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FACE AK-95-23

TO: **Ted Petit, NIOSH, Division of Safety Research**

FROM: **Gary Bledsoe, Manager**
Occupational Injury Prevention Program

SUBJECT: **Commercial Fishing Vessel Skipper Dies After Being Pulled Into a Deck Winch -- Alaska**

SUMMARY

On August 2, 1995, a 24-year-old, male commercial fishing vessel skipper (victim) died as a result of being pulled into a deck winch of a 56-foot purse seiner working the salmon fishery. The incident occurred while a load of salmon was being brought in and the seine net pursed prior to placing the load on the vessel's deck. A line ("purse line") from the net was placed through the winch head to close the bottom of the seine net. The vessel skipper stood on the starboard side of the vessel near the deck winch, while he coiled the purse line on onto the deck as it came through the winch. The "pass line," which connects to the purse line and is used to bring the purse line onto the vessel, was disconnected from the boat end of the net. This line fell across the deck winch. The victim reached over and picked up this line to remove it and keep the line from becoming entangled in the winch. During this process his raingear was caught by the moving purse line and he was pulled through the winch head one revolution. As he came around the other side of winch his head struck the deck. CPR was attempted, but was unsuccessful because the crewmen could not get a clear airway.

Based on the findings of the epidemiologic investigation, to prevent similar occurrences employers should:

- ensure that all winch operators do not work so close to winch-driven lines or rotating winch heads as to potentially entangle the worker or the worker's clothing.

- ensure that all winch operators confine loose clothing, as far as is practicable, when working near a winch-driven line or rotating winch head.

- ensure that winches have a foot pedal-operated "deadman's switch" that would deactivate the winch if the operator lost his balance and removed his foot from the switch, or assign an operator to attend the winch control at all times.

INTRODUCTION

On August 2, 1995, a 24-year-old male commercial fishing vessel skipper died after he was pulled into the vessel's deck winch. The victim's raingear was caught by the moving purse line when he reached over to remove the pass line that had fallen over the winch. The victim was pulled through the winch one revolution and suffered fatal injuries when his head impacted the deck. The Alaska Division of Public Health, Section of Epidemiology identified this fatality as an in-scope occupational death after monitoring the news media on August 5, 1995. An investigation, involving an Injury Prevention Specialist from the Alaska Department of Health and Social Services, Division of Public Health, Section of Epidemiology, ensued on August 6, 1995. Interviews of the cannery company officials, victim's relatives, vessel owner, Alaska State Trooper investigator, and experts in commercial fishing were conducted. Photographs of the incident vessel and winch were also obtained. The autopsy report was also obtained. The case was not followed by any other regulatory authority.

The employee was a vessel skipper operating a 56-foot purse seiner in the salmon fishery. The victim worked for the co-owners of the vessel and he had a crew of four deckhands. This was the victims second season as a vassal skipper. He also had an additional seven years of experience as a deckhand. No formal safety training program was used on this vessel.

Process Overview: The fishing vessel crew were harvesting salmon by purse seining. In this process, a large fishing net (seine) is towed behind the vessel. The upper part of the net is called the cork line because of the floats that keep it at the water's surface. The upper part of the seine is connected to the lower part of the net via the breast line. The lower net is weighted and is called the lead line. The net is removed from the water by a ship crane and the bottom of the net is "pursed" by attaching the purse line to the ship winch. When the net is completely pursed, the catch can be brought on board the vessel.

A pass line is then connected to the purse line so that the purse line can be brought aboard the vessel and connected to the winch. A crewman stands near the winch (on the opposite side of the incoming purse line), and coils the purse line onto the deck of the vessel. When the purse line has been attached to the winch, the pass line is disconnected and the seine is pursed. When this process is completed, the catch is brought onto the vessel's deck, and the seine net opened to allow further processing of the catch.

This process is shown below in Figure 1 - "*The Process of Purse Seining*" and Figure 3 - "*Top View of Vessel*."

INVESTIGATION

At approximately 4:30 PM on August 2, 1995, a commercial fishing vessel skipper was killed when his raingear became entangled in a winch-driven line and he was pulled through the deck winch. The employee was coiling a purse line as it was pulled into the vessel by a deck winch. The pass line was removed from the boat end of the purse line when it was wrapped on the winch. The winch was activated and the purse line was in the process of being winched in to close the seine net. When

the pass line was disconnected, it fell over the winch. The skipper reached across the moving purse line to remove the disconnected pass line. If pass lines remain on a rotating winch head, the winch can be jammed by the purse line and pass line becoming entangled. The victim was wearing loose raingear and his sleeve was snagged by the purse line. The purse line pulled the victim into the winch and he was rotated approximately one revolution around the winch head, striking his head on the vessel's deck. Deckhands immediately attempted CPR, but they could not obtain a clear airway. After a state trooper investigation, the victim's body was removed from the vessel and he was declared dead at a nearby medical facility. Figure 2 is a photograph of the vessel's deck winch. Figure 3 is a diagram showing the positions of the winch and lines relative to the victim's work position.

CAUSE OF DEATH

The autopsy indicated "transection of cervical spinal cord" as the primary cause of death. Also noted was "traumatic wound to neck."

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should ensure that all winch operators do not work so close to winch-driven lines or rotating winch heads as to potentially entangle the worker or worker's clothing.

Discussion: The operator in this incident reached over the purse line to remove the pass line, which had fallen onto the winch. An alternative system would be to have another crewman be responsible for maintenance of the pass line. This would prevent the worker coiling the purse line from placing his body in a position that him to pinch hazards. Given limited crew sizes, allocating such a position may not be possible. In cases where this is the case, the winch should be stopped prior to removing any materials that fall onto the machine. Under no circumstances should workers place themselves in positions which will expose them to the high torques of deck winches.

Recommendation #2: Employers should ensure that all winch operators confine loose clothing, as far as is practicable, when working near a winch-driven line or rotating winch head.

Discussion: The victim in this incident was wearing loose raingear; his sleeve came into contact with the moving purse line. Where possible, workers should ensure that loose clothing is confined. This can be accomplished through the use of duct tape around coat cuffs, trouser cuffs, and other free-moving areas. However, a balance between confined clothing and unrestricted movement must be obtained. If clothing is so restrictive that workers are unable to effectively avoid a hazard, a new hazard has been created.

Recommendation #3: Employers should ensure that winches have a foot pedal-operated "deadman's switch" that would deactivate the winch if the operator lost his balance and removed his foot from the switch, or assign an operator to attend the winch control at all times.

Discussion: The use of a "deadman's switch" on deck winches could prevent such incidents. Ideally, another crewman should standby the deck winch controls in case of an emergency. However, sole reliance on this method presents two potential problems. Commercial fishing crew sizes are limited by profit margins. Dedicating a deckhand to solely operate the deck winch may not be a popular choice among Alaska's commercial fishers. Even if emergencies are detected, the winch may not be able to be stopped in time. A fraction of a second delay could result in fatal injuries as noted above. The use of a "deadman's switch" could provide an alternative safety measure that would not rely on the variability of detection by various winch control operators. The "deadman's switch" would deactivate the winch as soon as pressure on the foot pedal is released. An arrangement of a flexible cable attached to a foot switch is a workable solution. The control cable could be secured on the deck so that it is prevented from being a trip hazard or becoming entrapped in the winch.

REFERENCES

1) Personal Communication - Director, Alaska Marine Safety Association, 1995.