COMMERCIAL FISHING SAFETY TRAINING IN ALASKA

Alaska Marine Safety Education Association (AMSEA)
P.O. Box 2592
Sitka, Alaska. 99835

Continuing Education Safety Grant
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Program Director: Jerry Dzugan, M.S.
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ABSTRACT

The five-year project period has seen sustained reduction in fatalities in the Alaska commercial fishing industry (appendix 2). Alaska commercial fishing fatalities have been at their historical low during this period.

Two studies have demonstrated the positive correlation between taking safety training and surviving an emergency at sea. However, the latest and longest term study (Lincoln et al) has shown that recurrency in training is a significant factor. This study demonstrated that after five years from date of initial training, the correlation between training and survivability was insignificant. This highlights the need for refresher training in Drill Instruction.

Another important factor in this period is the lower number of fishers trained in Drill Instructor (DI) courses. The number trained per year has fallen from 900 per year to about 200 a year. This is due to several factors: (1) many of the more safety conscious fishermen have been trained and (2) drill instructors are not currently required to take a formalized retraining class (3) the Coast Guard has found it difficult to enforce this requirement for training.

Anecdotal information and observations have shown that emergency drills are often not conducted monthly on fishing vessels as is required. Therefore, skills for surviving a casualty at sea are not being regularly practiced. This furthers the need for more formalized refresher training.

More effort needs to be made within the fishing fleet and the Coast Guard to promote refresher training for Drill Instructors. Meanwhile, efforts will be ongoing to train students in schools in fishing ports who are now and will become fishermen. The long term "seed" support of NIOSH for this project has been extremely important in meeting commercial fishermen's need for training. It has allowed long term continuity for this training and education effort. This continuity has made training accessible to fishermen who otherwise would have been unable to obtain safety training.

SIGNIFICANT FINDINGS
DEVELOPMENT/ACCOMPLISHMENTS

1. AMSEA fishing safety training curriculum was revised and updated, a new Drill Instructor course was approved for smaller crews and other courses re-approved by the U.S. Coast Guard. New safety publications were published.

2. Drill Instructors (DI) on commercial fishing vessels were trained in 41 fishing ports totaling 1,323 people trained in 133 classes.

3. A comprehensive study showing the relationship of all fishermen trained and their survival rates was completed by Lincoln et al, for the years 1991 to 1999. This study found that there was still a positive relationship ($p=0.05$) between taking safety training and surviving an incident, but only if the event occurred within 5 years of training (see appendix).

4. The Lincoln study discovered that survival due to safety training was linked to the recency of the training. This study demonstrates the need for increased efforts in retraining DIs.

5. Twelve Marine Safety Instructor-Trainer (MSIT) courses were held which trained 154 new instructors. These courses took place in the centralized locations of Seattle, Sitka, Seward and Barrow.

6. During this period, 76 Drill Instructors took refresher training in 25 classes. Increased efforts need to take place in refresher training, especially in light of the Lincoln study.

7. More efforts need to take place to place fishers into DI classes and the Coast Guard needs to do more enforcement of fishers taking the DI.

8. Fishermen may not be conducting monthly emergency drills on a regular basis, thus formalized refresher training may be important.

9. The Alaska commercial fishing fatality rate has been at a historical low during this project period, and safety training has had a positive impact on this continued decline.

FACULTY

In 1996, due to Congressional cut backs, AMSEA was reduced to one staff position. During the past five years however, with support from NIOSH and other sources, AMSEA staff has grown to 5.5 full time positions. This has allowed AMSEA to continue offering a large number of Drill Instructor classes, despite the lack of enforcement of this training requirement by the U.S. Coast Guard.

A survey conducted last year found that for every Drill Instructor course that was held, another Drill Instructor course was canceled due to lack of participation. This demonstrates that promotional efforts are extremely important to this program. The target audience will not go to a centralized source of training: the training must go to the target audience, which are fishermen in their home ports.

