

**SESSION THREE:
RISK FACTORS FOR COMMERCIAL FISHERMEN–
A LOOK AT THE DATA**



Bringing home the catch in Pakistan (Photo courtesy of Dr. Muhammad Khan)

NONFATAL INJURY SURVEILLANCE AND PREVENTION IN THE BERING SEA CRAB FISHERY

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Introduction

Commercial fishing is one of the most dangerous occupations in the United States. In 2002, commercial fishermen had the second highest traumatic injury fatality rate of all workers in the United States—71.1/100,000 workers, which is 16 times the national rate of 4.4/100,000 workers across all industries (Bureau of Labor Statistics 2003). Only timber cutters had a higher fatality rate of 117.8/100,000 (Bureau of Labor Statistics 2003). Many fishermen work in harsh environments with high winds, cold water, and icy conditions. The deck of a fishing vessel is a congested work area, crowded with fishing gear and equipment, and is constantly moving. The National Research Council noted “the apparent high incidence of workplace accidents suggests inadequately designed safety features in machinery, deck layouts, and fishing gear” (National Research Council 1991). Other factors that could impair safety in this workforce include isolated locations, long working hours, and days with little rest. Many commercial fishermen endure fatigue, physical stress, and financial pressures to push their vessels and crew to make their livings (Lincoln and Conway 1997; Conway, Lincoln et al. 2002).

Commercial fishing fatalities in Alaska are a result of the vessel sinking, falls overboard, or severe injuries from machinery and fishing gear on deck. Extensive research has been conducted in describing the fatality problem in the Alaskan fishing industry and progress in saving lives after a vessel has been lost (Lincoln and Conway 1997, 1999; Lincoln, Husberg, and Conway 2001). Many (41%) nonfatal injuries in Alaska are due to machinery and fishing equipment (Thomas, Lincoln et al. 2001; Husberg, Lincoln et al.

2001). Conclusions from these papers include the statement that “further efforts are required to redesign or install safety features on fishing machinery and equipment.” Various fleets and fisheries use their own specific fishing equipment and fishing methods, so tailored techniques are needed.

It is challenging to look at nonfatal work-related injuries in any industry. Problems arise when defining what a nonfatal injury is. Many times the completeness and accuracy of the reporting system is questioned. In the commercial fishing industry, the US Coast Guard has the following requirements for reporting nonfatal injuries:

46CFR4.05: An injury that requires professional medical treatment (treatment beyond first aid) and, if the person is engaged or employed on board a vessel in commercial service, that renders the individual unfit to perform his or her routine duties...

However, this reporting requirement is not regularly enforced, and no mechanism is in place to measure how accurately these injuries are being reported. Fortunately, Alaska has another surveillance system to collect data on work-related nonfatal injuries—the Alaska Trauma Registry (ATR). The state maintains the ATR as a quality assurance tool for the state’s trauma system. It has allowed identification of causes and specific information for useful injury surveillance in the fishing industry (Husberg, Lincoln et al. 2001; Thomas, Lincoln et al. 2001).

The ATR is a population-based trauma registry administered by the State of Alaska, Department of Health and Social Services, Division of Public Health, Section of Community Health and Emergency Medical Services. Technical assistance and funding for work-related injury surveillance are provided by the National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research, Alaska Field Station. To be included in ATR, patients must have sustained a traumatic injury as identified through a review of their hospital discharge diagnosis (ICD-9-CM code 800.00 through 995.89). Work-related cases in the ATR meet NIOSH Operational Guidelines for Determination of Injury at Work (Marsh and Layne 2001). Information is collected for all patients admitted to any of the 24 hospitals in Alaska who have been injured severely enough to be hospitalized for more than 1 day.

In October 2000, the NIOSH Alaska Field Station partnered with engineers and naval architects at Jensen Maritime Consultants, Inc. (JMC), to develop injury prevention recommendations to address deck hazards in the commercial fishing industry. Here, we describe the nonfatal injuries recorded in the ATR from 1991-1999 and the initial steps in developing the “Injury Prevention in the Commercial Fishing Industry” project.

Methods

Injury surveillance data from ATR from 1991-1999 were used to identify causal factors and circumstances surrounding work-related injuries in the Alaskan commercial fishing industry. We categorized the results into cause of injury, types of injury, and the body region injured. We also reviewed the injury narratives and identified the Bering sea crab fishery as the fleet to use to start our deck safety efforts. After consolidating the injury data, project staff met with groups of crab fishermen in Seattle, Washington, and Kodiak, Alaska, to get input on the possible causes and potential injury prevention solutions to injuries. The feedback from these sessions was used to create a survey to gather further information and comments regarding potential solutions to deck safety. Staff from the Coast Guard and JMC administered the survey in Unalaska, Alaska, during the crab fleet’s pre-season vessel inspections in October 2001. Survey results were completed, and interventions were identified from these results.

Results

From 1991-1999, 39,143 injuries were recorded in ATR. Approximately 10% (3,951) were classified as work-related, and 648 of these were in the commercial fishing industry.

Data from ATR show that the top three primary causes of commercial fishing injuries were machinery (205), followed by falls (163), and struck by object (100). The three most common types of injury were fractured bones (309), open wounds (77), and burns (32). The body regions most commonly injured were the upper extremities (203), lower extremities (189), and head (96). A review of the narrative field for machinery identified crab pot launcher, crane, and bait chopper as the most frequently cited pieces of machinery involved in injuries.

The Coast Guard and JMC surveyed 89 fishermen on 75 vessels. Information from these surveys helped identify priority areas and create recommendations for the improvement of safety on these vessels.

Through the process of using ATR surveillance data, working with fishermen, conducting surveys, and analysis of the resultant information, several topics were generated that could lead to the development of recommendations. These included—

- ✦ Improving deck visibility
- ✦ Installing closed-circuit television
- ✦ Installing mirrors
- ✦ Improving lighting
- ✦ Painting moving deck machinery in bright colors
- ✦ Working more safely with crab pots
- ✦ Installing pot guides
- ✦ Identifying and marking launcher's danger zones
- ✦ Developing means of preventing slips and falls
- ✦ Covering manholes
- ✦ Installing nonskid gratings and mats
- ✦ Studying the best rail heights
- ✦ Installing seawalls
- ✦ Developing procedures for man-overboard recovery
- ✦ Modifying other miscellaneous equipment
- ✦ Installing bait chopper guards
- ✦ Improving crane maintenance and index markings
- ✦ Developing hydraulics maintenance and emergency procedures

The specific topics noted above are discussed in the paper by Blumhagen et al. in these proceedings and are further explained in the “Deck Safety for Crab Fishermen” booklet published by JMC (2002). This booklet also contains information on the cost of implementing the recommendations.

Conclusion

Surveillance information from the ATR has assisted in identifying and prioritizing causes of nonfatal injuries on the deck of crab-fishing vessels. This first phase has led the way to specific injury prevention recommendations. The second phase is currently focusing on fisheries other than Bering Sea crab fishing in Alaskan waters. Collaboration between NIOSH, JMC,

US Coast Guard, University of Utah School of Engineering, and the fishing industry is continuing to identify and recommend specific injury prevention measures for this dangerous industry.

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