

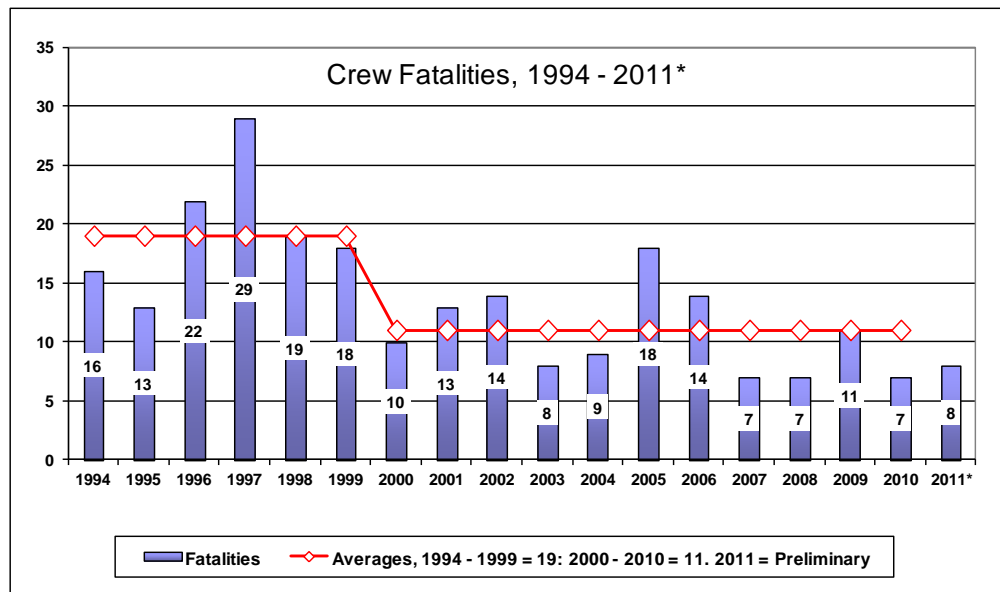
**Coast Guard-AWO Safety Partnership
Quality Action Team**

**On
Reducing Fall-Overboard Crew Fatalities**

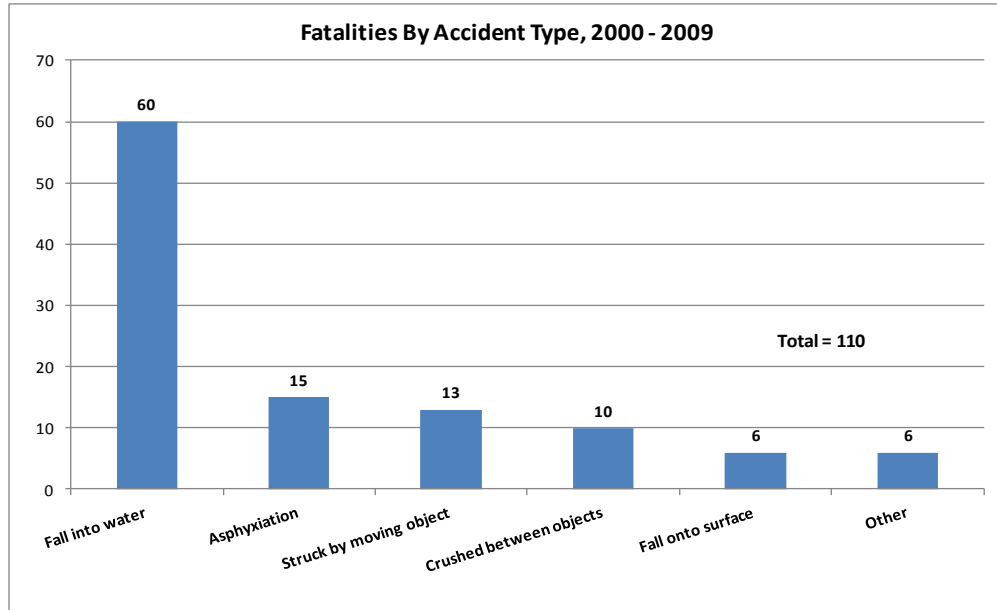
April 2012

Overview

The Quality Action Team (QAT) on Reducing Fall-Overboard Crew Fatalities was chartered on June 28, 2011, under the auspices of the Coast Guard-AWO Safety Partnership first inaugurated in September 1995. The Coast Guard-AWO Safety Partnership centers around a National Quality Steering Committee (QSC), a group of senior Coast Guard and barge and towing industry leaders whose principal function is to identify safety or environmental protection problems of national scope for cooperative Coast Guard-industry attention. The Coast Guard and AWO have worked together to address the issue of crew fatalities since 1995 (Appendix I). In 1996, the Partnership produced a report that assessed the causes of deckhand fatalities in the inland towing industry and made recommendations to prevent future fatalities. Since the year 2000 the average annual number of fatalities appears to have fallen by about half to the current low of approximately eight in 2011, as shown on the chart below. However, the Coast Guard and AWO believe there is no number of fatalities that is acceptable.