All AMSEA staff have a background in commercial fishing in Alaska. This greatly aids in the credibility of the program. All staff have also successfully taken AMSEA's Marine Safety Instructor-Training course and are experienced marine safety instructors. Therefore the orientation and expertise of staff are very relevant and useful for a training oriented program. Staff is used as instructors and instructor trainers when needed.

In calendar year 1998, AMSEA Director Jerry Dzugan completed his Master's Degree in Marine Education and Training from the World Maritime University in Sweden. This University is run by the United Nation's International Maritime Organization. Mr. Dzugan used this experience to further develop AMSEA's methods of instruction and align AMSEA's training with international standards.

In 1998, AMSEA staff received both the Western States and National Boating Education Advancement Awards from the National Safe Boating Council, for its work in marine and boating safety education in Alaska.

CURRICULUM

The curriculum used for the MSIT course is the *AMSEA Marine Safety Instructor-Training manual.* This 464-page curriculum includes marine safety lesson plans, objectives, overhead materials, resources and references for fishing vessel safety topics such as helicopter rescue, cold water survival, safety orientations, emergency safety drills, survival equipment use and emergency procedures.

During this project period, this curriculum went through two revisions (editions 6 and 7). These revisions were used to update information, provide additional teaching materials and add an index so topics can be more easily referenced.

In addition, all DI and MSIT students receive Alaska Sea Grant's *Beating the Odds on the North Pacific: A Guide to Fishing Vessel Safety* (244 pages) and AMSEA's *Emergency Instruction & Drill Manual* (18 pages) as text books for these courses.

During this period, AMSEA received U.S. Coast Guard approval for a shorter 10-hour Drill Instructor course. This course is designed for smaller groups and is intended to take place on fishermen's own vessels. This will allow fishermen the convenience of holding a safety class for their own crew during a time that is best for them, instead of waiting for a larger class. This class has proven to be a useful and popular addition to AMSEA's safety training offerings to fishermen. During this period, AMSEA's other USCG approved DI course and MSIT were reapproved.

Due to a need for safety in the commercial aquaculture industry, AMSEA also secured funding from other sources to write and publish a manual on aquaculture safety in 1998. In 1999, lessons plans and courses were also designed and delivered for safety in seafood processing as well that included new lessons on ergonomics, personal protective equipment and other areas that are also useful to commercial fishermen.

In this period, a Methods of Instruction (MOI) book was developed by AMSEA for use in its MOI section of its Instructor-Trainer class. A section on cross-cultural communication was developed for this publication, based in part on the Director's postgraduate work. The cross cultural communication section was deemed important due to the cultural diversity of fishermen in safety training in Alaska. Alaska Native peoples make up a large part of Alaska's fishing industry.

ADMINISTRATION

This program is administered by AMSEA staff. The AMSEA Director, Jerry Dzugan, is primarily responsible for the administration of this project. He has been the Director of AMSEA for over 14 years. During this time he has been the lead administrator and program developer of commercial fishing safety training programs. AMSEA Assistant Director is Shawn Newell who has been employed by AMSEA since 1997 and was the former Director of S.E. Region Emergency Medical Services.

The AMSEA Director and staff are further given program guidance and fiscal oversight by a statewide board of directors. A list of director names and organizations represented can be found in appendix one.

AMSEA board member and original founder, Hank Pennington, retired during this project period. He was awarded the U.S. Coast Guard Meritorious Service Award for his work in starting AMSEA. He still serves as a volunteer technical advisor.

FACILITIES

AMSEA collaboration has allowed us to use the training facilities of the Alaska State Trooper Academy, University of Alaska, Alaska Vocational Technical Center (AVTEC) and the training classrooms of many other agencies and schools. These facilities are the premier training sites in Sitka and Seward, the primary sites for our MSIT classes. Drill Instructor classrooms are found on a

community by community basis, but usually involve using the local school, firehall or University facilities. In addition, AMSEA has its own classroom for smaller classes. Local pools are used for in-water training with survival equipment or protected ocean waters used where no pools are available as is often the case in Western Alaska.

