboat/Tugboat	Lower Mississippi River



USCG photo  
by Ken Olsen

Position	Accident Type	Resulting Injury	Activity
Deck Crew	Fall into water	Drowning	Fleeting barges (Securing barges to make up tow)
Employee	Workplace, other	Burn	Welding-clothes caught fire, died from 2nd & 3rd degree burns
Deck Crew	Fall into water	Drowning	Reconfiguring tow
Deck Crew	Fall into water	Drowning	Uncoupling barge
Deck Crew	Fall into water	Drowning	Line handling of barges
Deck Crew	Fall into water	Unknown	Not known
Employee	Fall into water	Drowning	Stepping onshore
Deck Crew	Fall into water	Drowning	Connecting barges together, working with wire rope/turnbuckle
Deck Crew	Fall into water	Crushed	Configuring barge in fleet

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**Upcoming issues —**

July–September: Homeland Security

October–December: Uninspected Passenger Vessels



# MARINER'S SEABAG



Coast Guard photos  
courtesy of USCG  
Activities New York.

*Top: An inspector assesses the vessel's damage; Bottom: Showing that the starboard rudder is missing.*

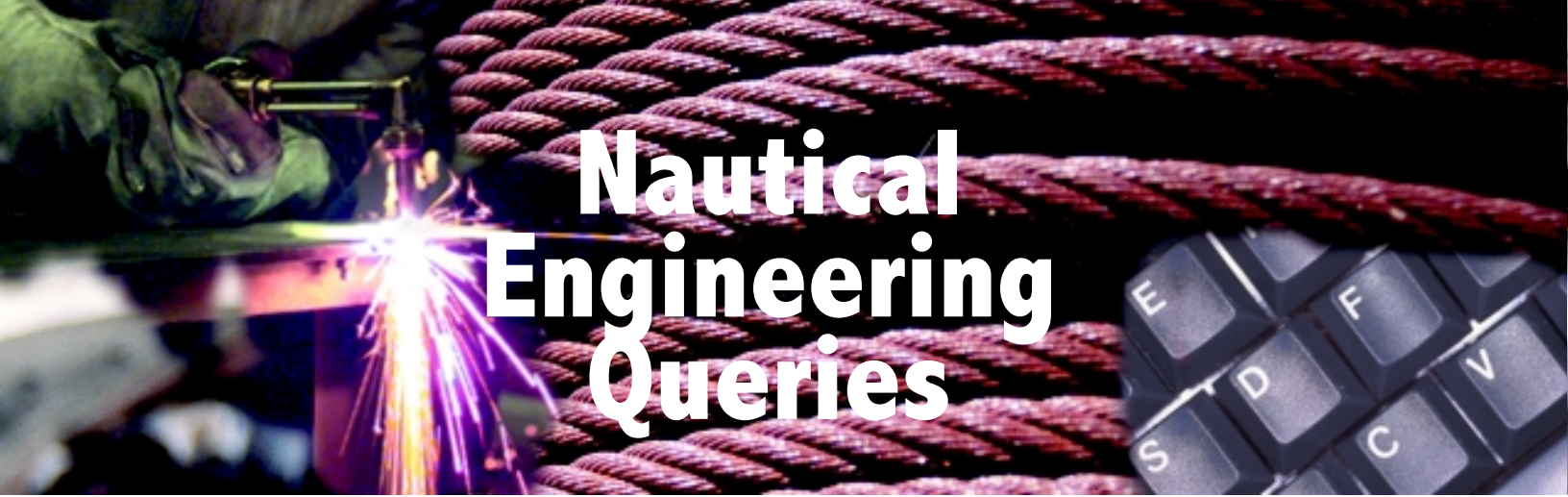


The *McAllister Sisters*, owned by McAllister Towing & Transportation Co., struck a submerged object May 29, 2002 in New York while en route to Alaska.

The vessel suffered approximately \$500,000 damages to its starboard kort nozzle, starboard flanking rudders, propeller, and its starboard main rudder was missing. The vessel's hull also was breached in two areas.




