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# **NIOSH**

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## **Comments to DOL**

**COMMENTS OF THE  
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH  
ON  
THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION'S  
NOTICE OF PROPOSED RULEMAKING ON  
LOGGING OPERATIONS**

**29 CFR Part 1910  
Docket No. S-048**

**U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Public Health Service  
Centers for Disease Control  
National Institute for Occupational Safety and Health**

**7/31/89**

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U.S. DEPARTMENT OF COMMERCE  
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The National Institute for Occupational Safety and Health (NIOSH) has reviewed the Occupational Safety and Health Administration's (OSHA's) proposed rule on logging operations [29 CFR 1910.266 et seq.] and appreciates this opportunity to comment in support of OSHA in promulgating this proposed rule.

NIOSH has reviewed the data presented in the preamble and has reviewed additional NIOSH data on logging accidents (Attachment 1; NIOSH 1983). We concur with OSHA in the conclusion that logging is "inherently dangerous" and that workers in the logging industry face a substantial risk of physical harm due to logging accidents. NIOSH also concurs with OSHA's projection that the proposed rule will substantially reduce injuries and fatalities in the logging industry through the requirements for recurrent training, personal protective equipment, and enforceable work practice requirements.

The requirements of the proposed rule, in large part, have long been recognized as standard safe practice in the logging industry (Dent 1974). Although OSHA has characterized this rule as a "performance standard," the proposed rule does contain a substantial number of objective criteria. The proposed rule as set forth will require all logging operations to meet a uniform national standard.

NIOSH has certain specific comments on sections of the proposed rule based on analysis of the data available since the NIOSH criteria document, "Logging from Felling to First Haul" (NIOSH 1976), was published 13 years ago. For example, although snake bites were considered to be a frequent occurrence in 1976, the Bureau of Labor Statistics' (BLS) Supplementary Data System (SDS) indicates that there were only 4 worker compensation claims for snake bites in the logging industry between 1985 and 1986. The National Traumatic Occupational Fatalities (NTOF) database maintained by NIOSH, which identifies occupationally related deaths since 1980, does not indicate any fatalities in the logging industry due to venomous snakes. Insect bites, by comparison, resulted in 39 claims on the BLS SDS system for worker compensation in the same States and in the same time period. Based on this new data, NIOSH has recommended that OSHA consider insect stings and first aid provisions in its final rule. Our specific comments, addressed to subsections of the proposed rule will follow our general comments.

The following are general comments we have on the proposed rule:

NIOSH appreciates the problems faced by OSHA in formulating a generic standard for the logging industry where there are such diverse harvesting requirements. Specific work practices that are appropriate for pulpwood operations, where trees are generally less than 14 inches in diameter and less than 70 feet in height, are not applicable to logging operations in the Pacific Northwest where trees up to 8 feet in

diameter and greater than 300 feet in height may be harvested. NIOSH understands that OSHA has taken into consideration the existing OSHA-approved State standards in Washington, Oregon, and California with reference to appropriate safety standards for harvesting large old growth timber. We anticipate that OSHA will encourage these States to continue to include specific practices applicable to harvesting old growth timber in their approved State plans.

