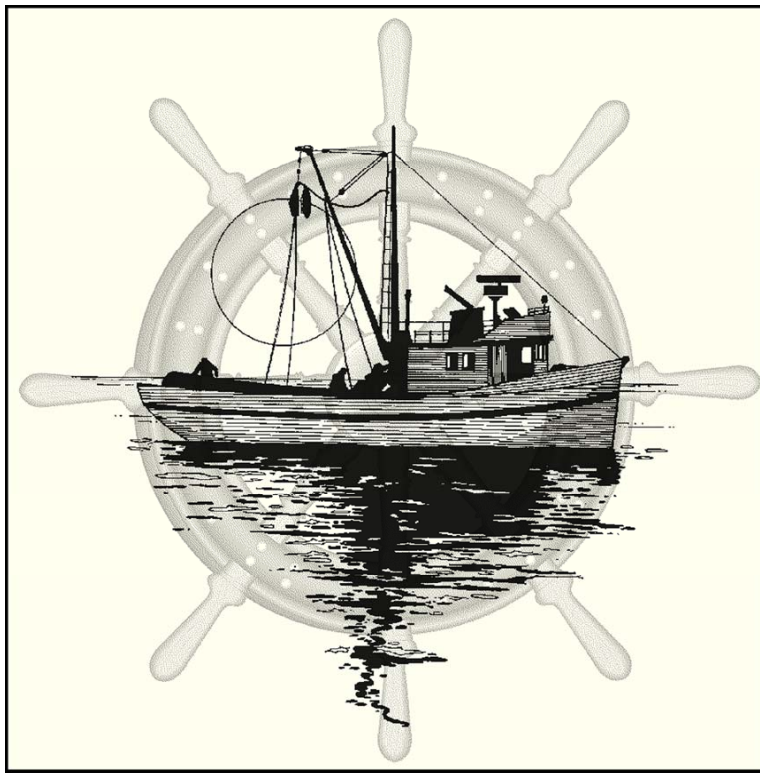


Evaluation of Alaska's Commercial Fishing Vessel Safety Program



**Alan J. Sorum MPA
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Executive Summary

Commercial fishing historically is the most dangerous occupation in Alaska. Remote fishing grounds, poor weather and cold water compound the problem. This alarming loss of life prompted congress to pass safety legislation in 1988. Alaska's Commercial Fishing Safety Program is a direct response to this legislation. The Coast Guard and other major organizations have developed a multifaceted program in Alaska. Among its components are public education, law enforcement, and voluntary dockside safety examination of fishing vessels.

This evaluation seeks to ask three questions. First, are there unrealized opportunities or deficiencies present in the current fishing vessel safety program? Secondly, has the commercial fishing vessel safety program improved overall safety? Finally, is there current research that could improve fishing vessel safety not being utilized in the current safety program? A three-part approach was made to answer these questions. The components utilized were:

- A qualitative interview conducted with fishermen and representatives of the program.
- Fishing vessel casualty and fatality data analysis.
- Review of current literature and research.

Results show strong support for the dockside safety examination program. Deaths and vessel losses have declined in Alaska since the program began. Research suggests a measurable reduction in deaths, national acceptance of some Alaska practices and the potential opportunity to predict specific dangers for Alaska's fishing fleet.

Recommendations developed in this evaluation suggest an increased focus on promoting dockside safety examinations and improved communications between the participants. Fishermen valued dockside examinations as a chance to ensure compliance with complex regulations. Coast Guard representatives favored them as an opportunity for a positive interaction with fishermen. Research shows those fishermen that were included in initial safety program planning and policy-making efforts continued later with their involvement and participation in the safety programs. Many fishermen echoed this thought. They were much more comfortable with continued regulation when they could be part of the safety related process.

Introduction - Commercial fishing has always been thought of as a dangerous industry⁵. It is the most hazardous occupation in Alaska. Poor weather, small vessels, darkness, remote fishing grounds, and cold water only compound the dangers of fishing here in Alaska. Alaska's commercial fishing industry has lost¹⁰ an average of 34 vessels and 23 lives per year for the last 15 years.

During the early 1990's, the death rate for fishermen in Alaska was 200 deaths per 100,000 workers a year. The overall rate for all workers statewide during the same period was almost 5 times the national average of 7 deaths per 100,000 workers a year¹². The United States Coast Guard (USCG) established the Commercial Fishing Vessel Safety Program to help address this tragic loss¹⁴.

