



American
Waterways
Operators



August 05, 2015

U.S. Coast Guard - American Waterways Operators Safety Report National Quality Steering Committee

Towing Industry Safety Statistics 1994 – 2014

Established Safety Metrics

For 15 years the National Quality Steering Committee has used three measures to track overall trends in safety and environmental protection. These measures are presented annually at the summer meeting. While not all-encompassing, the measures are considered to be useful indicators of towing industry trends. The safety measures are:

- Crew fatalities per 100,000 towing industry workers.
- Gallons of oil spilled from tank barges per million gallons transported.
- The number of vessel casualties (overall or by incident severity).

Since 2006, the Coast Guard has also tracked statistics on crew member injuries. This report includes summary statistics on crew member injuries for calendar years 2006 - 2014.

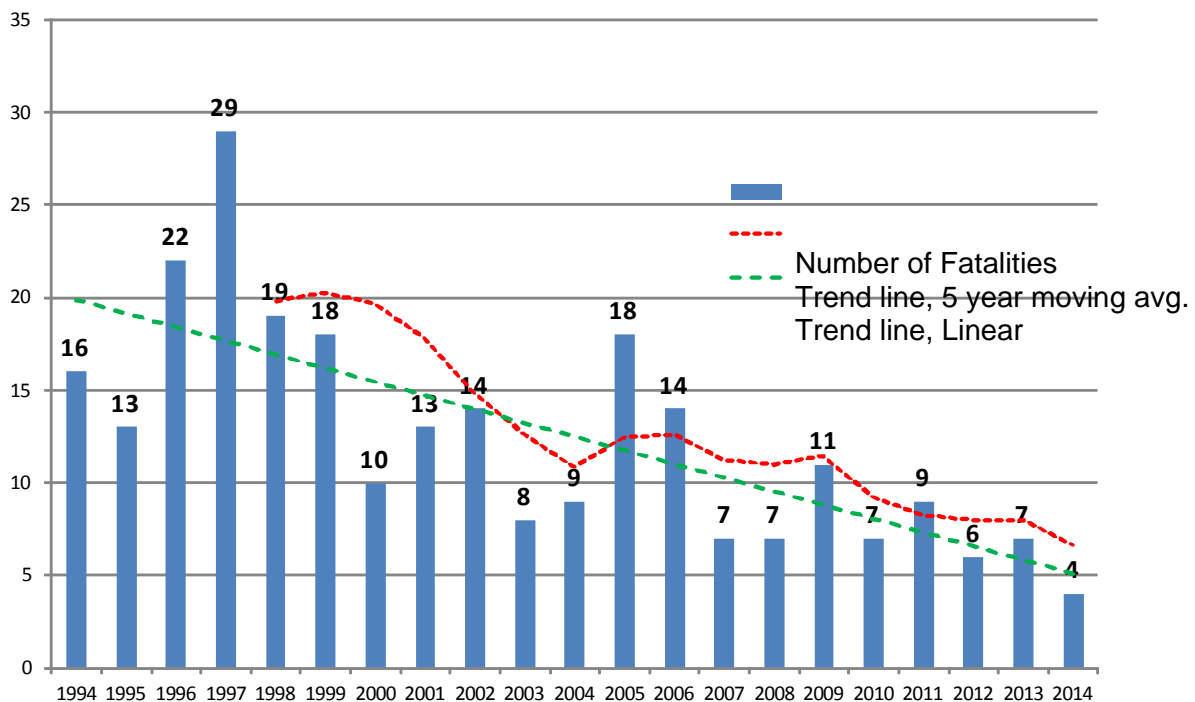
Crew Fatalities

In 2014, there were four crew fatalities¹, which is the lowest number on record. There were a total of eight deaths reported to the Coast Guard, and four were directly related to towing vessel operations. The other four deaths were attributed to existing medical conditions or natural causes.

Three crew fatalities were the result of crew members falling into the water. In one incident, a construction barge capsized resulting in three crew members going into the water and the subsequent drowning of one person. In two other incidents, a crew member went missing overboard – one while the vessel was underway and one while the vessel was anchored. In both incidents, the crewmen were found some time later and their deaths were attributed to an unintentional fall overboard. The fourth crew fatality was the result of a crane barge striking a bridge, which caused the crane to collapse on the pilothouse of the vessel.

Chart 1 shows the annual fatality count, the linear trend line, and the 5 year moving average for calendar years 1994 through 2014.

Chart 1: Crew Fatalities by Calendar Year (CY)



¹ The death of a crew member serving onboard a towing vessel or barge is considered a crew fatality. Missing crew members are also recorded as crew fatalities. Deaths due to natural causes, and deaths of external parties, shipyard workers or shore-side workers are excluded from this measure.