AMSEA also keeps an extensive training inventory of equipment for use by instructors which includes 146 immersion (survival) suits, 12 liferafts and many other types of marine safety equipment. This equipment keeps our community-based instructor network supplied with training equipment so that hands-on training can be delivered in fishing ports.

TRAINEES

Training in this project took place on three levels:

Level 1. *Drill Instructors* (DI): 1,338 trained

Drill Instructors actually provide the monthly emergency drills on fishing vessels. Generally speaking, these trainees are fishermen who are certified to give the federally required drills training to their vessel's crew. Ideally, each documented fishing vessel in Alaska would have its own DI as a member of its crew. There were about 6,500 documented fishing vessels in Alaska, but that number has declined to about 5,500 during this project period. Many of the more safety conscious fishermen have been trained, and more effort is needed to recruit those fishermen who do not see the need for training.

During this five-year project period, 1,338 fishermen were trained in 133 classes in 41 separate fishing ports. (Previous to this project period 2,800 were trained.) Some of the ports were given multiple courses due to their size and interest. All of the following ports have given DI training in Alaska except where noted. The number next to the port name indicates the number of courses held there during the project period.

Nome	Kodiak (15)	Dillingham (2)	Port Angeles, WA.
Girdwood	Sitka (28)	Ketchikan (6)	Dutch Harbor (3)
Valdez (4)	Tenakee Springs	Haines (2)	Juneau (5)
Petersburg (11)	Homer (6)	New Stuyahok (2)	Seward (6)
Clark's Point (2)	Nelson Lagoon	Crescent City, CA. (2)	
Neah Bay, WA. (3)	Levelock	Port Townsend, WA	Egegik (2)
Hoonah	Cordova	Wrangell (2)	Anchorage (3)
Togiak	Aleknagik	Thorne Bay (2)	Port Heiden
Sand Point	Chignik Lake	Hydaburg (2)	Pilot Point
Fort Bragg, CA. (2)	Westport, WA. (2)	Elfin Cove	Whittier
Edna Bay	Manokotak		

It is important to note that many of these fishing ports are extremely remote. The only way to travel into the port is by plane. Airfare in Alaska is cost prohibitive for many fishermen to attend centralized training.

A recent unpublished study by the NIOSH DSR field office in Anchorage, Alaska (Lincoln et al) used methodology developed in the Perkins study of 1995 to determine the difference in survival rates between trained and untrained fishermen. The Perkins study found a positive relationship between safety training and surviving a casualty at sea (p=0.034). The latest study by Lincoln et al, which included the years 1991 to 1999 (appendix three), found that there was still a positive relationship (p=0.05), but only if the event occurred within 5 years of training (see appendix).

The Lincoln study discovered that survival due to safety training was linked to the recency of the training. This study demonstrates the need for increased efforts in retraining DIs, since it is apparent that the cognitive and psychomotor skills initially learned during the training have a limited retention rate. This is further demonstrated by the fact that it appears that fishermen are not often actually conducting their required monthly drills. On a survey of drills being conducted on vessels that have fisheries observer coverage, only 17% of the vessels were observed conducting monthly drills. Many anecdotal examples also exist which point to the lack of emergency drill training being conducted. Since monthly emergency drills are not being conducted, fishermen are not getting the reinforcement that is needed for skills such as speedily donning immersion suits. U.S. Coast Guard casualty reports have shown that these skills have an effect on survival in a sudden emergency at sea.

Post course evaluations were conducted by instructors to obtain feedback on the DI course. The overwhelming majority of student responses were very positive. Therefore the class is being well received by fishermen who take the training. Some examples of typical responses to the training were:

Very hands on and realistic!

I feel like I am more prepared for an emergency now.

I thought that this was an excellent course. Learned some very important basic functions.

Also exit surveys were conducted which asked fishermen "what changes will you/ have you made in your operations to make it safer as a result of this training". Almost all participants mentioned improvements in safety equipment and procedures that they would make after the class. In almost every DI class that is taught, unknown deficiencies were discovered in fishermen's survival equipment that they were unaware of and then corrected. It is impossible to quantify the

number of lives this may have saved in an emergency, but the frequency that this uncovered is significant.