Commercial Fishing Vessel Safety Program (CFVS) - The Commercial Fishing Vessel Safety Program (CFVS) is primarily an USCG scheme to improve safety in the fishing industry. A major driver for establishment of this program was the Commercial Fishing Industry Vessel Safety Act of 1988 (CFIVSA)¹⁵. The National Institute for Occupational Safety and Health (NIOSH), National Weather Service (NWS), Occupational Safety and Health Administration (OSHA) and the Alaska Section of Epidemiology are also considered major contributors to the Alaska CFVS program.

The current CFVS program is comprised of many different elements. Among these are public education, law enforcement, and voluntary dockside safety examination of fishing vessels. OSHA enforces federal standards for workplace safety. NIOSH conducts research into improving safety and offers suggestions on how to implement it⁹.

Elements of Evaluation for the Commercial Fishing Vessel Safety Program - This evaluation of the CFVS program in Alaska attempts to address three separate questions. They are:

- Are there unrealized opportunities or deficiencies present in the current fishing vessel safety program?
- Has the commercial fishing vessel safety program improved overall safety?
- Is there current research that could improve fishing vessel safety not utilized in the current safety program?

This evaluation uses several approaches to answer these questions. The first is a qualitative interview with those involved in the industry, fishermen, and USCG marine safety personnel. This effort seeks to find common thoughts on the program and hopes to identify unrealized opportunities. Secondly, a review of fishing related fatality and vessel casualty data in Alaska is necessary to see if there are any apparent trends or relationships. Finally, this evaluation reviews fishing vessel safety research to gauge the effectiveness of the CFVS program. A research review can also identify missed opportunities and strategies.

Qualitative Interview with Those Involved in the Industry - Fishermen and the CFVS program sponsors were interviewed to see if there are any unrealized opportunities or deficiencies present in the current program. The interviews provided a way to gauge the effectiveness of the program and its acceptance with those involved in it. This process also generated additional suggestions on how to improve the program

Interview Design - A six question interview format was designed to gauge attitudes and perceptions of those involved in the CFVS program. The questions were open-ended and offered the opportunity for extended discussion of pertinent topics. The interview started from a general viewpoint and worked towards specific topics. Eight people actively involved in the CFVS program and another ten people currently working as commercial fishermen were selected for interview. Constraints of time and access to those involved limited a truly random selection process. Group sampling is less important with the personnel working in the CFVS program, since the interviews covered almost all of those working within the Coast Guard's portion of the program in Alaska.

Data derived from the process is used in a number of ways. The first is identification of safety topics as developed through the interview process. Secondly, an examination to determine if there are common safety themes shared between the program sponsors and fishermen. Finally, a description will be developed that depicts the relationships that exist between the program sponsors and fishermen.

Qualitative Interview Data and Discussion of Results - Sponsor and fishing personnel were asked to recall efforts made to improve fishing vessel safety. The most common responses from fishermen were the dockside safety examinations and safety equipment required as part of the

CFIVSA of 1988. Coast Guard personnel focused entirely on training efforts that included drills, stability, and damage control.

When asked to identify the most effective subprogram being conducted, both sides overwhelmingly selected the dockside safety examinations. An interesting point was that to most fishermen the dockside exams were important because it helped them with regulatory compliance, while the program sponsor's personnel favored the exams as a chance to effectively interact with the fishing industry.

Fishermen questioned about what would be the least effective part of the CFVS program were split. Half of them had no real issues with the program and were glad to have the Coast Guard available. The majority of Coast Guard personnel focused on an overall lack of vessel on inspections. They felt there was a failure to promote more dockside safety examinations. There was also support for more extensive periodic inspections on machinery and hulls.

The fourth question in the interview was designed to gauge the understanding each party in the program might have to the other. Fishermen in general felt the Coast Guard often uses broad general regulations and tries to apply them to unique, specific conditions. Many fishermen mentioned that there needed to be a more realistic, rational approach to rule making. Regulations are easier to adopt than apply in the working world. Coast Guard personnel were concerned that fishermen should know they truly have an interest in their safety. A few people felt there could be lack of trust present between the communities and that this needed to be addressed.