Chart 2 shows the distribution of crew fatalities by accident type. The largest number of crew fatalities is attributed to falls overboard (72 of 144, 50%). The next largest group of fatalities is attributed to asphyxiation (21 of 144, 14%).

Chart 2: Crew Fatalities by Accident Type (CY 1994 – 2014)

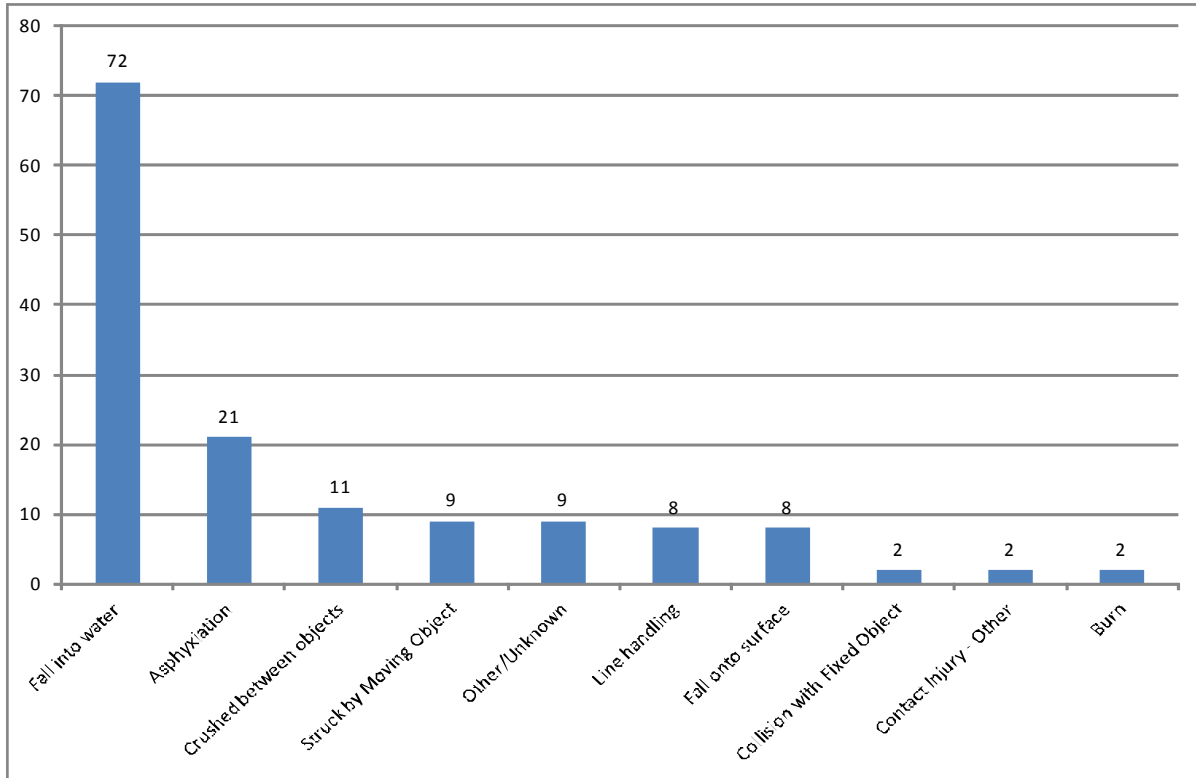
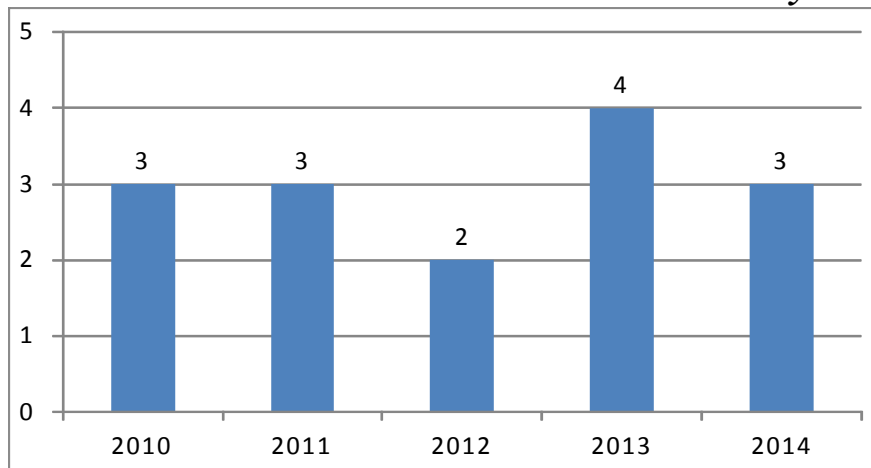


Chart 3 shows the number of fatalities resulting from falls overboard for CY 2010 to 2014. While the annual number of fatalities for all accident types has gone down over the last five years, the number of fatalities due to falls overboard has remained nearly constant.