This rule, as stated in the summary to the preamble, addresses worker safety requirements. NIOSH would note that there are also a number of health hazards in the logging industry. Exposures to chain saw exhaust can, under certain conditions, approach or exceed toxic levels (Nilsson 1987). Hand-arm vibration syndrome may affect from 20% to 50% of workers in felling operations (Brubaker 1987; Saito 1987). Chain saw operations may result in exposures to wood dust and sawing vapors containing terpene compounds. Wood dust is a potential occupational carcinogen, and a number of respiratory diseases have been associated with various forms of wood dust (NIOSH 1987). Rotting fungi, bluestaining fungi and bacteria on the tree may cause suberosis, sequosis, and maple-bark disease (Fink 1986). A NIOSH surveillance report raises an inference that there may be elevated mortality rates for tuberculosis, lymphatic leukemia, bronchiectasis, and chronic interstitial pneumonia among workers in the logging industry (NIOSH 1983). NIOSH has insufficient data at the present time to project the magnitude of the risk or recommend appropriate criteria for controlling any of these potential health risks. Wood dust has been assigned a permissible exposure level (PEL) by OSHA in 1910.1000 and NIOSH testified in 1988 that the OSHA PEL was not sufficiently protective. OSHA may consider requiring that the worker training address the need for adequate ventilation (or air circulation) for certain tasks even in the outdoor environment. Workers also should be trained to recognize the symptoms of hand-arm vibration syndrome. NIOSH is preparing a criteria document on hand-arm vibration. A recent study suggests that work practice controls in use in the Japanese national lumber industry are effective in reducing the onset of this syndrome (Saito 1987). OSHA may consider referencing this study or including the results of the Japanese study in the preamble.

Correlating logging accidents to their time of occurrence suggests that worker fatigue may be a factor in accidents (Paulozzi 1987; ELS 1984). A number of elements can contribute to worker fatigue, including heat stress and noise. NIOSH concurs with OSHA's proposal [1910.266(e)(1)(vii)] for using 29 CFR 1910.95 for protecting loggers from noise-induced hearing loss. NIOSH recommendations for heat stress are included in our Criteria for a recommended standard...occupational exposure to hot environments (NIOSH 1986). Work practices to reduce worker fatigue are often task specific and vary widely from workplace to workplace. Although NIOSH cannot recommend specific work practices for the logging industry to reduce fatigue, OSHA should include a section in the preamble to the final rule emphasizing the need for

employers to evaluate the amount of heat stress, physical exertion, and other factors contributing to fatigue in planning an appropriate work schedule.

Specific comments follow:

1. (d)(3): NIOSH supports OSHA in requiring that a worker who is inexperienced in a task be under the close guidance of a person who is experienced in the safe performance of the task. The OSHA proposed rule should have adequate balance in classroom pre-worksite and on-the-job training. OSHA should take into account the advisability of on-the-job training in different operations. For example, such on-the-job training may be less hazardous in pulpwood operations where trees are more manageable, but more hazardous when large sawlog harvesting is occurring. On-the-job training should be especially effective for pointing out poison ivy, poison oak, and other indigenous poisonous plants to inexperienced loggers, and should be required training in areas where poisonous plants occur.

Training programs that include a close support person during the on-the-job training phase should have safeguards against endangering both the trainee and the support person. Certain operations (such as felling, bucking, limbing, and skinning) may be more hazardous with the presence of a second person.

2. (e)(1)(ix) and (e)(1)(x): While poisonous snakes, such as copperheads, timber rattlesnakes, western rattlesnakes, and cottonmouths are potential hazards to loggers, the data as mentioned earlier, do not indicate that snakebites are a frequent occurrence.

Snake venom poisoning is a medical emergency requiring immediate attention and the exercise of considerable judgment (Russell 1986). The person bitten by a snake has a very good chance of survival with prompt medical attention, usually suffering only acute illness. Furthermore, it is possible that serious injury will occur to the person by improper use of a snakebite kit. Therefore, it is recommended that OSHA make the provision that all individuals who receive first-aid training be given detailed instructions on the proper use of the kits, along with the necessary training on when not to use the kit. The regional snakebite control center at the University Medical Center in Cincinnati recommends that if medical treatment is available within one hour, a snakebite kit should not be used for rattlesnake bites (phone communication with Dr. Mel Otten, July 24, 1989, 513/558-5281).

Because loggers are also equally at risk from stinging insects, OSHA should require a provision that first-aid field personnel be aware of all workers on the site that are allergic to insect stings, and that these personnel be trained in the proper first-aid treatment for insect sting victims (Frazier 1977; Schwartz 1965; Reisman 1973; Barnard 1973; Torsney 1973).