The QSC at its meeting on February 23, 2011, received a report on crew fatalities from 2000-2009 prepared by the Coast Guard's Office of Investigations and Analysis. This report revealed that two-thirds of all fatalities in this ten year period, similar to the 1995 study findings, involved deckhands, and more than half these deaths resulted from falls overboard. The chart below shows the latter distribution. Therefore, the QSC directed that a new QAT be established to make recommendations to prevent towing vessel crew fatalities resulting from falls overboard. The QSC asked that the QAT attempt to glean information from Coast Guard Incident Reports, during this period, of crewmember fatalities resulting from falls-overboard and AWO data on near-misses (i.e., falls into the water that did not result in fatalities).



Tasks

The Coast Guard-AWO QAT on Reducing Fall-Overboard Crew Fatalities conducted the following tasks:

Using Coast Guard investigative reports and information available from AWO member companies:

- 1) Performed a detailed review of all crewmember fatalities related to falls overboard occurring during the period 2000-2010;
- 2) Reviewed information available from AWO member companies on fall overboard incidents that did not result in fatalities;
- 3) Identified causal factors contributing to fall-overboard incidents and fatalities resulting from falls overboard;
- 4) Developed a list of recommended intervention strategies to address these casual factors;
- 5) Prepared interim reports to the QSC at its August 2011 and February 2012 meetings of its preliminary analysis of the factors leading to falls overboard; and,
- 6) Developed a recommended outreach plan to ensure all AWO members are aware of the Working Group's recommendations and tools available to assist them in implementing these recommendations.

Membership

Co-chaired by team leaders CDR Lee Boone, Office of Vessel Activities, Domestic Compliance Division, Coast Guard Headquarters, and Mr. James K. Smith, Chairman AWO Interregion Safety Committee, Safety and Environmental Coordinator, Magnolia Marine Transportation Company, the QAT brought together participants from the inland towing industry, U.S. Coast Guard Headquarters and the Towing Vessel National Center of Expertise (TVNCOE). The QAT conducted its work between September 2011 and March 2012. (A full list of QAT members is included in Appendix II).

Process and Findings

The QAT's first meeting was held in September 2011 and reviewed the report of the 1996 Crew Fatalities QAT and a Coast Guard prepared Review of Crew Fatalities 2000-2009. The review showed that the major factors related to crewmember deaths in the current data remain largely unchanged since 1995. While the number of fatalities has fallen by approximately 50 percent over this time period, falls overboard, predominantly of deckhands, remain the leading cause of crewmember deaths.

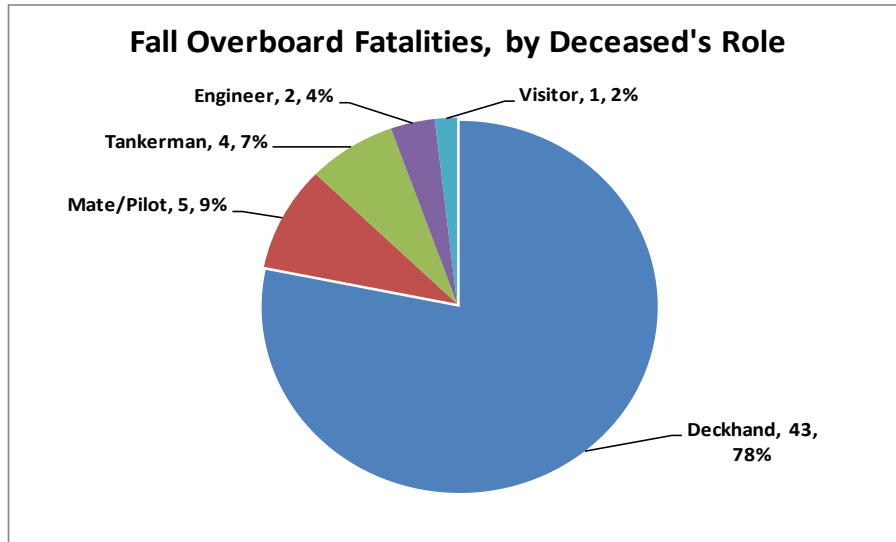
To begin its work, the QAT developed a set of criteria to evaluate the causes and possible preventative strategies of each fall overboard fatality. Members decided to study all incidents that occurred between 2000 and 2010 and, after eliminating several inapplicable incidents, the data set included 55 fall-overboard fatalities. The team developed an electronic form for use in analyzing the 55 fatalities. The electronic forms were pre-loaded with incident investigation details from the Coast Guard's MISLE (Marine Information for Safety and Law Enforcement) database, so the members could focus on the analysis of causes and preventive strategies. Also, team members had access to the individual investigation reports, minus items subject to the Privacy Act. (Items reviewed from the Incident Review form are shown in Appendix III and the lists of causal factors and possible preventive strategies, developed by the QAT members, are shown in Appendix IV).

The QAT agreed that the casualty review of the 55 cases from the 2000–2010 would be best accomplished in teams. Therefore, the QAT divided itself into four working groups. Each group included one representative from the Coast Guard and four AWO members who reviewed approximately 14 casualty reports individually, then as a group, and agreed on the major causal factors for each. During their review of the casualty reports, team members found that some details were not available, for various reasons. For example, some of the falls overboard were not observed. Thus, the event or action that caused the person to fall overboard was unknown.