Chart 3: Crew Fatalities due to Falls Overboard by CY

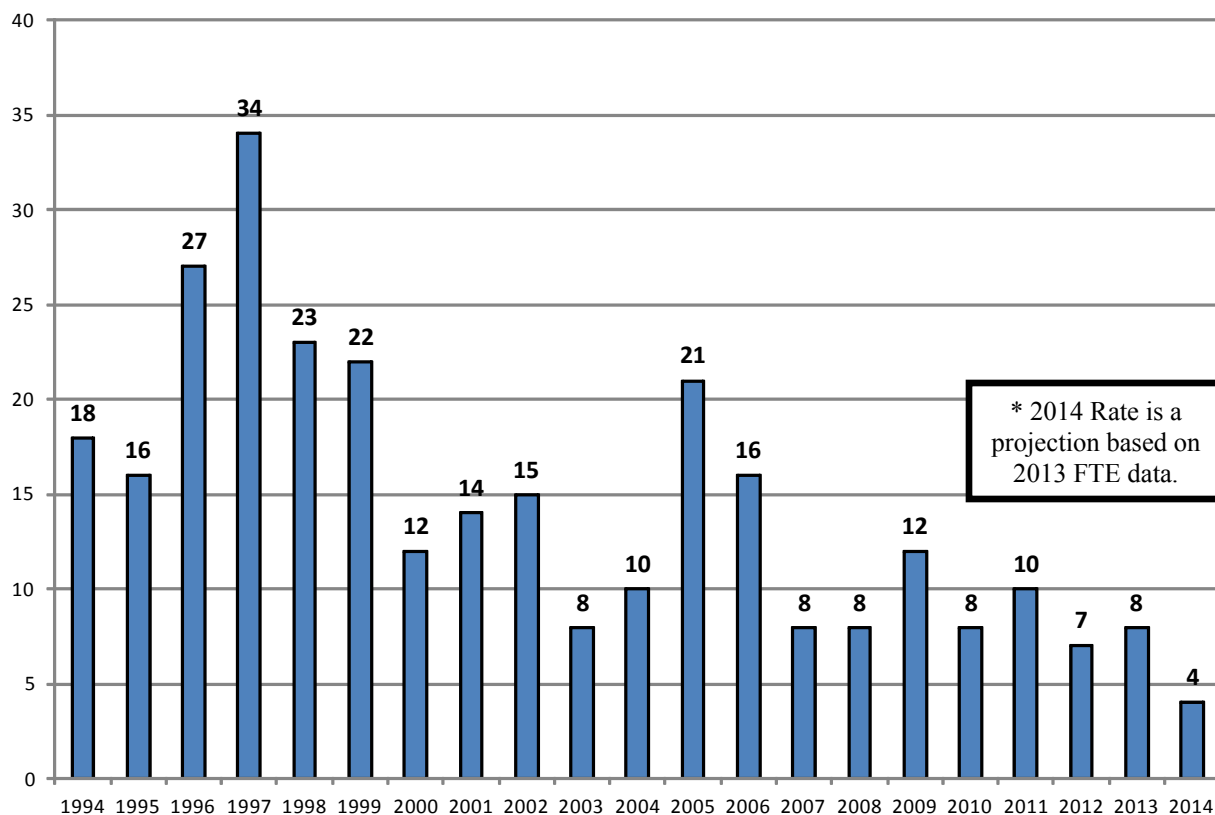


Crew Fatality Rate

The crew fatality rate for 2013 was eight, and the projected crew fatality rate for 2014 is four. Chart 4 shows the crew fatality rate from 1994 to 2014.

The crew fatality rate is calculated using the “Mercer Model”, which was developed with AWO-funded research. The denominator for this rate is derived from the number of towing vessels in operation, as reported by the U.S. Army Corps of Engineers (ACOE). The most recent data available is for calendar year 2013. The depicted 2014 rate is a projection based on the 2013 ACOE data.

Chart 4: Crew Fatalities per 100,000 FTE² by CY



The crew fatality rate can be used in comparisons with other industries. For example, the Bureau of Labor Statistics reports that in 2013 there were a total of 4,585 nationwide fatal work injuries which represents a continued year over year decrease from the 4,628 fatal work injuries reported in 2012. This also translates to a slightly lower fatality rate for all workers, including office workers, of 3.3 per 100,000 FTE³. In 2013, 41% of the fatal occupational injuries were the result of transportation incidents. The worker fatality rate for the transportation sector was 14.4, with 59% of the transportation fatalities related to roadway incidents.

