



American
Waterways
Operators



U.S. Coast Guard - American Waterways Operators Annual Safety Report

August 5, 2024

Established Safety Metrics

For over 30 years, the National Quality Steering Committee has used three measures to track overall trends in safety and environmental protection. While not all-encompassing, the measures are considered useful indicators of towing industry trends. The measures are:

- Crewmember fatalities per 100,000 towing industry workers.
- Gallons of oil spilled from tank barges per million gallons transported.
- The number and severity of towing vessel casualties.

This report also contains other freight carrying towing industry data and measures for the years 1994 to 2023.

Crewmember Fatalities

There were five deaths reported to the Coast Guard in 2023 involving freight carrying towing vessels or barges. A review of these casualties revealed that four of the five reported deaths were directly related to towing vessel operations and involved crewmembers. The following is a summary of the operational crewmember fatalities:

- During fleeting operations, a crewmember fell overboard while serving as a lookout on the head of the tow. The captain noticed the missing crewmember when the crewmember stopped calling out distances over the VHF radio. No one witnessed the fall overboard. Upon shifting of the barges, the crewmember was located in the water and was unresponsive. The crewmember was wearing a man overboard transmitter, but it did not appear to transmit underwater.
- While departing a lock, a crewmember fell overboard and it is suspected that he was struck by a bumper that had come free as the barge passed through the lock. No one witnessed the fall overboard. Another crewmember on the opposite side of the barge reported the missing crewmember. The crewmember was located in the water face down.
- While in transit, the operator of a towing vessel suffered a cardiac event which rendered him unconscious and caused the vessel to strike a submerged object and capsize. The cardiac event was the result of a pre-existing medical conditions.
- While in transit, a pickup truck and trailer on a deck barge rolled off the stern with the driver inside the truck. The driver of the truck drowned. There were no wheel chocks or rails to prevent the truck from rolling off the barge.

The following is a summary of the one crewmember fatality reported to the Coast Guard in 2023 that was not directly related to towing vessel or barge operations:

- While in transit, a crewmember was found unresponsive in his berthing area. He had previously reported his sickness and was relieved early on his prior watch. Autopsy noted the death was due to natural causes with a history of substance abuse.

In addition, there were five fatalities associated with four collisions involving towing vessels and recreational boats. There was also one incident involving a shipyard worker that fell into and drowned in a large pump impeller.

The following charts and tables in this section relate to the operational crewmember fatalities only.

Chart 1 displays the crewmember fatalities per year and the 5-year moving average from 1994 to 2023.