Both groups were asked to identify the one rule they would impose to improve fishing vessel safety. The majority opinion of each group was to enforce mandatory dockside safety examinations of fishing vessels. The consensus was to ensure compliance on vessels prior to their leaving the harbor.

An overall observation could be made after talking to these interested participants in the CFVS program. There is support from the program sponsors and fishermen to prevent marine casualties. Both sides share more common attitudes than they might have initially believed. Saving lives and vessels can create strong bonds.

Fishing Related Fatality and Vessel Casualty Data - The Alaska District of the USCG provided information concerning all fishing vessel accidents since 1989. Ms. Sue Jorgenson, USCG CFVS Coordinator, was very helpful in describing the material. USCG personal in Valdez also contributed information specific to Prince William Sound and background on the voluntary dockside examination program.

Fatality Rate Information on Alaska Commercial Fishing Industry

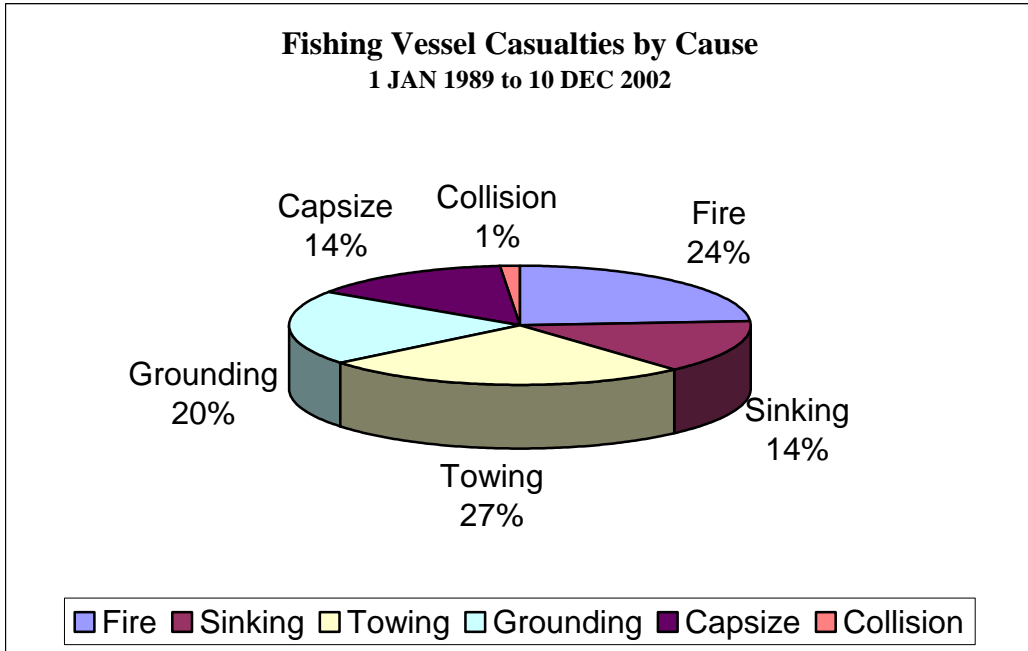
Year	Number of Vessels Lost*	Number of Persons on Board*	Number of Persons Killed*	Fatality Rate‡
1989	35	119	30	25%
1990	31	137	31	23%
1991	35	104	28	27%
1992	46	114	33	29%
1993	21	86	18	21%
1994	36	266	13	5%
1995	27	118	18	15%
1996	39	116	25	22%
1997	32	93	3	3%
1998	33	145	13	9%
1999	31	148	17	11%
2000	19	97	8	8%
2001	30	130	24	18%
2002	22	114	12	10%

*Source: USCG Alaska District, Fishing Vessel Safety Coordinator.

‡Case Fatality Rate = (number killed / number at risk) x 100.

