FACE 92-09

Tree Faller Killed when Struck by Decayed Slab Jarred Loose by Fallen Tree--Alaska

SUMMARY

A 45-year-old male tree faller (the victim) was cutting and felling trees on a mountainside with a 50 percent slope. The victim cut a hemlock snag (dead standing tree) that was 90 feet tall and 40 inches in diameter at the butt. About 24 feet directly uphill from the snag was a decayed hemlock log that was lying horizontally, parallel with the contour of the slope. The decayed log was lying on top of two smaller yellow cedar logs that were parallel to each other (about 14 feet apart), and perpendicular to the slope. When the victim cut the snag, it fell across one of the yellow cedar logs, which jarred the decayed hemlock log. A slab from the decayed log (measuring 23.5 feet long by 2 feet wide by 6 to 8 inches thick) broke loose and slid about 24 feet down the two yellow cedar logs, striking the victim on the side of the head and fatally injuring him. NIOSH investigators concluded that, in order to prevent future similar occurrences, employers should:

- ensure that fallers properly evaluate the area around timber to be felled so that potential hazards can be identified and avoided
- ensure that tree fallers prepare an adequate escape path before cutting and felling any tree
- designate a company safety manager to conduct regularly scheduled, and unscheduled, safety inspections
- ensure that worker safety has been addressed in the planning process of logging operations.

INTRODUCTION

On October 11, 1991, a 45-year-old male tree faller (the victim) was fatally struck by a slab of decayed log that was jarred loose by a standing dead tree (snag) that the victim felled. On October 23, 1991, officials of the Alaska Department of Occupational Safety and Health (AKOSH) notified the National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR), Alaska Activity of the death. On October 30, 1991, a safety specialist from the DSR Alaska Activity traveled to the incident site and conducted an investigation. The safety specialist reviewed the incident with company representatives, coworkers of the victim, and the AKOSH compliance officer assigned to this case. Photographs of the incident site were obtained during the investigation.

The employer in this incident was a logging company that had been in operation for 24 years. The employer had 183 employees (15 of whom were fallers), and a fully integrated logging operation consisting mainly of fallers, buckers, limbers, choke setters, heavy equipment operators, truck drivers, chasers, hook tenders, mechanics, sort yard workers, and siderods. (All of these employees are collectively referred to within the logging industry as "loggers.") The company had experienced two previous fatalities, including a faller crushed by a falling tree 2 months before this incident (see FACE Report 92-15). The employer had a safety policy, safety program, and basic safe work procedures at the time of the incident. There was no full-time safety manager; one of the company managers was responsible for the safety program as a collateral duty. Safety meetings were conducted weekly to discuss a variety of safety issues pertaining to logging operations. Although the victim had only been employed by the company for 1 month before the incident, he had 17 years of logging experience (mostly as a faller). The fallers (including the victim) were paid according to the number of trees they fell (piece-rate wage).

INVESTIGATION

Eight months prior to the incident, the employer (the logging company) had attempted to conduct logging operations on a mountainous island in southeast Alaska, but was enjoined against these operations by a court order. The injunction, issued over environmental concerns, caused the company to suspend operations for 2 months, and resulted in a reduction in the anticipated harvest for the March 15 through December 15 logging season. Approximately 3 months before the incident, the environmental injunction was removed, and the company resumed full operation at the logging site. An accelerated logging operation was undertaken to minimize loss from the shortened season; as a result, a number of logging phases, which would have normally taken place in sequence, were being conducted concurrently. This complicated the individual logging phases considerably, and produced some confusion among the tree fallers. For example, since the logging road was being constructed while trees were being felled in the same area, many fallers were unsure of a safe direction for felling trees. Their usual practice (standard operating procedure) of felling trees toward cleared areas along the logging roads might endanger road construction workers. On the other hand, felling trees toward uncleared areas might result in felled trees lodging on standing trees, or striking unstable objects (i.e., decayed logs), thus endangering the fallers.

On the day of the incident, the victim and another faller (coworker) had been assigned to clearcut two adjoining strips (a strip is a wooded area allotted to a faller) on a 50 percent slope. The lower border of the strips were about 150 feet above a logging road. The victim and his coworker began working approximately 150 yards apart, each within one of the two adjoining strips. Both fallers had previously agreed to progressively clear their own strip, working their way in the same direction, with the victim working toward the edge of the coworker's strip. Before starting their work, the victim told the coworker that he would be at the edge of the coworker's strip "in a few hours."

