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Evaluation of An Alaskan Marine Safety Training Program

SYNOPSIS

THE ALASKA MARINE Safety Education Association provides commercial fishermen with an intensive 18–24-hour course addressing emergency preparedness, emergency response, and survival training. This study is a retrospective evaluation of the effectiveness of the course in reducing drownings and hypothermia deaths among commercial fishermen from January 1, 1991, to December 31, 1994.

None of the 114 fishermen who died during the study period were graduated from the course, and none of the 64 vessels on which a death occurred had an course-trained person on board.

A broken weld in the hull, a malfunctioning pump system, a leaking hatch cover, a man overboard, an engine fire, or any number of other disasters can occur quickly and unexpectedly at sea. Alaska's commercial fishing industry has the highest occupational fatality rate in the United States. Nearly 25 percent of all U.S. commercial fishing fatalities occur in Alaska, twice the number of the second highest State (Louisiana) (*1*). An average of 40 boats go down off the coast of Alaska each year, with an annual average of 28 lives lost.

Alaskan fishing crews work year-round in extremely hazardous conditions. Imagine working in a factory where the floor is covered with water or ice and is constantly moving. Imagine a work environment in which not all of the heavy equipment is anchored down and you have to wear heavy, bulky clothing. And if a fire, flood, or other disaster strikes, it is impossible to escape by running outside. Commercial fishing in Alaska is a very dangerous occupation.

The Congress passed the "Commercial Fishing Industry Vessel Safety Act of 1988" to address the industry's safety deficiencies. The Act established standards for survival gear, safety equipment, fire fighting equipment, distress signals, alarms, and first aid training for personnel on fishing vessels. Under the Act, each boat's crew is required to have a trained person conduct monthly emergency safety drills.

This retrospective study was designed to determine whether the Alaska Marine Safety Education Association's (AMSEA) safety training sessions, which meet the requirements of the 1988 Act, are effective in reducing drownings and hypothermia deaths of commercial fishermen. AMSEA's training is

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modeled on the International Maritime Organization's (IMO) Personal Survival Module.

Methods

AMSEA's Marine Survival Equipment, Procedures, and Drills Course addresses emergency preparedness, survival training, vessel stability and loading, and the procedure for conducting safety drills. The participants in the 20-hour course are taught how to abandon ship, fight fires, use distress signals, make distress calls, launch survival craft, don survival suits, recover people from the water, and other skills. Requiring safety and survival equipment is valuable, but people must practice using the equipment prior to an emergency for maximum effectiveness.

Nearly all of the course participants were either skippers or crew members on commercial fishing vessels. The course is taught by AMSEA trained instructors.

A cumulative total of 1,518 people were trained by AMSEA as Drill Instructors from January 1, 1991, to December 31, 1994; this number represents only three percent of the total number of fishermen registered in 1994 (*2*).

Our study period was from January 1, 1991, to December 31, 1994. The United States Coast Guard database was used to identify vessels that were either involved in drownings or required rescues during the study period. The database lists vessel name, date of incident, victims, survivors, and a brief description of the incident. We used information from incident investigations conducted by the National Institute for Occupational Safety and Health (NIOSH)—Alaska Activity—and from a newspaper clipping service to cross-check for accuracy and to find additional names for victims and survivors. A survivor was defined as a person who was rescued from a boat in distress, either by the Coast Guard or by another vessel. Every effort was made to identify the 116 unidentified survivors from Coast Guard reports, NIOSH investigations, and newspaper accounts.

The names of victims and survivors were then compared with a list of AMSEA Drill Instructor Course graduates. The dates of the vessel loss and of the course graduation were compared, with people who took the course after losing their boat excluded.

Victims and survivors who could not be identified by name were not included in the study. Lost vessels that were unoccupied were also excluded.

Table 1 shows a two by two table created using the number of deaths, the number of survivors, and whether or not they were AMSEA trained. The Fisher exact 2-tailed test was used to determine the probability that the difference is survivability was random.

Results

The U.S. Coast Guard reported a total of 159 vessel incidents in Alaska during the four-year study period. None of the 114 documented deaths were of AMSEA Drill Instructor Course graduates (P = 0.034). There were 343 survivors, of whom 227 (66 percent) were identified by name. Of the identified survivors, 10 were AMSEA graduates from eight different vessels. Only the survivors who were AMSEA graduates were counted as "saves," although there was an average of three additional (non-AMSEA trained) persons on each of the eight vessels.

Death toll in Alaska vessel incidents among AMSEA[1] and non-AMSEA graduates 1991–94

Year	Vessels	Incidents	Deaths	Identified Survivors	AMSEA	Non-AMSEA
1991	17,580	47	41	44	2	0
1992	17,194	45	42	41	1	0
1993	16,276	26	21	45	1	0
1994	16,192	41	10	97	6	0
Totals		159	114	227	[2]10	0

[1]Alaska Marine Safety Education Association.

[2]Only the survivors who were AMSEA graduates were counted as "saves," although there was an average of three additional (non-AMSEA trained) persons on each of the eight vessels.

One person's knowledge of life raft deployment, distress signal use, or emergency response could easily save an entire vessel and crew. We identified 64 vessels on which at least one death occurred during the study period and an additional 86 vessels with at least one identified survivor and no deaths.

Eight of the 86 "at least one survivor vessels" and none of the 64 "at least one death vessels" had an AMSEA-trained person on board (P = 0.021).

Discussion

It is apparent that the AMSEA training course is having an effect in reducing drownings among commercial fishermen.

According to the crews from two vessels not counted in this study, practicing the emergency drills described in the AMSEA manual had saved their lives. Several AMSEA graduates have noted that their knowledge and preparedness actually prevented the need to call the Coast Guard for help.

One possible confounding variable, beyond the scope of this study, is whether people who chose to take the AMSEA course had unique characteristics that made them different from other commercial fishermen. In other words, were "safety conscious" people more likely to take the course?

Other drill instructor courses are considerably shorter (eight hours) and use very few hands-on exercises. Additional evaluations are needed to determine the effectiveness of these abbreviated courses.

References

1. National Traumatic Occupational Fatality database. 1980–1989. National Institute of Occupational Safety and Health, Morgantown, WV, 1992.
2. Fish and game licensing. Alaska Department of Revenue, Juneau, October 1994.