FINAL PROGRESS REPORT

Alaska Marine Safety Education Association
Sitka, Alaska 99835

Commercial Fishing Safety Training
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ABSTRACT

The five years of this project has allowed AMSEA to continue to provide and refine marine safety training to commercial fishermen in Alaska. Monthly emergency drills are required on fishing vessels over five net tons. The person conducting these drills must be trained as an EDC. The maintenance of this training infrastructure has been critical to allow fishermen in Alaska to access federally required Emergency Drill Conductor (EDC) training. EDC training has increased in every year of this current five year project.

Marine Safety Instructor-Training (MSIT) continued and expanded to further enhance the port based instructor network that can deliver this training to fishermen. The existence of this Alaskan program has also allowed other regions of the nation to use its expertise and experience to establish infrastructure in underserved portions of the U.S.

Continuing research continues to demonstrate that this training is effective in surviving an emergency at sea. Fishing fatalities have continued to maintain their 65% decrease since safety training was made available. However research has shown that the protective effects of training diminish over time, highlighting the need for refresher training.

The continuation of this program in Alaska has demonstrated to the U.S. Coast Guard the importance of marine safety training to fishermen. This has resulted in a federally proposed rulemaking that would make EDC training more enforceable. It would also result in a requirement for EDC refresher training. This marine safety education and training project has resulted in research that has in turn positively affected policy towards fishing vessel safety.

SIGNIFICANT FINDINGS - 2001 – 2006

1. Marine Safety Instructor-Training (MSIT) continued with 246 trained in 18 courses, mostly in Alaska. Four classes were also taught in Hawaii, Washington, Texas and Massachusetts to help develop training infrastructure in these areas of the nation.

2. The number of Emergency Drill Conductors (EDCs) trained in this project increased an average of 16% in every year of this project. Objectives to train at least 200 EDCs in each year of this project were exceeded by 152 to 458 people annually.

3. A total of 2,371 EDCs were trained, in 221 separate EDC courses. Most of these courses took place in 46 different Alaskan fishing ports. Outside of Alaska, 17 fishing ports were also served with EDC courses, on both the West and East coasts at no direct cost to this project. This has resulted in more than 6,400 EDCs being trained since 1993.

4. AMSEA has introduced EDC training to high risk fishing groups such as commercial dive harvesters, small rural Western Alaska Native Community Development Quota (CDQ) groups in 14 villages and five high schools located in fishing ports.

5. An average of 18 refresher courses for an average of 82 fishermen a year were conducted for a total of 89 courses and 411 fishermen refresher trained in 2001 –2006.

6. Four MSIT refresher courses were conducted for a total of 37 instructors

7. A total of 2,575 fishermen took part in other marine safety workshops.

8. A total of 5,640 people have been trained in marine safety.

9. Five marine safety DVDs were produced and translated into Spanish and Vietnamese.

10. Fatality rate 1990-1992 (pre-EDC requirement) 190/100,000; 2003-2005=92/100,000.

11. Anecdotal and casualty reports evidenced individuals who reported that training had played an important role in their surviving a casualty at sea.

12. Prior to the requirement for EDC training, the fishing industry fatality rate was 29 times the national average (pre 1993). Currently, commercial fishing has dropped to 7 times the national average (U.S. Department of Labor).

13. Commercial fishing fatalities in Alaska averaged 13 per year from 2001 to 2006, the same as the previous five years (1996-2000).

14. Research demonstrated that EDCs were 1.5 times as likely to survive an emergency than untrained fishermen, emphasizing the role of safety training, but the protective value of the training fell to the same as untrained personnel after 5 years of initial training.

15. Man overboard fatalities (25%) have not decreased although other loss causes have.

BODY OF REPORT

This project originally started in 1993. During the current phase, its objectives remain fundamentally the same. The ultimate goal of this project has been to reduce the fatality rate among commercial fishermen, who suffer the highest fatality rates of any other occupational group in the U.S. This is to be accomplished by making federally mandated Emergency Drill Conductor (EDC) courses available to fishermen to increase survivability in case of vessel loss. The 10 to 18 hour EDC training includes practice in how to effectively use survival equipment such as liferafts, immersion suits and other safety and survival equipment. It also teaches effective procedures to take in case of an emergency and how to conduct emergency drills.

Commercial fishermen have been required to conduct monthly emergency drills since 1992. Since September of 1994, the person conducting the monthly drill has been required to take a Coast Guard approved Emergency Drill Conductor (EDC) course. Alaska fishermen live in far-flung communities not connected by roads. Some of the fishing ports in Alaska are as distant as Florida is from California. In order to make this training accessible, AMSEA developed a port based instructor network. By recruiting and training EDC instructor trainers who live in fishing ports, trainers are accessible and more credible to fishermen. AMSEA then supplies these trainers with updated Coast Guard approved curriculum, training equipment, promotion and other means of facilitating classes.