Chart 1 – Crewmember Fatalities, 1994 to 2023

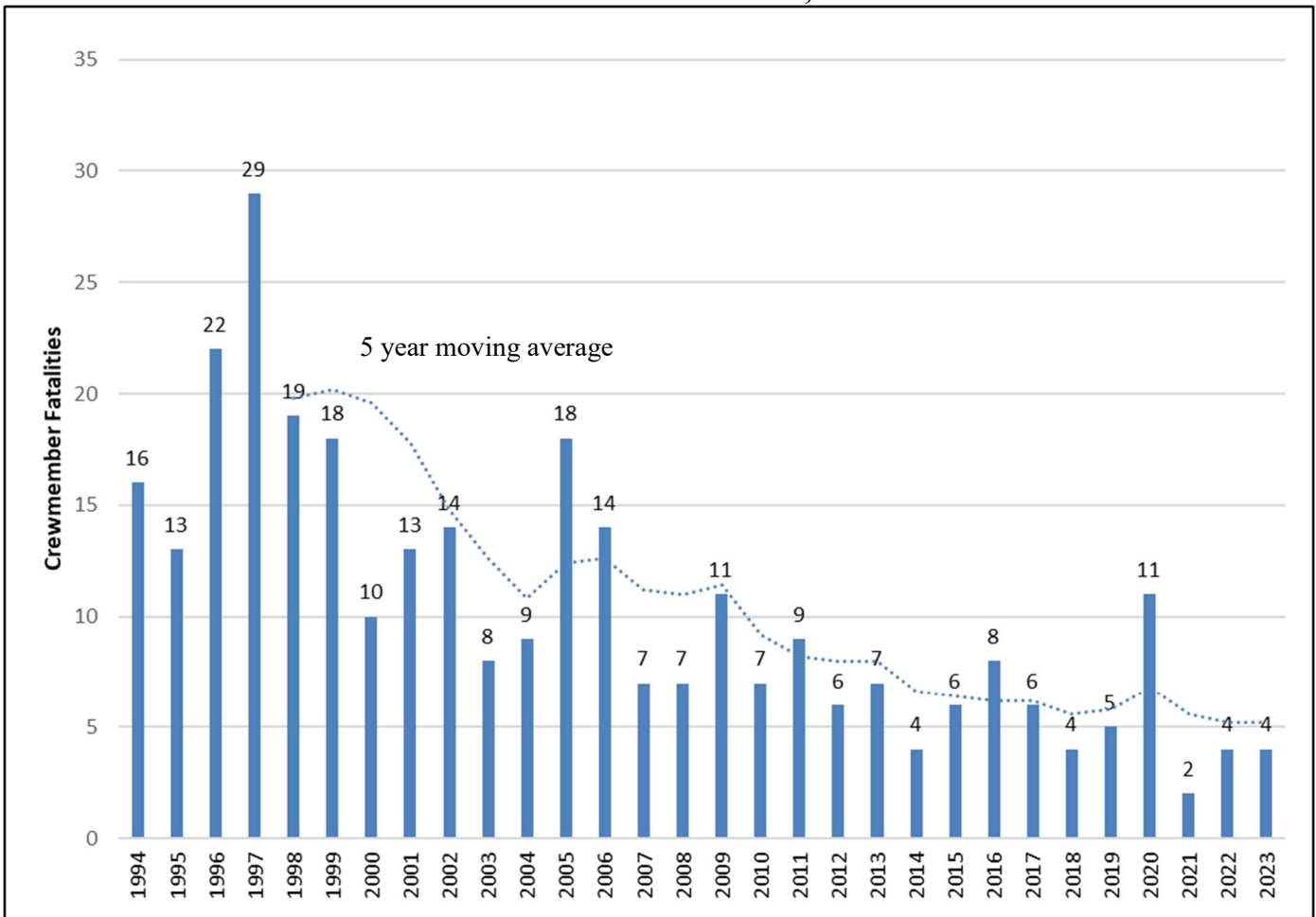


Chart 2 displays the cumulative total of crewmember fatalities by accident type from 2000 to 2023. During this period, the largest number of fatalities were attributed to “Contact Injury – Fall into Water”.