Level 2. *Marine Safety Instructor-trainers* (MSITs): 154 trained
These MSITs are the core of the program and either teach or help facilitate Drill Instructor classes in fishing ports. Twelve MSIT courses were held in the Alaskan ports of Sitka and Seward over the project period. One of these courses was held in Barrow for the Alaska Native captains of subsistence whaling vessels. Another course was held in Seattle for the trainers of commercial fisheries observers from all coasts of the U.S.

In addition, 8 MSITs went through MSIT refresher training during this period to update their teaching skills and subject content knowledge. The course evaluations for the MSIT courses was overwhelmingly positive. Some students have stated that this has been some of the most effective professional training they have taken.

Despite the positive feedback, during this project period an independent evaluation was made of this train-the-trainer MSIT course and new improvements were made to the design and delivery which have proven very effective.

Level 3. *Drill Instructor Refresher Training*: 76 trained
A new level of training was to take place under this project, that of refresher training for DIs. During this period, 76 DIs took refresher training in 25 classes. Man overboard and stability topics were emphasized in the sections of the course for people being refresher trained. Often, these previously trained DIs chose to participate in either all or parts of a regular DI course instead of a separate refresher class. This was an efficient delivery mechanism, but has the effect of making it seem as though there were small numbers trained per class.

Refresher training of DIs has proven difficult to promote and recruit. A main problem has been the lack of any requirement for refresher training for Drill Instructors by the Coast Guard. Currently, once you are trained in a 10- or 18-hour DI course, no refresher or retraining is required. This is despite the fact that the Lincoln study has evidence of survivability decreasing the longer it has been since receiving initial training.

CONCLUSIONS

Several conclusions can be drawn from this project. One is that there is a continued need to train MSITs. Turnover in Alaska is high. It is a highly geographically mobile population and people also frequently change careers.

Another conclusion is that the number of DIs being trained is decreasing due to the lack of enforcement of the drill training requirement by the Coast Guard, the agency responsible for fishing vessel safety. In the past year however, there have been efforts within the Coast Guard and from the Commercial Fishing Industry Advisory Committee to increase enforcement in this area.

There is also evidence of a need to make refresher training more available, and promotional efforts will continue to be made in this area. The Lincoln study will be used to further promote refresher training within the fishing industry. The study will also be used to promote the need for refresher training within the Coast Guard, when it is considering what further efforts it needs to make in fishing vessel safety training. Alternative ways to deliver refresher training will be Investigated.

The training funded by this project has helped to reduce the rate of fatalities in Alaska. Alaska has seen some of the most dramatic reductions in the nation. The single leading cause of fatalities in commercial fishing in the U.S. since 1995, is no longer capsizings in Alaska. In three of the five years of this project period, Alaska did not lead the nation in fatalities per Coast Guard district. This is a historical first, as for many years Alaska led all Coast Guard districts in fatalities.

Maine is consulting with AMSEA to help the state establish its own community-based training network similar to Alaska's. They are interested in delivering training to ports in the Northeast, which in contrast to Alaska has seen a rise in fatality rates, due in part to the fact that little or no safety training is available. Therefore there is a opportunity to see if this Alaska-based program can serve as a model program for other parts of the nation.

The recent sinking of the Seattle based F/V Alaska Rose in Alaska waters with the loss of 15 lives was the worst commercial fishing loss of a U.S. fishing boat in Alaska for at least 50 years. This casualty highlights the need to continually promote and make safety training available. The difficulty in delivering training to a crew that hails from all over North America, makes it imperative that safety training spread to ports outside Alaska, especially ports that recruit fishermen for Alaska waters. At the same time it is important to train the itinerate fleet that resides in Alaska. Perhaps most important of all, will be the need to increase marine safety training efforts in the schools, and develop the safety consciousness of young people who will make up the next generation of fishermen. Long term NIOSH support has allowed AMSEA to build the expertise, instructor network and continuity to keep this training available to fishers.