Initial response to training in the early 1990s was very strong and over 1,000 EDCs were being trained per year. But a lack of Coast Guard enforcement resulted in a lower demand, despite the fact that Coast Guard casualty reports still indicated a need for this training.

The first objective of this 5 year project was to expand the Marine Safety Instructor-Trainer (MSIT) network that can deliver the EDC training to fishermen. This was needed to deal with the attrition and turnover rate of instructors in Alaska, who live in an extremely mobile part of the nation. AMSEA's 48 hour MSIT course is Coast Guard approved and was used as the model course for the national curriculum. The annual objective was to conduct 2 MSIT courses and train 16 new MSITs per year. These objectives were greatly exceeded. In the five years of this project period, an average of 3.6 MSIT courses were conducted annually and 49 new MSITs were trained per year for a total of 246 new MSITs trained in 18 courses,

The need for MSIT training outside of Alaska, in order to deliver Emergency Drill Conductor Training in other areas of the nation, was apparent as 4 of these MSIT courses were held outside of Alaska in Hawaii, Washington, Texas and Massachusetts. The state of Maine had previously funded AMSEA to conduct MSIT training to build training infrastructure in New England. This was done at no direct cost to this project and has helped establish marine safety training infrastructure on all other coasts of the nation.

The second objective was to continue to provide Emergency Drill Conductor (EDC) training to fishermen. To counter the lack of Coast Guard enforcement of this training requirement, increased promotional effects and course offerings took place over the period of this project. Emergency Drill Conductor workshops are Coast Guard approved trainings of 10 to 18 hours in length. The number of EDCs trained in this project increased an average of 16% in every year of this project. Objectives to train at least 200 EDCs in each year of this project were exceeded by 152 to 458 people trained in excess of the objective of 200 to be trained yearly. A total of 2,371 EDCs were trained in this 5 year period, in 221 separate EDC courses. Most of these courses took place in 46 different Alaskan fishing ports. However, due to the need outside of Alaska for the EDC training, 17 fishing ports were also served outside of Alaska on both the West and East coasts at no direct cost to this project. This has resulted in more than 6,400 EDCs being trained since 1992.

The availability of EDC training to fishermen during this period has been critical. At the end of this five year period, the Coast Guard has seen the need to ramp up enforcement of this requirement due to the lack of adequate training in losses of life on the fishing vessels Arctic Rose, Galaxy, Big Valley in Alaska and the F/Vs Italian Gold, Candy B II, Northern Edge and Atlanta on the East Coast. The availability of this training to fishermen and the Coast Guard's recognition of the fact that the only survivors on the Northern Edge and Big Valley sinkings were the only ones with safety training, has led to a proposed federal rulemaking being currently formulated that will seek to make EDC training more enforceable and seek to require refresher training for EDCs. This rulemaking is set to go out for public comment in the summer of 2007.

During this project, particular high risk fisheries have been targeted. For example, commercial dive harvesters who dive for clams, sea urchins and sea cucumbers, have had a high casualty rate in certain seasons. These are small vessels that work in the most dangerous weather season (fall and winter) using the most high risk harvest techniques (diving). This is also one of the last open entry fisheries (which anyone can participate in without an expensive permit) so it tends to draw fishermen who are the least capitalized. They are typically on the economical margins. AMSEA has worked with the organization that represents this group (SARDFA) to offer EDC and commercial dive safety workshops before every fishing season, for most of the years in this five year project. The main dive ports of Craig, Ketchikan, Petersburg, Sitka and Wrangell have held EDC and dive safety workshops as a result of these efforts.

In addition, in western Alaska, Community Development Quota (CDQ) groups, owned by Native Alaskans, have been allocated a larger portion of the fish resources. Thus they have been upgrading to larger vessels, fishing farther from shore and using newer fishing technology that they are not experienced with. AMSEA has seen the potential risk in this and has been very active in working with CDQ groups to incorporate this training as part of their safety program. Currently, most of the CDQ groups are working with AMSEA to ensure that safety training is an integral part of the development of these fisheries. Over 198 fishermen have been trained in EDC courses in 14 villages from three CDQ groups.

In addition, several hundred fishermen in these tiny Western Alaska villages have taken shorter marine safety workshops.

Another focus in this five year project, was to train more students in high school with active fishing ports. These young people often start fishing as crewmembers and often take up commercial fishing as a career choice after graduating. It is seen as an effective intervention to train these young people at the beginning of their career, as opposed to the middle or end of it, so safety training would be a more integral part of their occupation on the water. During this project, the high schools in Hydaburg, Kodiak, Sitka Alternative School, Valdez and the state wide "magnet" school Mt Edgecumbe, located in Sitka, have these EDC workshops embedded in their programs, and have trained 129 students.