Chart 2 – Crewmember Fatalities by Accident Type, 2000 to 2023

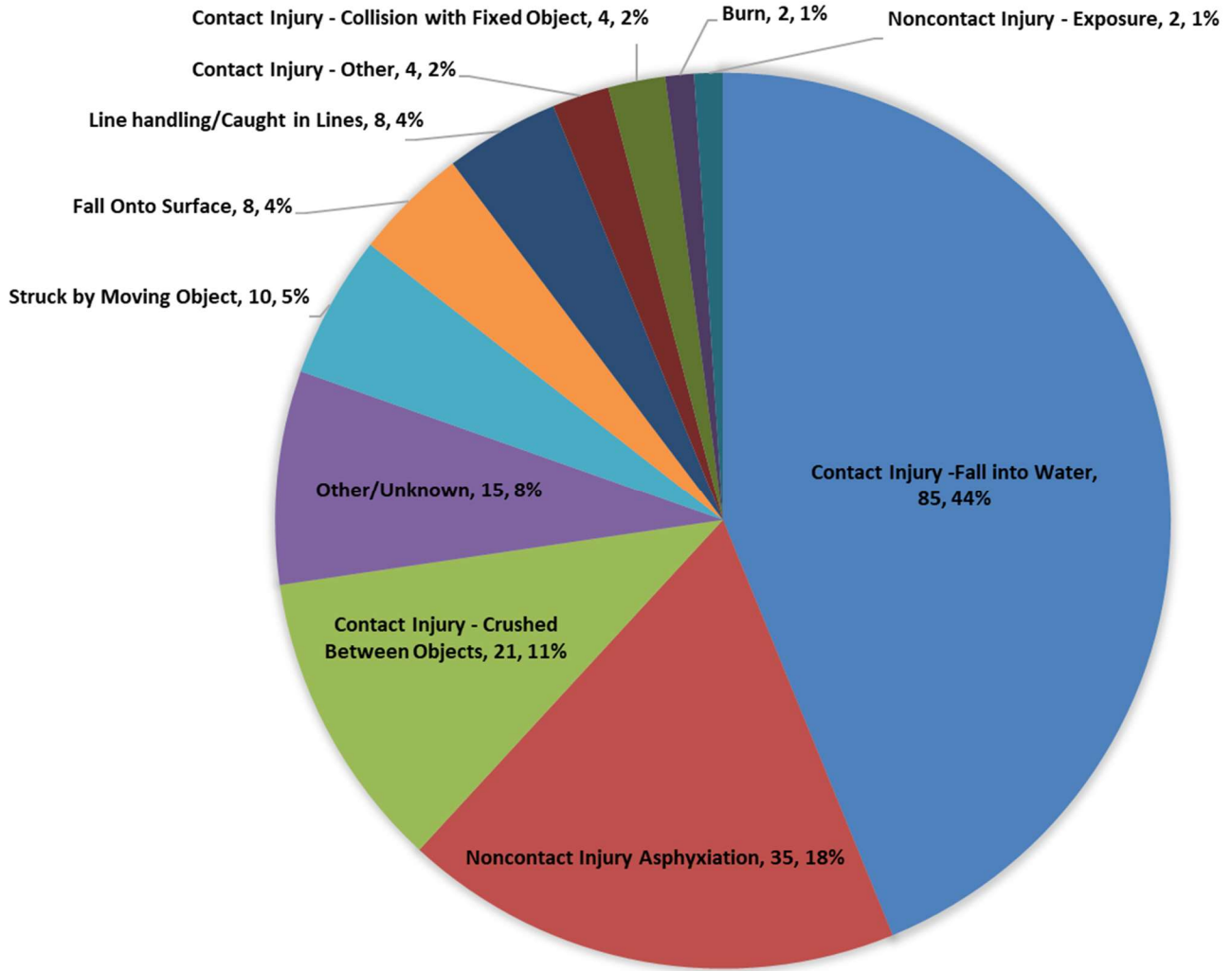


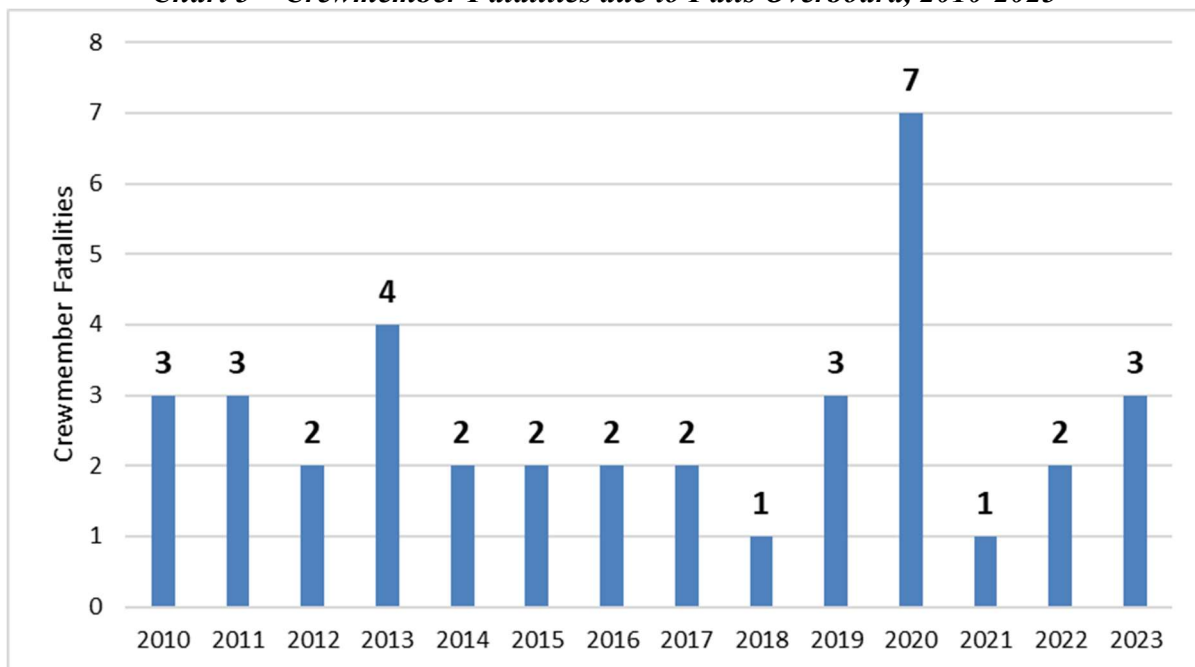
Table 1 provides a comparison of crewmember fatalities by accident type from 2019 to 2023 versus the cumulative total of crewmember fatalities by accident type from 2000 to 2023. This table allows for comparison of more recent fatality data against the cumulative fatality data.

Table 1 – Crewmember Fatalities by Accident Type, 2019-2023 versus Cumulative Totals, 2000-2023

Accident Type	2019	2020	2021	2022	2023	Last 5 Years		Since 2000	
						2019-2023	% 2019-2023	2000-2023	% 2000-2023
Contact Injury- Fall into water	1	3	0	0	2	6	23.1%	83	43.8%
Noncontact Injury - Asphyxiation	1	4	0	0	1	6	23.1%	34	18.0%
Contact Injury- Crushed between objects	2	0	1	2	0	5	19.2%	18	10.8%
Other/Unknown	1	3	1	0	1	6	23.1%	13	7.7%
Struck by Moving Object	0	1	0	0	0	1	3.8%	10	5.2%
Fall Onto Surface	0	0	0	0	0	0	0.0%	8	4.1%
Line handling/Caught in Lines	0	0	0	0	0	0	0.0%	8	4.1%
Contact Injury- Other	0	0	0	0	0	0	0.0%	4	2.1%
Contact Injury- Collision with Fixed Object	0	0	0	1	0	1	3.8%	3	2.1%
Burn	0	0	0	0	0	0	0.0%	2	1.0%
Noncontact Injury - Exposure	0	0	0	1	0	1	3.8%	1	1.0%
TOTAL	5	11	2	4	4	26	100.0%	184	100.0%

Chart 3 displays the crewmember fatalities resulting from falls overboard from 2010 to 2023. The data in Chart 3 is based on a manual review of the casualty investigations and accounts for all fatalities where the crewmember entered the water, regardless of the “accident type” selected by the marine investigator which is summarized in Chart 2 and Table 1.

