PRACTICAL DECK SAFETY FOR CRAB FISHERS

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Purpose

Crab fishers face some of the highest occupational injury and death rates in the nation. In Alaska, the fatality rate for the shellfish fishery was higher than all other fisheries in the industry with 356 fatalities per 100,000 fishers per year between 1991 and 1996, or about 50 times the national average (Lincoln and Conway 1997). While most fatalities were caused by vessels sinking or person-overboard events, most of the nonfatal injuries were caused by deck machinery or falls on board the vessel. The goal of this study was to find practical, inexpensive solutions to deck safety problems and disseminate that information to fishers. We approached the problem of deck safety from the fishers' perspective, using extensive input from fishers during the course of the project.

This project was not intended to be a basis for any type of new regulation for deck safety installations. It was only intended to provide fishers with the information required to make improvements on their boats if the modification were appropriate for their particular arrangements and circumstances. The nonregulatory approach was critical to the success of the project. Without this approach, we would have had great difficulty in getting ideas from fishers. We would also have had far more limited fisher participation in the survey.

Methods

The initial analysis of the most common injuries on crab fishing boats was taken from the Alaska Trauma Registry (ATR), which records all traumatic injuries requiring hospitalization in Alaska (Lincoln, Husberg, and Conway 2002). By its nature, this database only includes the more severe injuries. The ATR includes a short narrative description of the circumstances surrounding the injury. A sample description from the ATR reads "left hand caught in a bait grinding machine on board vessel." These descriptions were used to categorize incidents into a particular fishery, as well as sort them by type of incident (slip/fall, machinery, etc.). This research helped determine where the hazards are on deck, allowing us to better focus our efforts during the rest of the project.

The next step was to spend time on board a crab boat during fishing operations, both to observe likely hazards and to document the process of setting, retrieving, and otherwise handling pots. The use of all deck equipment was observed and documented in photos and video recordings. Project staff spent 2 days on board the *Royal Viking* out of Akutan, Alaska, observing pot cod fishing, which uses the same equipment and procedures as crab fishing.

Armed with first-hand knowledge of fishing operations, project staff held a focus group meeting with a small group of crab boat skippers, each of whom had over 20 years of experience in the Alaska crab fisheries. We discussed modifications they had already made to their boats to reduce deck injuries, toured one of the boats to view the modifications, and discussed which safety issues were most likely to be addressed by physical changes to the vessels.

After the focus group meeting, we developed a list of proposed modifications to vessels, combining the ideas listed in the focus group meeting with some of our own ideas. These ideas were used in a survey to be given in port to the largest group of crab fishers possible immediately prior to a crab season. We asked the fishers if each idea or modification would help improve deck safety and whether it had been implemented on their boat. If the modification was not in place, we asked why it had not been incorporated. We also collected basic information such as number of years experience in the fishery, vessel name, and crew position. Where necessary, we inserted drawings or photos into the survey to help explain ideas to fishers.

The survey was administered during October 2001 in Dutch Harbor, Alaska, immediately before the start of the Bristol Bay red king crab season. A total of 89 fishers from 75 different boats were surveyed by project staff and US Coast Guard personnel. Forty-one of the fishers surveyed were skippers, while the others held other positions in the crew. Forty-four of those surveyed had more than 20 years of experience in the fisheries, while 11 had less than 5 years experience. We believe that the survey sample reflects a representative cross-section of crab fishers.

Results

Following are interventions discussed in the survey.

Group I: Visibility

1. Install adequate lighting on deck. This increases visibility in dark areas and during night and helps the crew work more safely (Figure 1).
2. Use a closed-circuit TV system on house-forward boats. This helps the skipper see what is happening on deck from the wheelhouse. He or she can then become more easily aware of dangerous conditions and activity on deck (Figure 1).

Figure 1: Closed-circuit TV camera (in the round white housing) and extra lighting at bait chopper

Figure 2: Truck mirror seen from inside wheelhouse

3. Install a truck mirror on the starboard side of the wheelhouse. This helps the skipper see work along the starboard rail and pot launcher (Figure 2).