Another part of this objective was to increase the availability of refresher training for EDCs. A study by the NIOSH Anchorage field office had demonstrated that the protective value of the training diminished after five years from initial training. Therefore it became a priority to make EDC refresher training available. This was accomplished by inviting previously trained fishermen to take portions of scheduled EDC workshops as well as offering shorter marine safety refresher workshops. The EDC refresher objective was to conduct five courses in three different locations a year. An average of 18 refresher courses for an average of 82 fishermen a year were conducted for a total of 89 courses and 411 fishermen refresher trained over the 5 years of this project.

In addition, there is a continuing need to refresher train MSITs who teach EDC courses, since the technology in marine safety and survival is changing. In the five years of this project, four MSIT refresher courses were conducted for a total of 37 instructors.

Short marine safety workshops were also held for fishermen. These usually ranged from one hour to 4 hours in length. An example would be a yearly cold water survival pool exercise in a fishing community using immersion suits, liferafts and lifejackets. A total of 2,575 fishermen took part in these safety workshops in the five years of this project.

Another objective was to keep instructional materials for instructors updated. The MSIT manual was updated into an 8th edition during this project. In addition, with additional funding resources, five marine safety videos/DVDs were created on fishing vessel safety and translated into Spanish and Vietnamese, to target these underserved fishing groups. Also safety brochures, the textbook *Beating the Odds on Northern Waters* and quarterly issues of *Marine Safety Update* were sent to MSITs to keep them updated on marine safety issues and topics.

From 2001 to 2006, a total of 5,640 people have been trained in fishermen's marine safety courses. This project is just not about survival and rescue. In addition, many deck safety and fishermen's health issues were discussed during training and in published articles which accessed thousands of other commercial fishermen.

CONCLUSIONS

From 1990-1992, the immediate years before the project was initially started, the fatality rate in Alaska commercial fishing was 29 times the national average. Currently, commercial fishing has dropped to 7 times the national average (U.S. Department of Labor). The pre-EDC training requirement three year fatality rate from 1990-1992 was 190/100,000. The most recent three year (2003-2005) fatality rate is 92/100,000 (NIOSH). There are many possible reasons for this decrease, including safety equipment requirements, enforcement, training, reduction in at-sea days fishing and change in safety culture. Because of the interrelatedness of these issues, it is difficult to attribute how much a single intervention has positively affected safety, but robust attempts have been made to quantify the effect of safety training.

The most recent five year period has been critical for fishing vessel safety training. Coast Guard headquarters enforcement of training and equipment requirements was sporadic, weak and confusing at times. Without the efforts of AMSEA working with local Coast Guard personnel in Alaska, and NIOSH support, there would have been little training infrastructure left for fishermen to access. Despite this, AMSEA managed to increase the number of people trained in safety procedures in every succeeding year of this project.

Despite this lack of federal leadership, during most of the five year period of this project (2001 – 2005) the number of commercial fishing fatalities in Alaska averaged 13 per year, the same as the previous five years (1996-2000). The loss of one vessel, the F/V Arctic Rose with 15 lives, accounted for 23% of all the fatalities in this most recent five year period. This highlights how the loss of one vessel can alter averages.

In the five years before 1993, before training requirements were in place and before this project was started, the average number of commercial fishing fatalities in Alaska was 37 per year. Thus the last five years have seen a continued 65% reduction in fatalities compared to the pre training period before 1993. In fact, in two years of this project (2003 and 2004) the number of fatalities was in single digits. This had only happened in two previous years since statistics on fishing had been compiled. This continues to be the largest sustained decrease in fishing fatalities in any part of the nation. It is also significant that Alaska has the most developed infrastructure of any part of the nation thanks in part to NIOSH support.

A number of studies have looked at the effectiveness of this training on Alaska fishing fatalities. In 1995, Perkins looked at the initial1,518 people trained as EDCs by AMSEA from 1991 to 1994, and found a significant positive correlation ($p= 0.034$ between being EDC training and surviving an emergency at sea, compared to an untrained group.[1]

In 2001, after an initial 4,000 EDCs had been trained, The NIOSH Anchorage field office conducted an ongoing follow up study and determined that an AMSEA trained EDC was 1.7 times more likely to survive an emergency at sea, than a non-trained person.[2] This

was not as statistically significant as the Perkins results but was expected since trained fishermen had been working at sea much longer from the date of their initial training and were therefore more exposed to risk for a longer period of time. In addition, Cullenberg had demonstrated that emergency drills were not being practiced on most fishing vessels and thus skills were deteriorating.[3]

Rigorous attempts have been made by Jennifer Lincoln, Ph.D., of the Anchorage NIOSH field office, to quantify the effect safety training has had on fatality rates. In 2001 a continuation of the NIOSH study demonstrated that training was effective ($p<0.05$) in saving lives but only if the event occurred within 5 years of training.[4] Outside of five years, no effect could be demonstrated. This study highlighted the need for refresher training. This study continued for five more years examining more than 10,000 EDCs trained in the Pacific Northwest, and was part of Jennifer Lincoln's as yet unpublished Ph.D. dissertation in 2006. The dissertation reconfirmed that trained EDCs were 1.5 times as likely to survive an emergency than untrained fishermen, and also reconfirmed that the protective value of the training fell to the same rate as untrained personnel after 5 years of initial training.

