Final Training Program Grant Report (Closeout Report)
NIOSH Grant # 5T03/OH008631-11
Grant Period: July 1, 2011 – June 30, 2016

Alaska Marine Safety Education Association (AMSEA)
Commercial Fishing Safety Training
Non-Academic Training Program

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ABBREVIATIONS

AMSEA: Alaska Marine Safety Education Association

CFSAC: Commercial Fishing Safety Advisory Committee

EDC: Emergency Drill Conductor

Fishermen: All the fishermen referred to in this report are commercial fishermen or women. The term "fishermen" is preferred to reference both genders in this industry.

F/V: Fishing vessels. All the fishing vessels in this report are commercial fishing vessels.

FY: Fiscal Year

FTE: Full Time Equivalent position

MSIT: Marine Safety Instructor-Training

NIOSH: National Institute for Occupational Safety and Health

PI: Principal Investigator

USCG: United States Coast Guard

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Final Close Out Abstract: Commercial fishing has continually been one of the most hazardous occupations in the USA. This is due primarily to vessel disasters and man overboard incidences with contributing factors such as severe weather, strenuous labor, long hours, and vessel instability. AMSEA's Commercial Fishing Training Program has helped reverse this public health fatality trend through training *12,724* mariners in survival equipment and emergency procedures. AMSEA has documented 86 fishermen who have taken the training and survived an emergency at sea during this five-year grant period. Training was held in 24 coastal states and US territories (156 communities) from New England to American Samoa, Florida Keys to Barrow Alaska, the Great Lakes to the Gulf Coast.

Over the 5-year grant period July 1, 2011-June 39, 20160 AMSEA's programs emphasize performance based, hands-on training in using safety equipment and implementing emergency procedures. Over 925 classes were held. Approaches for mitigating the high fatality rates in fishing occupations were met by leveraging multiple funding sources to maximize this NIOSH funding to help AMSEA exceed original objectives to train 9,859 but instructed an additional 2,865 trainees. cumulative results:

1)Marine Safety Instructor Training (MSIT): a six day, 48/hr. intensive "train the trainer" course that broadens the network of US port-based instructors with fishing experience, knowledge of the local area and familiarity with local fishing risks. Instructors utilize effective methodologies in training fishermen and demonstrate drills using marine safety equipment (personal floatation devices, immersion suits, life rafts, flood control, fire and emergency signals.) Nationally, 195 people were trained as Coast Guard accepted instructors. Original objective was to train 240.
2) Emergency Drill Conductor (EDC) Training: Certified MSIT instructors deliver workshops (required by the Coast Guard) to fishermen in 24 states and territories. Workshops offer field training to maintain and use survival equipment and best practices in conducting monthly vessel emergency drills. EDC was delivered to 7,282 fishermen through 693 classes. The original objective was 4,600.
3) Specialized Marine Safety: Specific hands-on workshops on vessel stability, emergency messages, damage control (fire and flooding) cold water survival skills, etc. Courses were provided to 4,445 people. The original objective was for 2,300.
4)EDC & MSIT Refresher: There is documentation that shows refresher courses curtail the erosion of skills and ability to implement survival procedures. 802 people received these courses in EDC (731) and MSIT (71). The original goal was to train 2,719. This is not yet a mandated course, thereby by decreasing participation. USCG rules will require this training every 5 years.

Fishermen evaluations overwhelming reflect plans to focus on risk prevention and intention to practice on-going safety drills. From 2012-2015 compared to the prior four years, NIOSH has shown a 32% reduction in national fatalities for "fishers and related fishing workers" and remarkably for the first time in Alaska, no one in died commercial fishing in a vessel-related incident in federal FY15. This is a contrast from the period of 1980-1988, where an average of 31 fishermen died in Alaska annually.