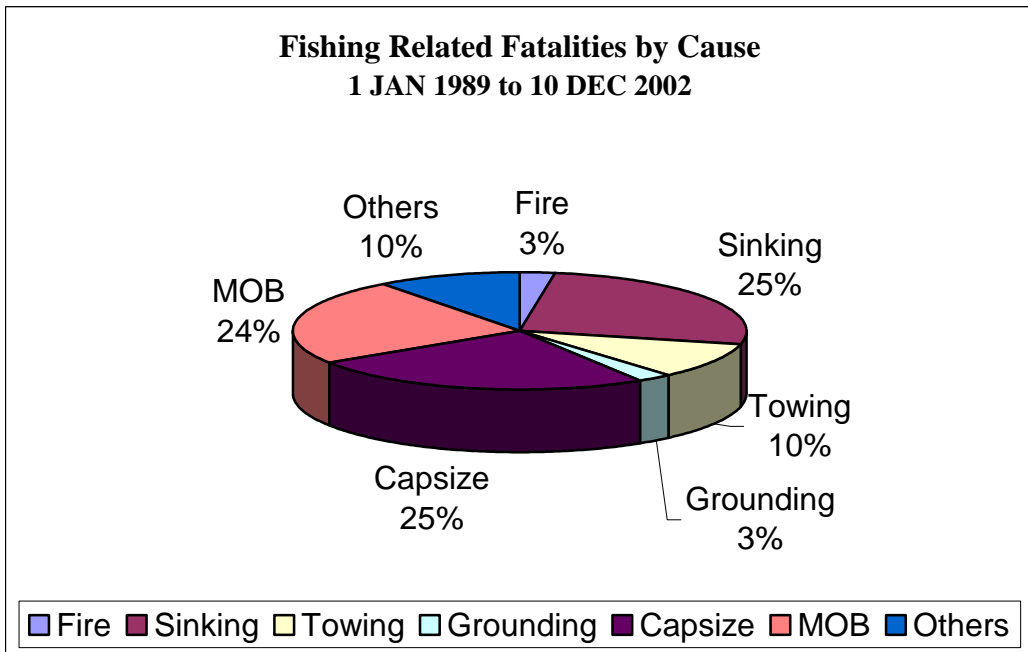
Analysis of USCG data shows vessel casualties have remained relatively constant with a mean of vessels lost at 31.2 and median at 31.5 since 1989. The number of people onboard and at risk has also been constant with a mean of 127.6 and a median of 117. The fatality rate looks at the relationship between those put at risk and the number killed in the vessel casualty. This rate has shown an improvement since 1989.

One major problem with vessel statistics is the variability of losses. The commercial fishing fleet has a wide variety of vessel sizes and if a larger vessel sinks, it can skew the totals. The sinking of the Arctic Rose greatly affected the fatality rate for 2001.



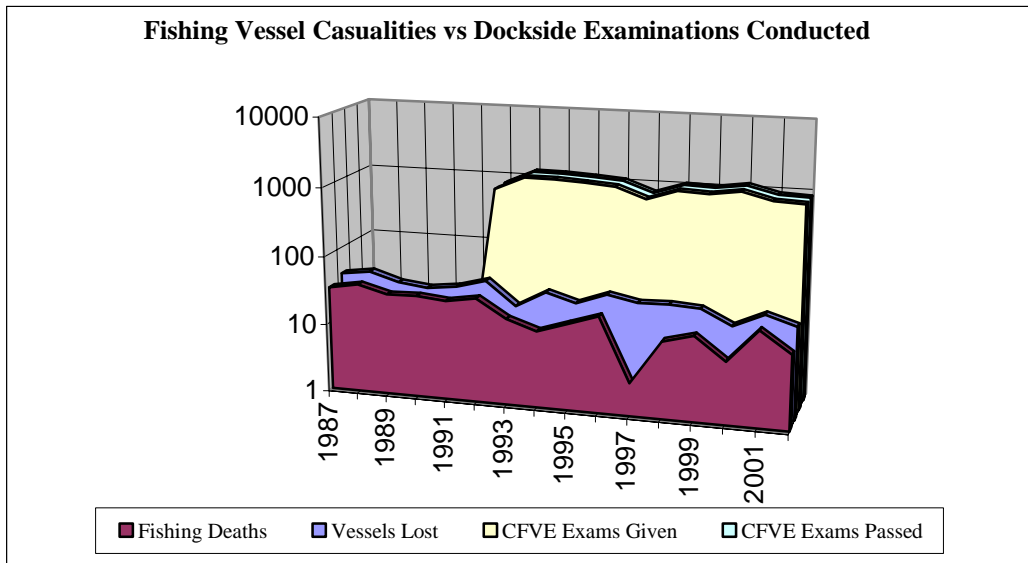
Fishing vessel casualties can be classified by cause from the USCG data set. Causes of vessel casualties include capsizing, sinking, fire/explosion, towing and grounding. Research suggests that capsizing and sinking incidents pose the greatest risk to the crew.