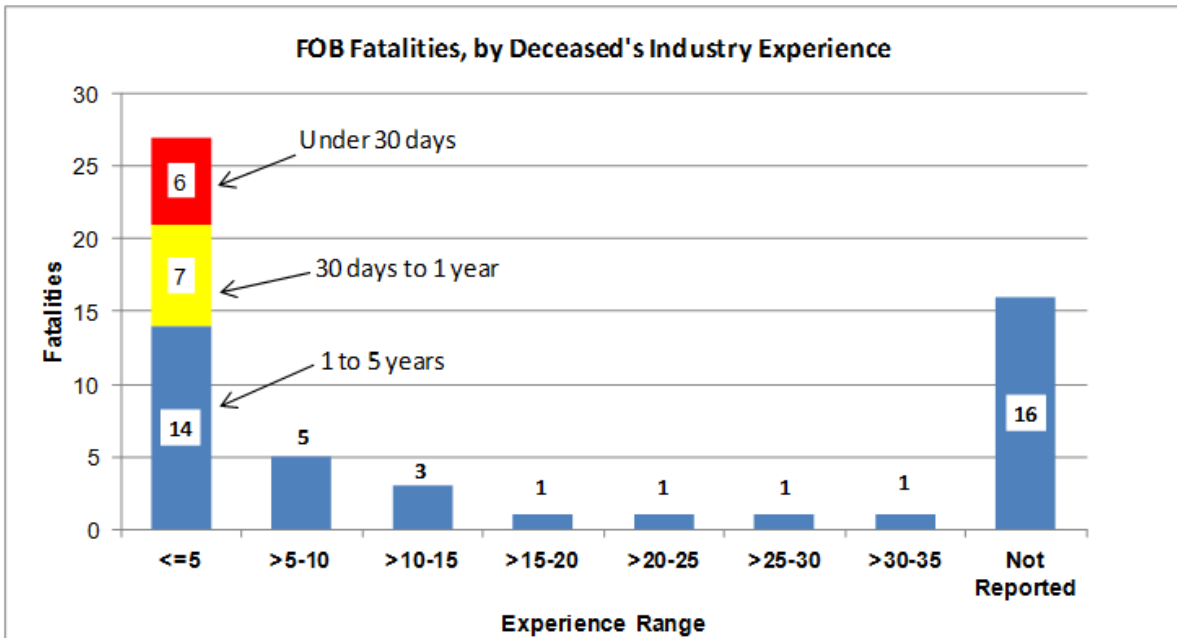
Results of the QAT's review revealed:

- One third of all fatalities occurred while the towing vessel was moored.
- Deckhands experienced 78 percent of the fatalities.
- Statistically the correlation between time and fatalities was low.
- Experience level appeared to be a significant factor. Twenty four percent of the fatalities involved persons with less than one year of experience. In fact, six fatalities involved persons with less than one month of experience.
- Two-thirds of the fatalities were not witnessed.
- PFD's were used in only 38 percent of the fatalities.
- The causal factors are distributed across several categories. Most of the primary causes were attributed to the deceased. The top two causes were illegal drug/alcohol use and loss of balance, with eight incidents each. Overall, the largest organizational factors were inadequate oversight and inadequate supervision.
- The most frequently recommended preventive actions in the initial review were training, better procedure enforcement, buddy/shadow system, and better oversight.