LIST OF PUBLICATIONS

During this project period the following publications were printed:

Books:
Methods of Instruction. AMSEA. Sitka, AK. 2001. 38 pages.

Outdoor Adventures: A K-12th grade curriculum on marine safety. Dzugan, Jensen, et al. AMSEA. Sitka, AK. 1999. 1st edition, 772 pages. 2000. 2nd edition. 624 pages.

AMSEA Marine Safety Instructor-Training Manual 6TH (1997) and 7th edition (1999).

Spawn, Spat, and Sprains A Manual for Aquaculture Safety in Alaska, Jerry Dzugan and Dan Falvey. University of Alaska Sea Grant College Program. Fairbanks, AK. 1998. 84 pages.

Periodicals:
Dzugan, J. (2001). 'Fishing Vessel Fatality Causes and Man Overboard,' *Proceedings of the Marine Safety Council.* Volume 58, number 2, page 69.

Marine Safety Update, AMSEA. Sitka, AK. 20 issues, 10- to 12-page periodical on marine safety issues.

Conference Proceedings:
Dzugan, J. (2000). *A Port-Based Fishing Safety Instructor Network, and the 2nd Follow up Study on the Effects on Fishing Fatalities.* IFISH Conference, Woods Hole, MA. October 23-25, 2000.

Dzugan, J. (1998) *Cross Cultural Communication in Maritime Communication.* International Maritime Lecturers Association Conference, St. Malo, France September 14-18, 1998.

Thesis:
Dzugan, Jerry (1998) *An Investigation into Multicultural Communication and its Effects on MaritimeSafety: Implications for Maritime Trainers.* Master of Science thesis. Malmo, Sweden: World Maritime University.

APPENDIX 1

Board Members of the Alaska Marine Safety Education Association
8/29/01

VOTING MEMBERS
Jim Herbert- President AVTEC PO Box 889 Seward, AK 99664
Ph: 224-4174 / Fax 224-3380 james_herbert@eed.state.ak.us

Dolly Garza- Vice President Marine Advisory Program 2030 Sea Level Dr. Suite 352 Ketchikan, AK 99901 Ph: 247-4978 / Fax: 247-4976 ffdag@uaf.edu

Don Lane- Sec. Treasurer_North Pacific Fishermen's Assn. PO Box 2921(home address/phone) Homer, AK 99603 Ph: 235-7898 / Fax: 235-7898 drl@xyz.net

Paula Cullenberg- North Pacific Fisheries Observer Training Center
707 A St. Ste 207 Anchorage, AK 99501-3600 Ph: 257-2770 / Fax: 257-2774
anpjc@uaa.alaska.edu

Shawn Sorrenson_SEARHC-Environmental Health 222 Tongass Dr. Sitka, AK 99835 Ph: 966-8741 / Fax: 966-2489 shawn.sorenson@searhc.org

John Winther/ Gerry Merrigan_Petersburg Vessels Owners Assn.
PO Box 1364 Petersburg, AK 99833 Ph: 772-4734 / Fax: 772-3048
pvoa@alaska.net (INACTIVE)

ADVISORY MEMBERS (non voting)
Martha Moore_Alaska DHSS-CHEMS Section PO Box 110616 Juneau, AK 99811-0616 Ph: 465-8631 / Fax: 465-4101 Martha_Moore@health.state.ak.us