HIGHLIGHTS/SIGNIFICANT OUTCOMES

AMSEA's Commercial Fishing Training Program (July 1, 2011-June 30, 2016) trained 13,132 mariners in survival equipment and emergency procedures. This project has a national scope and takes place on all coasts of the US. Training was held in 24 coastal states and US territories (156 communities) from New England to American Samoa, Florida Keys to Barrow, Alaska, the Great Lakes to the Gulf Coast. Marine Safety Instructor Training (MSIT) training has built and reinforced a national network of fishing vessel safety instructors who can provide required safety training to their own or nearby fishing ports. This effort has focused on underserved areas of the nation and on underrepresented populations of fishermen. The total cost per person trained during the five-year project is $38.63. The total original grant award was for $491,560 (including administrative and non-training expenses).
$491,560 / 12,724 = $38.63

In the five years of this project period, over 70 US fishermen survived a disaster at sea after being trained in AMSEA courses. This is an average of one survivor for every month of this project. In addition, it is logical to assume that many uncounted surviving crewmembers were also assisted in the emergency by the trainees of this program who know how to operate the emergency gear and were given proper emergency procedures and direction. During the first four years (2012-2015) of this project compared to the prior four years, NIOSH has shown a 32% reduction in national fatalities for "fishers and related fishing workers[1] ." The period of this CDC/NIOSH Training Grant Program has shown the greatest decrease in fishing vessel losses since modern records have been kept.

During federal fiscal year 2015, Alaska, who produces over 50% of US seafood, had zero vessel related commercial fishing fatalities. "Vessel related" fatalities refer to sinking, capsizing, fire and man overboard situations. Although six commercial fishing boats sank in the summer of 2015, no one was killed. This is the second straight year of zero commercial fishing fatalities that were vessel related. This is a significant reduction as compared to the 30-40 Alaska vessel related annual fatalities of the 1980's. NIOSH data may show a few illness/drug overdose/suicide fatalities during this time period, but these are not specifically vessel related and we do not run a health/drug/suicide prevention/intervention program here. There was one commercial fish dive harvest fatality in Kodiak last Fall but it was not vessel related. The sinking of the FV Alaska Juris with 46 crew (all survived) shows that risk always exists.

External evaluation has shown the curricula and pedagogy specific to the target population of fishermen are effective. Fishermen course evaluations overwhelmingly reflect plans to focus on risk prevention and intention to practice on-going safety drills, indicating a plan to change behavior to implement preventative measures in marine safety.

During this project period AMSEA has had our MSIT workshop submitted to the Coast Guard and accepted for another five-year period. In addition, AMSEA has published a new and updated MSIT curriculum for use in these workshops.

[1] Bureau of Labor Statistics, Census of Fatal Occupational Injuries. Data retrieved from: http:www.bls.gov/iif/oshcfoi1.htm

OUTCOMES/ IMPACT/RELEVANCE

Outcomes: (Midterm)

In the five years of this project period, this project has continued to expand and replenish the national instructor network. AMSEA has delivered training to thousands of fishermen and has developed new required and non-required safety training curriculum. This project is national in scope and takes place on all coasts of the US. AMSEA's Commercial Fishing Training Program trained 13,132 mariners in survival equipment and emergency procedures reflecting a change in knowledge and skills in marine safety procedures and protocols. This exceeded the goal for number of trainees by 25%. AMSEA expertise in training commercial fishermen has been critical to program development that is relevant to commercial fishermen.

Impact (Long-term)

Through student evaluations there is an overwhelming indication that fishermen will implement preventive marine safety practices. This behavior change will be a significant factor in further decreasing fatality rates among commercial fishermen in the nation.

Fishermen have been required to take protective training in the form of a USCG accepted Emergency Drill Conductor course since 1994. This training covers how to use safety and survival equipment to prevent fatalities due to vessel disasters and falls overboard. Most of the recommendations NIOSH lists on their commercial fishing website are emphasized in the DC training. The training for fishermen is delivered in either a 10 or 18 hour workshops. The training consists of hands on, performance based, experiential safety and survival exercises. Evaluations have demonstrated that hands-on exercises are well received by fishermen and indicate they will change their safety practices.