Demographics

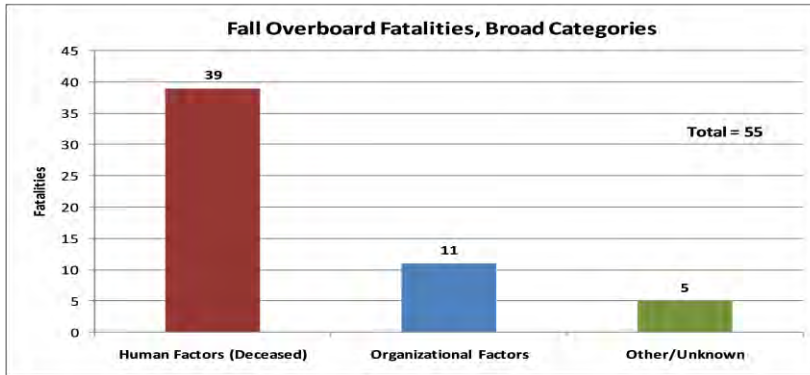


Deckhands experienced the highest fatalities at 78 percent

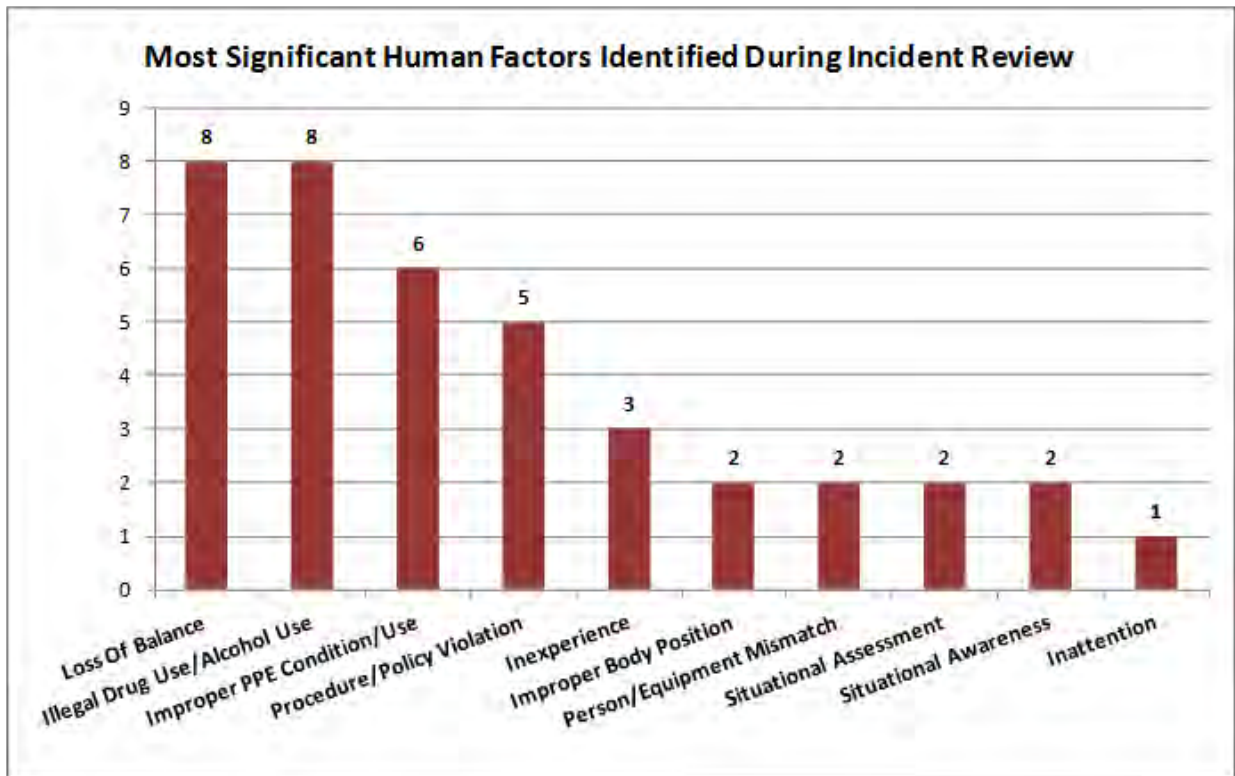


Six of the fatalities were crew members with less than one month of experience, 24 percent had less than one year of experience, and a full two-thirds of the fatalities were not witnessed.