The victim began cutting and felling trees (mostly hemlock) with a 4-horsepower, 32-inch-bar chain saw. Although there were no eyewitnesses to the incident, evidence suggests the following sequence of events (Figure):

About 12 hours after beginning to clear his strip, the victim began cutting a hemlock snag that was about 90 feet tall and 40 inches in diameter at the base. The victim did not clear an escape path anywhere around the snag before cutting it.

About 24 feet upslope from the snag was a decayed hemlock windfall (a tree blown over by the wind). The decayed windfall was lying across the uphill end of two small yellow cedar windfalls, which were lying parallel to each other about 14 feet apart.

When the cut snag fell, it landed across the downhill end of the left yellow cedar windfall and rolled off the end. This disturbance caused the uphill end of the left yellow cedar windfall to rebound, jarring a large slab measuring 23 feet, 7 inches long by 2 feet wide by approximately 7 inches thick, off the decayed hemlock windfall. The slab slid about 24 feet downhill on top of the yellow cedar windfalls and struck the victim, who was standing about 5 feet from the right side of the felled snag stump. The impact to the right side of the victim's head caused instant death (according to the medical examiner).

About 45 minutes later, the coworker wondered why he did not see the victim or hear the victim's chain saw. After shouting for the victim and hearing no reply, the coworker walked about 200 yards into the victim's cutting strip. He found the victim on his back, curled up under one end of the decayed hemlock slab.

The victim was unresponsive and without a pulse, so the coworker administered cardiopulmonary resuscitation (CPR) for 45 minutes, but was unsuccessful in reviving the victim. The coworker then ran to his pickup truck, called for help on his radio, returned to the victim, and resumed CPR. Other fallers responding to the emergency call arrived at the scene and continued CPR without success. Police officers and the coroner arrived approximately 2 hours later, and the coroner pronounced the victim dead at the scene.

CAUSE OF DEATH

The medical examiner listed the cause of death as "massive basal skull fracture."

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should ensure that fallers properly evaluate the area around timber to be felled so that potential hazards can be identified and avoided.

Discussion: Section 07.115(p)(1-3) of the Alaska Department of Labor (DOL) Logging Standard addresses cutting and falling trees below unstable objects: "Each day in the course of regular operations, a general inspection must be conducted of the area to be worked that day to identify logs, rootwads, rocks, chunks or other objects that may roll or slide towards employees ... Employees shall be alert at all times for logs, trees, rootwads, rocks or other objects that could roll or slide towards them or others as a result of any work activity. If the object is identified as likely to roll or slide, before the beginning or resuming regular operations, the object must be moved to a stable position or it must be secured in place." The Fallers' and Buckers' Handbook (a safety guidebook generally accepted by the logging industry) also addresses the safe felling and removal of snags as follows: "Check material lying on the ground in the immediate area. Will it be disturbed by the falling snag? If so, will it be a danger to you or others?" In some situations, unsafe snags may be too hazardous to fell with saws, requiring alternate felling methods discussed on pages 42-43 of the Fallers' and Buckers' Handbook.

Recommendation #2: Employers should ensure that tree fallers prepare an adequate escape path before cutting and felling any tree.

Discussion: An evaluation of the site revealed such obstacles as brush, limbs, windfalls, etc., that the victim had not cleared for a possible escape path before cutting and felling the hemlock snag. Preparing an adequate escape path before felling any tree is imperative for a safe felling operation. Doing so will allow the faller to quickly reach a safe distance from the falling tree, snag, unstable windfall, etc. According to the Alaska Department of Labor, Occupational Safety and Health Standards on Logging (Alaska DOL Logging Standard), Section 07.130(d)(5), "A way of escape must be planned before felling a tree, and must be kept free of brush, tools, or other obstructions. The route of escape must be clear of the intended direction of the falling tree. Workers must keep at a safe distance from the base of the tree as it is falling." The Fallers' and Buckers' Handbook suggests that the faller prepare an escape path free from obstacles, and an alternate escape path in case the tree does not fall according to plan.

Recommendation #3: Employers should designate a company safety manager to conduct regularly scheduled, and unscheduled, safety inspections.

Discussion: Conducting regular safety inspections of all logging tasks (among other safety-related responsibilities) by qualified individuals will help ensure that established company safety procedures are being followed. Additionally, scheduled and unscheduled safety inspections clearly demonstrate that the employer is committed to preventing occupational injuries.

Recommendation #4: Employers should ensure that worker safety has been addressed in the planning process of logging operations.