NIOSH recommends that the first-aid training section specify cardiopulmonary resuscitation training per the American Heart Association, American Red Cross, or equivalent agencies.

3. (e)(4)(i), (e)(4)(iii) and (g)(1)(i): All three proposed rules address the need for continuous contact between workers on a logging site while maintaining a safe working distance between fellers and other workers. (e)(4)(i) requires the continued visual and audible contact between workers. The rule does create certain problems when combined with (e)(4)(iii) and (g)(1)(i) that require safe work distances, especially (g)(1)(i) where a minimum of 2-tree distances is required between the feller and the next worker. These provisions are quite acceptable in pulpwood operations where distances of 140 feet between the feller and the next worker should not interfere with maintaining visual and audible contact. However, other timbering operations involve trees of much greater height. Examples include hardwood sawlog operations that involve trees as much as 120 to 150 feet in height, or sawlog operations in the Pacific Northwest where trees of 350 to 400 feet will be harvested. In the case of logging in the Northwest, a minimum distance of 200 yards or more between the feller and the next worker will be common practice. NIOSH concurs that the two-tree minimum distance is necessary, but since the terrain may be mountainous, maintaining visual contact and audible contact usually will not be possible. Therefore, when large trees are involved and contact with the feller is required, it may be necessary to allow the use of a spotter to maintain the desired contact. OSHA should allow for this exception in the 2-tree clearance rule stated in (g)(1)(i).

Finally, audible contact must be better defined. If it is OSHA's intention to exclude saw noise as audible contact, then OSHA should specifically state vocal recognition. Again, under certain circumstances, vocal recognition may be difficult to achieve while maintaining the proposed 2-tree distance without the use of a spotter.

4. (e)(5)(i): The use of guard-tips on chainsaws reduces the danger of kick-back only under certain conditions--specifically, when the log or limb is elevated and does not have any off angle to cause pinching on the bar. The tips may in fact cause more hazards than saws with no tips because they require the buckler to maintain working stances that are less stable, while also dealing with the

problem of the limb or log pinching the bar. To reduce the hazard of kick-back, it is recommended that where possible, chainsaws be equipped with chain brakes and kick-back-reducing chains.

An additional requirement for chainsaws should include that all chainsaw mufflers have a spark arresting design.

5. (e)(3)(v): "Firmly" supported should be clarified to mean that the chainsaw should be started with the worker anchoring the chainsaw with his foot, using the foot pad located at the rear handle section of the saw.
6. (e)(3)(viii): The rule should require that the chain-brake, if available, be engaged any time the worker is moving from one location to another, unless working on the same tree or log, regardless of the distance. If the distance is over the 50 feet specified by OSHA, then the saw should be shut off. An exception should be made for tree fellers who should be allowed to run the saw at idle when using their escape path. Once they are at a safe distance, the feller should be required to shut off the saw.
7. (e)(6)(iv): The proposed standard should be expanded to include the shutting down of the equipment when the operator gets off the machine.
8. (e)(6)(xiii): These "no rider" provisions should not exempt persons for training purposes. Many logging operations occur on rough terrain which would expose any rider to a high risk of injury or death. Serious errors made by a trainer or trainee under these conditions endangers both people; it must be recognized that logging equipment is not designed for training purposes (i.e., the trainer cannot take control of the equipment from the trainee in a safe, orderly fashion). Therefore, it is recommended that OSHA stress the importance of balance in pre-worksites training of operators under a controlled environment and "on-the-job" training that does not involve carrying passengers on vehicles that are not designed to do so safely.
9. (f)(1)(i) and (f)(1)(ii): Roll-over protective structures (ROPS) are a protective device to reduce fatalities from equipment rollovers. The extent of the problem can be gauged through the NIOSH NTOF database. Between 1980 and 1985, 80 deaths occurred due to equipment rollovers in the logging industry. This equates to an industry-wide fatality rate of 15 deaths per 100,000 workers. This rate indicates the need for a standard requiring retrofitting of ROPS for logging equipment because of the high risk of equipment rollovers. It is recommended that this section be modified to require all logging equipment (e.g., skidders, tractors, loaders, bulldozers) be equipped with ROPS. All equipment retrofitted with ROPS should at the same time be retrofitted with seat belts where necessary.