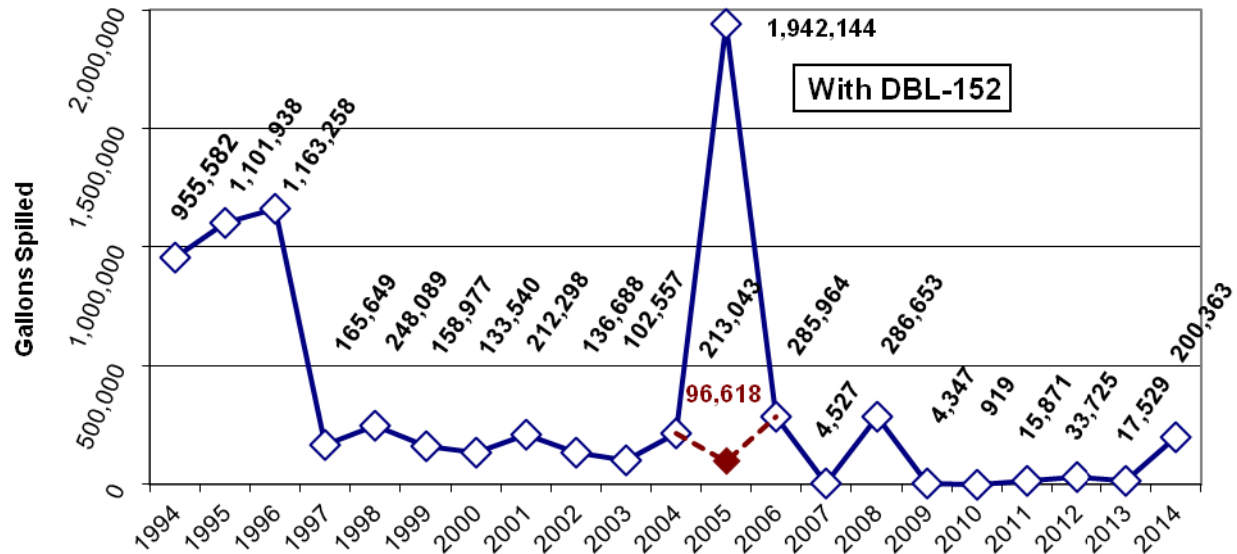
² An FTE or Full Time Employee is the equivalent of one person working a 40-hour work week, for 50 weeks of the year.

³ <http://www.bls.gov/iif/oshwc/foi/cfch0012.pdf>, page 19, accessed 16 June 2015.

Oil Spill Volumes

According to Coast Guard records, 200,363 gallons of oil was spilled as a result of 85 tank barge pollution incidents in 2014. Chart 5 shows the oil spilled from tank barges from 1994 to 2014.

Chart 5 – Oil Spilled from Tanks Barges by CY



The largest oil spill of 168,000 gallons (84% of the volume spilled in 2014) was the result of a collision between the freight ship SUMMER WIND and tank barge KIRBY 27706, which was being pushed by the UTV MISS SUSAN in the vicinity of the Texas City “Y”. If you remove this one significant event, then there would have been only 32,367 gallons of oil spilled, similar to 2012.

The second largest spill of 30,240 gallons (15% of the total volume spilled in 2014) was the result of a collision between 20 dry cargo barges being pushed by the UTV LINDSAY ANN ERICKSON with two tank barges being pushed by the UTV HANNAH C SETTOON on the Lower Mississippi River. These two spills accounted for 99% of the total volume of oil spilled from tank barges for 2014.

Table 1 shows the number of oil spills by spill size.

Table 1 – Oil Spills by Size for 2014

Gallons of Oil Spilled	Number of Oil Spill Events (spill amounts in gallons)
More than 1000	2 (168k, 32k)
101 to 1000	5 (630, 500, 200, 125, 101)
1 to 100	42
Less than 1	36