**Top: Damage to the lower starboard side; Bottom: The outboard kort nozzle.**



# Nautical Engineering Queries

- Lube oil filters remove contaminants more efficiently if the oil being filtered is \_\_\_\_\_.
  - under high pressure
  - under low pressure
  - heated to reduce viscosity
  - cooled to increase viscosity
- Before an auxiliary boiler is shut down for an extended period of time, the water in the boiler should have a pH value of \_\_\_\_\_.
  - 1
  - 4
  - 7
  - 10
- Comparing the exhaust gas output of each cylinder of a diesel engine is one method of determining if the engine load is balanced, and can be determined by the use of a \_\_\_\_\_.
  - tachometer
  - calorimeter
  - pedometer
  - pyrometer
- When the hydraulic control lever for a deck winch is placed in neutral or off position, the spring set brake on the fluid motor drive shaft is \_\_\_\_\_.
  - engaged by spring action and only released by hydraulic pressure
  - released by spring action and hydraulically locks the winch when the drum ceases rotating
  - engaged by spring action and is insured to be locked in place by hydraulic pressure
  - opened hydraulically and held open by spring action whenever the electrical supply is secured
- In multi-box refrigeration systems, the sensing bulb of the thermostatic expansion valve used on refrigerated boxes with elevated temperatures should be located \_\_\_\_\_.
  - in the diffuser fan inlet air stream
  - in the diffuser fan outlet air stream
  - before the back pressure regulating valve
  - after the back pressure regulating valve
- Which of the listed components is used to protect the boiler superheater against the radiant heat of the furnace?
  - Superheater support tubes
  - Control desuperheater
  - Screen tubes
  - Generating tubes
- When the operating handle of a molded-case circuit breaker is in the mid-position, this indicates that the circuit breaker is \_\_\_\_\_.
  - on
  - off
  - reset
  - tripped
- Using a diesel engine indicator P-V diagram, the cylinder mean effective pressure is calculated to be 21.3 kg/cm<sup>2</sup>. What is the scale of the spring used on the indicator if the diagram area is 18.46 cm<sup>2</sup> with a length of 13 cm?
  - 9.0 kg/cm
  - 10.0 kg/cm
  - 12.5 kg/cm
  - 15.0 kg/cm
- In comparing engines of equal horsepower, higher exhaust gas temperatures occur in a/an \_\_\_\_\_.
  - opposed-piston engine
  - double-acting engine
  - two-stroke/cycle engine
  - four-stroke/cycle engine
- If you have a duplex single acting reciprocating pump making 120 strokes/minute, with a 5" diameter cylinder, a 9" stroke and operating with 92 percent volumetric efficiency, what is the capacity of the pump?
  - 35 gpm
  - 42 gpm
  - 84 gpm
  - 169 gpm

Answers: 1.C, 2.D, 3.D, 4.A, 5.C, 6.C, 7.D, 8.D, 9.D, 10.C



# Nautical Deck Queries

1. Your tow includes a loaded chlorine barge. After inspecting the tow, the mate reports hearing a hissing sound coming from the safety valves. Where will you find information on emergency procedures regarding the uncontrolled release of cargo?
  - A. Barge's Certificate of Inspection
  - B. Cargo Information Card on your towboat
  - C. Cargo Manifest or Loading Paper
  - D. Dangerous Cargo Regulations
2. A face line is used to \_\_\_\_\_.
  - A. prevent barge movement in a lock
  - B. secure two barges end-to-end
  - C. secure barges to the towboat
  - D. secure barges side-by-side
3. The "Vessel Bridge-to-Bridge Radiotelephone Act" applies to which towboat?
  - A. A 100-gross-ton towboat, 24 feet in length
  - B. A 90-foot towboat tied to the pier
  - C. A 60-foot towboat towing by pushing ahead
  - D. A 400-gross-ton towboat anchored
4. INTERNATIONAL ONLY: Which vessel is NOT regarded as being "restricted in her ability to maneuver"?
  - A. A vessel servicing an aid to navigation
  - B. A vessel engaged in dredging
  - C. A towing vessel with tow unable to deviate from its course
  - D. A vessel constrained by her draft
5. BOTH INTERNATIONAL & INLAND: The towing light is a(n) \_\_\_\_\_.
  - A. flashing amber light
  - B. yellow light with the same characteristics as the sternlight
  - C. all-round yellow light
  - D. yellow light with the same characteristics as the masthead light
6. A tow can override its tug as a result of \_\_\_\_\_.
  - A. a mechanical breakdown on the tug
  - B. adverse tidal current conditions
  - C. the tug reducing its speed
  - D. all of the above
7. The owner or Master of a towing vessel shall ensure that each person who directs and controls the movement of the vessel can accurately fix the vessel's position using all of the following EXCEPT \_\_\_\_\_.
  - A. installed navigational equipment
  - B. buoys alone
  - C. all available aids to navigation
  - D. depth soundings and hydrographic contour lines
8. A tow of nine barges is made up three abreast and three long. The towboat is faced up to the center string, which is known as the \_\_\_\_\_.
  - A. main string
  - B. push string
  - C. power string
  - D. face string
9. The effect of ocean current is usually more evident on a tug and tow than on a tug navigating independently because the \_\_\_\_\_.
  - A. speed of the tug and tow is less
  - B. towline catches the current
  - C. current causes yawing
  - D. current will offset the tow
10. When pushing ahead, wires leading from the quarters of the after outboard barges to the bow of a towboat \_\_\_\_\_.
  - A. prevent the towboat from sliding when the rudder is moved
  - B. prevent the barges from spreading out when backing down
  - C. hold the towboat securely to the barges
  - D. prevent the sidewise movement of the face barges

# A 41-FOOT THANKS ...



to Coast Guard Activities Baltimore  
for the awesome photo shoot  
while on a Harbor Patrol

From RIGHT to LEFT:  
MK3 Paul Hood, BM1 Eric Dieckmann, SN Jason Schroyer, FN Keith Rosario

*“Champions of the Chesapeake”*