Chart 3 – Crewmember Fatalities due to Falls Overboard, 2010-2023

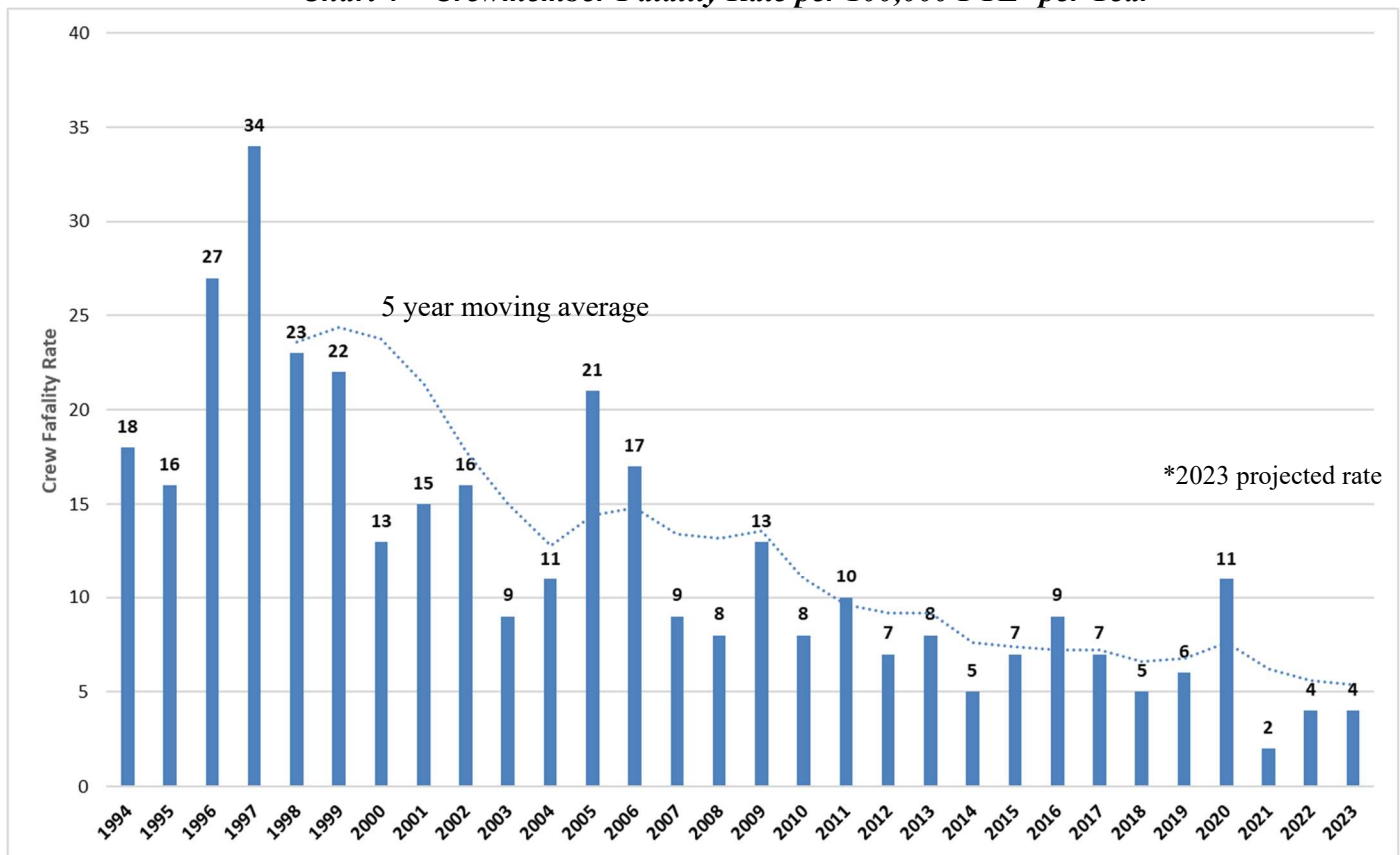


Crewmember Fatality Rate

The crewmember fatality rate for 2022 was 3.3 fatalities per 100,000 Full Time Employees (FTE). The projected crewmember fatality rate for 2023 is 3.3, which is based on the 2022 data from the U.S. Army Corps of Engineers (ACE)¹. Chart 4 displays the crewmember fatality rate from 1994 to 2023 with rates rounded up to the nearest whole number.

The crewmember fatality rate is calculated using the “Mercer Model” which was developed through AWO-funded research. This model uses ACE data to calculate the number of FTE in the towing vessel industry. The crewmember fatality rate enables comparison against other fatality rates from the Bureau of Labor Statistics, which are also expressed by the number of fatalities per 100,000 FTE.

Chart 4 – Crewmember Fatality Rate per 100,000 FTE² per Year



¹ The crewmember fatality rate is based on data from the *Waterborne Transportation Lines of the United States* report published by the U.S. Army Corps of Engineers.

² One FTE or Full Time Employee is the equivalent of one person working a 40-hour work week for 50 weeks of the year.

For comparison, Table 2 provides the worker fatality rates as calculated by the Bureau of Labor Statistics (BLS) for all workers and the transportation sector from 2018 to 2022³ along with the Towing Industry Crewmember Fatality Rate.

Table 2 – Comparison of Worker Fatality Rates

Data Source	2018	2019	2020	2021	2022
Bureau of Labor Statistics (BLS), All Fatal Work Injuries	3.5	3.5	3.4	3.6	3.7
BLS, Transportation Sector Fatal Work Injuries	14.0	13.9	13.4	14.5	14.1
Towing Industry Crewmember Fatality Rate	4.1	5.2	10.6	1.9	3.3

Table 3 provides the BLS worker fatality counts and rates for all industry sectors for 2022.