Fishing related deaths can also be classified by cause. Man overboard (MOB) is the major cause of death for fishermen not involved with a vessel casualty.



Sinking and capsizing comprise 50% of deaths in incidents that involve a vessel casualty.

Data was also provided by the USCG on the number of voluntary dockside safety examinations that have been conducted since the beginning of the program. The y-axis on the chart below was constructed with a logarithmic scale to allow examination data to overlay casualty information. Visually the chart shows a slight decrease in vessels lost and an apparent improvement in the total number of lives lost. This observation would match well with the CFVS



Data Source: USCG Alaska District, Fishing Vessel Safety Coordinator.

program emphasis on protecting lives after an accident has occurred. The other observation that can be gained from this data is that the total number of examinations given has remained very flat and has decreased slightly since 1994.

Research and Literature Review - There is limited research available on commercial fishing vessel safety. Related research and literature included in this evaluation came from searches of online resources, library records, USCG references and contacts with various agencies. NIOSH is the research leader in this field. Ms. Jennifer Lincoln, of the Anchorage NIOSH office, provided the NIOSH related research for this evaluation.

There are numerous and lengthy lists of recommendations available from government, education, industry and trade groups. It is apparent that many of the same recommendations have been suggested repeatedly over the years. There is no one causal factor that can be addressed to improve fishing vessel safety. Fishing vessel safety is a puzzle of competing interests and

concerns. Rather than list other researcher's recommendations, this section of the evaluation will address information directly supportive of the Alaska effort or represent information not presented at the national level.

Research conclusions can be broken into a number of related topics. These describe the effectiveness of Alaska's CFVS program or offer possible improvements to it. They include:

- The Alaska CFVS program benefits from the specific mandates implemented from the CFIVSA.
- Recent CFVS program efforts on a national scale have incorporated many of the safety concepts developed in Alaska.
- The incidence of fishing related fatalities and vessel casualties can be predicted through the use of statistical analysis. This analysis evaluates external factors that impact the fleet.
- The commercial fishing industry has experienced a measurable reduction in fatalities and vessel casualty rates.

The Alaska CFVS Program -The CFIVSA mandated a number of new requirements for safety equipment and training on fishing vessels. This included the use of immersion (survival) suits, life rafts, and radio beacons. Required training includes first aid and conducting emergency drills. Reductions in fishermen's deaths have mainly been the result of keeping them afloat and dry after they enter the water. Eighty-eight percent of all fishing deaths are caused by hypothermia and/or drowning.

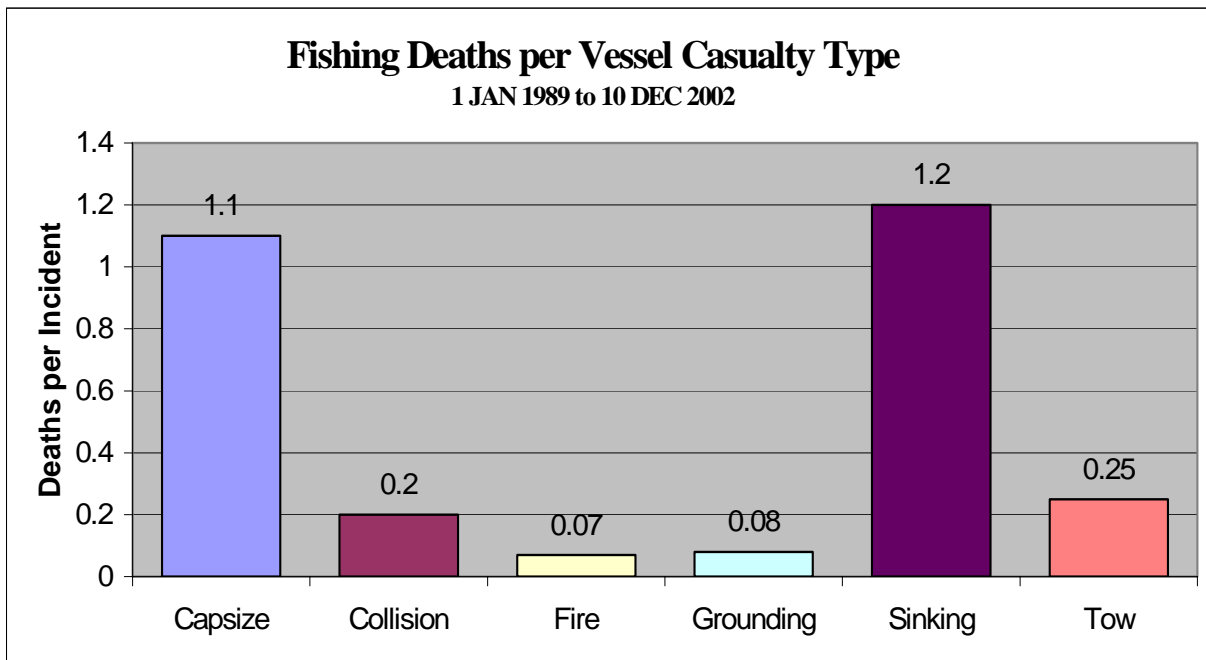
Program mandates caused a significant decline in deaths from 1991 to 1998. One criticism of the program is that lifesaving efforts are all post-accident and that not enough is being done to prevent accidents.