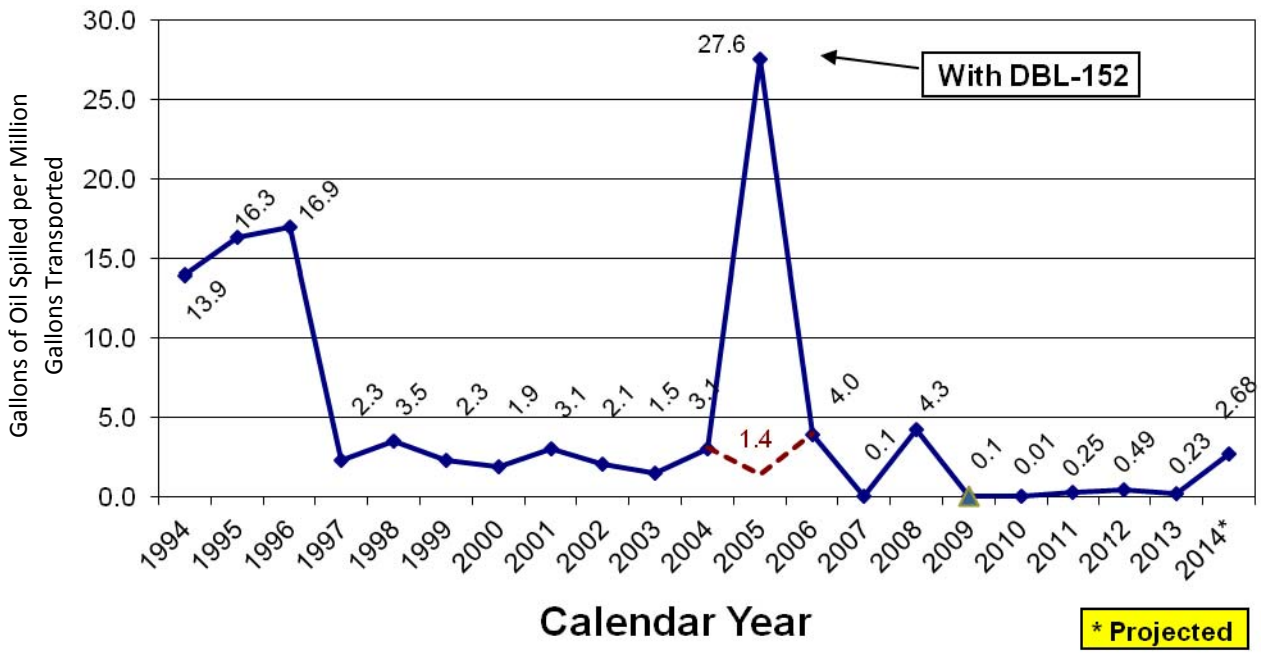
Oil Spill Rate

Based on the ACOE data, the oil spill rate for 2014 is projected to be approximately one gallon of oil spilled per 373,000 gallons transported, or 2.68 gallons of oil spilled per million gallons transported. Chart 5 shows the oil spill rate from 1994 to 2014.

The tank barge oil spill rate is calculated using a denominator from the annual U.S. Army Corps of Engineers (ACOE) publication “*Waterborne Commerce of the United States*,” Part 5, Table 2-3. The most recent complete data year of that publication is 2013. The 2014 value is a projection based on 2013 data.

For 2013, the ACOE reported 273.1 million short tons, or approximately 74.9 billion gallons of oil transported by barge on U.S. waterways. That amount represents 83% of all oil carried on domestic waterways. The amount of oil transported by barge in 2013 increased by 20.7 million short tons or 5.7 billion gallons. This represents a 7.6% increase over 2012.

Chart 5: Gallons of Oil Spilled by Tank Barges per Million Gallons Transported by CY



While there has been an increase (+7.6 %) in the amount of oil transported by barge from 2012 to 2013 and the projected oil spill rate for 2014 (2.68) is a significant increase given the last five years of data, an oil spill rate of 2.68 is still very low given the volumes transported. Further, as noted previously, two marine casualties are responsible for 99% of the total volume of oil spilled in 2014.

Vessel Incidents

Charts 6 and 7 show all towing vessel incidents by the severity scale which was approved by the National Quality Steering Committee. Towing vessel incidents include all reportable marine casualties that involved any towing vessel or barge. Each incident is counted only once, regardless of the number of vessels involved.

In 2014, 89% of towing vessel casualties were of the low severity type. Medium and high severity incidents represented 7% and 4% of all incidents, respectively. The severity scale description is provided at the end of this report. There was a slight decrease in all incidents, as well as medium and high severity incidents between 2013 and 2014.