Relevance: Survivor quotes from this project year:

AMSEA has documented 163 fishermen who have taken the training and survived an emergency at sea. Following are just a few examples of incidents that occurred in this reporting period. These examples are taken from the Dungeness Crab fishery off Oregon which has been identified by NIOSH as one of the highest risk fisheries in the US.

A fishing vessel targeting crab experienced an engine room fire. The crew had gone through the March 2016 EDC course supported by this project in Brookings, OR. According to the captain, the crew jumped into action and knew what to do. The fire was put out quickly and didn't disable the vessel. The captain credits the training for keeping people from panicking and knowing what to do during the emergency.

Another fishing vessel was inbound to Coos Bay, Oregon (a hazardous body of water in certain conditions) when they lost propulsion and drifted into the 10 ft. breaking surf. The captain attended the AMSEA Drill Conductor course in Charleston, OR. in September, 2015. He ordered his crew to don their immersion suits immediately while he put out a MAYDAY call. Thanks to the AMSEA training, he had started wearing a life vest while crabbing. He was wearing one when the vessel capsized and pitched him and his crew into the water. The captain spent about 5 minutes in the cold water and credits the buoyancy vest for helping keep his head above water in the breaking high surf while the Coast Guard was on their way. He is an experienced fisherman who admits he never gave much thought to wearing a Personal Flotation Device while working on the vessel until he took the AMSEA class. He is now living proof that wearing one saved his life!

Section 2: Technical Report

Background: Commercial fishing has been noted by the US Department of Labor as having one of the highest fatality rates of any industry in the nation for decades. Although this rate has been falling, the most recent fatality rate according to the NIOSH website is still 39 times higher than the national average. This is a physically demanding occupation which takes place in the high risk environment of working on small vessels on large bodies of water. The large majority of these fatalities come from vessel disasters and falls overboard. The specific aim of this project is to decrease the number of fishing fatalities through training to vessel crewmembers. NIOSH data may show a few illness/drug OD/suicide fatalities during this time period, but these are not specifically vessel related and AMSEA does not coordinate a health/drug/suicide prevention/intervention programs.

Through this project (July 1, 2011-June 30, 2016), 1207 courses were offered in 156 communities in: Alaska, Alabama, American Samoa, California, Connecticut, Florida, Georgia, Hawaii, Louisiana, Maine, Massachusetts, Michigan, Mississippi, New Jersey, New York, North Carolina, Ohio, Oregon, Puerto Rico, Rhode Island, Texas, Virginia, Washington and Wisconsin. The total number of trainees for this NIOSH TPG program was 12,724.

Objectives	What was accomplished toward objectives during the 5-yr project?	Notes and Observations
1) During the 5-year project period, deliver 20 MSIT courses to 240 fishing industry workers in coastal US communities and territories.	• 18 MSIT Courses delivered, six were canceled. • 195 fishermen & fishing industry workers trained. • Trained 11% fewer people than projected.	1. The purpose of the MSIT course is to both impart safety skills and train instructors. 2. AMSEA uses USCG accepted curriculum with co-teaching opportunities with experienced AMSEA instructors. 3. AMSEA does its best to schedule classes but many are canceled due to low enrollment and other considerations. 4. MSIT trains port-based instructors across the US. This project allowed for marine safety workshops to be delivered to areas without local instructors and to underserved areas of the nation rather than being taught by direct AMSEA staff. Topics covered include: • Preparation for Emergencies • Cold-Water Survival • Sea Survival, Equipment, Procedures & Onboard Drills: Discussion, hands-on demonstrations and practice with survival equipment (EPIRBs, life rafts, flares, immersion suits, etc.) firefighting equipment, abandon ship procedures, vessel stability, USCG-assisted evacuations, vessel