National Adoption of Alaska Practices - Efforts made in developing the Alaska CFVS program have contributed to national efforts to improve fishing vessel safety. The Fishing Vessel Casualty Task Force was established in 1999 to address an alarming increase in fishing accidents on the east coast. Eight Alaska NIOSH office recommendations for improving fishing vessel safety were adopted by the task force⁹.

Prediction of Fishing Related Losses - Research supports the concept that some fisheries are more dangerous than others are⁵. An example is the crab fishery in the Bering Sea. Crabbing is especially dangerous because of the poor weather typical for its season. Vessels fish for a limited amount of stock and only have a narrow fishing window. Factors like vessel size, market price of fish and experience impact safety.

One group of researchers (Jin D et al) actually developed a statistical model that predicts which fishing conditions pose the greatest risk to those involved⁵. Conclusions of the study suggest that capsizing and sinking accidents pose the greatest chance of causing a total loss of a vessel. An increase in the price of the fish harvested decreased the chance of a vessel loss. The risk of fatality is greater in capsizing and fire/explosion accidents.

Examination of the data describing Alaska’s experience shows that sinking/capsize events have the greatest risk for fishermen. This is at odds with national trends, but could be result of very cold waters.



Data Source: USCG Alaska District, Fishing Vessel Safety Coordinator.

Future efforts in the CFVS program could utilize this research method to target and attempt to reduce high-risk accidents. The methodology could accept details specific to Alaska and allow a more customized interpretation of local data. The chart above shows a death per incident rate for

various casualty types. It is apparent that accidents placing fishermen in the water are a major risk factor.

Recommendations - The Alaska effort to improve fishing vessel safety has been successful. That being said, no one involved in this industry believes commercial fishing is as safe as it could be. Recommendations developed from this evaluation are focused on improving Alaska based initiatives. There are many excellent recommendations being developed on the national level that have been suggested before and may eventually be implemented here. In the meanwhile, actions developed, approved and taken within Alaska will provide more immediate results.

The following recommendations were drawn from material developed by this evaluation. These are analysis of casualty data, review of related research and discussions with stakeholders. The list is not meant to be comprehensive, but is an attempt to generate discussion of common topics discovered in the evaluation process.

Involve the fishermen – Swedish research points to the continued involvement and participation of those fishermen that were included in initial planning and policy-making efforts. An outreach should be made by the USCG any time new policies, procedures or regulations are being considered.

Coast Guard personnel felt that many fishermen believed the agency's role was to impose additional government regulation and increase the cost of doing business. Marine safety employees need to consider every contact with a fisherman as an opportunity to associate a human face with concern for safety.

One example of a positive contact was the marine industry safety day and blessing of the fleet sponsored by the USCG Valdez Marine Safety Office in 2001. Fishermen were able to practice the use of survival equipment and interact with Coast Guard personnel. The event was well received. It cast a positive light on the Coast Guard's safety efforts. It was conducted at minimal cost. Other opportunities exist in the communities of Alaska. Health and safety fairs, high school career nights and similar events are excellent avenues for public education.