Identification of Causes

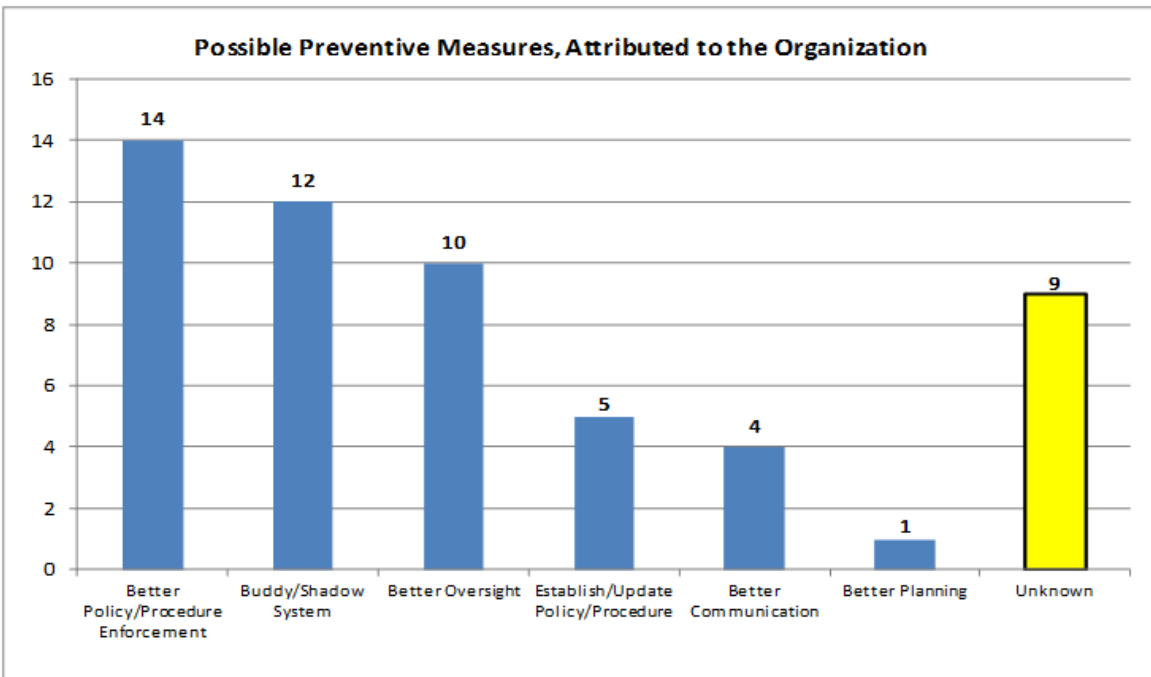
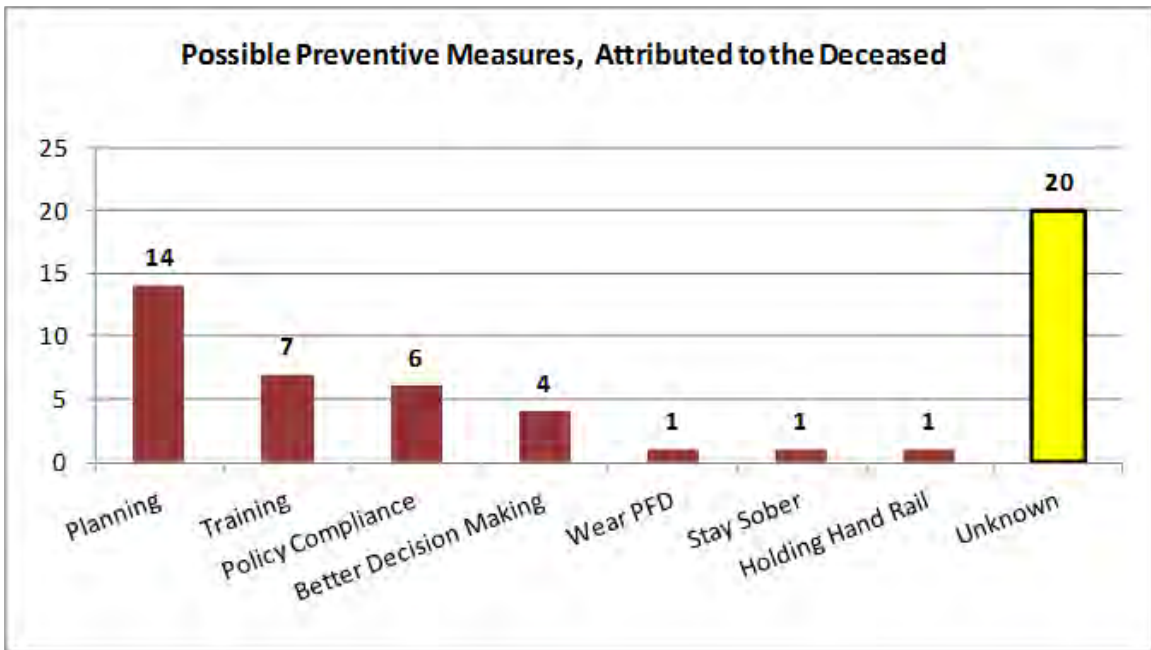


The team looked at causal factors in three broad areas: Human factors (attributed to the deceased), Organizational factors, and other (such as equipment failure or external factors).



The QAT's analysis found that more than two-thirds of the fatalities were human factors attributed to the deceased. The human factors, Loss of Balance and Drug/Alcohol use were identified as the most frequent factors. It is important to keep in mind that these factors, although unacceptably high, accounted for just eight incidents each over the ten year period.

Preventive Strategies



While a majority of the identified causes were attributed to the crew member, most of the potential preventive strategies seemed to be organizational. Further, no single factor or strategy was identified that will reduce falls overboard. Instead, the QAT team members concluded that development a *safety culture* that involves all levels of the organization would be the best approach.

AWO Member Companies Fall Overboard Incidents

In addition to the Coast Guard’s investigation reports, the team reviewed data from the AWO Safety Statistics program. The AWO Safety Statistics Program is a voluntary program designed to efficiently collect and report crew injury and fall overboard statistics for participating AWO members. AWO’s third-party contractor, Hile Group, manages the program, collecting and reporting safety statistics to participants in a completely confidential manner. Hile Group receives quarterly reports from participating companies and from that data produces a summary report. The summary report includes quarterly and year-to-date totals in a format that can be use to compare a company’s injury rates to companies engaged in like operations and against the universe of participants as a whole. Participating companies receive reports with data from their own companies and aggregate totals based on information reported by other participants. Safety statistics are collected in four areas: crew fatalities, recordable injuries, lost time injuries, and fall overboard incidents. (A copy of the AWO Safety Statistics Fourth Quarter 2011 Report is included in Appendix V).

The table below summarizes the fall overboard reports that were received in a recent 3 year period. Overall, the data indicates that for every reported fatality, approximately 22 other persons fell overboard. Those other incidents might be considered “near misses” for fatalities. It should be noted that incident reporting to the AWO is voluntary, and the data does not identify causes. Thus, these figures represent only a sample of the occurrences in the industry. However, the team believes that it provides valuable feedback and can be a source of valuable lessons learned.

Year	Fatalities	Non-Fatalities
2008	1	62
2009	3	53
2010	3	41

The AWO Safety Statistics showed that 68% of the reported falls overboard, (fatal and non-fatal), for calendar years 2009 – 2011 involved deckhands. This is consistent with the fatality reports received by the Coast Guard. Also, the Hile Group near-miss data indicates that the use of Personal Flootation Devices can significantly improve the survivability of a fall overboard. Of the non-fatal incidents, 93% of the survivors were wearing either a PFD or a work vest.