Chart 6: All Vessel Incidents by Severity and CY

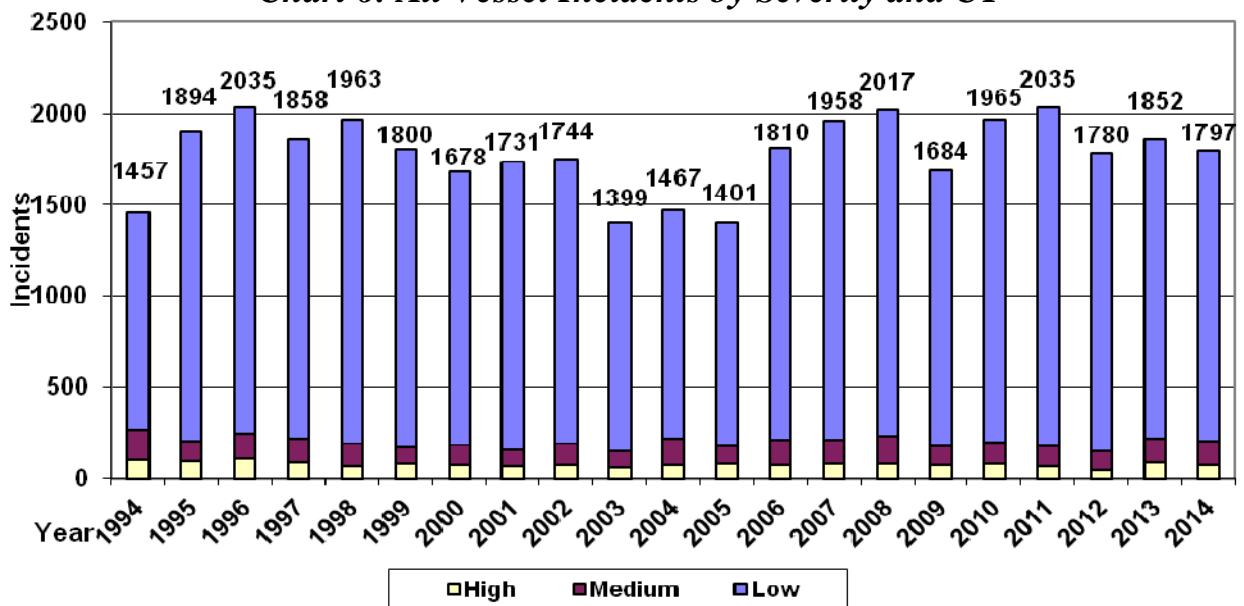


Chart 7: Medium and High Severity Incidents by CY

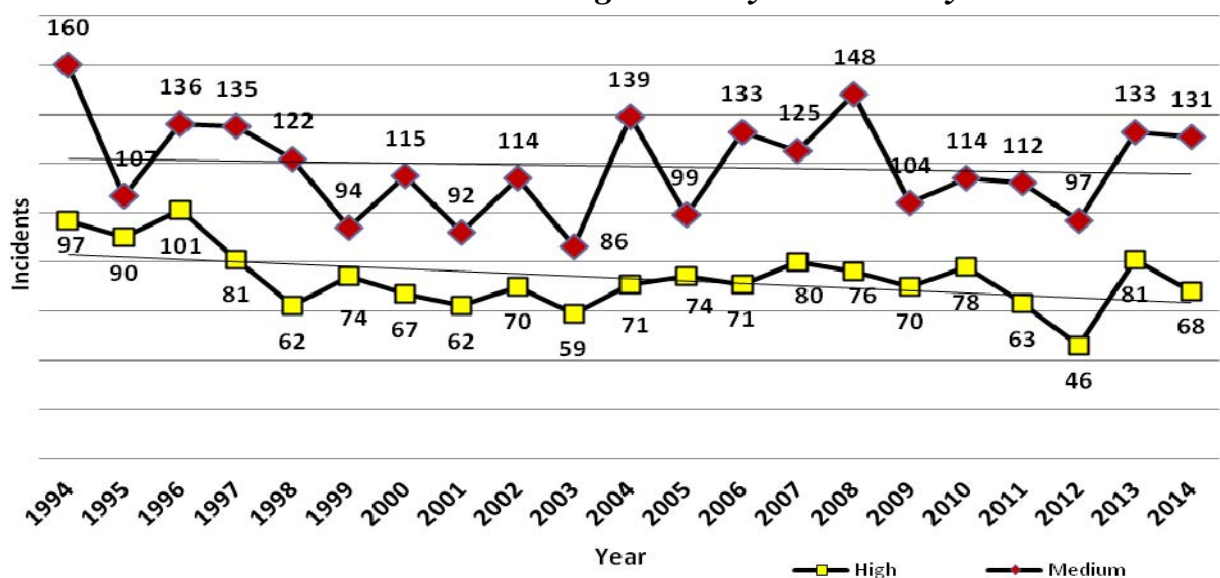
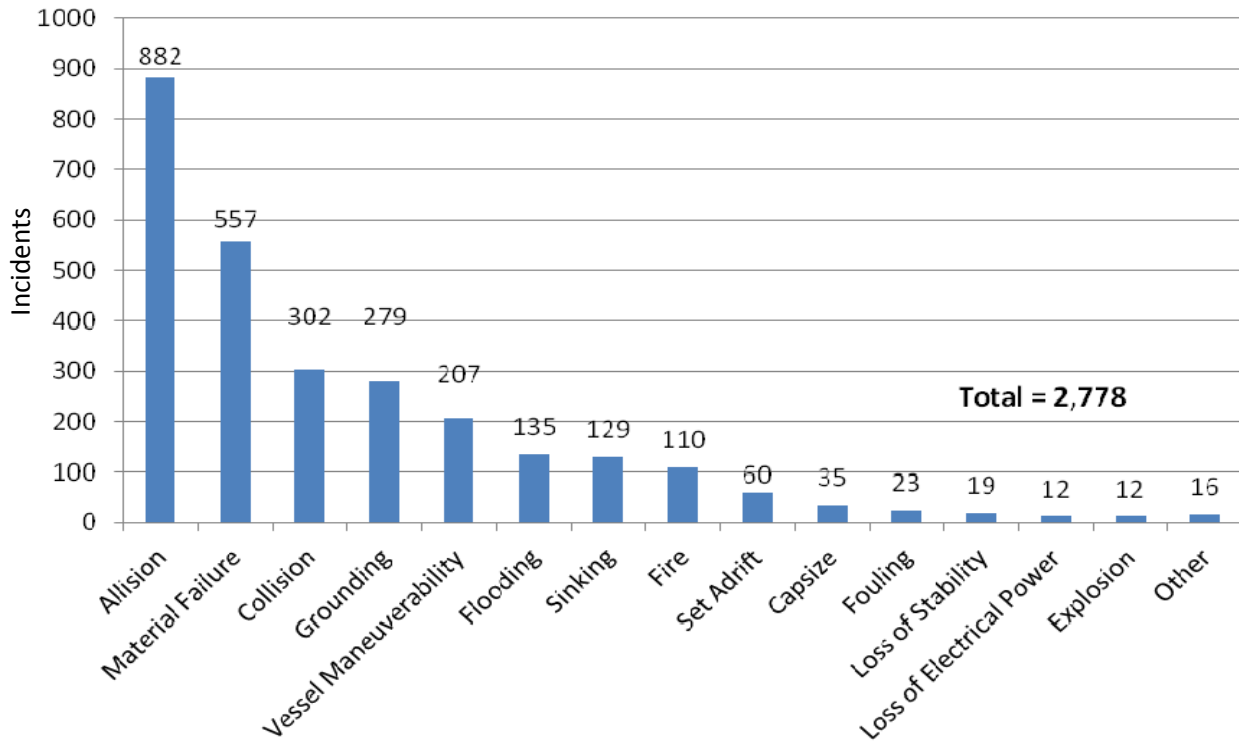