Table 3 – Number and Rate of Fatal Work Injuries for 2022 by Industry Sector

Industry	Number of fatal work injuries	Fatal work injury rate (per 100,000 FTE workers)
Construction	1,069	9.6
Transportation and warehousing	1,053	14.1
Professional and business services	598	3.1
Agriculture, forestry, fishing, and hunting	417	18.6
Manufacturing	404	2.6
Leisure and hospitality	306	2.8
Retail trade	301	2.1
Other services (exc. Public admin.)	200	2.9
Educational and health services	178	0.8
Wholesale trade	171	5.4

The following are key findings from the 2022 BLS Census of Fatal Occupational Injuries:

- There were 5,486 fatal work injuries recorded in the United States in 2022, a 5.7-percent increase from 5,190 in 2021. The fatal work injury rate was 3.7 fatalities per 100,000 FTE workers, up from 3.6 per 100,000 FTE in 2021.
- A worker died every 96 minutes from a work-related injury in 2022 compared to 101 minutes in 2021.
- Unintentional overdoses increased 13.1 percent to a series high of 525 fatalities in 2022, up from 464 in 2021, continuing a trend of annual increases since 2012.
- Workers in transportation and material moving occupations experienced 1,620 fatal work injuries in 2022 and represented the occupational group with the most fatalities. The next highest was construction and extraction workers with 1,056 fatalities.
- Transportation incidents remained the most frequent type of fatal event accounting for 37.7 percent of all occupational fatalities. There were 2,066 fatal injuries from transportation incidents in 2022, a 4.2-percent increase from 1,982 in 2021.

³ Census of Fatal Occupational Injuries – Current, <https://www.bls.gov/news.release/cfoi.nr0.htm>

Oil Spill Volumes

Approximately 5,799 gallons of oil was spilled into U.S. navigable waterways as a result of 36 operational tank barge pollution incidents in 2023. Chart 5 displays the total gallon quantity of oil spilled from tank barges from 1994 to 2023.

Chart 5 – Gallons (in thousands) of Oil Spilled from Tank Barges per Year

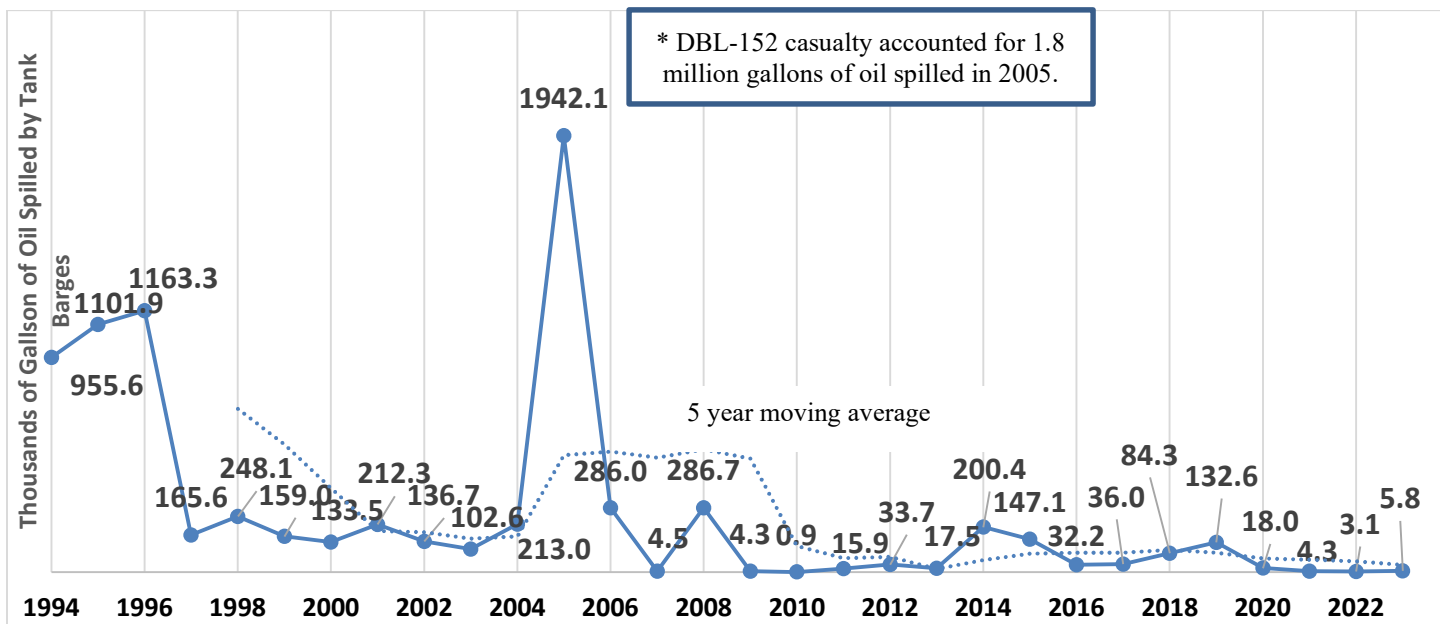


Table 4a provides the number of tank barge oil spills and the total volume oil discharged into the water by oil spill discharge category. The four largest oil spills accounted for 94.8% of the total volume of oil spilled from tank barges in 2023.

Table 4a – Tank Barge Oil Spills by Spill Size Category for 2023

Discharge Category (in gallons)	Count of Discharge Category	Sum of Discharge Amounts into Water (gallons)
less than 1	6	2
1 to 10	20	70
10 to 100	6	227
100 to 1000	3	800
more than 1000	1	4700
Total	36	5799

The following is summary of the causes for the four largest oil spills involving tank barges:

- The largest oil discharge was the result of a tank over-pressurization which was attributed to an overheated boiler.
- One oil discharge was attributed to improper valve alignment during filling operations.
- One oil discharge was attributed to person-in-charge (PIC) inattention during transfer operations resulting in overfilling of the tank. It was also noted that the PIC failed to notice the high level alarm.
- One oil discharge was the result of a tank barge sinking.

Table 4b provides the number of towing vessel oil spills and total volume oil discharged into the water by oil spill discharge category. The eight largest oil spills account for 88.1% of the total volume spilled from towing vessels in 2023.