	2009	2010	2011
Non-fatality/no PFD	2	1	2
Non-fatality/PFD	6	9	8
Non-fatality/work vest	16	9	17
Fatality/PFD	0	1	1
Fatality/no PFD*	2	0	0

* For the two fatalities where the victim was wearing a PFD:

- One fell between two barges;
- One was swept off a boat by a line in high wind and water.

Recommendations

The QAT developed the following recommendations based on its review of the Coast Guard Incident Reports and the local knowledge and experience of the team members.

1. Develop guidance that companies can use in developing a robust Safety Culture wherein unsafe acts are unacceptable to all employees. The QAT's analysis of the 55 fatalities revealed a preponderance of fatalities resulted from human factors such as acts or omissions by the victim, yet it was organizational factors such as training, policy enforcement and management oversight that the QAT believes are the most significant areas for improvement. No single prevention strategy is sufficient to address all of these factors and achieve the goal of preventing crew fatalities resulting from falls overboard, rather a holistic approach that stresses the establishment of a *safety culture* wherein engaging in unsafe behaviors is unacceptable to executive, line management and vessel crews alike. The QAT believes that establishment of a robust *safety culture* is the best preventative measure! Based on the experience of the airline industry, and advice from the National Transportation Safety Board (NTSB), the essential elements in establishing a *safety culture* are:

- a. A management culture where senior management demonstrates a commitment to safety and a concern for hazards that are shared by employees at all levels within the organization;
- b. An informed culture where the organization collects and analyzes "the right kind of data" to keep informed of the safety health of the organization;
- c. A reporting culture where employees are open and encouraged to report safety problems, have the assurance that the information will be acted upon, confidentiality will be maintained or the data de-identified and employees will not be punished or ridiculed for reporting;
- d. A learning culture where the organization is able to learn and change from its prior mistakes; and,
- e. A just culture where employees realize they will be treated fairly, not all errors and unsafe acts will be punished (if the error was unintentional), but those who act recklessly or take deliberate and unjustifiable risks will be punished.

If the QSC agrees, to accomplish this recommendation, the QAT in follow on work, will reach out to AWO member companies that have been successful in developing the type of *safety culture* described above, and using that information, as well as information gained from other sources, produce a guidance document for presentation to the QSC at its February 2013 meeting that companies can use to guide them in developing their own robust *safety culture*.

2. Develop a tool box of fall-overboard lessons learned and best practices that can be incorporated into a company's safety management system policies and procedures. Many companies have implemented successful strategies to prevent falls-overboard. The QAT believes that by cataloging these prevention strategies and making them available to all towing companies through the AWO Website, awareness of risk, and strategies to prevent these types of casualties, will result in a reduction in the number of fall-overboard incidents. Production of this tool box should be led by the AWO Responsible Carrier Program Accreditation Board, working with the AWO Interregion Safety Committee and made available to member companies and the industry by February 2013.

3. Use the Safety Committees to share the experiences of companies that have developed

successful fall overboard prevention strategies. The AWO Safety Committees, which include the largest gathering of safety professionals in the tugboat, towboat and barge industry, can be used to communicate successful strategies used by companies to prevent falls overboard and act as a catalyst for discussion and increased awareness of the problem. Fall-overboard prevention strategies and lessons learned should be made a regular part of all AWO Interregion Safety Committee meetings beginning with the 2012 Summer Meeting.

4. Establish a process for the collection and dissemination of fall-overboard near-miss data. Currently the only near-miss data specifically collected on falls overboard comes from the AWO Safety Statistics program. The QAT believes that this is inadequate. Collection and communication of data is a necessary element in developing a *safety culture*. AWO should continue its work to develop a near-miss reporting system that is user-friendly, contains sufficient data to develop cause-specific prevention strategies, and is mandatory under the RCP. The QAT believes that aggregate data should be shared widely throughout the AWO membership and the industry. Effective immediately, all AWO companies reporting a fall-overboard on their quarterly safety statics report to AWO should include with that report a completed copy of the AWO Fall-Overboard Questionnaire Form (Appendix VI). Data collected will be included in the quarterly generic safety statistics report and reported in the *AWO Letter*.
5. Develop an incident investigation form that can be used by investigators (CG or company) helpful in developing corrective/preventive actions. During the review of the 55 fall-overboard casualties, it was apparent that information contained in fall-overboard incident reports often lacked sufficient information on the details of the incident to enable reviewers to determine the probable cause of the incident and develop preventative strategies to address the cause or causes. Therefore, the QAT recommends the development of an incident investigation form that can be used by both the Coast Guard and companies to guide the collection of relevant information that can be used to identify the causes and identify possible preventative strategies to prevent falls-overboard. Such a form may be useful for other types of casualties. Development of this form should be accomplished by a new QAT chartered under the NQSC.
6. AWO and Coast Guard should develop and sponsor a Protection of the Mariner Safety Award. In addition to the development of a strong *safety culture*, the QAT believes that competition and peer pressure are among the most effective strategies to encourage companies and individuals to maintain their focus and awareness of safety. Therefore the QAT recommends that the Coast Guard and AWO jointly sponsor a safety award that specifically focuses on outstanding efforts by companies in protecting their employees from injury. Details of such a program should be developed jointly by the Coast Guard and AWO to include criteria for the award, the composition of an awards committee and recommendations on the type and level of recognition of the winners. The development of this program, if approved by senior Coast Guard leadership and the AWO Board of Directors, should be developed by a new QAT chartered by the NQSC.
7. Results of this QAT, the importance of the use of Personal Floatation Devices, and future work to prevent falls-overboard should be widely shared with industry. Communication of the work of the QAT should be accomplished through the Coast Guard-AWO Safety Partnership National Quality Steering Committees (QSC) and Regional Quality Steering