Chart 8 shows the medium and high severity incidents for 2000 to 2014 by the first event². 32% of medium & high severity incidents began with an allision. Material failure was the first event in 20 % of marine casualties.

Chart 8: Medium & High Severity Incidents by First Event (CY2000 to 2014)



² The Coast Guard’s information system is designed to document marine casualties as a series of events, with corresponding locations, involved vessels and other details. The “First Event” or “Initiating Event” is the first event in a sequence of events leading up to the casualty.

Crew Member Injuries

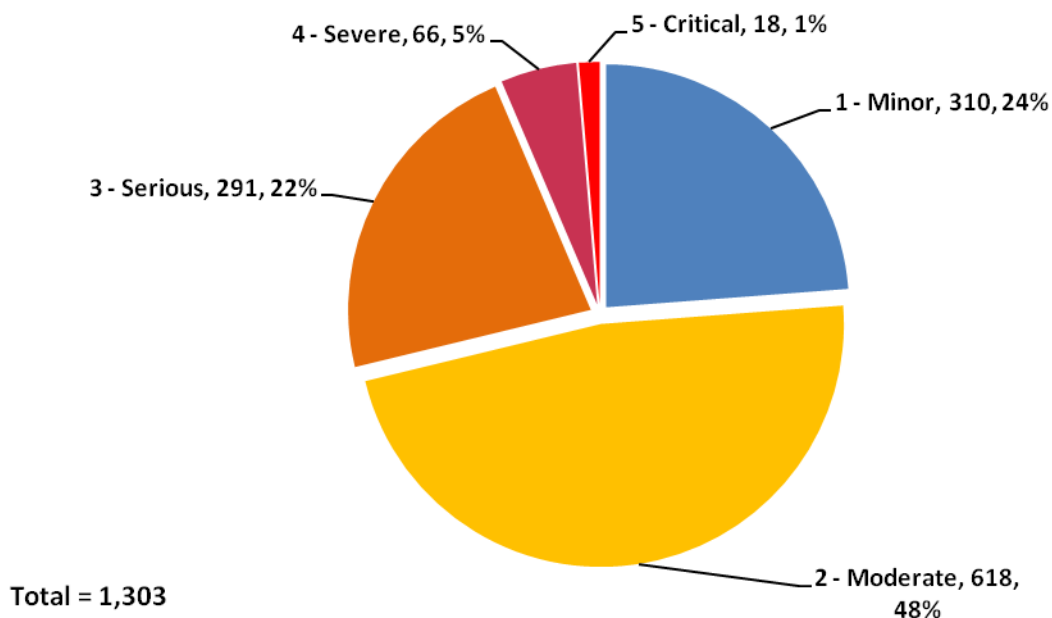
In 2005, the Coast Guard began documenting injury severity with each personnel casualty investigations. A description of the injury severity scale is provided at the end of this report. In 2014 there were 133 injuries to crew members where the “vessel class” or “vessel service” was either “towing vessel” or “barge”. The breakdown of injuries by severity is shown in Table 2, and 67% of injuries were classified as minor or moderate. In 2013, 68% of the injuries were classified as minor or moderate. In comparing serious, severe and critical injuries, there was an increase in these injuries between 2013 and 2014.