Table 4b – Towing Vessel Oil Spills by Spill Size Category for 2023

Discharge Category (in gallons)	Count of Discharge Category	Sum of Discharge Amount into Water (gallons)
less than 1	13	4
1 to 10	78	276
10 to 100	19	580
100 to 1000	7	1343
more than 1000	1	5000
Total	118	7203

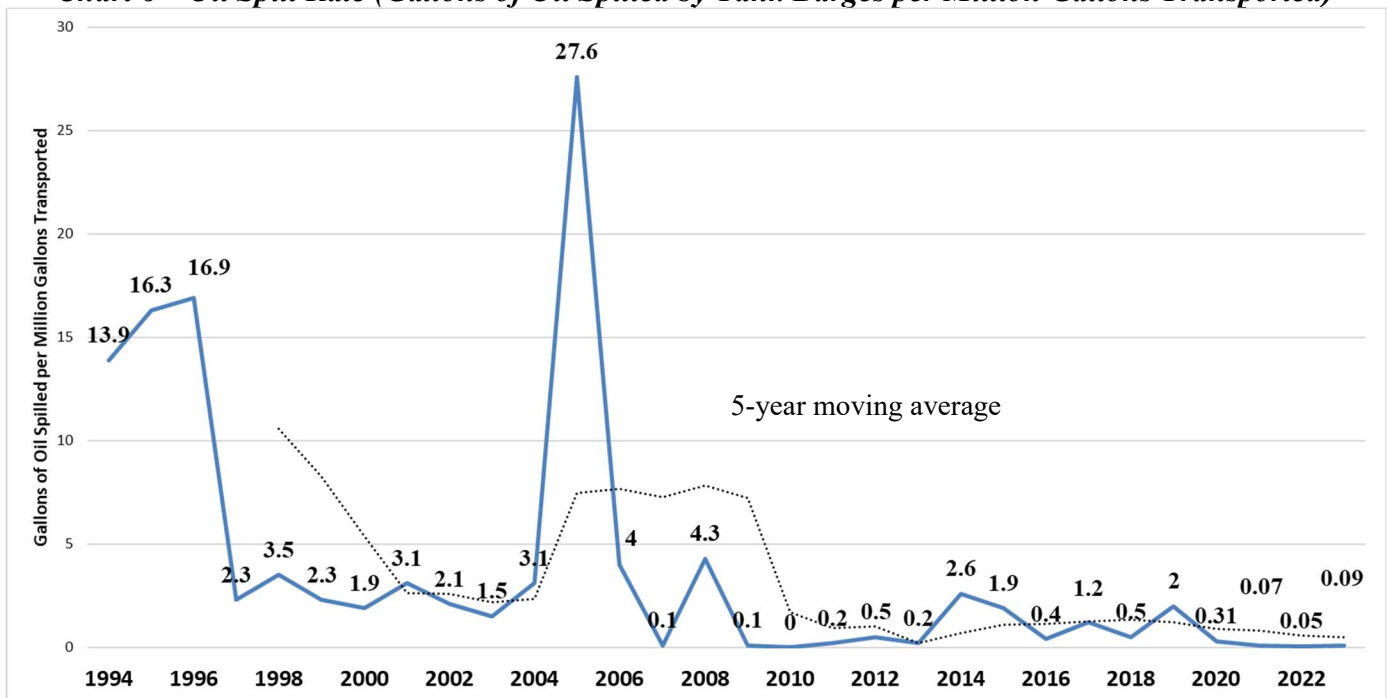
The following is a summary of the causes for the eight largest oil spills involving towing vessels:

- Two oil discharges (including the largest oil discharge) were the result of towing vessel sinkings.
- One oil discharge was the result of operator inattention during an internal oil transfer.
- Two oil discharges were the result of tank fractures.
- Three oil discharges occurred during refueling operations.

Oil Spill Rate

The tank barge oil spill rate is calculated using data from both the Coast Guard and the U.S. Army Corps of Engineers (ACE). Based on the latest data from the ACE, the oil spill rate for 2022 was 0.05 gallons of oil spilled for every million gallons of oil transported, and the projected oil spill rate for 2023 was 0.09. Chart 6 shows the oil spill rates for the years 1994 to 2023.

Chart 6 – Oil Spill Rate (Gallons of Oil Spilled by Tank Barges per Million Gallons Transported)



* The oil spill rate for 2023 is a projected rate.

For reference, the following table provides the tank barge commodity data from the ACE from 2014 to 2022.

Table 5 – Petroleum Transported by Tank Barges per Year

Calendar Year	Petroleum Transported by Tank Barge (in short-tons)	% change (year to year)
2014	278,851,000	+2.11%
2015	282,993,000	+1.49%
2016	272,757,000	-3.62%
2017	258,582,089	-5.20%
2018	244,432,497	-5.47%
2019	245,970,000	+0.06%
2020	214,134,000	-12.9%
2021	217,009,000	+1.3%
2022	231,181,000	+6.5%

Severity of Vessel Incidents

There were 1,304 incidents in 2023 involving towing vessels or barges that were investigated by the Coast Guard. All incidents for 2023 were scored using the scale developed by the AWO National Quality Steering Committee (below). Each incident is counted only once, regardless of the number of vessels involved or events recorded by the Coast Guard during the marine casualty investigation. Table 6 provides the number of towing vessel or barge incidents by AWO Severity Class from 2019 to 2023.