Committees (RQSCs), publication of its recommendations and progress in accomplishing these recommendations through the *AWO Letter* and AWO Website, and in reports to AWO's Executive Committee and Board of Directors. The QAT also envisions that the Coast Guard Towing Vessel National Center of Expertise and the Seamen's Church act as a resource to provide information and assistance to companies in developing their own *safety culture* and fall-overboard implementation strategies.

8. Publish the results of this study in various industry publications. *Workboat*, *Waterways Journal* and *Professional Mariner* are among the publications that should be encouraged to publish the QAT's findings and recommendations to increase the public and industry's awareness of its safety efforts. This effort should be lead by the AWO's Public Affairs department.

APPENDIX I

SUMMARY OF
FALL-OVERBOARD PREVENTION INITIATIVES

Summary of
Fall Overboard Prevention Initiatives

1996

- Fall Overboard QAT issued its report.
- A requirement for a Fall Overboard Prevention policy became the first addition to the RCP.
- Safe Decks brochure developed through Coast Guard-AWO Safety Partnership.

1999

- New QAT formed to review the 1996 QAT report on Towing Vessel Crew Fatalities recommendations and assess their implementation status.

2001

- Safety Committee developed a list of FOB prevention Best Practices.

2002

- Safety Committee developed a FOB Prevention lesson plan.
- Safety Committee developed a Slip, Trip and Fall Prevention lesson plan.

2003

- Safety Committee developed a list of inland FOB Risk Factors.
- Safety Committee developed a Working in Darkness lesson plan.
- AWO begins collecting FOB statistics.

2004

- Safety Committee developed a list of coastal FOB Risk Factors.

2005

- Safety Committee developed a Preventing Slip, Trips, and Falls – Beyond the Basics lesson plan.
- Safety Committee developed a Ladder Safety lesson plan.

2006

- Safety Committee developed FOB Prevention – Making/Breaking Tow lesson plan.
- Safety Committee conducted FOB survey.

2009

- Requirement for FOB Prevention training for all crewmembers added to the RCP.
- Requirement that companies track falls overboard added to the RCP.
- Fall Overboard Subcommittee developed a Developed FOB Questionnaire.

2011

- Fall Overboard Subcommittee developed improved FOB Observation Form.
- AWO conducted a FOB survey of top ten risk factors for FOBs.

APPENDIX II

QAT MEMBERS

Coast Guard-AWO Safety Partnership
Quality Action Team

on

Reducing Fall-Overboard Crew Fatalities

MEMBERS

Co-Chairman CDR Lee Boone, Office of Vessel Activities, USCG Headquarters

Co-Chairman Jim Smith, Magnolia Marine Transport Company

Bill Abernathy, Office of Design & Engineering Standards, USCG Headquarters.

Jason Adams, Ingram Barge Company

Dave Dickey, Office of Investigations & Analysis, USCG Headquarters

Andy Cannava, C & B Marine

Jim Fletcher, Team Services, LLC

Paul Hassler, JB Marine Service, Inc.

Glenn Hotz, Hile Group

LCDR Charlotte Keogh, USCG Towing Vessel National Center of Expertise

Mike Morris, AEP River Operation

Steve Richards, BP Shipping USA

LCDR Wade Russell, USCG Towing Vessel National Center of Expertise

Tim Sizemore, AEP River Operations

Mike Weisend, AEP River Operations

APPENDIX III

ITEMS REVIEWED BY THE QAT FROM THE MISLE DATABASE

The items listed below were included in the incident review form used by team members. Many of the items were pre-loaded from the Coast Guard's MISLE database.

MISLE Incident ID Number
Calendar Year
Activity of Deceased at Time of Casualty
Activity of Vessel at Time of Casualty
Location of Deceased at Time of Casualty
Person's Role on the Vessel
Age of Deceased
Deceased's Experience on the Vessel
Deceased's Experience in the Company
Deceased's Experience in the Industry
Deceased's Hours on Duty
Incident Time of Day
Incident Hour
Was Deceased Wearing a PFD?
Was Weather a Factor?
Weather Condition
Were Drugs a Factor?
Was Alcohol a Factor?
Was Fatigue a Factor
Was a Medical Condition a Factor?
Geographic Region of the Incident
Coast Guard District of the Incident
Incident Title
Vessel Name
Vessel's Official Number
Towing Industry Segment
Vessel's Operating Company
Was the Company an AWO Member?
Was the Incident Witnessed?
Was Deceased a Vessel Employee?
The Event or Action Leading to Fall Overboard.
Causal Factor 1
Causal Factor 2
Causal Factor 3
Causal Factor 4
Causal Factor 5
Possible Preventive Measure for the Organization
Possible Preventive Measure for Deceased

APPENDIX IV

CAUSAL FACTORS AND POSSIBLE PREVENTIVE MEASURES

Shown below are causal factors and possible preventive measures developed by the QAT members to use in evaluating each of the crew member fatalities.