Table 2 - Number of Injuries by Severity for CY 2014

Injury Severity	Count
2 - Moderate	67
3 - Serious	32
1 - Minor	22
4 - Severe	11
5 - Critical	1
Grand Total	133

Chart 9 summarizes crew member injuries by severity, for calendar years 2006 – 2014. The data continues to show that almost three-quarters of injuries (72%) were minor or moderate in severity.

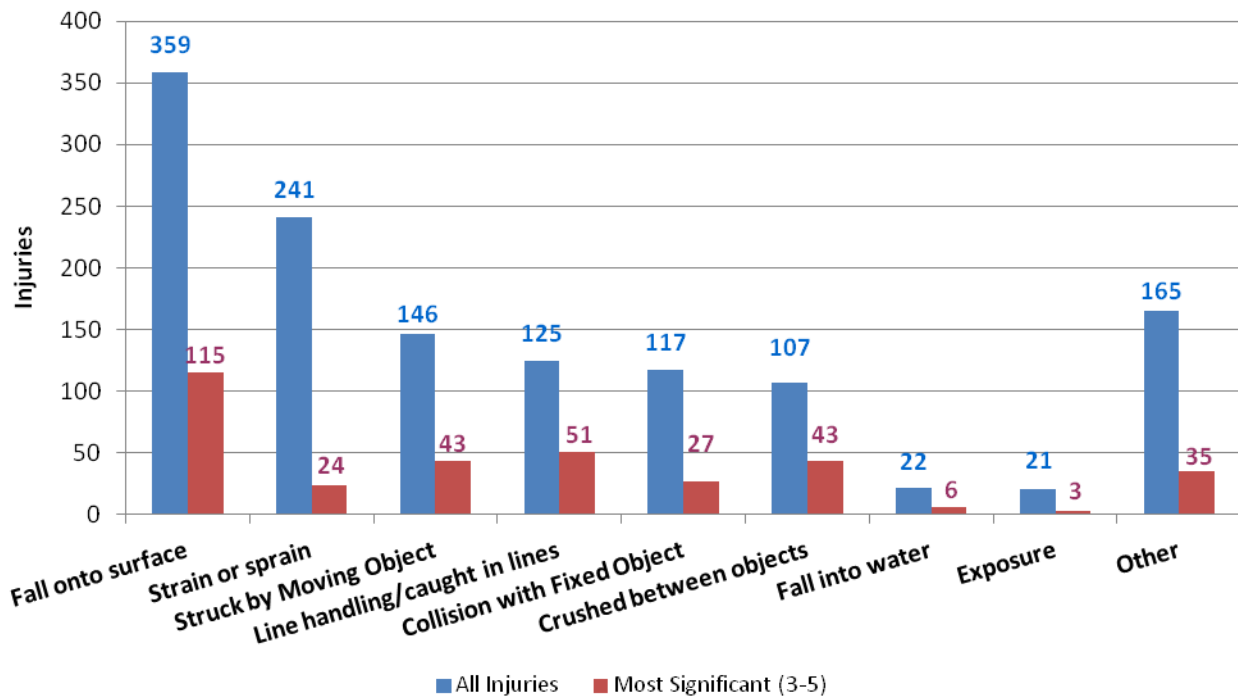
Chart 9 - Injuries by Severity (CY2006-2014)



Injury data may also be grouped by type of accident. Four accident types appear to account for most of the **higher** severity injuries:

- Fall onto surface,
- Line handling/caught in lines,
- Struck by moving object, and
- Crushed between objects.

Chart 10: Injuries by Accident Type (CY2006 – 2014)



AWO Safety Partnership Severity Classes for 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: 11-1000 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 Casualty Class "Serious" or "Major"

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