Promote the use of dockside safety examinations – Analysis of casualty data and anecdotal comments support the effectiveness of dockside examinations. What is apparent from the data is

that the level of participation has remained flat since the program was developed. Coast Guard personnel and fishermen were almost unanimous in their support of the exams as an excellent method of interacting and educating fishermen about safety.

There needs to be further incentive for fishermen to participate in the program. The Ship Escort Response Vessel System (SERVS) provides oil spill prevention and response equipment for Prince William Sound. Fishing vessels under contract to SERVS to assist in spill cleanup are required to have a current dockside examination. Finding other organizations that could benefit from dockside examinations should be explored. These could include educational foundations contracting vessels for hire, agencies that place fisheries observers onboard fishing vessels and insurance carriers. Some of these efforts have already begun.

There is wide support among program sponsors and fishermen that the dockside examinations be made mandatory. There were three principal reasons given. First, current regulations are difficult to interpret and having a second opinion helps with compliance. It pays to have outside inspections of required safety equipment. Secondly, most of the vessels involved with the program have been part of it for quite a while. Eighty percent of the vessels in Alaska do not participate. The final supporting opinion is that the examination process offers a great opportunity for interaction between those involved that is not conducted under threat of punishment. Dockside examinations are not currently meant to be a strict compliance tool of the Coast Guard.

Conclusions - Alaska's CFVS program has reduced deaths and vessel casualties since its inception. Many ideas generated here have had greater application to the entire nation. There is no doubt expressed by those involved in the fishing industry that there are still too many deaths and vessels lost each year. The Coast Guard has developed the framework of a truly successful program.

Interviews with the program sponsors and fishermen show wide support for the CFVS program. These communities are more united in their concern for safety than either may realize. There are many valid recommendations in existence that could improve the CFVS program. What the Coast Guard lacks now are the tools to complete the mission and implement these important ideas.

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Appendix A
CFVS Program Interview Questions

1. What is your involvement with commercial fishing?
2. What efforts can you recall being made to improve commercial fishing vessel safety?
3. The US Coast Guard has a commercial fishing vessel safety program in place. It is composed of many different components like dockside examinations, research, regulation, investigation and law enforcement.
 - A. Is there part of this program you believe has been very effective? Why?
 - B. Is there part of this program you believe can be improved? Why?
4. The Fishing Vessel Safety Program involves people from within fishing and government communities. What do you think people from the other side of the program fail to realize about your community?
5. If you could propose one rule to improve fishing vessel safety, what would it be? Why?
6. Do you have any further comments that should be considered in the discussion of fishing vessel safety?

Appendix B

Selected Interview Comments

- Stability testing of vessels should be required. Many fishermen don't realize how easy it is to roll a loaded vessel.
- Complete a damage control class. The knowledge and skills turned out to be lifesavers for fishermen facing a sinking vessel.
- Mandatory licenses for fishing vessel operators would insure knowledge and practical understanding of marine operations. Many fishermen have little or no experience operating fishing vessels.
- Emergency equipment required by the CFVSA of 1988 is very important and only represents a minimal level of protection.
- Voluntary dockside safety examinations are very important. They help insure equipment is functional, that the vessel meets current regulations and offers a great change for interaction between the Coast Guard and fishermen.
- The results of marine casualty investigations should be readily available to the industry. The Coast Guard "Lessons Learned" program is very useful.
- Dockside examinations of fishing vessels should be mandatory. Eighty percent of the fishing vessels in Alaska do not participate in a proven program that could save their lives.
- The Coast Guard needs to realize fishermen are operating small businesses. Inspections, regulations and boarding should be planned to disrupt work whenever possible.
- Safety regulations are easier to draft than enforce. There needs to be a practical application of regulations impacting the fleet.
- There is no inspection required for fishing vessel rigging. Every year several people are killed by falling booms, broken pins and winches. Deck safety need to be addressed by the industry and regulators.
- Vessel orientation and safety drills are very important. Classroom instruction is not as valuable as on-the-job training in the field. Documentation standards for onboard drills need to be strengthened.
- The Coast Guard is really doing a great job.
- Fishermen need to realize that they not only place themselves at risk in an unsafe vessel, it endangers the lives of Coast Guard personnel coming to save them.
- Stress marine firefighting skills and equipment use. A vessel on fire at sea represents a major disaster for the crew.
- The Coast Guard needs more adequate funding to support CFVS.
- Communicate. Talk. Listen.