Human Factors (Deceased)
Distraction
Fatigue
Illegal Drug Use/Alcohol Use
Improper Body Position
Improper PPE Condition/Use
Inattention
Inexperience
Loss of Balance
Other
Person/Equipment Mismatch
Physical limitations
Procedure/Policy Violation
Situational Assessment
Situational Awareness
Organizational Factors
Inadequate Communications
Inadequate Oversight
Inadequate Policy/Procedure
Inadequate Pre-Job Planning
Inadequate Preventive Maintenance
Inadequate Supervision
Inadequate Training
Other Factors
Equipment Failure
Inadequate Equipment Design
Inadequate Lighting
Sudden Vessel Movement
Weather
Wet surface
Unknown

Preventive Measures (Deceased)
Better Decision Making
Hold Hand Rail
Planning
Policy Compliance
Stay Sober
Training
Wear PFD
Insufficient Information/Unknown
Preventive Measures (Organization)
Better Communication
Better lighting
Better Oversight
Better Policy/Procedure Enforcement
Buddy/Shadow System
Establish/Update Policy and/or Procedure
Improved Equipment Design
Improved Maintenance
Process Audit
Unknown

APPENDIX V

AWO SAFETY STATISTICS FOURTH QUARTER 2011 REPORT

Report: AWO Safety Statistics Q4 2011 (October/November/December)

		Manhours	Fatalities		Recordable Injuries		Lost Time Injuries		Fall Overboards	
			Number	Rate	Number	Rate	Number	Rate	Number	Rate
Canal	Quarter	1,306,021.00	0	0.00	6	0.92	1	0.15	1	0.15
	YTD	5,011,452.00	0	0.00	27	1.08	4	0.16	3	0.12
Coastal East	Quarter	1,719,595.00	0	0.00	15	1.74	12	1.40	3	0.35
	YTD	7,147,467.70	0	0.00	55	1.54	38	1.06	4	0.11
Coastal Harbors	Quarter	2,478,091.40	2	0.16	12	0.97	18	1.45	1	0.08
	YTD	7,284,358.75	2	0.05	82	2.25	74	2.03	2	0.05
Coastal West	Quarter	838,773.00	0	0.00	7	1.67	4	0.95	1	0.24
	YTD	4,807,164.50	0	0.00	47	1.96	20	0.83	2	0.08
Fleets	Quarter	1,671,157.50	1	0.12	14	1.68	6	0.72	4	0.48
	YTD	6,300,214.75	1	0.03	78	2.48	33	1.05	14	0.44
Inland Dry	Quarter	5,747,683.00	1	0.03	41	1.43	24	0.84	3	0.10
	YTD	22,223,057.20	1	0.01	235	2.11	127	1.14	15	0.13
Inland Liquid	Quarter	5,841,591.00	0	0.00	23	0.79	14	0.48	3	0.10
	YTD	22,066,941.00	0	0.00	119	1.08	68	0.62	21	0.19
All Participants	Quarter	19,602,911.90	4	0.04	118	1.20	79	0.81	16	0.16
	YTD	74,840,655.90	4	0.01	642	1.72	354	0.95	61	0.16

APPENDIX VI

FALL OVERBOARD QUESTIONNAIRE

FALL OVERBOARD QUESTIONNAIRE

Please answer/check the appropriate items

COMPANY ID: _____

TIME OF DAY

- Morning Afternoon Evening Night

LIGHT QUALITY

- Dawn Light Dusk Dark

WEATHER CONDITION

- Clear Cloudy Fog Rain
 Snow High Winds Severe Storm

SURFACE CONDITIONS

- Clear/Dry Wet Icy Debris Covered

AREA OF WORK

- Fleet Underway Docking Undocking
 Skiff Locking Facing /Un-Facing Tow Work
 Vessel Barge Cargo Operations Boarding/Departing

POSITION HELD

- Captain Pilot Engineer Deckhand
 Cook Tankerman Shoreside Other _____

PERSONAL PROTECTIVE EQUIPMENT WORN

- PFD PFD w/Light Work Vest Footwear
 Flashlight Other _____

FALL OVERBOARD EVENT

- Slip Trip Fall Knocked off
 Loss of balance from push/pull action

RESULTING INJURY

- Non-recordable Recordable Lost Time Fatality
 First Aid Only No Injury

INCIDENT DESCRIPTION:

How did the fall overboard occur?

Actual Date: _____ River: _____ Mile Marker: _____

Current Condition: _____

Description _____ (Indicate Location From Where Fall Occurred on Reverse)