10. (f)(1)(iii): OSHA should maintain that FOPS be retrofitted at the same time as the retrofitting of ROPS on older equipment.
11. (f)(5)(iii): OSHA should consider that the safe use of trees or stumps as guideline anchors is highly dependent on the tree species involved. In general, the genera of trees that include spruce, fir, and aspen are shallow rooted trees. Other species, such as black cherry and certain species of pine, are also shallow rooted and will not provide a reliable anchor for guidelines. It is recommended that OSHA review this section and develop an exclusion list of the species that are known to be shallow rooted, and thus unsuitable for anchoring purposes. Assistance should be sought from the U.S. Department of Agriculture's Forest Service in compiling this exclusion list.
12. (g)(2)(iii): OSHA should consider that at least two methods of making wedges and backcuts exist. The standard method is adequately described in this section. The second method is occasionally used, especially in veneer log harvesting operations. The second method is known as the "Humboldt" method. In the Humboldt method, the undercut is level, but the wedge is removed from below the initial cut rather than above the cut (Figure 1). Therefore, for either method, the backcut should be into the wedge, but not necessarily above the initial undercut as stated in (g)(2)(v). No evidence is known to support that the standard method of cutting wedges and backcuts is any safer than the Humboldt wedge and backcut method.

Additional comments on the cutting of wedges and performing backcuts should include the removal of flutes on the butt of the tree so that the wedge is made into the bole rather than the flutes. The removal of flutes also allows for a cleaner, more accurate backcut, reducing the risk of missing the front wedge (Figure 2).

Finally, OSHA should address the issue of "domino" felling of trees, a practice sometimes seen in pulpwood logging operations (particularly plantations). Domino cutting occurs when a feller cuts wedges and partial backcuts in a series of trees that form a continuous line. The last tree is felled into the line pushing the trees to the ground in a chain-reaction fashion.

It is recommended that OSHA recognize this hazardous practice by specifically stating that only one tree be felled by the feller at a time, and that no wedges or backcuts be made on additional trees until the one he is working on is on the ground. Exceptions to this standard may be made if it is apparent to the feller and his supervisor that another tree must be removed to reduce the hazard of felling the original tree. In general, once the backcut has

been initiated on a tree, it is recommended that the tree be felled before cutting any other tree because of the loss of stability in the standing tree caused by the backcut.

13. (g)(7)(v): This provision should be expanded to include passengers that ride in these vehicles. OSHA should require that personnel vehicles have a seat belt for the driver and each passenger, and that the number of passengers permitted in the vehicle be limited to the number of seat belts available in the vehicle. Furthermore, OSHA should require all occupants of the vehicle wear the seat belt.
14. (g)(9)(vii): It is recommended that OSHA not exclude the use of binders during the unloading process even when the load is at or below the height of the truck bed stakes. The release of binders should not be allowed until a sufficient number of logs have been removed below the stake's height to insure the stability of the remaining logs. Stakes, while providing a reasonable barrier to logs moving off the truck bed, do not provide the same level of protection as binders.
15. NIOSH recommends that a more specific statement of respiratory protection be included in subparagraph (e)(1), at (vi). The following is suggested: (vi) Where the exposure to respirable wood dust exceeds the permissible exposure limit, respiratory protection shall be provided and used in accordance with Subpart I (1910.134).
16. NIOSH recommends that chainsaws used in logging operations have isolating material inserted between the handle and the chainsaw body to reduce the vibration that is transmitted to the hands and arms of the worker using the saw. Certain commercially available chainsaw models already incorporate this type of isolation, usually as an option at an increase in price. Perhaps it should be required that chainsaws used in commercial logging operations include vibration-isolated handles.
17. Similarly, chainsaws used in logging operations should be equipped with mufflers meeting the chainsaw manufacturers' specifications. If add-on (retrofit) mufflers were to be utilized, they would be effective for noise reduction, but may cause some operational difficulties. A retrofit muffler may contribute to an increase in back pressures that may cause a corresponding decrease in cutting effectiveness. When the saw and muffler is designed as a unit, the system can be developed so both cutting efficiency and noise reduction are achieved.