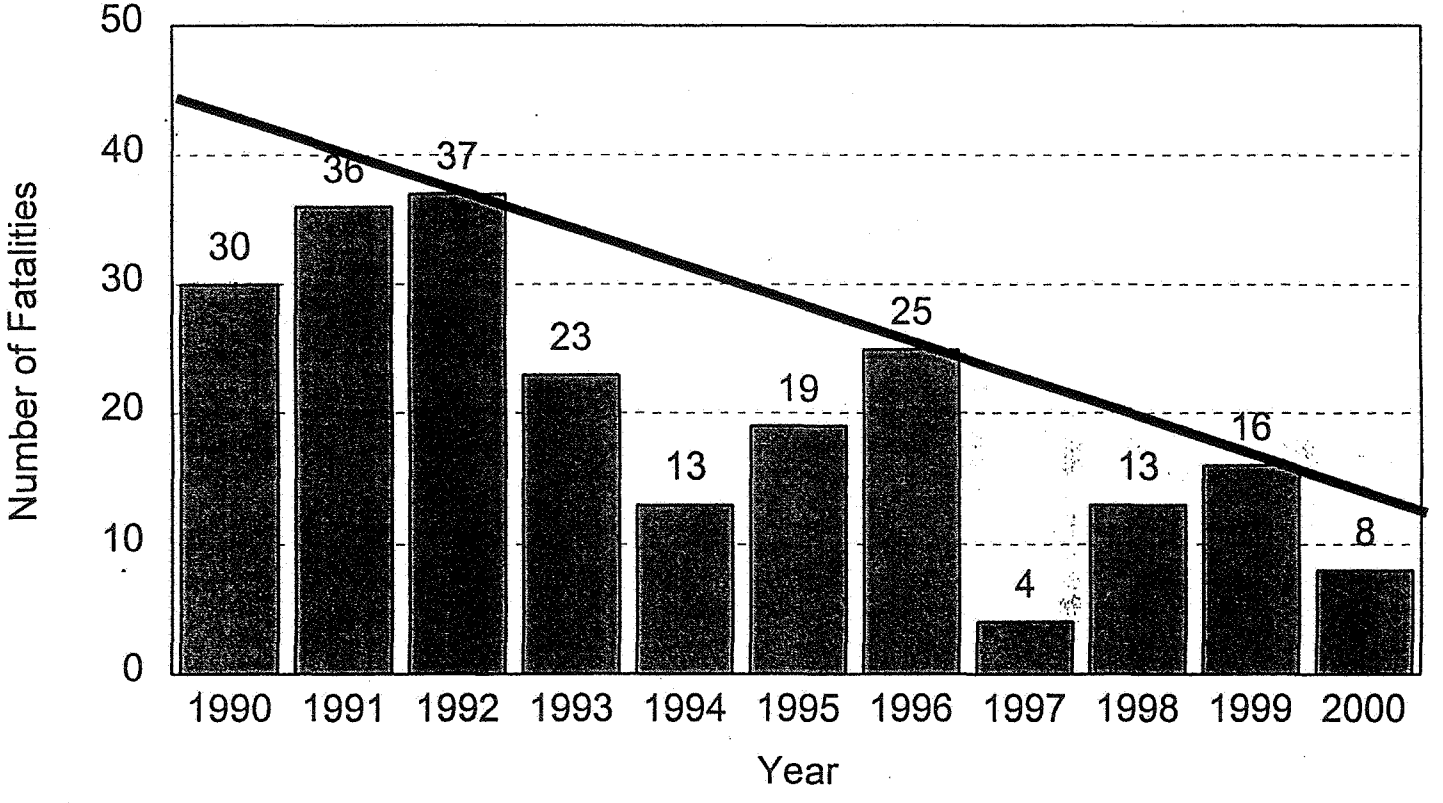
Jennifer Lincoln_NIOSH – DSR 4230 University Drive Grace Hall, Ste 310
Anchorage, AK 99508 Ph: 271-2383 / Fax: 271-2390 jxw7@cdc.gov

Sue Jorgensen_17th District MOC PO Box 25517 Juneau, AK 99802-5517
Ph: 463-2810 / Fax: 463-2820 sjorgensen@CGAlaska.uscg.mil

Sue Hargis 17th District MOC PO Box 25517 Juneau, AK 99802-5517
Ph: 463-2297 / Fax: 463-2256 shargis@CGAlaska.uscg.mil