Table 6 – Incidents by AWO Severity Class

AWO Severity Class	2019	2020	2021	2022	2023	Total
Low	1,024	975	964	952	1030	4,945
Medium	130	130	109	142	145	656
High	124	157	163	151	126	721
Total	1,278	1,262	1,236	1,245	1,304	6,322

The “Initiating Event” is the first unwanted event in a casualty sequence. Identifying the Initiating Event facilitates analysis of the causal factors leading to the first event in the casualty sequence. The four Initiating Event Types most commonly associated with high severity incidents for 2023 were:

- In 62 of the 126 (48.1%) high severity incidents, the injury of a crewmember was determined to be the Initiating Event.
- In 20 (15.5%) of the high severity incidents, an allision was determined to be the Initiating Event.
- In 14 (10.9%) of the high severity incidents, a collision was determined to be the Initiating Event.
- In 6 (4.7%) of the high severity incidents, a material failure/malfunction was determined to be the Initiating Event.

AWO Severity Classes for Towing Vessel Casualties

Incident Severity	Description
Low	Damage: \$0 - \$50,000 or not reported No injuries or deaths Pollution: 0 - 10 gallons of oil spilled CG Casualty Class: None/Routine
Medium	Damage: \$50,001 - \$250,000 No injuries or deaths Pollution: 11 - 1,000 gallons of oil spilled CG Casualty Class: “Significant”
High	Damage: \$250,001 or more ANY injuries or deaths Pollution: 1,001 or more gallons spilled CG Casualty Class: “Serious” or “Major”

Severity of Crewmember Injuries

There were 76 incidents involving towing vessels or barges in 2023 that resulted in 77 injuries to crewmembers. Table 7 displays the number of the injuries by the USCG injury severity category from 2019 to 2023. For reference, the USCG Injury Severity Scale is provided on the following page.

Table 7 – Number of Injuries by Injury Severity Category, 2019 to 2023

Injury Severity	2019	2020	2021	2022	2023	Total	% Total
Critical	1	0	0	2	0	3	0.6%
Severe	5	5	2	3	1	16	3.0%
Serious	22	22	24	15	6	89	16.9%
Moderate	50	45	56	40	43	234	44.3%
Minor	42	38	39	41	26	186	35.2%
Total	120	110	121	101	76	528	100.0%

Table 8 provides a breakdown of the critical, severe, and serious injuries by accident type for 2023.

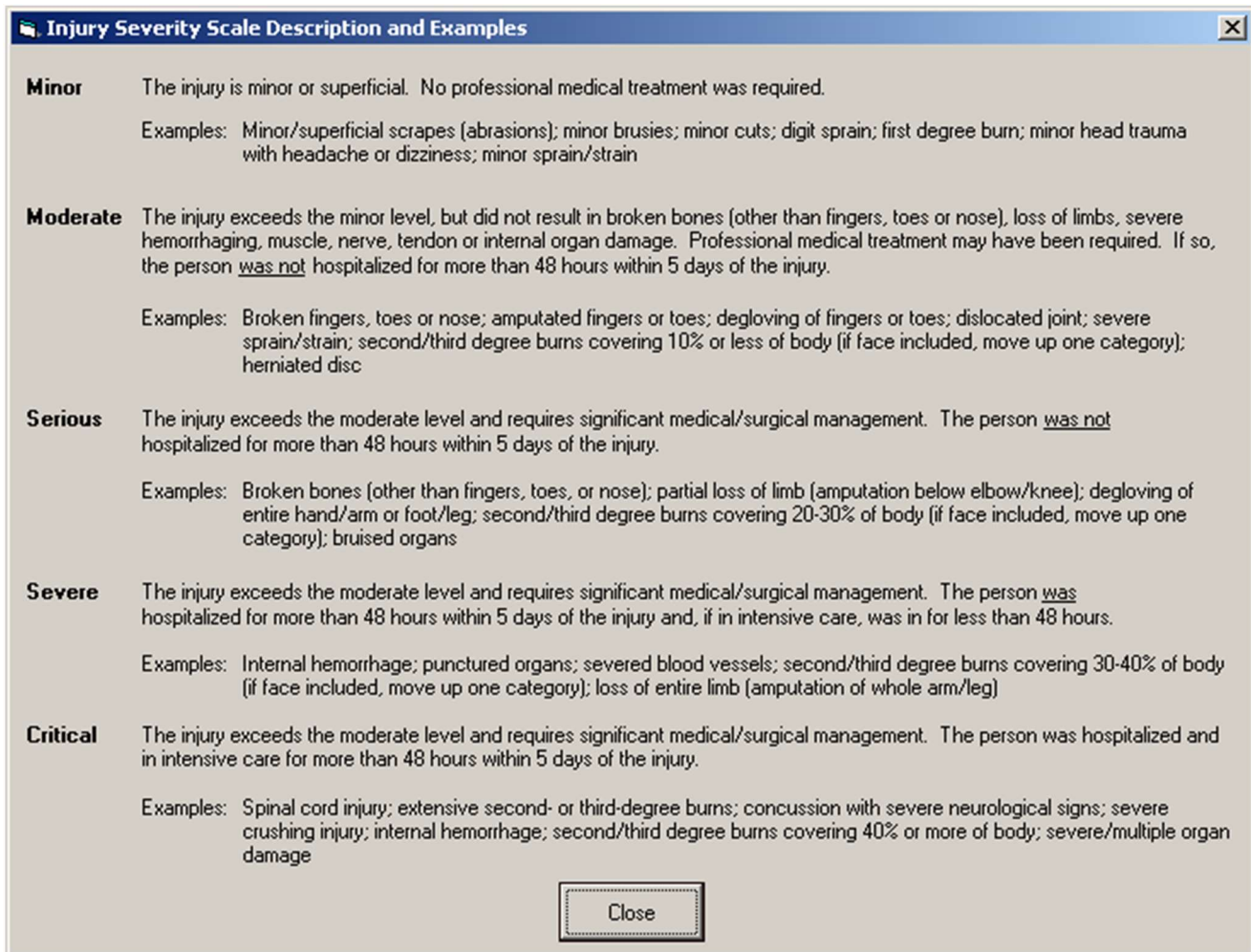
Table 8 – Critical, Severe, Serious Injuries by Accident Type for 2023