In addition to the previous comments, other concerns arise from the lack of proposed rules dealing with the inspection or maintenance of logging chains, cables (wire rope), and chokers. It is recommended that OSHA require the inspection of chains and cables for weak points, cracks, stressed links, frayed areas, breaks, or kinks at the beginning of each shift and at least once during the work shift. If a machine operator is aware of any of these hazards, he/she should relieve the tension on the chain or cable as safely as possible and not place a load on the chain or cable until they have been replaced or repaired. Chokers should be inspected by the choke-setter each time the choke is set, with a thorough inspection of the choker claps on a regular basis (4 to 5 times during the work shift). If a kink, fray, crack, or break is noted by the choke-setter, he should stop the activity until repair or replacement can be made.

Chains, cables, and binders being used on trucks to secure logs for transport should be inspected before attaching them to the truck bed and while applying binders. If a kink occurs during the setting of binders, the binder should be released and reset to remove the kink.

OSHA should also examine the additional American National Standards Institute's (ANSI's) standards concerning strength requirements and inspection standards that may exist for chains, cables, chokers, or binders.

NIOSH recommends that OSHA include specific reference to field sanitation requirements in the logging standard. The construction industry standard at 29 CFR 1926.51 and the field sanitation requirements for agricultural workers at 1928.10 represent the minimum acceptable sanitation requirements consistent with public health (NIOSH 1981). In addition, logging operations should be required to have washing facilities for workers due to the high likelihood of loggers having skin contact with naturally occurring dermal irritants.

## FIGURES

1. Alternative methods of making the wedge-cut for felling trees:  
1. standard method; 2. the Humboldt method
2. Cross section of stump with flukes

## ATTACHMENT

1. Memo to Reed (NIOSH) from Myers (NIOSH) regarding data request for occupational injury and fatality statistics in the logging industry, dated July 6, 1989. (Internal Only)

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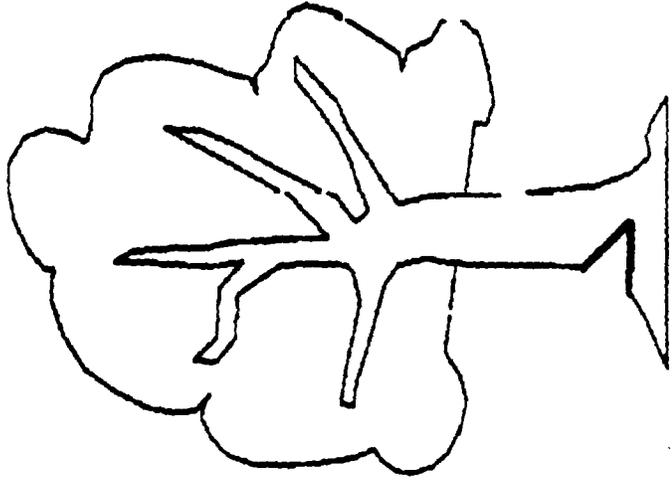
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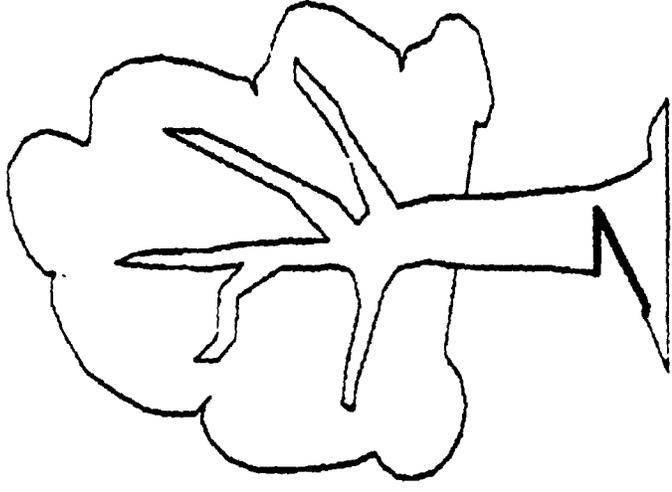
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**Alternative Methods of Making the Wedge-cut  
for Felling Trees: 1. Standard Method; 2. The  
Humboldt Method.**