Hank Pennington_Technical Advisor PO Box 22 Chiniak, AK 99615Bedrock, CO 81411 Ph: 486-2893 Fax: 486-2944 hjpenn@ptialaska.net

Commercial Fishing Fatalities by Year, Alaska, 1990-2000, n=224



EVALUATION OF A COMMUNITY-BASED EMERGENCY TRAINING PROGRAM FOR COMMERCIAL FISHERMEN

Jennifer M. Lincoln, Ron Perkins*, George A. Conway
CDC, NIOSH, DSR, Alaska Field Station. Anchorage, Alaska USA
*Alaska Injury Prevention Center, Anchorage, Alaska, USA

PROBLEM UNDER STUDY: Working conditions in the Alaska commercial fishing industry are very hazardous and factors associated with commercial fishing deaths are complex. Fishing gear type, fatigue, and environmental conditions contribute to the severity and frequency of these incidents. However, from 1990-1999, due to new regulations and concerted efforts by government and industry groups, Alaska experienced a 61% decline in commercial fishing deaths. This has been due largely to reducing deaths after an event has occurred, by fishermen being able to stay afloat and warm using immersion suits and life rafts, and by being able to locate them through electronic position indicating radio beacons (EPIRBs). This emergency gear has been a requirement of the Commercial Fishing Industry Vessel Safety Act (CFIVSA). The CFIVSA also requires that fishermen conduct emergency drills on their boats, and that the person conducting the drill be certified to do so.

The Alaska Marine Safety Education Association (AMSEA) provides US Coast Guard (USCG) approved drills training for fishermen. AMSEA's goal is to reduce loss of life and injury due to hypothermia and drowning in cold water environments, through public education and training. To date, more than 4,000 fishermen have participated in the Marine Survival, Equipment, Procedures and Onboard Drills Course. This is a hands-on training course that combines didactic and in-water training to demonstrate this equipment during the course. Topics covered in the course include: liferaft and EPIRB deployment and maintenance, making emergency mayday calls, immersion suit usage and maintenance, conducting emergency drills, and cold water survival skills.

In 1995, a study was published examining the effectiveness of this training. The study showed that from 1991-1994 this course had an effect in reducing drownings among commercial fishermen in Alaska (p=0.034) (Perkins, 1995). We now have data from 1991-1999 to update this study.

OBJECTIVES: We have two objectives for this study: to determine if AMSEA training is effective in preventing drownings and to determine if there is an interval at which this training should be repeated.

METHODS: All USCG casualty reports for vessels either capsizing or sinking were examined and a list made of all victims and survivors of these events. This list was manually compared to the list of AMSEA drills course participants to determine if the individual involved had received AMSEA training and when the training occurred. We then analyzed this information on an incident rather than an individual basis because one AMSEA-trained person could save the entire crew. Only cases in which every person on board the vessel could be identified were included in the final analysis.

RESULTS: There were 660 fishermen involved in 234 separate incidents. Of these, 66 were fatal events and 168 were non-fatal. Eleven of the fatal events had an AMSEA-trained person onboard and 44 of the non-fatal incidents had a trained person onboard. We were able to show that training is effective ($p<0.05$) in saving lives if the event occurs within five years of training. But we could not show an effect if the training to incident time period was greater than five years.

CONCLUSION: Based on the results of this study, more frequent drills training may be needed to maintain training effectiveness.

LIMITS: We could not ascertain the AMSEA training background of all fishermen involved in all fishing casualties that occurred during this time interval. Also we could not determine if perhaps fishermen received safety training through other training centers. We also couldn't factor in how often fishermen conduct drills on their boats to keep these skills fresh.

CONTRIBUTION OF THE PROJECT TO THE FIELD: There hasn't been any other evaluation study published on the effectiveness of marine safety drills training. Drills training is a requirement of the CFIVSA and is an element

in other commercial fishing safety programs throughout the world. This study not only further confirms that this training is effective, but also shows that refresher training should be done.

References

Perkins R. Evaluation of an Alaskan marine safety training program. Public Health Reports, 1995; 110: 701-2.