Discussion: In this incident, a number of logging operation phases (which would normally take place in sequence) were being conducted concurrently as a result of a shortened harvest season caused by an environmental injunction. These accelerated operations resulted in greater than usual congestion in the area of logging operations. The congestion created some confusion among the tree fallers and restricted their usual practice of felling trees into open areas along the logging roads. According to the Fallers' and Buckers' Handbook (page 29), before starting to fell timber, employers should have a thorough knowledge of the area and of the work procedures used at the logging site. Employers must know logging site positions in relation to roads in use and to other equipment and workers in the area. Better organization in the logging planning process in this incident might have reduced a major risk factor contributing to the fatality.

REFERENCES

Workers' Compensation Board of British Columbia. Fallers' and Buckers' Handbook. Vancouver, Canada: 1990, pp. 29, 42-43.

Alaska Department of Labor, Division of Labor Standards and Safety. Occupational Safety and Health Standards for Logging, Section 07. August 1990.

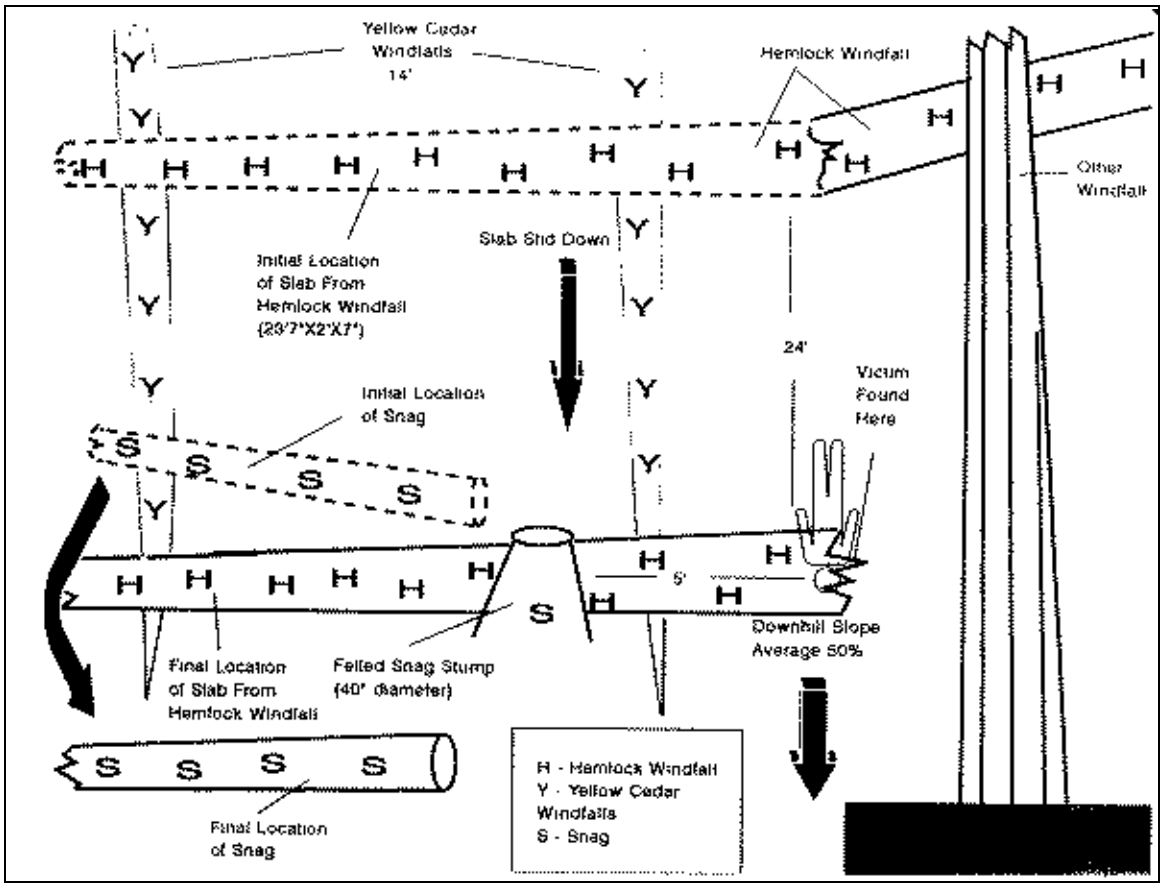
Yellow Cedar Windfalls
14'
Hemlock Windfall
Other Windfall
Initial Location of Slab From Hemlock Windfall (20'7"X2'X7')
Slab Slid Down
24'
Victim Found Here
Initial Location of Snag
5'
Downhill Slope Average 50%
Final Location of Slab From Hemlock Windfall
Felled Snag Stump (40" diameter)
Final Location of Snag
H - Hemlock Windfall
Y - Yellow Cedar Windfalls
S - Snag

Figure.