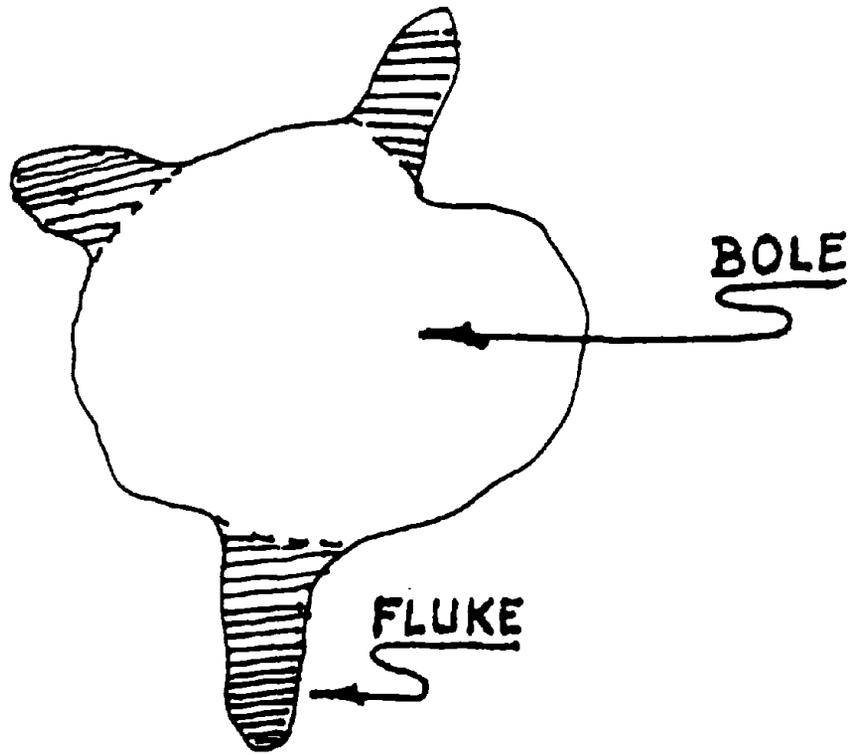
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**Figure 1.**

Figure 2  
CROSS SECTION OF  
STUMP WITH FLUKES



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16. Abstract (Limit: 200 words) This testimony detailed the concerns of NIOSH on the proposed rule changes for logging operations as advanced by OSHA. Specifically, NIOSH supported OSHA in requiring that a worker who is inexperienced in a task be under the close guidance of a person who is experienced in the safe performance of that task. NIOSH also indicated that snakebites are not a frequent hazard to these workers, that all three proposed rules address the need for continuous contact between workers on a logging site while maintaining a safe working distance between fellers and other workers, that the use of guard tips on chainsaws reduces the danger of kick back only under certain conditions, that the rule should require the use of the chain break any time the worker is moving from one location to another, that "no rider" provisions should not exempt persons for training purposes, that roll over protective structures are a protective device to reduce fatalities from equipment rollovers, that OSHA should consider that the safe use of trees or stumps as guideline anchors is highly dependent on the tree species involved, and that OSHA should consider that at least two methods of making wedges and backcuts exist. <i>The Occupational Safety and Health Administration</i>					
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