Group II: Machinery

4. Install lock valves on cranes, haulers, or winches on older machinery. These valves make the machinery hold the load when the hydraulic valve is in the neutral position. On most hydraulic machinery, this is not a problem, since most machinery already has these valves installed.
5. "Footprint" the pot launcher. A small half-round or half-oval strip around the deck where the pot launcher meets the deck will outline hazardous areas. This will help the crew feel when their feet are starting to get into a dangerous working zone (potentially leading to crushed feet, toes, or lower extremities).
6. Install pressure relief valves on the pot launcher. This would keep the launcher from crushing a person underneath the launcher when it is being lowered from the upright position.
7. Install an emergency shut-off for the launcher near the launcher. This allows the crew to shut down the launcher quickly if a person is caught while it is moving.
8. Paint the hazardous zone around the launcher, and/or the launcher itself, a contrasting color. This helps the crew see the danger area around the pot launcher and makes the moving part of the launcher more visible.
9. Install "pot guides" on the outside of the bulwark (Figure 3). Pot guides are triangular stops that run vertically on the outside of the

Figure 3: Pot guides

bulwarks. In heavy seas, pot guides help the crew control the crab pot after it is out of the water, but before it is pulled over the rail on to the launcher.

10. Install a guard over the bait chopper. This helps prevent the crew from reaching into the chopper box and risking injury (Figure 4).
11. Install an emergency shut-off on the bait chopper. This allows another person to turn off the bait chopper if a fisher either has been injured by the chopper or is about to be injured.

Figure 4: Bait chopper guard made from old conveyor belt material.

Figure 5: Boat with raised bulwark on port side and raised pipe rail on starboard side

12. Mark the crane to help align it with the pot launcher. This allows the crew to position the crane head rapidly and accurately over the pot launcher, reducing the chance of injury from a swinging pot as it is being lifted or lowered at the launcher.

Group III: Crew protection

13. Install a raised bulwark on the port side or around the entire working deck. This provides a sheltered area that helps protect the crew from large waves coming over the side (Figure 5).
14. Install gratings over hold manholes. This prevents a fall into the hold manhole if the watertight cover must be removed. If the watertight cover is removed, some of the water circulating in the hold flows out on deck, helping reduce ice buildup on the deck.
15. Increase the rail height along the perimeter of the working deck. This helps prevent a wave from washing a crew member overboard (Figure 5).

16. Install nonskid grating in low-wear areas. Most crab boats are fitted with a steel or wood grating above the actual deck to prevent the crab pots from wearing away the watertight deck. Nonskid grating provides better footing in low-wear areas. However, it cannot be installed everywhere, since it will not stand up to the wear from the crab pots.
17. Install man-overboard recovery devices (life rings, life slings, flares, etc.) at the stern of the boat or at the hauling station. This helps the crew respond quickly to a person-overboard event.

After the data from the survey had been analyzed, we created a booklet describing each of the ideas we discussed in the survey. Since no idea received less than a 25% overall "approval rating," the project team decided to include all the suggested interventions in the booklet. However, some items were consolidated into general sections.

The project team also added some ideas to the booklet based on the surveys and discussions with fishers. The most significant of these was a section on emergency preparedness. Several fishers told us about the importance of planning ahead for emergencies, creating procedures for responding, and drilling the crew on those procedures. The emergency most commonly mentioned was person overboard. In this case, fishers said it was important to practice both returning the vessel to the person in the water and retrieving the person from the water.

The booklet gives the fishers all the information required to make an informed decision about whether each safety idea will work in given situations. For each idea, the booklet has a description of the idea with drawings and photos as necessary, what problem it is intended to solve, and how to go about making the change to the vessel. Approximate costs for implementing each idea were also included. The booklet was published and has been distributed widely throughout the West Coast, with particular emphasis on Alaska.

To further illustrate the improvement ideas, a model of a typical crab boat showing most of the safety ideas was made to display at conventions and trade shows. The model has attracted quite a bit of discussion and interest wherever it has been displayed.

Conclusions

This project has been an effective tool in finding low-cost, effective solutions to deck safety problems on commercial crab vessels and in distributing the information to the fleet. Fishers have been very willing to participate in the project and have appreciated the information presented in the booklet and deck model. Much of the success of this project has been due to the non-regulatory approach and assistance from fishermen's associations and the US Coast Guard. The success and acceptance of this project has led to a similar project working with smaller vessels engaged in longline, troll, seine, dive, and small-pot crab fisheries.

References

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SESSION FOUR: DECK SAFETY

Faroese fishermen at work (Photo courtesy of Anna Maria Simonsen)

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