		orientation, emergency instruction, and station bills. • Land Survival • Food and Water in a Survival Situation • Cold-Water Near Drowning • Methods of Instruction • Risk Assessment & Risk Management: • Cross-Cultural Communication
2) During the 5-year project period, deliver 375 EDC courses 4,600 fishermen & fishing industry workers in coastal US communities and territories.	• 693 EDC Courses delivered. • 7,282 fishermen & fishing industry workers trained. These workers are the fishing crewmembers who are required to conduct the monthly onboard safety drills. • Trained 37% more people than projected.	1. Training in 24 coastal states and US territories (156 towns) 2. Since 2010, all federally documented fishing vessels that fish beyond the boundary line must conduct monthly emergency drills. Drills must be conducted by someone with USCG accepted training to conduct these drills; AMSEA EDC is USCG accepted. AMSEA trained 7,282 people in conducting these drills. 3. The EDC course required and enforced by USCG. This demonstrates the advantage of required training versus voluntary training in terms of motivating people to participate in the training. 4. The focus is to provide training to those in the commercial fishing industry and underserved people including tribal and isolated rural citizens especially those in areas that don't have access to marine safety training and regions with high fishing related mortality rates.
3) During the 5-year project period, deliver 190 Specialty Safety Workshops 2,300 fishermen & fishing industry workers in coastal US communities and territories.	• 195 Specialty Courses delivered. • 4,445 fishermen & fishing industry workers trained. • Trained 48% more people than projected.	1. This project proposed to increase the number of fishermen trained in specialized one-day safety workshops such as stability, damage control, cold water survival etc. Many of these topics will be required in the future by the USCG.
4) During the 5-year project period, deliver MSIT and EDC Refresher training to 2,719 fishermen & fishing industry	• 802 fishermen & fishing industry workers received MSIT (71) or EDC Refresher Training (731). • This objective very fell short by 1,917 students who were projected to receive refreshers.	1. The EDC refresher training requirements of the Coast Guard are still not enforced and have yet to be written and published. Despite this, a total of 731 fishermen took DC refresher training. This was below our

workers in coastal US communities and territories.		targeted objective. This is an example of the lack of interest in safety training in commercial fishing unless it is mandated. 2. The EDC refresher mandate is expected to take several more years to become enforceable. 3. Refresher training of the marine safety instructors is important due to the rapid changes in safety and survival equipment technology that needs to be passed on to workers in the commercial fishing industry. 4. Fifteen refresher MSIT workshops (71) were held in and outside of Alaska but the project fell below projected numbers. This was negatively influenced by the lack of Coast Guard requirements, although marine safety instructor trainers are a more highly self-motivated group.
5) Development of marine safety curriculum meeting proposed USCG safety training mandates for commercial fishermen.	• Updated MSIT and EDC curriculum was field tested in workshops and revised as needed.	1. A culturally relevant curriculum is important because many fishermen have less education and many have low English literacy. Experience continues to demonstrate that fishermen are more responsive to experiential learning methodologies. 2. The PI has been working collaboratively with the USCG's Commercial Fishing Safety Advisory Committee (CFSAC) to develop objectives, lesson plans, syllabi, and standards for future safety training requirement. The final curriculum is being finalized for approval at the next meeting of the CFSAC in September, 2016. 3. Over 100 fishermen have been field-tested in portions of the new curriculum and feedback from participants have been incorporated into the curriculum.
6) Evaluation	• The educational quality of the program has been assessed from both ongoing internal sources and an external study. • This project has monitored program effectiveness through surveillance of fatality rates from	1. The focus of the 2014 Walker Study was to measure the effectiveness of the teaching methods, or pedagogy of the MSIT class. Previous evaluations focused upon the effectiveness of AMSEA training in injury prevention. 2. The study surveyed 75 active instructors who were involved with training. 47 responded to the survey (a return rate of

	USCG and NIOSH data.	63%). Key questions centered upon participants' ability to apply the trainer skills learned in the course. 80% or more respondents indicated that they were prepared in the topics of: Education Theory, Lesson Plans, Teaching Methods, AV Tools, and Cross cultural communications. 3. Student evaluation of this training program is ongoing in every workshop in this project. Written course evaluations are received from every student, and a skills proficiency checklist is used for every participant to ensure that the skills needed in the use of safety and survival equipment in a vessel emergency and checked off by a certified MSIT instructor.

PUBLICATIONS

Training Manuals

Dzugan J. Marine Safety Instructor Training Manual, 9th and 10th Edition