Accident Type	Critical	Severe	Serious	Total
Contact Injury- Crushed between objects	0	0	2	2
Contact Injury- Fall onto surface	0	0	1	1
Contact Injury- Line handling/caught in lines	0	1	0	1
Noncontact Injury- Burn	0	0	1	1
Other Injury Type	0	0	1	1
Overexertion Injury- Strain or sprain	0	0	1	1
Total	0	1	6	7

There were seven incidents that resulted in critical, severe or serious injuries to crewmembers. The following is a summary of these incidents:

- A crewmember suffered a fractured leg when his leg got caught in a messenger line and he was dragged into a chock.
- A crewmember slipped on an icy deck and injured his back, shoulder and head.
- A crewmember was burned on the face and arms when a paint can exploded in a burn barrel.
- A crewmember suffered a fractured leg when his leg got caught between the bow of the vessel and side of the barge.
- A crewmember was crushed between the barge and pier wall resulting in internal injuries.
- In two separate incidents, crewmembers were injured when they were lifting heavy equipment.

USCG Injury Severity Scale



Injury Severity Scale Description and Examples

Minor The injury is minor or superficial. No professional medical treatment was required.

Examples: Minor/superficial scrapes (abrasions); minor bruises; minor cuts; digit sprain; first degree burn; minor head trauma with headache or dizziness; minor sprain/strain

Moderate The injury exceeds the minor level, but did not result in broken bones (other than fingers, toes or nose), loss of limbs, severe hemorrhaging, muscle, nerve, tendon or internal organ damage. Professional medical treatment may have been required. If so, the person was not hospitalized for more than 48 hours within 5 days of the injury.

Examples: Broken fingers, toes or nose; amputated fingers or toes; degloving of fingers or toes; dislocated joint; severe sprain/strain; second/third degree burns covering 10% or less of body (if face included, move up one category); herniated disc

Serious The injury exceeds the moderate level and requires significant medical/surgical management. The person was not hospitalized for more than 48 hours within 5 days of the injury.

Examples: Broken bones (other than fingers, toes, or nose); partial loss of limb (amputation below elbow/knee); degloving of entire hand/arm or foot/leg; second/third degree burns covering 20-30% of body (if face included, move up one category); bruised organs

Severe The injury exceeds the moderate level and requires significant medical/surgical management. The person was hospitalized for more than 48 hours within 5 days of the injury and, if in intensive care, was in for less than 48 hours.

Examples: Internal hemorrhage; punctured organs; severed blood vessels; second/third degree burns covering 30-40% of body (if face included, move up one category); loss of entire limb (amputation of whole arm/leg)

Critical The injury exceeds the moderate level and requires significant medical/surgical management. The person was hospitalized and in intensive care for more than 48 hours within 5 days of the injury.

Examples: Spinal cord injury; extensive second- or third-degree burns; concussion with severe neurological signs; severe crushing injury; internal hemorrhage; second/third degree burns covering 40% or more of body; severe/multiple organ damage

Close

This verbiage is taken from the Marine Information for Safety and Law Enforcement (MISLE) Incident Investigation Activity User Guide, which provides data entry guidance for Coast Guard Investigating Officers.

Instructions for Reviewing Incident Investigation Reports on the USCG Maritime Information Exchange

The USCG Maritime Information Exchange (CGMIX) is a public portal that provides access to Incident Investigation Reports (IIR) that have been closed by the Coast Guard.

To access an IIR:

1. Go to: <https://cgmix.uscg.mil/IIR/IIRSearch.aspx>
2. Enter the Activity Number for the IIR.



USCG Maritime Information Exchange Incident Investigation Reports

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Involved Vessel:

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Start Date Range: From: To: End Date

Search

Reset

This page provides reports for closed investigations of reportable marine casualties investigated by the U.S. Coast Guard from October 2002 to present.

Cases closed after October 2002 may have a start date range several years prior

Last Update:
Monday, July 24, 2023

3. Click on the View Details hyperlink to see the redacted IIR.



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Search By: Activity Number - 7383285

NOTICE: These search results are based on the vessels and parties listed in the investigation report. Not all vessels and parties listed were directly involved in the incidents, such as vessels providing emergency assistance or witnessing the event. Please select the link next to the Investigation Title for additional details.

View Details	Title	Start Date	End Date
View Details	BAYOU DAWN - Loss of Life	19-Jan-2022	14-Jul-2022

1 Records Returned.

Last Update:
Monday, July 24, 2023