Throughout this five year period, interviews conducted with survivors and Coast Guard casualty reports have noted that the EDC training was credited as helping crewmembers survive a casualty. It is not known however, how the training has helped fishermen be more aware and less tolerant of risks, or prevented them from even being involved in a casualty.

Based on the results of these studies, more frequent drills refresher training may be needed to maintain training effectiveness. In addition, better at sea enforcement of monthly drills conducted by qualified EDCs is needed. Both will increase the demand for this training. However, without the maintenance of a marine safety training infrastructure in Alaska, there will be no accessibility for fishermen, even if more rigorously enforced. Nor will other regions of the nation be able to start their own training infrastructure by drawing on the experience and expertise that AMSEA has gained in this field for the past 22 years of its work with commercial fishing safety.

There is more work to be done in fishing safety. For example, it is significant that fatalities from all causes of fishing fatalities (capsizings, sinkings) have fallen, expect for man overboards, despite safety requirements and training.[5]

Commercial fishing is one of the oldest professions in the nation. The health of fisheries, especially in Alaska, indicates that it will be around as a profession into the foreseeable future. However, the nature of safety issues confronting this industry are as dynamic and changeable as the ocean itself. This project has allowed a training network to be sustained

that has been able to respond to the changes in the industry that have a resultant effect on safety.

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[2] Lincoln J, Perkins R., Conway G., *Evaluation of a Community-Based Emergency Training Program for Commercial Fishermen.* Unpublished paper. 2001.
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[4] Dzugan, J. *A Port-Based Fishing Safety Instructor Network, and the Second Follow-up Study of its effects on Fishing Fatalities (1995-1999) in Alaska.* Proceedings of the IFISH Conference. Woods Hole, MA. USA Oct. 23-25, 2000.
[5] Lincoln, J., *Presentation to the Commercial Fishing Industry Vessel Safety Advisory Committee.* Washington, D.C. September 12, 2006. Washington, D.C.

LIST OF PUBLICATIONS RESULTING FROM GRANT

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2. Dzugan, J. *Marine Safety Update*. Quarterly periodical 2002-2006
3. Dzugan, J. *Responding to Dive Emergencies*, Brochure. 2005
4. Dzugan, J., Sherrodd, K., *Boating and Fishing with Children in Alaska*. Brochure. 2005.
5. Dzugan, J, *AMSEA Marine Safety Instructor-Manual*, AMSEA 8th edition, 2005.
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7. Dzugan, J. *Is Safety Training in Alaska Commercial Fishing Effective?* Proceedings of the 2nd Annual Regional National Occupational Research Agenda (NORA) Young/New Investigators Symposium. Salt Lake City, Utah. April 15-16, 2004.
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11. Dzugan, J. et al *Surviving Outdoors Adventures*, Volume 1-4, Alaska Sea Grant, 2002
12. Dzugan, J, *Alaska WaterWise*, a recreational boating safety curriculum for the Alaska State Boating Office, 2nd edition 2002.
13. Dzugan, J : Produced, scripted, directed and coordinated five videos/DVDs on commercial fishing safety. *Beating the Odds- Emergency Onboard Drills- 2002; Rescues at Sea- 2003; A Matter of Survival- Use of SOLAS Liferaft kits- 2004; Defensive Diving- A Guide to Commercial Harvest Diving- 2005; Fishing Vessel Stability-* 2006. All translated from English to Spanish and Vietnamese.
14. Dzugan J, Jensen, S, *Beating the Odds on Northern Waters: A Guide to Fishing Safety*. Alaska Sea Grant, 5th edition. 2004
15. Dzugan, J, *A Port Based Fishing Safety Instructor network, and the Second Follow Up Study of its Effects on Fishing Fatalities (1995-1999) in Alaska*. Proceedings of the (2nd) International Fishing Industry Safety and Health Conference (IFISH). 2002
16. Dzugan, J., Sherrodd, K. *Seven Ways to get Hurt (or Killed) While Commercial Fishing in Alaska*. Brochure. 2002.

Also, numerous articles written and published in commercial fishing industry media.